American Indian Law Review

Volume 24 | Number 2

1-1-2001

Removing Dam Development to Recover Columbia Basin Treaty Protected Salmon Economies

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REMOVING DAM DEVELOPMENT TO RECOVER COLUMBIA BASIN TREATY PROTECTED SALMON ECONOMIES

Rollie Wilson*

Table of Contents

I. Introduction	358
II. The 1855 Treaties Reserve the Harvest of an Economically Viable Fishery	361
A. Tribal Economies in the Columbia Basin	363
B. Negotiating to Reserve their Salmon Economies	368
III. The 1855 Treaties are a Continuing Source of Law Governing the Columbia Basin	373
A. The United States Never Abrogated the 1855 Treaties	373
B. Legislation Authorizing Dam Construction Affirms the 1855 Treaties	375
C. Management and Conservation Statutes Affirm the 1855 Treaties	377
IV. Supreme Court Precedent Interpreting and Enforcing the 1855 Treaties Requires the Tribes' Fisheries be Maintained at Economically Viable Levels	379
A. Limiting Development that Diminishes the Tribes' Harvests ...	380
B. Protecting Treaty Reserved Resources at Economically Viable Levels	384
C. Requiring Economically Viable Salmon Harvests	387
V. The Columbia Basin Dams Limit Salmon Viability and Sustainability	390
A. Impacts of the Dams on Salmon Habitat and Populations	391
B. Failed Mitigation Attempts	398
C. Status Quo Management Under the Endangered Species Act ...	405
D. Returning Salmon to the River through Dam Removal	409
VI. Conclusion	417

Abstract

In the Pacific Northwest, the Columbia and Snake Rivers once supplied habitat for one of the world's most productive salmon fisheries. The Indian

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Nations residing in the Columbia Basin harvested these abundant salmon runs to provide for their daily nourishment, winter food supply, and their economic livelihood. In 1855, recognizing the pressures of increasing non-Indian settlement, these tribes ceded millions of acres of land to the United States but reserved their primary economic resource — the salmon fisheries. Despite assurances that the fisheries would be maintained as the tribes knew them, the United States extensively developed the Columbia Basin and depleted the fisheries. Attempting to compensate for the effects of the dams, the United States pursued mitigation policies that have failed to sustain salmon populations at harvestable levels. In contrast, the United States Supreme Court has established that such treaty-reserved resources must be maintained at economically viable levels. Moreover, United States laws governing development in the Columbia Basin consistently affirm the force of the 1855 treaty agreements. To restore the tribal fisheries and comply with its 1855 treaty obligations, the United States must remove its damaging hydropower development in the Columbia Basin. Most of the recent studies on the biological and ecological issues of salmon recovery conclude that dam removal is the only option that will rebuild self-sustaining salmon populations and restore tribal fisheries to economically viable levels.

I. Introduction

In the Pacific Northwest along the Columbia and Snake Rivers, the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, and the Confederated Tribes and Bands of the Yakama Indian Nation share an inextricably linked existence with the great salmon runs of the region.¹ This relationship was forged over thousands of years as the Tribes derived their daily sustenance and economic livelihood from the ten million to sixteen million salmon that returned to the Columbia Basin each year. In 1855, recognizing the pressures of increasing non-Indian settlement, the Tribes protected and reserved their salmon harvests in treaty with the United States. However, subsequent U.S. dam development altered the ecology of the basin and decimated the Tribes' fisheries.

The Columbia Basin is currently the most dammed watershed in the world with more than 500 federal, state, and private dams. In addition to licensing each

1. Hereinafter I refer to these four tribes as "the Columbia Basin Tribes" or "the Tribes." In developing political, legal, and ecological arguments for reviving the Tribes' salmon based economies, this article focuses on the four Tribes signing treaties at the 1855 Walla Walla treaty council and possessing treaty fishing rights to Columbia Basin salmon. However, the issues addressed here are raised by other tribes living throughout, and beyond, the Columbia Basin and apply to many other river systems. In addition, anadromous fishes of economic value to the Tribes include both salmon and steelhead trout; however, because the impacts of river development are similar for different species of anadromous fish, I will use "salmon" to refer to both species.

of these dams, the federal government's construction of large hydropower and multipurpose dams began with the Bonneville Dam near the mouth of the Columbia in 1938. By 1975, the United States developed a total of nine major dams along the mainstem Columbia and lower Snake Rivers. On the upper Columbia, one of these dams is impassable to salmon and blocks access to 1100 miles of mainstem and tributary habitat. On the lower portions of the Columbia and Snake Rivers, the reservoirs of the other eight major federal dams create slackwater conditions from Bonneville Dam to Lewiston, Idaho. Lewiston is now an inland seaport 471 miles inland from the Pacific Ocean.

As a result of this development eliminating or degrading nearly all Columbia Basin salmon habitat, fifty-nine Columbia Basin salmon stocks passed into extinction in less than a century. To remain viable, many of the remaining stocks are dependent on hatchery production. Currently, ten Columbia Basin salmon stocks are listed under the Endangered Species Act (ESA). Of the salmon that continue to return to the Basin, each must contend with some or all of the eight federal dams on the lower Columbia and Snake Rivers. In addition to posing a substantial impediment to up or downstream migration, these dams impose hundreds of miles of lacustrine conditions where the rivers once ran cool and clean. Only 150 miles of the Columbia and Snake rivers still provide free-flowing alluvial salmon habitat: the Hanford Reach on the Columbia River and a portion of Snake River downstream from the Hells Canyon Complex.

Promoting economic extraction of the region's resources, federal agencies governing river development limited their treaty obligations to mitigating the effects of the dams on the Tribes' fisheries. These federal agencies only required tribal access to the fisheries and a tribal share of whatever salmon remain in the rivers. Contrary to this narrow reading of U.S. treaty obligations, the 1855 treaties reserve tribal salmon harvests far above levels sustained by U.S. mitigation policies. Tribal history and an analysis of the 1855 treaty negotiations demonstrate that the Tribes specifically reserved the harvest of an economically viable fishery. Moreover, the United States Supreme Court recognizes this reservation and enforced it against development that threatens the Tribes' fisheries.

By diminishing salmon populations below economically harvestable levels, U.S. development of the Basin violates the 1855 treaties with the Columbia Basin Tribes. To comply with the treaties, the United States must recover salmon stocks by removing some of the dams along the Columbia and Snake Rivers. Contrary to the past thirty years of unsuccessful mitigation efforts offered by federal agencies, dam removal directly addresses the environmental degradation that threatens salmon stocks. Nearly every recent study on Columbia Basin salmon recovery concludes that salmon populations cannot be recovered to self-sustaining levels without breaching some of the major federal dams on the Columbia and Snake rivers. As the evidence supporting dam removal continues to build, regional politicians have dug in their heels against removing U.S. development. However, if the United States is to comply with its legal

obligations to the Columbia Basin Tribes, the fisheries must be recovered to economically viable levels as was ratified by the 1855 treaties.

Figure 1. Map of Columbia Basin Tribes, dams, and primary rivers.²

2. WY-KAN-USH-MI WA-KISH-WIT (SPIRIT OF THE SALMON), THE COLUMBIA RIVER ANADROMOUS FISH RESTORATION PLAN OF THE NEZ PERCE, UMATILLA, WARM SPRINGS, AND YAKAMA TRIBES 3-32 fig. 3.7 (1995) [hereinafter SPIRIT OF THE SALMON].

II. The 1855 Treaties Reserve the Harvest of an Economically Viable Fishery

The exclusive right of taking fish in all the streams, where running through or bordering said reservation, is further secured to said confederated tribes and bands of Indians, as also the right of taking fish at all usual and accustomed places in common with the citizens of the Territory, and of erecting temporary buildings for curing them; together with the privilege of hunting, gathering roots and berries and pasturing their horses and cattle upon open and unclaimed land.³

In 1855, as May turned over into June, the Tribes convened in the Walla Walla country of the Washington Territory for a treaty council with two representatives from the United States. The U.S. representatives were Governor Isaac Stevens from the Washington Territory and Superintendent of Indian Affairs, Joel Palmer, from the Oregon Territory.⁴ Having recently negotiated treaties and extensive land cessions along the Washington coast, Stevens was eager to complete treaties in the interior of the territory that would secure access to timber, gold, and settlement routes to the coast.⁵ Unlike Palmer, who served as a peace commissioner and sought amicable settlements with the Indians to avoid bloodshed,⁶ the military-trained Stevens was deceptive and ambitious as he sought to remove Indians from trade and settlement routes leaving the choice places for white settlement.⁷

However, the Columbia Basin Indians were prepared for Stevens. The Indians were well informed about what the white men wanted, and they knew of tribes in California who had entered into treaties only to find them worthless and their land gone.⁸ To impede Stevens, Kamiakin, the most

3. Treaty with the Yakima, June 9, 1855, art. 3, 12 Stat. 951, 953. This provision in the Yakama's (reflecting the tribe's recent change in the spelling of its name) treaty is nearly identical to the fishing provisions contained in treaties with other Columbia Basin Tribes; *see also* Treaty with the Tribes of Middle Oregon, June 25, 1855, 12 Stat. 963; Treaty with the Nez Percés, June 11, 1855, 12 Stat. 957; Treaty with the Walla Walla, June 9, 1855, 12 Stat. 945.

4. *See* Manuscript of the Proceedings at the 1855 Walla Walla Treaty Council (1855), in ISAAC INGALLS STEVENS, A TRUE COPY OF THE RECORD OF THE OFFICIAL PROCEEDINGS AT THE COUNCIL IN THE WALLA WALLA VALLEY, 1855, at 8 (Darrell Scott ed., 1985) [hereinafter COUNCIL IN THE WALLA WALLA VALLEY].

5. *See id.* at 7.

6. *See* THEODORE STERN, CHIEFS & CHANGE IN THE OREGON COUNTY: INDIAN RELATIONS AT FORT NEZ PERCÉS 1818-1855, at 294 (1996) [hereinafter CHIEFS & CHANGE].

7. *See id.* Superintendent of Indian Affairs Stevens, charged with fulfilling federal trust obligations to the Indians, was also known as the new Governor of the Washington Territory and Chief Engineer responsible for surveying a proposed northern railroad. *See* COUNCIL IN THE WALLA WALLA VALLEY, *supra* note 4, at 8.

8. *See* CHIEFS & CHANGE, *supra* note 6, at 293; COUNCIL IN THE WALLA WALLA VALLEY,

prominent Yakama chief, organized the Indians into a unified front whereby they would establish tribal boundaries and not offer any land for sale to the United States.⁹ Yet after more than two weeks of negotiations, Stevens remained undeterred.¹⁰ Finally, by dealing individually with the chiefs at night, after the council had closed for the day, Stevens was able to induce the chiefs into signing treaties.¹¹ Nevertheless, the Indians' solidarity and reluctance to negotiate served them well in reserving a greater part of their land base¹² and their tribal fisheries.

The provisions agreed to at the 1855 Walla Walla council reserve to the Tribes "[t]he exclusive right of taking fish . . . in all the streams . . . running through or boarding . . . [the] reservation, . . . [and] the right of taking fish at all usual and accustomed places in common with the citizens of the Territory."¹³ Although courts use these provisions to determine the nature of the Tribes' reserved fishing rights, this language is only an indication of the fisheries' importance to the Tribes. It does not represent the Tribes' views with regard to management of their fisheries. The importance of salmon fishing to the Tribes is not fairly understood through the language of white hands anxious to constrain tribal autonomy so that settlement and resource appropriation could begin. Rather, U.S. courts and policy makers along the Columbia and Snake Rivers need to read the treaties with an awareness of what fishing means *to the Tribes*.

Read in the context of the Tribes' historical fishing practices, the 1855 treaties reserve to the Tribes' the harvest of an economically viable fishery. Tribal history demonstrates that salmon fishing has always been the foundation of the Tribes' economic structure. Recognizing the importance of salmon to the Tribes, Stevens drafted treaty provisions that would assure their reservation and protection. Moreover, in their negotiations with Stevens, the Tribes insisted on maintaining their salmon harvests and relied on Stevens' promises that the treaties would secure their fisheries against detrimental encroachment. Using this history as a guide demonstrates that the language of the 1855 treaties reserves more than the right to fish in a nearly empty river.

supra note 4, at 13.

9. See CHRISTOPHER L. MILLER, *PROPHETIC WORLDS: INDIANS AND WHITES ON THE COLUMBIA PLATEAU* 111-12 (1985); *CHIEFS & CHANGE*, *supra* note 6, at 275-76.

10. See *CHIEFS & CHANGE*, *supra* note 6, at 310.

11. See *id.*

12. For example, Stevens originally hoped to group the Cayuses, the Walla Wallas, and the Umatilla onto the Nez Percés' reservation, but drafted another reservation for these tribes when they did not consent to his original plan. See *COUNCIL IN THE WALLA WALLA VALLEY*, *supra* note 4, at 89-90.

13. Treaty with the Yakima, June 9, 1855, 12 Stat. 951.

A. Tribal Economies in the Columbia Basin

Tribal economies throughout the Columbia Basin depend on abundant seasonal salmon harvests. Unlike extractive economies where resources are consumed without regard for their long term sustainability,¹⁴ the Tribes' economic structure is highly dependent on maintaining the return of the annual salmon runs. This dependence is demonstrated by the Tribes' cultures which express the primacy of salmon in their peoples' lives.¹⁵ From time immemorial, salmon have returned to provide the Tribes with physical and spiritual nourishment. In this densely populated region of North America,¹⁶ there were "no legends in the tribal lore relating to pestilence, famine and want along the river."¹⁷ Rather, with salmon at their foundation, the Tribes' economies flourished establishing the Columbia Basin as one of the great cultural and economic centers of North America.¹⁸

Linking salmon with their continued survival, many of the region's Tribes note that the origin of human life coincided with the arrival of fish in the rivers.¹⁹ In Wishram accounts of the arrival of humans, Coyote transforms the spirit world into one which will provide for the coming humans.²⁰ In one account, Coyote learns of two Swallows who were preserving fish in a pond.²¹ Disguised, Coyote enters their camp to free the fish into the river. Coyote tells the Swallows, "Soon now people will come into this land. . . . Now they will come into this land; those fish will be the people's food. . . . When the people will come they will catch the fish; . . ."²² Releasing salmon into the river, Coyote reorders the spirit world into the natural world to provide for human sustenance.²³

14. See LISA MIGHETTO & WESLEY J. EBEL, *SAVING THE SALMON: A HISTORY OF THE U.S. ARMY CORPS OF ENGINEERS' EFFORTS TO PROTECT ANADROMOUS FISH ON THE COLUMBIA AND SNAKE RIVERS* 18-26 (1994) (reporting on the wasteful and irresponsible fishing practices of canneries and fisherman during the late 1800s while salmon were still abundant). "[R]efuse from the canneries amounted to 7 million pounds every year." *Id.* at 25.

15. See Yvonne Smith & Laura Berg, *Ancient Tradition Modern Reality*, WANA CHINOOK TYMOO, Issue 1, 1998, at 10.

16. See CARL WALDMAN, *ATLAS OF THE NORTH AMERICAN INDIAN* 29-30 (1985).

17. CLICK RELANDER ET AL., *TREATY CENTENNIAL 1855-1955: THE YAKIMAS* 41 (1955) [hereinafter *TREATY CENTENNIAL*].

18. See *id.* at 42-44; *SPIRIT OF THE SALMON*, *supra* note 2, at 2-4.

19. See Barbara Leibhardt, *Law, Environment, and Social Change in the Columbia River Basin: The Yakama Indian Nation as a Case Study, 1840-1933*, at 328-29 (1985) (unpublished Ph.D. dissertation, University of California at Berkeley) (on file with author) [hereinafter *Yakima Indian Nation Case Study*].

20. See JAROLD RAMESY, *COYOTE WAS GOING THERE: INDIAN LITERATURE OF THE OREGON COUNTRY* xxiv (Jarold Ramesy ed., 1977) [hereinafter *COYOTE WAS GOING THERE*]; *Yakima Indian Nation Case Study*, *supra* note 19, at 328.

21. See *COYOTE WAS GOING THERE*, *supra* note 20, at 47.

22. *Id.* at 49.

23. See *id.* at xxiii-xxiv; EUGENE S. HUNN, *NCH'I-WANA, THE BIG RIVER: MID-COLUMBIA*

The Tribes' historical reliance on salmon is well documented by the testimony taken in *United States v. Winans*.²⁴ In this case, the Winans brothers displaced a highly productive Yakama fishery by purchasing property fronting the Columbia River and erecting state licensed fish wheels in the prime fishing locations.²⁵ Seeking enforcement of their 1855 treaty reservations, many Yakama came before the United States District Court in the Southern Division of Washington to testify about their dependence on salmon and the nourishment the fish provided.

One witness, William Speedies, was fifteen at the time of the 1855 treaties and a lifelong resident of the Wisham fishery. He stated, "[Salmon] is the only thing we have been raised on; that is all I depend on. . . . [Without salmon,] I am just pretty near dried out. . . . Whenever I had [sic] plenty of salmon to eat I am healthy, I am strong; . . ." ²⁶ Another Yakama fisherman, Louis Simpson, who was a grown man at the time of the 1855 treaties, stated, "Now you see the Indians used to have a good time and eat lots of fish, but now their mouth is dry. . . . [Salmon] makes a man look fresh and stout. The Indians that were raised [at the fishery] were fat. I am a fat looking man myself. I eat salmon and berries."²⁷

In addition, Chief White Swan, a plaintiff in the *Winans* case, explained how farm raised animals do not provide for the Indians as the salmon do. He testified, "They could not very well without salmon get along — the Indians were raised with salmon and they want salmon all the time. . . . I can't myself get along without the salmon. I don't know how to eat hog meat; I don't like it well myself, and that is the way with the other Indians, I suppose."²⁸ Indeed, many of the other Indians to testify before the court stated that without salmon they were "hungry," "dry," or had "nothing to eat."²⁹

This same hunger for salmon is expressed generations later by the region's Tribes. A 1998 issue of *Wana Chinook Tymoo*, a publication of the Columbia River Inter-Tribal Fish Commission, asks, "Can cultures based on salmon survive without the sacred fish?" Reporting on modern conditions, the journal notes that the shortage of salmon has imposed dramatic changes in the Tribes' diet resulting in deteriorating physical health similar to that expressed by the *Winans* plaintiffs.³⁰ As the availability of traditional foods, like salmon, decreases the rate of diabetes, cancer, and heart disease has

INDIANS AND THEIR LAND 154-55 (1990).

24. 198 U.S. 371 (1905).

25. See *id.* at 377-79.

26. Testimony and Final Report of Examiner at 177-78, *United States v. Winans*, 198 U.S. 371 (1905) (No. 180); Record at 100-01, *Winans* (No. 180).

27. Testimony and Final Report of Examiner at 130-33; Record at 70-72, *Winans* (No. 180).

28. Testimony and Final Report of Examiner at 103; Record at 54, *Winans* (No. 180).

29. Testimony and Final Report of Examiner at 161; Record at 90, *Winans* (No. 180).

30. See Smith & Berg, *supra* note 15, at 14.

increased among the Columbia Basin Tribes.³¹ Unlike their ancestors who lived into their nineties and beyond, the Indian people of the Basin today face a below-average life expectancy and a high death rate.³²

Before European settlers inundated the rivers with dams and irrigation ditches, the Columbia Basin Tribes flourished from the enormous salmon runs. The rivers were "richly stocked"³³ with salmon and provided "aboriginal luxury" and "wealth."³⁴ According to revised estimations of the pre-contact population, adjusted to account for the spread of European infectious diseases, the Tribes' annual harvest was 41 to 43 million pounds or 4.5 to 6.3 million fish.³⁵ Harvesting this number of fish was not a sporadic recreational pursuit. Rather, like farming, the abundant and regular salmon runs assured the Tribes a consistent harvest to maintain their economic viability.³⁶

The Tribes tailored their economic structure around the geography of the Columbia Basin to ensure their long term economic sustainability. Before the dams hegemonized the landscape, the Columbia and Snake Rivers were punctuated by a rocky shoreline creating narrow, swift-moving channels. In these places, the Tribes' primary fishing grounds, the current forced salmon to the surface of the water enabling the Tribes' harvest.³⁷ A single dip of a fisherman's net retrieved one, two, or three fifty pound fish.³⁸ Using dip nets and spears, an experienced hand could catch approximately 100 salmon, or two to three tons, in a day's work.³⁹

The extent of the harvest was reflected in tribal diets. In addition to roots, berries, and deer meat, salmon were an important staple providing up to 40% of the Tribes' diet.⁴⁰ Given this heavy reliance on salmon, the Tribes

31. *See id.*

32. *See id.*

33. *See* Helen Hersh Schuster, *Yakima Indian Traditionalism: A Study in Continuity and Change 73-74* (1975) (unpublished Ph.D. dissertation, University of Washington) (on file with author) [hereinafter *Yakima Indian Traditionalism*].

34. *See* TREATY CENTENNIAL, *supra* note 17, at 41; RICHARD WHITE, *ORGANIC MACHINE* 23 (1995).

35. *See* Joseph E. Taylor, III, *Making Salmon: Economy Culture, and Science in the Oregon Fisheries, Pre-contact to 1960*, at 29 (1996) (unpublished Ph.D. dissertation, University of Washington) (on file with author) [hereinafter *Making Salmon*]; NORTHWEST POWER PLANNING COUNCIL, *COMPILATION OF INFORMATION ON SALMON AND STEELHEAD LOSSES IN THE COLUMBIA RIVER BASIN 69-75* (1986).

36. *See* *Making Salmon*, *supra* note 35, at 14; *Yakima Indian Nation Case Study*, *supra* note 19, at 326-28 (discussing the seasonal timing various salmon runs utilized by the Yakama).

37. *See* HUNN, *supra* note 23, at 148; WHITE, *supra* note 34, at 16.

38. *See* TREATY CENTENNIAL, *supra* note 17, at 42.

39. *See id.*

40. *See* WHITE, *supra* note 34, at 18 (reporting that salmon made up 30 to 40% of the Indians' diet); *Yakima Indian Nation Case Study*, *supra* note 19, at 329 (reporting 33%); *see also* *Making Salmon*, *supra* note 35, at 21; Brief for Appellants at 7, *United States v. Winans*, 198 U.S. 371 (1905) (No. 180).

developed a variety of ways to prepare their harvest. The Tribes utilized smoke houses, dried salmon on poles, cooked them in the sun, or concentrated the fish into a mixture called C'láy.⁴¹ These rich salmon harvests also sustained the Tribes through the winter months. A family might store 600-700 pounds of dried salmon in preparation for the winter.⁴² Describing the proportion of salmon in the Indians' diet, Thomas Simpson, a *Winans* plaintiff, stated, "That is the greatest food they have; . . . that is what raised us."⁴³ Decades later, a 1941 Bureau of Indian Affairs study reported that the average Yakama family consumed 1800 pounds of salmon per year.⁴⁴ Thus, after more than a century of contact with Europeans, salmon continued to be an important staple in the Tribes' diet.

As salmon provided the Columbia Basin Tribes' primary spiritual and physical nourishment, the Tribes also derived their principle trade and economic activities from their salmon harvests.⁴⁵ Many of the Indians to testify in the *Winans* case made clear that they depended on the salmon harvests "for their living."⁴⁶ In addition, observers of the nineteenth-century Indian fisheries noted that, "the Indians makes [sic] the salmon their commodity of trade,"⁴⁷ as they engaged in salmon "trade . . . and [they] sold them."⁴⁸

Extensive salmon trade existed in the region both prior to European contact and after. Before the reservoirs inundated the Dalles and Celilo Falls, these falls were recognized as the principle trading centers of the Columbia Basin.⁴⁹ Tribes from as far as the Plains, Northern California, and Puget Sound traveled a network of trails leading to these economic centers.⁵⁰ In the *Winans* testimony it was stated that the trails had been used for "hundreds of years,"⁵¹ were "well beaten, . . . [and] at places they were forty or fifty feet wide."⁵² Tribes traveling to the region imported skins, furs, slaves, wool, clothing, shells, dried deer and buffalo meat, seal oil and meat, hemp, wood carvings, and berries.⁵³ The most desired export obtained

41. See Testimony and Final Report of Examiner at 141; Record at 77, *Winans* (No. 180); Smith & Berg, *supra* note 15, at 14.

42. See Testimony and Final Report of Examiner at 141; Record at 77, *Winans* (No. 180).

43. See Testimony and Final Report of Examiner at 91; Record at 47, *Winans* (No. 180).

44. See Yakima Indian Nation Case Study, *supra* note 19, at 330 (citing Bureau of Indian Affairs, Officials Makes Survey of Diets (Aug. 2, 1945) (located in folder "Indians-Yakima-Government," Yakima Valley Museum, Yakima, WA)).

45. Brief for Appellants at 41-42, *United States v. Winans*, 198 U.S. 371 (1905) (No. 180).

46. Testimony and Final Report of Examiner at 162; Record at 91, *Winans* (No. 180).

47. Testimony and Final Report of Examiner at 231; Record at 135, *Winans* (No. 180).

48. Testimony and Final Report of Examiner at 289; Record at 173, *Winans* (No. 180).

49. See TREATY CENTENNIAL, *supra* note 17, at 43; WHITE, *supra* note 34, at 23.

50. See Making Salmon, *supra* note 35, at 31.

51. Testimony and Final Report of Examiner at 258; Record at 153, *Winans* (No. 180).

52. Testimony and Final Report of Examiner at 267; Record at 159, *Winans* (No. 180).

53. See TREATY CENTENNIAL, *supra* note 17, at 44; Making Salmon, *supra* note 35, at 32.

from the Columbia Basin Tribes was pemmican. Pemmican, a dried concentrated salmon meal, traveled well and provided nourishment through the winter.⁵⁴

Moreover, the economic significance of Columbia Basin salmon was not lost on the non-Indian settlers. With more than fifty successful canneries operating at mouth of the Columbia River in 1883,⁵⁵ settlers further upstream in the Columbia Basin also invested in the valuable salmon harvests. For example, in 1889 the Winans brothers purchased more than seventy acres of non-agricultural land and spent \$18,000 to construct and maintain four fish wheels on the Columbia River.⁵⁶ In addition, on the Oregon side of the river, one of the Seufert brothers' fish wheels harvested an annual 146,000 pounds of salmon per season.⁵⁷ Seufert also invested in purchasing salmon from the Indians. In 1895 he purchased 183,440 pounds, and in 1896 he purchased 55,209.⁵⁸ Thus, in 1895 for approximately six months of work, tribal fishermen could earn up to \$5500 selling salmon to a local cannery.⁵⁹ As Helen Hersch Schuster concluded in her extensive dissertation of the social and political organization of the Yakama Indians, "[f]ishing was a major economic activity."⁶⁰

Commercial trade remained a significant source of income for the Tribes despite the considerable economic changes of the twentieth century. A 1940s study indicated that while the Tribes consumed most of their salmon harvest, 40% of the harvest went to the market.⁶¹ Even later, in 1956 before Celilo Falls was inundated by water filling in behind the Dallas Dam, salmon continued to be an important economic resource for the Tribes. The flooding of Celilo Falls cut off means of support to many Indians and increased unemployment on the Yakama reservation by 45%.⁶² Thus, well into the

54. See *Making Salmon*, *supra* note 35, at 31-32.

55. See MIGHETTO & EBEL, *supra* note 14, at 19.

56. See Testimony and Final Report of Examiner at 330, 347-51; Record at 200, 212-13, *Winans* (No. 180).

57. See MIGHETTO & EBEL, *supra* note 14, at 24.

58. See Testimony and Final Report of Examiner at 289; Record at 173, *Winans* (No. 180).

59. In 1895, salmon sold for one to three cents a pound. Thus, for 183,440 pounds of salmon the proceeds ranged from \$1834 to \$5503. Seufert estimated the proceeds at \$3500 to \$5000. See Testimony and Final Report of Examiner at 294-97; Record at 177-78, *Winans* (No. 180).

60. *Yakima Indian Traditionalism*, *supra* note 33, at 67.

61. See *Yakima Indian Nation Case Study*, *supra* note 19, at 339-40 (citing Office of Indian Affairs, Circular of Information to Superintendents, Wildlife Conservation Officers, etc., Minutes of Meeting of Indian Service Personnel in the Pacific Northwest to Discuss Indian Hunting, Fishing, and Trapping Problems (May 28, 1940) (located in folder 115B "General Wildlife Correspondence and Circulars," Box 351, Decimal Subject File 921, Yakima Agency, Bureau of Indian Affairs, Record Group 75, National Archives-Seattle)).

62. See *Yakima Indian Traditionalism*, *supra* note 33, at 294.

twentieth century, the Tribes relied on salmon harvests to maintain their economies.

The Columbia Basin Tribes' relationship to salmon is all encompassing. Although non-Indians have sometimes recognized the spiritual and cultural aspects of this relationship, non-Indians must also acknowledge the economic importance of salmon to the Tribes. From time immemorial, the Columbia Basin Indians have relied on their salmon harvests to nourish themselves and as a basis for extensive trade. Salmon were, and continue to be, the heart of the Tribes' economies. Thus, in their 1855 treaty negotiations, the Tribes reserved more than the opportunity to recreationally fish at the river's edge. Rather, the fishing provisions contained in the 1855 treaties were intended to secure the Tribes' economic livelihood.

B. Negotiating to Reserve their Salmon Economies

Dependent on salmon for their primary nourishment and economic livelihood, the Tribes emphasized the importance of maintaining their salmon fisheries in the 1855 treaty negotiations with the U.S. However, subsequent development of the Columbia Basin has extensively degraded the Tribes' fisheries. This violation continues even though all parties to the 1855 treaties knew that the fishing provisions were essential to finalizing any agreement. To comply with the legal rights and responsibilities of the 1855 treaty fishing provisions, federal agencies must govern the Columbia Basin to provide for the maintenance of the Tribes' economic resources.

Recognizing the Columbia Basin Tribes' dependence and insistence on maintaining their salmon fisheries, the Stevens Treaty Commission developed fishing provisions specifically for its treaties with the Indians of the Pacific Northwest.⁶³ The provisions were the result of reports from Indian agents in the region and Stevens' research. The idea appears to be first mentioned in a report by an Indian agent on Puget Sound. His 1853 annual report recommended that "when treaties are made with these tribes, . . . their fishing grounds [should] be granted [to] them."⁶⁴ A year later, Stevens initiated research on the Indians' economic activities to help him develop treaty provisions that would secure the Tribes' fisheries.

63. Report from Edward Swindell, Jr., to the U.S. Department of the Interior, Office of Indian Affairs, Report on Source, Nature and Extent of the Fishing, Hunting and Miscellaneous Related Rights of Certain Indian Tribes in Washington and Oregon Together with Affidavits Showing Location of a Number of Usual and Accustomed Fishing Grounds and Stations 1 (Aug. 26, 1942) (on file with author) [hereinafter Swindell Report].

64. See Summary of Anthropological Report from Barbara Lane, Ph.D. to the court in *United States v. Washington*, 384 F. Supp. 312 (W.D. Wash. 1974), Political and Economic Aspects of Indian-White Culture Contact in Western Washington in the Mid-19th Century 25 (May 10, 1973) (on file with author) (quoting a 1853 report from E. A. Starling, Indian agent for Puget Sound) [hereinafter Political & Economic Aspects].

The research prepared for Treaty Commissioner Stevens reveals that the commission generally understood that the Tribes' fisheries were central to their economic structure.⁶⁵ Much of this research was performed by George Gibbs, a lawyer-ethnologist who drafted Stevens' 1854-55 treaties along the coast of Washington.⁶⁶ Visiting the Columbia Basin as a member of Stevens' survey party for the projected northern route of the transcontinental railroad,⁶⁷ Gibbs' observed the Indians' fishing practices.⁶⁸ Gibbs reported to Stevens regarding the location of fishing grounds, the importance of the salmon as food staple, and the extensive salmon trade.⁶⁹ Subsequently, at a meeting in early December 1854, the Stevens Treaty Commission drafted the provisions that would account for this important aspect of the Indians' economies.⁷⁰ Probably looking to Gibbs' expertise, the commission described the Tribes' reserved fisheries as "usual and accustomed" and "in common with the citizens of the Territory."⁷¹ Having developed these unique provisions, Stevens must have known that securing the Tribes' fisheries was essential to reaching an agreement with the Tribes.

Significantly, the language of the fishing provisions developed by the Stevens Treaty Commission in the winter of 1854 contained no restrictions on tribal fishing. Reviewing this language for the U.S. Department of Justice in the *United States v. Washington* litigation,⁷² Dr. Barbara Lane concluded that the commission did not contemplate or intend any restrictions on tribal fishing.⁷³ Assessing the phrase "usual and accustomed," Lane stated, "There is no mention of restrictions as to purpose, time, or method of taking [salmon] either in the treaties themselves or in the official records relating to treaty proceedings."⁷⁴ Similarly, Lane found "nothing in the official record to suggest that the U.S. intended 'in common' to connote future control by 'citizens' over Indians."⁷⁵ Looking at all the available evidence, she concluded that both parties intended for the Tribes to continue harvesting

65. See Report from Barbara Lane to the Department of Justice, *Usual and Accustomed Indian Fisheries in the Yakima Basin: Anthropological and Ethnohistorical Evidence* 20 (Dec. 1994) (on file with author) [hereinafter *Usual & Accustomed Indian Fisheries*].

66. See *Political & Economic Aspects*, *supra* note 64, at 25.

67. See *COUNCIL IN THE WALLA WALLA VALLEY*, *supra* note 4, at 8.

68. See *Political & Economic Aspects*, *supra* note 64, at 8.

69. See *Usual & Accustomed Indian Fisheries*, *supra* note 65, at 14-19.

70. See *id.* at 7.

71. See *Political & Economic Aspects*, *supra* note 64, at 25-26.

72. See generally *United States v. Washington*, 384 F. Supp. 312 (W.D. Wash. 1974), *aff'd*, 520 F.2d 676 (9th Cir. 1975), *cert. denied*, 423 U.S. 1086 (1976) (conducting an extensive analysis of the 1855 Treaty language).

73. See *Political & Economic Aspects*, *supra* note 64, at 26.

74. *Id.*

75. *Id.*

salmon as before which would provide for the Tribes' prosperity and contribute to the region's economy.⁷⁶

The emphasis on maintaining the Tribes' salmon economies is also evident in statements made by the Indians participating in the treaty negotiations.⁷⁷ For example, Young Chief of the Cayuses was disturbed by Stevens' evasiveness about the specifics of his offer. Unsure whether Stevens intended to protect the Tribes' fisheries, Young Chief described the Indians' inseparability from the salmon runs. He remarked,

The reason that I do not know anything about this ground is I do not see the offer you have made us yet. . . . Though I hear what the [E]arth says. The Earth says, God has placed me here. The [E]arth says that God tells me to take care of the Indians on this [E]arth. The Earth says to the Indians that fish on the Earth feed them right. . . . The water speaks the same way.⁷⁸

Continuing, he insisted that the Indians relationship to salmon cannot be changed. Young Chief stated, "Neither the Indians or the whites have a right to change those names."⁷⁹ Thus, for the Tribes to agree with Stevens' bargain, Young Chief insisted that their salmon fisheries be maintained as they knew them.

Similarly, White Swan, a Chief of the Yakamas at the treaty council, later explained in *Winans* how the fishing provisions were essential to reaching an agreement. White Swan explained in detail,

When they made the treaty . . . everyday day the council held for a month, and the second month they had not quite agreed yet, and the second month, about the middle of the month; . . . [Stevens], at that time announced to the [Indians], saying what is the reason you do not agree to this good law; then the Indians said at that time we will now mention why we do not want to agree to this bargain. I do love my food — that is, the salmon in the river, here it is very hard for me to say all right, . . . therefore I do not like to go to the little reservation and leave my fish. And then at that time Governor Stevens said, yes, I find out now what you want, I will agree with you now and tell you what you want exactly. You people that live as far as Cascade, and as far as up to Wenatchee, you have your rights in this Columbia River to get this fish; the Great Father in Washington is not asking you for this river or this salmon, all the Great Father

76. See *id.* at 26, 43.

77. See COUNCIL IN THE WALLA WALLA VALLEY, *supra* note 4, at 77, 89.

78. *Id.* at 77.

79. *Id.*

wants [is] the land for whites to settle by and by. *But as long as this world stays here you will have all the salmon you want in this river all the time. . . . And of course at that time all the Indians along the Columbia River . . . said all right, if this is the case we will agree at this council.*⁸⁰

Thus, the Tribes would not consent to the treaties until they were sure that the agreement secured their economic resources.

In addition, throughout the negotiations, Stevens reassured the Tribes that he intended to secure their salmon harvests.⁸¹ On different occasions, Stevens told the Tribes that the reservations contained "plenty of salmon"⁸² or were near "the best fisheries on the Snake river."⁸³ He also told the Indians that "[they] will be allowed to go to the usual fishing places and fish in common with the whites"⁸⁴ Assessing Stevens' carefully chosen language, anthropological researchers concluded that the Tribes understood Stevens to mean that they could "return to any and all of those numerous places where they had theretofore used and . . . continue to take fish [And] both the waters in which the fish were caught and the land upon which their camps and smoke houses were erected were the things being reserved for their continued use."⁸⁵

Finally, the testimony given in *Winans* provides further evidence of the Tribes' understanding of 1855 treaty provisions. When the Winans brothers' fences and fish wheels prevented the Tribes from harvesting their economic resources, the Indians explicitly described to the court their understanding of the treaty negotiations. With reference to the economic viability of their fisheries, White Salmon Charley, an interpreter at the treaty council, explained that Stevens had assured the Tribes that "the Government ain't wanting to buy what you are using for your life."⁸⁶ Rather, "the Government only wants to buy the land and the timber. The Indians [get] salmon and the deer and the roots and the berries and grounds for horses. [Further,] the fisheries the Indians were to keep forever, where the Indians were then catching salmon."⁸⁷

80. Testimony and Final Report of Examiner at 98, *United States v. Winans*, 198 U.S. 371 (1905) (No. 180); Record at 51-52, *Winans* (No. 180) (emphasis added).

81. See COUNCIL IN THE WALLA WALLA VALLEY, *supra* note 4, at 64, 65, 67, 98, 102.

82. *Id.* at 64.

83. *Id.* at 65.

84. *Id.* at 67.

85. Swindell Report, *supra* note 63, at 62; see also Usual & Accustomed Indian Fisheries, *supra* note 65, at 40.

86. Testimony and Final Report of Examiner at 133-34, *United States v. Winans*, 198 U.S. 371 (1905) (No. 180); Record at 72, *Winans* (No. 180).

87. *Id.*

Bill Charley, a resident of the Wisham fishery also stated to the court,

When the treaty had been made the old people had said, we want this; this is our privilege, this fishing right, this place; we want this always to be laid out for us and people to fish; that is where that wheel is to-day. . . . The law said when they made the treaty with them, . . . he said you shall be never disturbed in your rights; . . .⁸⁸

Thus, relying on Stevens' reassurances that they could return their fishing sites to harvest salmon forever and that the settlers would not diminish their ability to harvest and trade salmon, the Tribes consented to the provisions of the 1855 treaties.⁸⁹ Consequently, whether it is the Winans brothers' fish wheels or a hydroelectric dam, the 1855 treaties prohibit encroachment that disturbs the Tribes' reservation of an economically viable salmon harvest.

The importance of the fishing provisions to the 1855 treaties cannot be understated. Recognizing that the land sessions he sought would be dependent on inclusion of the fishing provisions, Stevens went to extensive lengths to understand the Tribes' reliance on salmon and to write provisions that would not restrict the Tribes' harvest. Despite these efforts, the Tribes reluctantly bargained with Stevens until he made clear that he was not asking the Tribes to relinquish their fisheries. The records of the treaty council and subsequent statements of those present at the negotiations, demonstrate that the Tribes required Stevens to ensure that their fisheries would be protected against extensive non-Indian encroachment.⁹⁰ In this atmosphere, all of the parties to the 1855 treaties recognized that securing the fisheries was essential to the agreement.

Indeed, ceding 64 million acres of land to the U.S. in the 1855 treaties, the Tribes needed to reserve their fisheries to maintain their cultural and economic health. Moreover, an economically viable fishery was the only type of fishery the Tribes knew. Since time immemorial the salmon fisheries sustained their communities and provided a valuable resource for trade. In the treaty negotiations, neither Stevens nor the Tribes contemplated that U.S. settlement and development would degrade the fisheries' economic viability. To the contrary, as Palmer explained at the treaty council, "If we make a treaty with you and our Great Chief and his council approves it, you can rely

88. Testimony and Final Report of Examiner at 163; Record at 91-92, *Winans* (No. 180).

89. See Swindell Report, *supra* note 63, at 58, 64.

90. Brief for Appellants at 8, *United States v. Winans*, 198 U.S. 371 (1905) (No. 180) (noting that the Yakama's present at the treaty negotiations had testified before the *Winans* court that they believed and understood that, "the United States was guaranteeing and preserving to them a real right which they had always enjoyed and without which they would not have entered into the treaty. It is shown that there was a demur over this very matter and the negotiations of Governor Stevens and General Palmer were not successful until the Indians had complete assurances on the point.").

on all its provisions being carried out strictly, . . ."⁹¹ In fact, no congressional legislation authorizing dam construction has ever sought to abrogate or limit U.S. obligations to the Tribes' fisheries.

*III. The 1855 Treaties are a Continuing Source of Law
Governing the Columbia Basin*

*The treaty gave the right. Congress has never divested the Indians
of the right.*⁹²

Despite developing the Columbia Basin to favor resource extraction over the Tribes' sustainable salmon economies, the legislation authorizing development and management of the Columbia Basin continually recognizes the importance of the salmon runs as well as U.S. treaty obligations to the Tribes.⁹³ This congressional affirmation is reflected in the efforts of federal agencies, such as the Army Corps and the Northwest Power Planning Council (NPPC), to conserve salmon populations.⁹⁴ Unfortunately, the mitigation policies employed by these agencies and approved by Congress have failed to sustain salmon populations.

Nevertheless, congressional legislation authorizing dam development and initiating conservation of salmon populations has recognized the continuing legal force of the treaties. First, principles of treaty abrogation described by the United States Supreme Court indicate that congressional legislation never abrogated the 1855 treaties with the Columbia Basin Tribes. Moreover, congressional hearings and authorizing legislation affirmed the continuing viability of the treaties. Finally, as salmon populations declined below self-sustainable levels, Congress directed that federal agencies take steps to fulfill their obligations under the 1855 treaties through conservation programs. However, given the failure of these programs, it is now imperative that Congress directly address the cause of its treaty violation.

A. The United States Never Abrogated the 1855 Treaties

Authorizing development of the Columbia Basin, the U.S. Congress never abrogated the 1855 treaties in which the Tribes reserved the harvest of an economically viable fishery. To avoid interfering with the resources reserved for the Tribes' economic livelihood, Congress endorsed a plan to mitigate the effects of the dams and allow passage of migrating salmon. While these

91. COUNCIL IN THE WALLA WALLA VALLEY, *supra* note 4, at 55.

92. Brief for Appellants at 36, *United States v. Winans*, 198 U.S. 371 (1905) (No. 180).

93. See Michael C. Blumm, *Saving Idaho's Salmon: A History of Failure and a Dubious Future*, 28 IDAHO L. REV. 667, 672 (1992) [hereinafter *Saving Idaho's Salmon*].

94. See generally MIGHETTO & EBEL, *supra* note 14, at 103-47 (discussing the attempts of the Army Corps to mitigate the effects of the dams); KEITH C. PETERSEN, RIVER OF DEATH, CHANNEL OF LIFE: FISH AND DAMS ON THE LOWER SNAKE 108-18 (1995).

technological fixes have failed to sustain salmon populations, the laws securing the Tribes' salmon harvests have never been abandoned.

As with any foreign nation, Congress could abrogate its treaties with Indian Nations by the subsequent passage of a statute or an act of Congress.⁹⁵ However, Congress never authorized the abrogation of the 1855 treaties with the Columbia Basin Tribes. Rather, principles of treaty abrogation demonstrate that subsequent statutes authorizing hydropower development uphold the treaties.

For treaty abrogation to occur, the U.S. Supreme Court requires that acts of Congress show a "clear and plain" intent to abrogate an Indian treaty.⁹⁶ While the Court's inquiry varies from case to case, it recently stated that "[w]hat is essential is clear evidence that Congress actually considered the conflict between its intended action on the one hand and Indian treaty rights on the other, and chose to resolve that conflict by abrogating the treaty."⁹⁷ The Court's "clear evidence" of abrogation may be found in the "legislative history," "surrounding circumstances," or on "the face of the act."⁹⁸ Thus, abrogation need not be explicitly stated by the statute, but the record developed by Congress must make clear a congressional intent to abrogate the treaty.

In addition, the Supreme Court does not permit treaties to be abrogated in "a backhanded way."⁹⁹ Because the U.S. consistently affirms the Columbia Basin treaties while pursuing a course of development that decimated the Tribes' fisheries, this principle of treaty abrogation is particularly important here. Rejecting such abrogation, in *Menominee Tribe of Indians v. United States*, the Court held that the Termination Act of 1954, while ending the federal trust relationship with the Menominee, did not nullify the tribe's reservation of hunting and fishing rights.¹⁰⁰ The Court found it "difficult to believe" that Congress would subject the U.S. to a claim for compensation by destroying the Menominee's hunting and fishing rights without an "explicit statement."¹⁰¹ Likewise, the fishing provisions of the treaties with Columbia Basin Tribes could not have been abrogated by the backhanded effect of statutes authorizing river development. Rather, as the *Menominee* case

95. See *Fong Yue Ting v. United States*, 149 U.S. 698, 720 (1893); *Lone Wolf v. Hitchcock*, 187 U.S. 553, 566 (1903).

96. FELIX S. COHEN'S HANDBOOK OF FEDERAL INDIAN LAW 223 (Rennard Strickland et al. eds., 1982); see also *United States v. Dion*, 476 U.S. 734, 738 (1986).

97. *Dion*, 476 U.S. at 739-40.

98. *Rosebud Sioux Tribe v. Kneip*, 430 U.S. 584, 587 (1977) (quoting *Mattz v. Arnett*, 412 U.S. 481 (1973)).

99. *Menominee Tribe of Indians v. United States*, 391 U.S. 404, 412 (1968).

100. See *id.* at 412-13.

101. *Id.* at 413.

requires, Congress may only abrogate a treaty provision with an "explicit statement" of its intent.¹⁰²

The Supreme Court repeated these principles in *Washington v. Washington State Commercial Passenger Fishing Vessel Association*,¹⁰³ its most recent case interpreting the 1855 fishing provisions.¹⁰⁴ With regard to the continuing viability of the treaties, the Court stated that, "[a]bsent explicit statutory language, we have been extremely reluctant to find congressional abrogation of treaty rights."¹⁰⁵ Although this case did not address the impact of hydropower development on the Tribes' fisheries, the Court upheld the continuing viability of the treaties.¹⁰⁶ Thus, in 1979, applying U.S. principles of treaty abrogation to the 1855 treaties, the Supreme Court confirmed that the treaties had not been abrogated by subsequent congressional legislation.

B. Legislation Authorizing Dam Construction Affirms the 1855 Treaties

Neither the legislation authorizing Columbia and Snake River dams, nor their legislative history, indicates a "clear and plain" intent to abrogate the fishing provisions of the 1855 treaties with the Columbia Basin Tribes. To the contrary, beginning in the 1930s with Bonneville Dam, Congress attempted to ensure that river development would not diminish the fisheries along the Columbia and Snake Rivers.¹⁰⁷ Prior to dam construction, Congress directed that "the question of the necessary provision for the passage of fish over the dams . . . will require more definite determination. The salmon fishing industry is of great importance to the states of Oregon and Washington, and should not be endangered."¹⁰⁸ Consequently, the design of Bonneville Dam, the first federal dam on the Columbia River, included fish ladders and fish lifts.¹⁰⁹ Moreover, to ensure the fish passage facilities met the approval of local fishery agencies and commercial fishers, Congress expended an extra \$1.1 million, for a total of \$3.2 million, to improve the design of the facilities.¹¹⁰ Thus, as Congress began to develop the Basin, it resolved the conflict between dams and salmon by investing heavily in mitigation measures to ensure that returning adult salmon would reach the Tribes' upstream fisheries.

102. *Id.*

103. 443 U.S. 658 (1979).

104. *See id.* at 662-87. *See* discussion of the Court's interpretation of the fishing provisions *infra* Part IV.C.

105. *Passenger Fishing Vessel*, 443 U.S. at 690 (citing *Menominee Tribe of Indians v. United States*, 391 U.S. 404 (1968)).

106. *See id.* at 691-92.

107. *See Saving Idaho's Salmon*, *supra* note 93, at 672; MIGHETTO & EBEL, *supra* note 14, at 54.

108. H.R. EXEC. DOC. NO. 73-103, at 1537, 1539, 1599, 1603 (1932).

109. *See* MIGHETTO & EBEL, *supra* note 14, at 55.

110. *See id.*

Having resolved the issues concerning upstream passage of salmon, Congress then sought to eliminate threats to downstream juvenile migration. However, the testimony before Congress demonstrates that law makers were so misinformed about the effects of the dams on downstream migration, that they could not have intended to sacrifice the Tribes' fish for hydropower development. To the contrary, the Army Corps assured Congress that the Columbia Basin could have both dams and salmon.

In hearings before the Senate Committee on Rivers and Harbors in 1941 and 1943, the Army Corps testified on two occasions that the dams' hydropower turbines would not harm juvenile salmon during their downstream migration.¹¹¹ In 1941, Assistant Chief of Engineers Brigadier General Thomas M. Robins testified,

[The] turbines are absolutely incapable of hurting the fish. If you could put a mule through there, and keep him from drowning he would go through without being hurt. Before we put the wheels in, we carried on experiments [sic] with fish, and proved conclusively that the pressure of the turbines will not injure fish.¹¹²

Later, in 1943, Army Corps General Kingman informed Congress that he did not "think it bothers [the fingerlings] at all to go through the turbines."¹¹³ Thus, finding no conflict between dams and the downstream migration of salmon, Congress could not have intend to decimate salmon populations by choosing to develop the rivers. Rather, considering the testimony before it, Congress took the precautions it thought necessary to preserve the fisheries and avoid abrogating its obligations to sustain the Tribes' economically viable salmon harvests.

Further, authorizing much of the remaining hydropower development on the Columbia and Snake Rivers, Congress included in the 1945 Rivers and Harbors Act its intent to preserve fisheries along the Columbia and Snake Rivers. In the section of the Act authorizing McNary Dam, the last dam on the Columbia before the confluence with the Snake River, Congress required that "in the design, construction, and operation of [McNary] Dam, adequate provision shall be made for the protection of anadromous fishes by affording them access to their natural spawning grounds. . . ."¹¹⁴ In addition to this direct support of the fisheries, the plain language of the Act did not indicate

111. See *Snake River, Oreg., Wash., and Idaho, Hearings Before the Comm. on Rivers and Harbors*, 75th Cong. 15 (1941); *Columbia River (Umatilla Dam) and Snake River, Oreg., Wash., and Idaho, Hearings Before the Comm. on Rivers and Harbors*, 78th Cong. 5 (1943).

112. *Snake River, Oreg., Wash., and Idaho, Hearings Before the Comm. on Rivers and Harbors*, 75th Cong. 15 (1941).

113. *Columbia River (Umatilla Dam) and Snake River, Oreg., Wash., and Idaho, Hearings Before the Comm. on Rivers and Harbors*, 78th Cong. 5 (1943).

114. Rivers and Harbors Act of 1945, Pub. L. No. 79-14, § 2, 59 Stat. 10, 22 (1945).

a "clear and plain" intent to abrogate the treaties. Rather, authorizing development on the lower Snake River, Congress simply allowed for "the construction of such dams as necessary."¹¹⁵

Significantly, the plain language of the 1945 Rivers and Harbors Act also confirms that when Congress was aware that development would conflict with the treaties, Congress offered to replace what was lost in the conflict. Considering the conflict between Bonneville Dam and "usual and accustomed" fishing sites that would be flooded by the dam, Congress acknowledged the loss and provided alternative fishing locations.¹¹⁶ Thus, reading the 1945 Rivers and Harbors Act in its entirety, Congress considered the effects the dams would have on the Tribes' fishing practices and consistently mitigated those effects attempting to protect the Tribes' reserved salmon harvests.

C. Management and Conservation Statutes Affirm the 1855 Treaties

As Congress moved from constructing hydropower projects to managing development in the Columbia Basin, its conservation statutes required balancing industrial interests with salmon survival. In 1958, Congress strengthened the 1945 Rivers and Harbors Act, to prevent river development from eclipsing the salmon fisheries. Amending the 1945 Act, Congress required that "wildlife conservation shall receive equal consideration" as hydropower development.¹¹⁷ Although development interests were eager to harness the rivers' power to extract electrical resources, Congress recognized the importance of the salmon industry and "never . . . intended the salmon to be sacrificed in pursuit of navigation, irrigation, or hydropower."¹¹⁸ Rather, recent Columbia Basin conservation legislation recognizes the 1855 treaties as an important component of hydropower regulation.

Reorganizing the Federal Columbia River Power System (FCRPS) to prioritize salmon conservation, the 1980 Northwest Power Act (NPA) required compliance with continuing treaty obligations and emphasized the role of the Tribes in salmon conservation.¹¹⁹ Speaking directly on this point, the Act states that recovery plans must "be consistent with the legal rights of appropriate Indian tribes in the region; . . ."¹²⁰ Thus, the plain language of the NPA affirms U.S. treaty obligations to the Tribes. Moreover, the provisions of the NPA indicate that the treaties have broad implications for how the region is managed and developed.

115. *Id.* § 2, 59 Stat. at 21.

116. *Id.* § 2, 59 Stat. at 22.

117. Fish and Wildlife Coordination Act, Pub. L. No. 85-624, § 2, 72 Stat. 563, 563 (1958).

118. *See Saving Idaho's Salmon*, *supra* note 93, at 671-72.

119. *See generally* Northwest Power Act, 16 U.S.C. §§ 839-839h (1994); Michael C. Blumm, *Implementing the Parity Promise: An Evaluation of the Columbia Basin Fish and Wildlife Program*, 14 ENVTL. L. 277, 285 (1984).

120. Northwest Power Act, 16 U.S.C. § 839b(h)(6)(D) (1994).

In the NPA, Congress requires that salmon conservation plans defer to tribal recommendations. To carry out these efforts, the Act created the NPPC to use hydropower revenues to develop a comprehensive program to protect, mitigate, and enhance fish and wildlife resources.¹²¹ In developing its Fish and Wildlife Program, Congress requires that the NPPC rely on the recommendations of the region's Indian Tribes.¹²² For each recommendation, the NPPC must give "due weight to the recommendations, expertise, and legal rights and responsibilities" of the Tribes.¹²³ If the NPPC does not adopt a particular recommendation for one of three statutorily defined reasons, the NPPC is required to explain its reasoning in writing.¹²⁴ Thus, presumptively favoring tribal recommendations, Congress sought to ensure that the NPPC's salmon conservation plans would be consistent with U.S. treaty obligations to the Tribes.

Interpreting the NPA's provisions in *Northwest Resource Information Center v. NPPC*,¹²⁵ the Ninth Circuit upheld Congress' intent to conform hydropower operations to the requirements of the 1855 treaties.¹²⁶ In *Northwest Resource Info. Center*, the court determined that the NPPC's 1991-92 Fish and Wildlife Program did not fulfill the requirements of the NPA and remanded the plan back to the NPPC.¹²⁷ To aid the NPPC on remand, the court interpreted the NPA's five criteria for a successful conservation program. Describing the requirement that the program comply with U.S. treaty obligations, the Court held that this requirement "significantly circumscribe[s] the [NPPC]'s discretion."¹²⁸ Moreover, the court ruled that the NPA directs the NPPC to give a "high degree of deference" to interpretations of the statute and recommendations submitted by the Tribes and other fishery agencies.¹²⁹ Reading the NPA as an attempt to "revolutionize" the FCRPS,¹³⁰ the Ninth Circuit upheld Congress' deference to the 1855 treaties as a continuing source of legal obligations in the Columbia Basin.

As this recent conservation legislation demonstrates, the Tribes' 1855 treaty reservations were never abrogated by Congress. Rather, beginning with fish passage facilities at Bonneville Dam to reorganization under the NPA, Congress attempted to ensure that river development would not prevent the

121. See *id.* § 839.

122. See *id.* § 839b(h)(5).

123. 16 U.S.C. § 839b(h)(7).

124. See *id.* §§ 839b(h)(7)(A),(B),(C).

125. 35 F.3d 1371 (9th Cir. 1994), *cert. denied*, 116 S. Ct. 50 (1995).

126. See *id.* at 1386-89.

127. See *id.* at 1395.

128. *Id.* at 1389.

129. *Id.* at 1389, 1392.

130. See Michael C. Blumm et al., *Beyond the Parity Promise: Struggling to Save Columbia Basin Salmon in the Mid-1990's*, 27 ENVTL. L. 21, 48 (1997) [hereinafter *Beyond the Parity Promise*].

Tribes' economic harvest of their treaty fisheries. When fishing sites were lost to river development, Congress provided alternative sites, and in the latter half of the twentieth century when salmon populations continued to decline, Congress wrote statutes requiring compliance with U.S. treaty obligations. The "plain language" and legislative history of these sources of law indicate that the 1855 treaties with the Tribes have never been abrogated by the U.S. Thus, consistent with these laws, federal agencies governing the Columbia Basin must move beyond development policies that diminish the Tribes' fisheries and violate the 1855 treaty provisions.

*IV. Supreme Court Precedent Interpreting and Enforcing
the 1855 Treaties Requires the Tribes' Fisheries
Be Maintained at Economically Viable Levels*

*I have something different to say than the others have said. It is your men who have spoken. I have been afraid of the white man. Their doings are different from ours. Your chiefs are good. Perhaps you have spoke straight, that your children will do what is right. Let them do as they have promised. That is all I have to say.*¹³¹

In three far reaching federal Indian law cases, the U.S. Supreme Court established precedent interpreting the 1855 treaties and quantifying enforcement levels for protection of treaty reserved economic resources. These cases require that development be limited or removed to maintain the Columbia Basin Tribes' salmon harvests at economically viable levels. To comply with this longstanding precedent, federal agencies governing the FCRPS must move beyond their failed mitigation policies and begin reducing U.S. development to recover salmon populations to levels enforced by the Supreme Court.

First, in *United States v. Winans*, the Supreme Court relied on testimony of the Yakama's economic hardship to enforce their 1855 treaty as imposing a development servitude against activities that threatened the Tribes' fisheries. Second, in *Winters v. United States*, the Court quantified its protection of tribal economic resources requiring that treaty-reserved resources be maintained at economically viable levels. Third, in *Washington v. Washington State Commercial Passenger Fishing Vessel Association*, the Supreme Court reaffirmed its earlier interpretation of the 1855 treaties in *Winans* and applied the *Winters* economic viability standard to protect the Tribes harvests from extensive encroachment. Following this established Supreme Court case law, current attempts at reconciling the decimation of the Tribes' fisheries must

131. COUNCIL IN THE WALLA WALLA VALLEY, *supra* note 4, at 59.

reconsider the failure of mitigation efforts and take steps to restore river conditions to those capable of rebuilding self-sustaining salmon populations.

A. Limiting Development that Diminishes the Tribes' Harvests

In 1905, prior to any major federal dam construction, the Supreme Court offered its first interpretation of the 1855 fishing provisions. In *United States v. Winans*,¹³² the Court relied on federal principles of treaty construction to interpret the 1855 Treaty with the Yakima as imposing limits on federal, state, and private development that diminished the economic viability of the tribe's salmon harvests.¹³³ Specifically, the Court ruled that the Winans brothers' fish wheel operations violated the treaty agreement by "excluding" the Yakima from their fisheries.¹³⁴ In the case of the fish wheels, as later with hydropower operations, the tribe was "excluded" from both accessing their fisheries and from obtaining an economically viable salmon harvest. Thus, in the first Supreme Court case to interpret the 1855 fishing provisions, the Court established precedent regarding proper treaty interpretation and set limits on the impact development may have on the Columbia Basin Tribes' fisheries.

Initially, the Supreme Court rejected the lower court's assertion that the 1855 treaty reserved to the Indians "no rights but what any inhabitant of the territory or state would have."¹³⁵ Referring to the 1855 treaty council at Walla Walla, the Court declared this interpretation was an "impotent outcome to negotiations and a convention which seemed to promise more, and give the word of the nation for more."¹³⁶ Consequently, to fulfill the intent of the signatory parties, the Court turned to principles of treaty construction for guidance in its interpretation.

Early in its adjudication of federal Indian law cases, the Supreme Court laid out ground rules for treaty construction in an attempt to ensure that the federal government fulfilled its treaty obligations owed to Indian Nations. For example, in *Worcester v. Georgia*,¹³⁷ the Supreme Court described the proper course of treaty construction.¹³⁸ The Court stated,

The language used in treaties with the Indians should never be construed to their prejudice. If words be made use of which are susceptible of a more extended meaning than their plain import,

132. 198 U.S. 371 (1905).

133. See *id.* at 381-82. Although *Winans* dealt specifically with Treaty with the Yakima, June 9, 1855, 12 Stat. 951, the Court's analysis of the fishing provisions is directly applicable to the treaties with the other Columbia Basin Tribes.

134. See *Winans*, 198 U.S. at 382.

135. *Id.* at 380.

136. *Id.*

137. 31 U.S. (6 Pet.) 515 (1832).

138. See *id.* at 582.

as connected with the tenor of the treaty, they should be considered used only in the latter sense. . . . How the words of the treaty were understood by this unlettered people, rather than their critical meaning, should form the rule of construction.¹³⁹

Following these mandated principles, the *Winans* Court held that the 1855 treaty should be construed as the Indians would have understood it, as justice and reason demand to fulfill duties of care and protection, in terms of the substance of the rights reserved, without regard for technical rules, and consistent with the circumstances surrounding the treaty.¹⁴⁰

Accordingly, with the testimony of the Yakama plaintiffs before it, the Court read the treaties in light of the tribe's prior use of their fisheries and economic dependence on salmon. Relying on this history and descriptions of the 1855 negotiations, the Court described the Yakama's salmon harvests as "not much less necessary to the existence of the Indians than the atmosphere they breathed."¹⁴¹ Yet the Court also noted that due to increasing settlement pressures, it became necessary for the U.S. to negotiate with the tribe for land cessions and for an accommodation of their fishing practices.¹⁴² Thus, relying on promises that the U.S. would protect their reserved land base and fisheries, the Yakama agreed to share their fisheries "in common" with the settlers as did the other Columbia Basin Tribes.¹⁴³

The Supreme Court appropriately notes that this agreement "was not a grant of rights *to* the Indians, but a grant of rights *from* them — a reservation of those not granted."¹⁴⁴ Consequently, the tribe retained its historic fishing rights with a slight accommodation while granting only limited rights to the U.S. Describing the limited rights granted to the U.S., the Court held that the treaty "imposed a servitude upon every piece" of land acquired by the U.S.¹⁴⁵ This servitude, running against the U.S., the state, and their grantees, reserved for the tribe "the right to occupy [the land] to the extent and for the purpose mentioned."¹⁴⁶ In other words, the treaty servitude requires limiting development to allow the Yakama to maintain its salmon based economy. As the Court determined that "[n]o other conclusion would give effect to the treaty."¹⁴⁷

139. *Id.*

140. See *United States v. Winans*, 198 U.S. 371, 380-81 (1905) (citing *Choctaw Nation v. United States*, 119 U.S. 1 (1886) and *Jones v. Meehan*, 175 U.S. 1 (1899)).

141. *Winans*, 198 U.S. at 381.

142. See *id.*

143. See discussion of treaties *supra* note 3.

144. *Winans*, 198 U.S. at 381 (emphasis added).

145. *Id.*

146. *Id.*

147. *Id.*

Following its construction of the treaty, the Supreme Court held that the Winans brothers' fish wheels violated the 1855 treaty fishing provisions by excluding the tribe from a principle fishery and from an economically viable harvest.¹⁴³ Although it allowed that white men and Indians may use different technologies to harvest salmon, noting the impact of the fish wheels, the Court stated that "it does not follow that the Indians may be absolutely excluded."¹⁴⁹ The Court determined that the Indians were "excluded" on two separate grounds. First, in terms of "the common right" of taking fish, the Court held that the settlers may not use technology which depletes the commons to the point of "absolutely excluding" the tribe's harvest.¹⁵⁰ And second, in terms of the fishing places, the Court found that white men may not "construct and use a device which gives them exclusive possession."¹⁵¹ Focusing on the effects of the fish wheel on the tribal fisheries, the Court held that U.S. settlers maintained only a limited right to merely share in the commons and may not "exclude" the Indians by severely diminishing the viability of the tribe's salmon harvest.¹⁵² Significantly, the Court's holding was not based on particular technology used by the settlers; rather, the Court looked to the technology's impact on the tribe's ability to sustain their treaty reserved economic resources.

In holding that the tribe had been economically excluded, the Court affirmed the Yakama's testimony describing the effect of the Winans brothers' fish wheels on the economic viability of their fisheries. Many witnesses testified that they could no longer harvest salmon in significant quantities because the fish wheels were located in their most productive fisheries, the Wisham and See-we-pam fisheries.¹⁵³ These locations provided the best fishing for the Yakama because their swift current channeled the salmon near the shore.¹⁵⁴ Although fish could potentially be caught from anywhere along the river's edge,¹⁵⁵ the testimony continues, the Indians developed their

148. See *id.* at 382.

149. *Id.*

150. *Id.*

151. *Id.*

152. *Id.*

153. See Testimony and Final Report of Examiner at 100, 135, *United States v. Winans*, 198 U.S. 371 (1905) (No. 180); Record at 52, 73, *Winans* (No. 180) (testifying "[t]hat is the chief fishery of the Indians where Winans wheels are now," and "the Indians thought this to be the boss of the salmon stations."). Many other Indians and whites also named the Wisham and See-we-pam fisheries as their most productive. See also Testimony and Final Report of Examiner at 108, 110, 114, 121, 127, 131, 133, 136, 141, 147, 149, 159, 175, 217; Record at 57, 58, 61, 65, 68, 71, 72, 74, 77, 80, 82, 88, 99, 126, *Winans* (No. 180).

154. See Testimony and Final Report of Examiner at 105; Record at 56, *Winans* (No. 180) (testifying that "[t]here is a swift current; the current runs right close to the shore and that is the only place they can catch fish with a net").

155. See Testimony and Final Report of Examiner at 101; Record at 53, *Winans* (No. 180) (testifying that catching fish just anywhere "would be pretty hard; there is no other place where

fishing technology to be used in these narrow channels.¹⁵⁶ At these locations, a single Yakama fisherman using only a dip net could catch nearly one hundred fish a day.¹⁵⁷ However, after fish wheels were constructed in the channel, witnesses testified that "the Indians get poor [and are having] hard times."¹⁵⁸ Attempting to replace their usual harvests at the Wisham and See-we-pam fisheries, some witnesses testified that they were able to catch a few fish above the wheels,¹⁵⁹ and others stated that they fished at sites belonging to relatives from other tribes.¹⁶⁰ In addition, some Yakama survived by harvesting salmon from some of their more limited seasonal fisheries.¹⁶¹ Summarizing the problem for the Court, plaintiff Thomas Simpson stated, "There are very few [fish] go by and the Indians can't catch them."¹⁶² Thus, without eliminating the entire catch,¹⁶³ the Winans brothers' fish wheels

we could fish like that place"); Testimony and Final Report of Examiner at 102; Record at 54, *Winans* (No. 180) (testifying that "the treaty also gave the Indians the rights to fish all along the Columbia River").

156. See Testimony and Final Report of Examiner at 101; Record at 53, *Winans* (No. 180) (testifying that "[t]heir way of catching that salmon there was spearing, hooking, and dipping — a long stick and a gaft hook . . . there is no other place where we could fish like that"); Testimony and Final Report of Examiner at 172; Record at 97, *Winans* (No. 180).

157. See Testimony and Final Report of Examiner at 157; Record at 87, *Winans* (No. 180) (testifying: "Q. How many fish a day did you catch with a net there before the fish wheels was put in? A. Good many in one day. . . . Q. One hundred? A. Yes"). The extent of the Yakama's harvest was confirmed by many witnesses. See Testimony and Final Report of Examiner at 146, 167, 178; Record at 80, 94, 101, *Winans* (No. 180).

158. Testimony and Final Report of Examiner at 150; Record at 83, *Winans* (No. 180).

159. See Testimony and Final Report of Examiner at 106; Record at 56, *Winans* (No. 180) (testifying: "Q. What effect did the putting of the fish wheels have on catching fish with the nets above the wheels? A. They catch some. . . . Not many; some, not like they used to catch before the fish wheels were put in."); Testimony and Final Report of Examiner at 108, 120, 136, 146; Record at 57, 64, 74, 80, *Winans* (No. 180).

160. See Testimony and Final Report of Examiner at 103, 149; Record at 54, 82, *Winans* (No. 180).

161. See Testimony and Final Report of Examiner at 218; Record at 127, *Winans* (No. 180) (testifying: "Q. Aren't there fisheries at White Salmon, Little White Salmon? A. There are at certain times of year, fall of the year, they fish in that stream or the different streams around there"); Testimony and Final Report of Examiner at 218; Record at 127, *Winans* (No. 180).

162. Testimony and Final Report of Examiner at 91, *United States v. Winans*, 198 U.S. 371 (1905) (No. 180); Record at 47, *Winans* (No. 180).

163. See Testimony and Final Report of Examiner at 360; Record at 220, *Winans* (No. 180) (taking the testimony of Hollister D. McGuire, State fish and game protector for the State of Oregon: "Q. Then while it is true that only five percent of the [total yearly catch] have been caught in the fish wheels, it is also true that . . . of the fish caught in the upper part of the river . . . one-half of the fish are caught with fish wheels? A. I think so; probably more. Q. . . . practically all the of the fish are caught with the fish wheels, are they not? . . . A. A large percentage . . . of the fish are taken with wheels"); Testimony and Final Report of Examiner at 132; Record at 71, *Winans* (No. 180) (testifying that "of course the wheel is getting the salmon and the nets can get a little . . .").

"excluded" the Indians by diminishing their harvests below economically sustainable levels.¹⁶⁴

Consequently, the Court determined that the practical and economic effects of the fish wheels violated the 1855 Treaty with the Yakima. The Court's holding was substantially based on its recognition of the limited rights granted to the U.S. and its settlers. Under all of the 1855 treaties, Columbia Basin development rights were limited by a treaty servitude intended to ensure maintenance of the Tribes' primary economic resource. Accordingly, the Court concluded that the fish wheels violated the agreement by reducing the Yakamas' salmon harvests below economically viable levels. As the Yakamas' attorneys successfully argued to the *Winans* Court, "the Indians. . . can not be shunted off to inferior places on the theory that it is a legitimate defense to say that they will do well enough at other points."¹⁶⁵ Similarly, with development of the dams, the responsibility for sustaining salmon populations cannot be passed off to mitigation measures on the theory that it is a legitimate defense to say that the Columbia Basin Tribes will do well enough on restricted harvests of threatened or endangered species. Rather, rejecting diminishment of tribal economic resources, the Supreme Court upheld economic viability as an important aspect of the 1855 treaties.

B. Protecting Treaty Reserved Resources at Economically Viable Levels

Soon after the *Winans* decision, the Supreme Court made clear that tribal economic viability was a central tenant in its construction of treaties and agreements with Indian Nations. In *Winters v. United States*,¹⁶⁶ settlers upstream from the Fort Belknap Reservation constructed a dam which depleted the tribes' irrigation waters.¹⁶⁷ Rejecting the settlers claim that the 1888 agreement creating the reservation did not reserve irrigation water for the Indians, the Court established an economic viability standard as the measure of protection for treaty-reserved economic resources.¹⁶⁸

Similar to *Winans*, the Court began its interpretation of the 1888 agreement by describing the Indians full enjoyment of the region's resources prior to

164. See Testimony and Final Report of Examiner at 117; Record at 63, *Winans* (No. 180) (testifying that "on account of those wheels the Indians can't get much salmon now"); Testimony and Final Report of Examiner at 91, 126, 127, 132, 143, 173; Record at 47, 68, 69, 71, 78, 98, *Winans* (No. 180).

165. Brief for Appellants at 17, *United States v. Winans*, 198 U.S. 371 (1905) (No. 180).

166. 207 U.S. 564 (1908).

167. See JOSEPH L. SAX ET AL., *LEGAL CONTROL OF WATER RESOURCES: CASES AND MATERIALS* 804-09 (2nd ed. 1991). The *Winters* doctrine is noted for furthering the reserved rights of Indian Nations into the area of water law. In the western U.S. most water allocation is determined by the prior appropriation doctrine, giving priority to the first water users of a particular source. Recognizing Indian Nations' reservation of water resources by treaty, or in this case an agreement, the *Winters* doctrine sets the appropriation date at the creation of the reservation, superior to later appropriators.

168. See *Winters*, 207 U.S. at 565, 576.

white settlement.¹⁶⁹ The Court noted that under pressures of non-Indian settlement the tribes agreed with the U.S. to reserve and occupy a smaller land base from which they would "become self-supporting, as a pastoral and agricultural people,"¹⁷⁰ However, to "undertake the cultivation of soil, or engage in pastoral [sic] pursuits, as a means of obtaining a livelihood,"¹⁷¹ as the U.S. encouraged, the Court found that it was necessary for the tribes to irrigate their arid lands with water from the Milk River which bordered the reservation.¹⁷² Without irrigation waters the tribes' treaty reservations would be valueless.¹⁷³

To secure the tribes' reserved irrigation water and uphold the "declared purpose" of the agreement,¹⁷⁴ the Court again relied on principles of treaty construction, holding that

by a rule of interpretation of agreements and treaties with the Indians, ambiguities occurring will be resolved from the standpoint of the Indians. And the rule should certainly be applied to determine between two inferences, one of which would support the purpose of the agreement and the other impair or defeat it.¹⁷⁵

Thus, contrary to the settlers' claims, the *Winters* Court found that the Gros Ventre and Assinibonie Tribes did not cede their extensive land base without reserving the resources needed to economically sustain themselves.¹⁷⁶ Consequently, by constructing substantial dams and reservoirs upstream from the tribes' water diversions in 1900,¹⁷⁷ the settlers violated the reservations made in the 1888 agreement.

Essential to the *Winters* Court's finding that the 1888 agreement reserved water for agricultural irrigation was its identification of the tribes' economic viability as a "prominent and significant" element of the agreement.¹⁷⁸ Similar to the 1855 Stevens treaties which secure salmon harvests for the economic livelihood of the Columbia Basin Tribes, the Court recognized that a central purpose of the 1888 agreement were enough water resources to

169. See *id.*

170. Brief for the United States at 15, *United States v. Winters*, 207 U.S. 564 (1908) (No. 499) (quoting the preamble to the 1888 agreement at 25 Stat. 113 (1888)); see also *Winters*, 207 U.S. at 576.

171. Brief for the United States at 15, *United States v. Winters*, 207 U.S. 564 (1908) (No. 499) (quoting Article V of the 1888 agreement at 25 Stat. 113 (1888)).

172. See *Winters*, 207 U.S. at 566.

173. *Id.* at 576.

174. *Id.* at 577.

175. *Id.* at 576-77.

176. See *id.* at 576.

177. See *id.* at 567.

178. *Id.* at 575-76.

promote agriculture on the Fort Belknap Reservation.¹⁷⁹ Struck by the audacity of the settler's attempt to read the agreement as not providing for the tribes' economic survival,¹⁸⁰ the Court stated that "[t]he lands were arid, and, without irrigation, were practically valueless. And yet, it is contended, the means of irrigation were deliberately given up by the Indians and deliberately accepted by the government."¹⁸¹

Rejecting this assertion, the *Winters* Court enforced the 1888 agreement as securing the resources necessary to promote reservation's economic viability. The Court asked, "Did [the Indians] reduce their area of occupation and give up the water which made it valuable?"¹⁸² No, the Court concluded, "[I]t would be extreme to believe that within a year Congress destroyed the reservation and took from the Indians the consideration of their grant, leaving them a barren waste, . . ."¹⁸³ Instead, finding that a central purpose of treaties and agreements is to provide for a tribe's economic welfare, the Supreme Court used the 1888 agreements to promote the economic viability of the tribes.

The economic viability standard enforced by the *Winters* Court was subsequently affirmed in *Arizona v. California*,¹⁸⁴ one of the United States' longest running water law disputes. In the *Arizona* litigation, which stemmed from a 1928 Act attempting to settle the apportionment of the Colorado River,¹⁸⁵ the Supreme Court again protected tribal reservations of water at economically viable levels. First, relying on the reserved rights doctrine of *Winans* and *Winters*, the Court determined that the congressional acts and Executive Orders establishing the reservations in question also reserved irrigation waters for the Indians' economic use.¹⁸⁶ Second, rejecting the State of Arizona's argument that water be allocated according to the "foreseeable needs" of the Indians currently living on the reservation,¹⁸⁷ the Court required that enough water be reserved to ensure the economic viability of the land reserved for the tribes. Thus, the Court held that to fulfill the purpose of the reservations, an allocation based on the practicably

179. See Brief for the United States at 15, *United States v. Winters*, 207 U.S. 564 (1908) (No. 499) (quoting the preamble to the 1888 agreement at 25 Stat. 113 (1888)); *Winters*, 207 U.S. at 576.

180. See Brief for the Appellants at 26-27, *United States v. Winters*, 207 U.S. 564 (1908) (No. 499).

181. *Winters*, 207 U.S. at 576.

182. *Id.*

183. *Id.* at 577.

184. 373 U.S. 546, 600 (1963).

185. See JOSEPH L. SAX ET AL., *LEGAL CONTROL OF WATER RESOURCES: CASES AND MATERIALS* 701-29 (2nd ed. 1991).

186. See *Arizona*, 373 U.S. at 598-601.

187. See *id.* at 600-01.

irrigable acreage (PIA) of each reservation would provide for the tribes' economic welfare.¹⁸⁸

Contrary to calculations based on individual Indians' foreseeable needs, the PIA standard follows *Winters* by ensuring that the land reserved by the tribes would be economically viable.¹⁸⁹ Although the PIA standard ultimately limits tribal allocation of a resource once completely enjoyed by the tribes and never ceded to the U.S., it significantly demonstrates the Supreme Court's continued enforcement of U.S. obligations to secure treaty reserved economic resources at economically viable levels. Thus, in a time of diminishing natural resources, the *Winters* and *Arizona* cases followed the discussion of economic encroachment begun in *Winans* to establish a standard for protecting treaty reserved economic resources.

C. Requiring Economically Viable Salmon Harvests

In the most recent Supreme Court case to interpret the 1855 treaties, *Washington v. Washington State Commercial Passenger Fishing Vessel Ass'n*,¹⁹⁰ the Court followed *Winans*, *Winters*, and *Arizona* to find that the Tribes reserved economically viable salmon harvests.¹⁹¹ Although the dams had yet to deplete the remaining salmon stocks, over-fishing and discriminatory state regulations favoring non-Indians pressured the Court to determine "the character of [the] treaty right to take fish."¹⁹² This litigation originally began with two highly charged cases in the 1960s and 1970s that attempted to apportion the salmon harvests between Indians and non-Indians. In the first case, *Sohappy v. Smith*,¹⁹³ the federal district court in Oregon interpreted the treaties as providing the Tribes with a right to a "fair share" of the annual salmon harvests.¹⁹⁴ Later, following the "fair share" principle, Judge Boldt, in *United States v. Washington*,¹⁹⁵ interpreted the 1855 treaty language, "in common with," to mean a 50/50 division between treaty and nontreaty salmon fisherman.¹⁹⁶ However, because of widespread defiance of these rulings and continued discriminatory state practices, the U.S. Supreme Court granted certiorari to settle the meaning of the 1855 treaty fishing provisions.¹⁹⁷

188. See *id.* at 598-601.

189. See *id.* at 600-01.

190. 443 U.S. 658 (1979) (litigating similar fishing provisions contained in treaties with coastal Washington tribes as well as the Columbia Basin Tribes); see, e.g., Treaty of Point Elliott, Jan. 27, 1855, 12 Stat. 927.

191. *Passenger Fishing Vessel*, 443 U.S. at 685-86.

192. *Passenger Fishing Vessel*, 443 U.S. at 662 (emphasis added).

193. 302 F. Supp. 899 (D. Or. 1969).

194. See *id.* at 910.

195. 384 F. Supp. 312 (W.D. Wash. 1974).

196. See *id.* at 342.

197. See *Passenger Fishing Vessel*, 443 U.S. at 674.

First, characterizing treaties with Indian Nations as essentially a contract between two sovereign nations, the Court attempted to view the "contract" as the Tribes would have understood it at the time of its execution.¹⁹⁸ Following this long standing principle of federal Indian law, the Court described the Tribes' reliance on salmon and determined that the fishing provisions were essential to the completion of the 1855 treaties.¹⁹⁹ In sum, the Court stated that, "it is . . . inconceivable that either party deliberately agreed to authorize future settlers to crowd the Indians out of any meaningful use of their accustomed places to fish."²⁰⁰ Moreover, because of the predictability and size of salmon runs, the Court also held that the treaties reserved the Indians' right to "take" salmon, as opposed to the mere opportunity to attempt to catch some fish.²⁰¹ Thus, the Court determined that the 1855 treaties "unambiguously . . . secure the Indians' right to take a share of each run of fish that passes through tribal fishing areas."²⁰²

Second, the Supreme Court affirmed the lower court's fifty-fifty apportionment of salmon harvests between Indians and non-Indians as consistent with its cases protecting treaty-reserved economic resources.²⁰³ Relying on *Winans*, *Winters*, and *Arizona*, the Court approved of this apportionment because it "assured that the Indians' reasonable livelihood needs would be met."²⁰⁴ The Court maintained that diminishing or eliminating the economic value of the Indians' treaty reserved resources violated the central purpose of treaties and agreements with Indian Nations.²⁰⁵

Third, focusing on the economic impact to the Tribes' treaty reserved economic resources, the Court described the Tribes' treaty allocation of the harvest as one that provides the Tribes with a "moderate living."²⁰⁶ Although a "moderate living" standard establishes a high level of protection for the Tribes' economic resources, like the PIA standard, the Court's standard could impose a limitation on tribal fishing that was never agreed to by the Tribes or intended when the "contract" was written in 1855.²⁰⁷ Nevertheless, the economic implications of a moderate living standard go a

198. *See id.* at 675.

199. *See id.* at 663-70, 675-76.

200. *Id.* at 676.

201. *See id.* at 679.

202. *Id.* (finding that this issue "is virtually a 'matter decided' by our previous holdings").

203. *See id.* at 685-86.

204. *Id.* at 685.

205. *See id.* at 685-86.

206. *Id.* at 686.

207. *See* Peter C. Monson, *United States v. Washington (Phase II): The Indian Fishing Conflict Moves Upstream*, 12 ENVTL. L. 469, 491 (1982) (concluding that the "moderate living" standard is contrary to principles of treaty construction and United States' trust obligations to the Tribes, and noting that the standard was probably only intended to be invoked if the Tribes abandoned their fisheries which they have not).

long way to support the Tribes' 1855 treaty reservations. For example, in *Lac Courte Oreilles Band of Lake Superior Chippewa Indians v. Wisconsin*,²⁰⁸ the court determined that even by harvesting all the resources in the treaty area, the tribal members' income would not reach, let alone exceed, a moderate living standard.²⁰⁹ Likewise, to exceed a moderate living standard, the Columbia Basin Tribes would need to sustain salmon harvests similar to their historic catch.

While the issue before the Court in *Fishing Vessel* only addressed allocation of the salmon harvests between treaty and nontreaty fishermen, the Court's characterization of the treaty right applies with equal force to the effects of the Columbia Basin dams on the Tribes' fisheries.²¹⁰ Whether the resource is diminished by non-Indian over-fishing or by dam development, the Court explicitly held that the Indians may not be denied "any meaningful use of their accustomed places to fish."²¹¹ The Court continued that such a diminished "right" is "totally foreign to the spirit of the negotiations" and "would hardly have been sufficient to compensate [the Tribes] for the millions of acres they ceded to the Territory."²¹² Further, specifically affirming the removal of development which threatens the Tribes fisheries, the Court summarized the *Winans* holding as "clearly includ[ing] removal of enough of the fishing wheels to enable some fish to escape and be available to Indian fishermen upstream."²¹³

Fishing Vessel, and its preceding cases, demonstrate the Court's use of an economically viable standard to protect treaty reserved economic resources against extensive encroachment. In these cases, the Court's rulings were based on a particular action's *impact* on the treaty resource, not the *action*

208. 686 F. Supp. 226 (W.D. Wis. 1988).

209. *See id.* at 227-31.

210. "Phase II" of the *United States v. Washington* litigation dealt directly with the environmental implications of the Tribes' treaty reservations. *See United States v. Washington*, 506 F. Supp. 187, 203 (W.D. Wash. 1980). The district court found that "[t]he most fundamental prerequisite to exercising the right to take fish is the existence of fish to be taken" and that "implicitly incorporated in the treaties' fishing clause is the right to have the fishery habitat protected from man-made despoliation." *Id.* On appeal, the Ninth Circuit dismissed the lower court's declaratory judgment which created an environmental servitude on the State of Washington. *See United States v. Washington*, 694 F.2d 1374, 1389 (9th Cir. 1982). However, the court did recognize that "the treaty places environmental restraints on the activities in the case area." *Id.* at 1381. Upon en banc review, the full Ninth Circuit modified this earlier decision to find that ruling on the environmental issue "is contrary to the exercise of sound judicial discretion . . . in the absence of concrete facts which underlie a dispute in a particular case." *United States v. Washington*, 759 F.2d 1353, 1357 (1985). Thus, as current river conditions have produced "concrete facts" of a "dispute" between the Tribes' fisheries and hydropower development, the Phase II litigation supports diminishing development to secure the Tribes 1855 treaty reservations.

211. *Washington v. Washington State Commercial Passenger Fishing Vessel Ass'n*, 443 U.S. 658, 676 (1979).

212. *Id.* at 677-78.

213. *Id.* at 681.

itself. Whether it is a fish wheel, an irrigation ditch, over-fishing, discriminatory regulations, or a series of dams, the Court's analysis simply looks to the effect of the encroachment on the resource. Thus, because damming the Columbia Basin has diminished the Tribes' harvest below economically viable levels, the dams violate the 1855 treaty provisions. To remedy this violation, the U.S. must reduce its development and restore salmon habitat capable of sustaining viable salmon populations.

V. The Columbia Basin Dams Limit Salmon Viability and Sustainability

*You have not witnessed the extinction of the Snake River Coho run. You have witnessed the final success of the eradication program of the Snake River Coho run*²¹⁴

Damming the Columbia and Snake Rivers to provide hydropower, irrigation, and navigation to the Pacific Northwest is the principle cause of declining salmon populations. National Marine Fish Service (NMFS) estimated that the development and operation of the Federal Columbia River Power System (FCRPS) is responsible for 80% of salmon losses since historical runs.²¹⁵ Prior to dam construction, the basin supported 10 to 16 million salmon from which the Tribes harvested approximately 5 million fish.²¹⁶ Subsequently, fifty-nine Columbia Basin salmon stocks have passed into extinction,²¹⁷ and the total population has declined by over 90%.²¹⁸ In 1998, the Tribes harvested 48,500 fall chinook and 13,000 steelhead, or a little more than 10% of their former catch.²¹⁹ Of all the runs relied on by the Tribes for their economic welfare, the Hanford Reach stock of fall chinook is the Tribes' only remaining commercial fishery. The Tribes have estimated their economic losses from the decimation of salmon populations in the billions of dollars.²²⁰

214. JOSEPH CONE, A COMMON FATE: ENDANGERED SALMON AND PEOPLE OF THE PACIFIC NORTHWEST 38 (1995).

215. See NATIONAL MARINE FISHERIES SERV., U.S. DEP'T OF COMMERCE, ENDANGERED SPECIES ACT—SECTION 7 CONSULTATION, BIOLOGICAL OPINION, REINITIATION OF CONSULTATION ON 1994-1998 OPERATION OF THE FEDERAL COLUMBIA RIVER POWER SYSTEM AND JUVENILE TRANSPORTATION PROGRAM IN 1995 AND FUTURE YEARS 4 (1995) [hereinafter 1995 BIOF].

216. See NORTHWEST POWER PLANNING COUNCIL, COMPILATION OF INFORMATION ON SALMON AND STEELHEAD LOSSES IN THE COLUMBIA RIVER BASIN 74 (1986).

217. See NATIONAL MARINE FISHERIES SERV., U.S. DEP'T OF COMMERCE, PROPOSED RECOVERY PLAN FOR SNAKE RIVER SALMON I-2 (1995) [hereinafter NMFS PROPOSED RECOVERY PLAN].

218. See SPIRIT OF THE SALMON, *supra* note 2, at 3-1.

219. See Paul Lumley & Mike Matylewich, *Fall Fishery Blues*, WANA CHINOOK TYMOO, Winter 1999, at 18.

220. See SPIRIT OF THE SALMON, *supra* note 2, at xi.

To comply with the 1855 treaties, the U.S. must end its decades of status quo management and begin providing the habitat required to rebuild viable salmon populations. Dam construction along the Columbia and Snake Rivers decimated the Basin's salmon populations by reducing both the quantity and quality of salmon habitat, degrading water quality, and directly killing migrating salmon.²²¹ None of these impacts can be overcome by the mitigation efforts pursued by U.S. agencies governing the FCRPS. Rather, this failed mitigation policy perpetuated the decline of salmon runs and caused additional salmon mortality. Similarly, recovery efforts under the ESA²²² have merely preserved the status quo and failed to account for U.S. treaty obligations to the Columbia Basin Tribes. Recovering salmon populations to levels reserved by the 1855 treaties requires that salmon habitat be restored through dam removal. Nearly every study on salmon recovery in the Columbia Basin concludes that breaching some of the dams on the Columbia and Snake Rivers is the only recovery method capable of rebuilding salmon populations to self-sustaining harvestable levels, as required by the treaties.

A. Impacts of the Dams on Salmon Habitat and Populations

The most devastating impact on the Tribes' once sustainable fisheries is the elimination, degradation, and isolation of alluvial salmon habitat by the Columbia Basin hydropower system.²²³ While salmon spend approximately two to four years in the ocean,²²⁴ the most critical phases of salmon life histories take place in their freshwater habitat. In the freshwater Columbia Basin, female salmon deposit their eggs in gravel stream and lake bottoms, males fertilize the eggs, hatchlings rear and feed in their nursery streams, and juvenile salmon grow, rest, and undergo smoltification while migrating to the ocean. Diminishing the quantity and quality of this habitat results in fewer eggs being deposited and fertilized successfully, more competition among juveniles for food and protective habitat, increased predation, inhibited juvenile

221. See generally THE INDEPENDENT SCIENTIFIC GROUP, RETURN TO THE RIVER: RESTORATION OF SALMONID FISHES IN THE COLUMBIA RIVER ECOSYSTEM xvii-xviii (1996) [hereinafter RETURN TO THE RIVER]; SPIRIT OF THE SALMON, *supra* note 2, at 3-1 to 3-29.

222. See Endangered Species Act §§ 2 to 5, 16 U.S.C. §§ 1531 to 1534 (1998).

223. The Columbia Basin watershed encompasses approximately 259,000 square miles in Washington, Oregon, Idaho, Montana, and British Columbia. Each component of this watershed potentially provides essential habitat functions for the life cycle of threatened and endangered salmon. For example, Snake River Spring/Summer Chinook utilize a variety of habitats, beginning their lives emerging from the gravel streambeds of subbasins spread across Washington and Idaho. After rearing in their nursery streams for about a year, the smolts begin migrating seaward from April until May. High spring flows assist the smolts in their migration, but smolts also pause along the way to grow, rest and feed. Reaching the mouth of the Columbia, spring/summer chinook inhabit nearshore areas before traveling throughout the northeast Pacific Ocean. Two to three years later, adult chinook return to the Columbia migrating back to their gravel streambeds where they spawn and then die. See 1995 BiOp, *supra* note 215, at 18-19.

224. See NMFS PROPOSED RECOVERY PLAN, *supra* note 217, at II-2.

development, and fewer salmon reaching the mouth of the Columbia alive or properly developed for their ocean habitat. Without appropriate habitat to complete these developmental stages in the salmon life cycle, dams will continue to limit the productivity of the Tribes' fisheries.

In some cases, high head dams without fish passage facilities simply block access to abundant upstream habitats. At one time, salmon populations utilized approximately 13,000 miles of Columbia Basin rivers and streams.²²⁵ However, since the mid-twentieth century, three dams on the Columbia, Snake, and Clearwater rivers have eliminated more than half of the historical mainstem and tributary habitat in the Columbia Basin.²²⁶ Eliminating these habitats caused the extinction of some runs, increased competition among remaining runs, and diminished the genetic variability of salmon stocks.²²⁷

On the Columbia River, Chief Joseph Dam blocks access to 1,100 miles of mainstem habitat.²²⁸ While on the Snake River, Hells Canyon Dam blocks access to another 600 miles of mainstem habitat.²²⁹ Although mainstem conditions above these two dams may be degraded by other projects, it is likely that suitable tributary habitat exists which would attract additional spawning populations.²³⁰ For example, Dworshak Dam, on the Clearwater River in Idaho, blocks access to high quality spawning habitat in the Clearwater National Forest. Although many national forests have been subject to extensive logging which can damage salmon habitat,²³¹ the forests of northern Idaho would offer some of the most remote and undeveloped areas available for salmon habitat. Providing such high quality spawning habitat, and protecting it from further development, has been identified by NMFS as an important step in salmon recovery.²³² Thus, by removing one or more of these dams, particularly Dworshak Dam, the U.S. could substantially increase valuable spawning habitat and ease population pressures in degraded areas.

More important for rebuilding existing salmon populations, however, are the habitat conditions in the accessible portions of the Columbia Basin. By degrading the quality of existing salmon habitat, the dams directly limit the viability of surviving salmon populations. Of particular importance are the devastating conditions created by the eight federal dams which begin at the mouth of the Columbia and extend along the lower Snake River into Idaho.²³³

225. See *SPIRIT OF THE SALMON*, *supra* note 2, at 3-14.

226. See *id.* at 3-20.

227. See *RETURN TO THE RIVER*, *supra* note 221, at 113, 161.

228. See *SPIRIT OF THE SALMON*, *supra* note 2, at 3-20.

229. See *id.*

230. See *RETURN TO THE RIVER*, *supra* note 221, at 134 (noting that salmon seek out high quality habitat for spawning and sometimes stray from their traditional spawning grounds).

231. See *id.* at 141-43.

232. See NMFS PROPOSED RECOVERY PLAN, *supra* note 217, at V-1-6 to V-1-67 (calling for a reduction in land use activities that degrade salmon habitat and protecting remaining high quality riparian habitats).

233. The eight dams and their dates of completion are: Bonneville Dam (1983), The Dalles

These dams, some or all of which must be passed by threatened and endangered salmon migrating in and out of the Columbia Basin, degraded approximately 400 miles of mainstem alluvial salmon habitat by creating a series of tepid lakes whose waters back up from one dam to the next.

Whether spawning or migrating in the mainstem lower Columbia and Snake Rivers, endangered salmon are adversely impacted by these eight dams. Regulating the flow of the lower Columbia and Snake Rivers, the dams limit habitat functions and create lethal conditions for salmon. The regulated rivers provide homogeneous, high temperature lacustrine habitat, contain high levels of fine sediments, dissolved gases and pollutants, and lack riparian vegetation and food resources.²³⁴

Conversely, salmon require cool, unpolluted alluvial habitat with a stable and permeable gravel substrate.²³⁵ The rise and fall of such unregulated rivers provide juvenile salmon with complex floodplains for rearing, feeding, and resting during downstream migration.²³⁶ These diverse floodplain habitats furnish vegetative cover, a steady supply of insects and small food particles, quiet-water areas, backwaters, small spring-fed channels, floodplain ponds and sloughs, and alcoves created by woody debris.²³⁷ In addition, adult salmon returning to spawn require deep resting pools, riparian forest canopy, undercut banks, and accumulations of large woody debris in the proximity of spawning habitats.²³⁸ This cover and habitat complexity provides adult salmon with shelter during high flow events and refuge during low flows as they complete the spawning process.²³⁹ As in the outright elimination of salmon habitat, the degradation of salmon habitat impacts juvenile and adult salmon during essential phases of their life histories.

The escalating impacts of habitat degradation on the viability of remaining salmon populations is demonstrated by the current configuration of the eight federal dams on the lower Columbia and Snake Rivers. Of the remaining mainstem Columbia and Snake Rivers only two portions still provide alluvial salmon habitat: the Hanford Reach on the mid-Columbia and a segment of the Snake River below the Hells Canyon Complex.²⁴⁰ While both of these areas are home to core populations of fall chinook, the dams threaten one population

(1957), John Day (1968), McNary (1953), Ice Harbor (1961), Lower Monumental (1969), Little Goose (1970), and Lower Granite (1975).

234. See RETURN TO THE RIVER, *supra* note 221, at 22, 211; SPIRIT OF THE SALMON, *supra* note 2, at 3-25, 3-28.

235. See RETURN TO THE RIVER, *supra* note 221, at 131; SPIRIT OF THE SALMON, *supra* note 2, at 3-14.

236. See RETURN TO THE RIVER, *supra* note 221, at 130, 132.

237. See *id.* at 49, 132.

238. See *id.* at 135.

239. See *id.*

240. See SPIRIT OF THE SALMON, *supra* note 2, at 3-22.

and not the other.²⁴¹ To reach the Pacific Ocean from their Hanford Reach habitat, fall chinook are only required to negotiate the four dams and reservoirs on the lower Columbia. On the other hand, Snake River fall chinook must contend with an additional four dams and reservoirs on the lower Snake River before entering the Columbia where they then encounter the four dams on the lower Columbia River. Not surprisingly, the free-flowing Hanford Reach is home to the largest naturally spawning population of chinook salmon above Bonneville Dam and remains stable while Snake River fall chinook have been listed as a threatened species under the ESA.²⁴²

The contrasting viability of these stocks also provides two important lessons regarding the effects of habitat degradation in the mainstem Columbia and Snake Rivers. Since developers substantially degraded mainstem conditions, it has been convenient for the federal government to assume that most spawning and juvenile growth takes place in tributaries, and to treat the mainstem rivers as nothing more than a migration corridor to the ocean. In fact, many salmon mitigation and recovery efforts follow this model.²⁴³ However, the Hanford Reach and Snake River fall chinook populations demonstrate that mainstem habitat is important for juvenile development and as spawning grounds for core populations which maintain overall salmon survival.

First, contrary to a linear model of downstream migration, the Independent Scientific Group (ISG), contracted by the NPPC to review its salmon recovery plans,²⁴⁴ concluded that juveniles follow a "discontinuous spiraling" pattern of downstream migration.²⁴⁵ Thus, in the free-flowing Hanford Reach, migrating juveniles are able to spiral downstream utilizing the main river channel and its well developed shoreline. In the Hanford Reach, the diverse shoreline provides riparian vegetation and flooded cobble beaches which contain abundant insect food, as well as pools of calmer waters for resting.²⁴⁶ Conversely, while rearing in free-flowing waters, Snake River fall chinook soon face the waters backed up behind Lower Granite Dam. In this lacustrine habitat, Snake River fall chinook spiral toward barren reservoir shorelines characterized by eroding soil banks or rock rip-rap, neither of which provide appropriate food

241. See RETURN TO THE RIVER, *supra* note 221, at 211.

242. See *id.* at xvii, xx, 211; see also Threatened Status for Snake River Spring/Summer Chinook Salmon, Threatened Status for Snake River Fall Chinook Salmon, 57 Fed. Reg. 14,653 (1992).

243. See discussion *infra* Part V.B (discussing mitigation efforts that do not account for juvenile use of the mainstem habitat and merely transport or flush salmon down the mainstem rivers to the mouth of the Columbia River).

244. Specifically, the ISG was contracted to review the NPPC's Fish and Wildlife Program authorized by the Northwest Power Act, 16 U.S.C. §§ 839-839h (1998), and to recommend a scientific conceptual foundation for future Fish and Wildlife Programs. See discussion *infra* Part V.D.

245. RETURN TO THE RIVER, *supra* note 221, at 198, 202.

246. See *id.* at 211.

resources.²⁴⁷ Further, in May and June, the unvegetated reservoir shoreline waters quickly warm forcing Snake River juveniles into pelagic waters where their preferred food is scarce.²⁴⁸ Under these conditions, Snake River fall chinook begin their 471 mile migration with barely enough food to account for their basal metabolism, while Hanford Reach salmon are more developed.²⁴⁹ Thus, by degrading mainstem conditions the dams eliminate important habitat for juvenile development.

Second, the very existence of these stocks indicate that the mainstem rivers potentially offer substantial spawning habitat. Contrary to the perception of the mainstem rivers as simply a migration corridor, the mainstem Columbia and Snake Rivers once provided extensive spawning grounds for core populations of fall chinook.²⁵⁰ However, by degrading the quality of mainstem spawning habitat, the dams threaten both mainstem and tributary populations. Populations spawning in the mainstem rivers were less susceptible to seasonal droughts or other events disturbing local river conditions.²⁵¹ Consequently, in the event of local extinctions or depressed populations, mainstem salmon with similar genetics could replenish local populations preserving the overall viability of the salmon stock.²⁵² Therefore, by threatening the existence of mainstem Snake River fall chinook, the dams threaten a core population that is essential to maintaining the viability of the stock. Conversely, because of their flourishing core population, the Columbia River fall chinook stock is more stable. Given the essential functions of mainstem habitat, recovery efforts are needed which focus on recovering the degraded mainstem lower Columbia and Snake Rivers.

Similar to the effects of declining core populations, the dams' isolation of spawning habitat creates conditions which threaten the long term sustainability of remaining salmon stocks. Recent scientific studies conclude that salmon stocks are most appropriately viewed as metapopulations.²⁵³ Metapopulations are spatially defined groups of local populations which are linked by dispersal of individuals.²⁵⁴ Isolating salmon habitat, particularly spawning and rearing grounds, fragments the metapopulation structure and results in isolated salmon populations. Isolating populations reduces the stock's overall genetic diversity, while limiting the ability of salmon to breed across local populations.²⁵⁵ In addition, isolated populations are more likely to pass into extinction because of degraded conditions or a local event.²⁵⁶ Finally, isolated habitats are less likely

247. *See id.*

248. *See id.*

249. *See id.* at 211-12.

250. *See id.* at 79.

251. *See id.*

252. *See id.* at 77.

253. *See id.* at 76-78.

254. *See id.*

255. *See id.* at 80.

256. *See id.* at 80-82.

to be refounded by straying salmon, making local extinctions permanent and driving the entire metapopulation incrementally toward extinction.²⁵⁷

Another impact of the dams significantly affecting salmon habitat and population viability is the degradation of Columbia Basin water quality. The most threatening change in water quality has been an increase in water temperatures.²⁵⁸ Creating slow moving reservoirs spanning hundreds of miles, the dams increase solar heating producing lethal conditions for salmon in the spring and summer.²⁵⁹ In addition, facilitating the irrigation of nearly three million acres of arid lands, the dams increase in-river temperatures by diverting incredible amounts of water away from the rivers.²⁶⁰ In all phases of their life cycle salmon prefer water temperatures between 50°F and 59°F.²⁶¹ However, August temperatures exceeding 70°F are common in the mainstem Columbia River below Chief Joseph Dam, throughout the Snake River, and in many tributary basins.²⁶² Again affecting critical phases of the salmon life cycle, the temperatures of the developed Columbia Basin can easily exceed those tolerable to incubating eggs which die at 60°F.²⁶³ Moreover, mid-sixties temperatures can stress adult and juvenile salmon, further diminishing their ability to migrate or perform reproductive functions.²⁶⁴

The dams also degrade water quality by producing high concentrations of dissolved gases. During periods of high flow, or as a mitigation measure, water is released through dam spillways. Water released through spillway gates at the tops of the dams falls into pools where water pressure forces entrained air bubbles into solution.²⁶⁵ These dissolved gases supersaturate the water until equilibrium can be achieved downstream from the dams by gas exchange with the atmosphere.²⁶⁶ In fast moving rivers, such as below a naturally occurring waterfall, gases are quickly released.²⁶⁷ However, in the slow moving

257. See *id.* at 82. This event is known as an "extinction vortex" and requires significant changes to reverse population trends. An "extinction vortex" is particularly threatening to species survival because the processes driving population declines are reinforced as the population diminishes. Consequently, in addition to mortalities from the dams, the path toward extinction pulls the population ever closer to permanent extinction.

258. Preliminary assessment of water quality under the Clean Water Act shows that Columbia and Snake River water temperatures are primarily limited by the dams. See Barry Espenson, *Study: Dams Show Biggest Impact on Water Temps*, COLUMBIA BASIN BULL. (Dec. 4, 1998) <http://www.nwppc.org/bulletin/bull_24.htm#8>.

259. See *SPIRIT OF THE SALMON*, *supra* note 2, at 3-25; *RETURN TO THE RIVER*, *supra* note 221, at 169, 172.

260. See *MIGHETTO & EBEL*, *supra* note 14, at 64; *RETURN TO THE RIVER*, *supra* note 221, at 145.

261. See *RETURN TO THE RIVER*, *supra* note 221, at 171.

262. See *SPIRIT OF THE SALMON*, *supra* note 2, at 3-25.

263. See *RETURN TO THE RIVER*, *supra* note 221, at 171.

264. See *id.* at 171.

265. See *id.* at 315; *MIGHETTO & EBEL*, *supra* note 14, at 89.

266. See *RETURN TO THE RIVER*, *supra* note 221, at 315.

267. See *MIGHETTO & EBEL*, *supra* note 14, at 89.

reservoirs, which span the lower Columbia and Snake Rivers, the gases are never entirely purged from the water.²⁶⁸ Salmon absorb these dissolved gases which can erupt in their bloodstream, cause blistered scales, or disrupt gill and fin functions.²⁶⁹ This damage can be lethal, or sufficiently debilitate salmon leading to additional deaths from predation, infection, or insufficient growth and development.²⁷⁰ While improved control over high flow events diminished mortalities from gas supersaturation from 70% in 1971²⁷¹ to around 2%,²⁷² using spill as a mitigation measure reintroduces the threat of increased gas supersaturation mortalities.²⁷³

Finally, eliminating wetlands and floodplains, and limiting river hydrology, the dams degrade water quality by increasing the amount of pollutants, silt, and sediments found in Columbia Basin waters. Although these degrading elements derive from surrounding land use practices, such as logging, mining, road building, industrial activities, and agriculture, the dams intensify the negative impact of these activities by diminishing ecological processes that maintain water quality.²⁷⁴ Creating homogenous landscapes which lack water cleansing wetlands and alluvial functions, the dams store this runoff in their stagnant reservoirs. Recovering salmon from their depressed levels, requires restoration of essential habitat characteristics and functions that promote salmon viability. Unlike any mitigation measure, dam removal would allow for reestablishment of appropriate salmon habitat and recover salmon populations to fulfill U.S. treaty obligations to the Columbia Basin Tribes.

Finally, the dams are also responsible for the direct mortality of 15%-30% of the juveniles and 5%-10% of the adults attempting to migrate through each project.²⁷⁵ NFMS estimates that the cumulative mortality for Snake River spring/summer chinook juveniles, who must pass eight mainstem projects to reach the ocean, is as high as 91%.²⁷⁶ The majority of salmon mortality occurs in dam turbines by subjecting fish to sudden increases in water pressure or from striking the turbine blades.²⁷⁷ Juveniles can enter turbines while passing through a dam, and sometimes adults fall back into the turbines after navigating up fish ladders. Although mitigation measures attempt to reduce turbine mortality, screens and diversions are often found in poor condition, oversized,

268. *See id.*

269. *See id.*; RETURN TO THE RIVER, *supra* note 221, at 315.

270. *See* RETURN TO THE RIVER, *supra* note 221, at 316.

271. *See* MIGHETTO & EBEL, *supra* note 14, at 89.

272. *See* RETURN TO THE RIVER, *supra* note 221, at 315.

273. *See id.* at 316-23.

274. *See id.* at 354-55.

275. *See* SPIRIT OF THE SALMON, *supra* note 2, at 3-28.

276. *See* 1995 BIOP, *supra* note 215, at 5.

277. *See* U.S. ARMY CORPS OF ENGINEERS, LOWER SNAKE RIVER JUVENILE SALMON MIGRATION FEASIBILITY STUDY — INTERIM STATUS REPORT, 4-2 to 4-3 (December 1996) [hereinafter INTERIM STATUS REPORT]; RETURN TO THE RIVER, *supra* note 221, at 280-81.

or entirely absent.²⁷⁸ Thus, as technological mitigation can not provide salmon habitat, it also provides only limited protection from mortality caused by the dams themselves.

B. Failed Mitigation Attempts

The United States policy of mitigating dam impacts is incapable of sustaining, let alone recovering, viable salmon populations. Quite simply, even if direct mortality from the dams could be prevented, no amount of mitigation measures can compensate for the overwhelming degradation of nearly every salmon habitat in the Columbia Basin. Mitigation, in all its forms, cannot provide salmon with their most basic habitat requirements: cool, free-flowing rivers, gravel beds, and insect rich vegetative shorelines. Thus, by focusing on mitigation, as opposed to appropriately restraining development, the U.S. has never addressed the most significant cause of salmon declines, degradation of their habitat.

Rather, through the Army Corps, the United States' narrow mitigation policy focuses on increasing migration times and reducing mortality of juvenile migrants as they negotiate the lower Columbia and Snake Rivers. Effectively removing the fish from the rivers, the Corps relies heavily on transporting juveniles around the dams. For salmon that are not herded onto barges or trucks, the Corps commits millions of dollars to spilling the fish over the dams or flushing salmon through the system. Yet, each of these measures ignore the important habitat functions of the mainstem Columbia and Snake Rivers. Finally, because none of these efforts can sustain wild salmon, the Corps compensates for salmon mortality by artificial propagation. Although mitigation efforts invariably create their own sources of mortality, NMFS continues to support these efforts without committing to significant changes in the current system. Thus, despite recent annual investments of \$200 million,²⁷⁹ these intensive, yet ineffective mitigation measures have not stemmed the precipitous decline of salmon populations.

The centerpiece of the U.S. mitigation policy is a program of trucking and barging salmon around the dams. Operational since 1971, the Army Corps transports as many as fifteen million to twenty million juvenile salmon a year.²⁸⁰ This program was supported and furthered in 1985, after a NMFS biologist comprehensively reviewed the available research on the transportation program. He concluded that, "[T]he current transportation program is in a

278. See *SPIRIT OF THE SALMON*, *supra* note 2, at 3-20.

279. In contrast, restoring normative river conditions through dam removal would cost approximately \$75 to \$153 million a year, depending on how soon the Army Corps began removing the dams. See *HARZA NORTHWEST, INC., FINAL REPORT: SALMON DECISION ANALYSIS: LOWER SNAKE RIVER FEASIBILITY STUDY 1-10, 1-14* (1996) [hereinafter *HARZA REPORT*].

280. See *INTERIM STATUS REPORT*, *supra* note 277, at 4-2.

position to provide fisheries managers a productive enhancement tool for the restoration of the Columbia River salmon. . . .²⁸¹ Subsequently, as salmon populations became ever more threatened by river conditions, up 100% of the fish collected at some dams are transported.²⁸² Observing these efforts, the Columbia River Inter-Tribal Fish Commission noted that, "Wheat used to be transported on land and the fish were in the river, now wheat is moved on the river, and young fish are transported on roads."²⁸³

Transportation takes place at the three upstream dams on the lower Snake River, and McNary Dam on the Columbia. Entering the dams, transported salmon are diverted away from the turbines and into collection facilities by "extended-length bar screens."²⁸⁴ Recently installed, these screens are 20 feet longer than the "submerged traveling screens" used since the mid-1970s.²⁸⁵ Although extended screens appear to increase guidance efficiency by 10 to 15%, the amount of threatened Snake River chinook salmon passing into the turbine chambers and not "benefiting" from the United States' primary mitigation effort is still as high as 50% to 70%.²⁸⁶ Moreover, to work effectively, the extended screens require cleaning brushes that sweep up and down their wedgewire face, additional vertical barrier screens to prevent diverted fish from swimming back into the turbines, and flow vanes to smoothly direct water and fish up the gate slots.²⁸⁷

If a fish makes it to the collection area, juvenile salmon are separated from adults, resident fish, debris, and routed either directly onto a barge for transport or into raceways where they are held for later transport by truck or barge.²⁸⁸ During peak migration times barges are used to haul as many as 50,000 pounds of juvenile salmon, while trucks are used to transport smaller loads at the beginning and end of each season.²⁸⁹ Each of these vehicles is equipped with devices intended to reduce the stress of artificial migration.²⁹⁰ If they survive this journey, transported fish are delivered to the estuary at the mouth of the Columbia a day or two later, and several weeks ahead of their normal migrations.²⁹¹

281. MIGHETTO & EBEL, *supra* note 14, at 123.

282. See 1995 BiOp, *supra* note 215, at 110.

283. MIGHETTO & EBEL, *supra* note 14, at 174 (quoting *Dam Operators Fight Increased Spills*, CRITFC NEWS, Oct. 1985-Feb. 1986, at 8).

284. INTERIM STATUS REPORT, *supra* note 277, at 4-2.

285. *Id.* at 4-4.

286. See *id.* at 4-7; SPIRIT OF THE SALMON, *supra* note 2, at 5B-26.

287. See INTERIM STATUS REPORT, *supra* note 277, at 4-4 to 4-7.

288. See *id.* at 4-2.

289. See *id.*

290. The barges include a system to circulate river water that can be closed in case of poor water quality in the river, degassing equipment, and compartments to separate the large and small fish. The trucks are equipped with recirculating systems, aerators, and compartments for large and small fish. See MIGHETTO & EBEL, *supra* note 14, at 122.

291. See HARZA REPORT, *supra* note 279, at 3-7 (reporting a two-day barge trip);

Figure 2

Despite substantially investing in the research, development, and daily operation of this transport program, after thirty years of operation, the program has failed to sustain salmon populations, and comes nowhere close to promoting their recovery.²⁹² Figure 2 shows the continuing populations declines, while the number of salmon transported around the dams has increased.²⁹³ Indeed, in all of the transportation experiments conducted from 1968-1990, transportation was only able to improve survival about half of the time.²⁹⁴ Moreover, because the transportation program has never been evaluated against conditions that would maximize in-river survival, transportation benefits may be inflated.²⁹⁵

Scientific assessment of the transportation program points to additional shortcomings. Although the program boasts a low 0.3% to 6.3% observed

MIGHETTO & EBEL, *supra* note 14, at 122 (reporting a sixteen-hour barge trip).

292. See RETURN TO THE RIVER, *supra* note 221, at 328; see also MIGHETTO & EBEL, *supra* note 14, at 119-28 (chronicling the Army Corps' numerous and varied activities developing the transportation program).

293. See SPIRIT OF THE SALMON, *supra* note 2, at 5B-26 fig.5B.4.

294. See RETURN TO THE RIVER, *supra* note 221, at 326.

295. Although NMFS seems determined to test the transportation program against improved in-river conditions, i.e. increased flow, the water to substantially increase flows has never been produced. See 1995 BiOp, *supra* note 215, at 111; Michael C. Blumm, *The Amphibious Salmon: The Evolution of Ecosystem Management in the Columbia River Basin*, 24 *ECOLOGY L.Q.* 653, 665-66 (1997) [hereinafter *Amphibious Salmon*] (noting that environmentalists were critical of the 1995 BiOp for failing to improve Snake River flows).

mortality rate,²⁹⁶ there is considerable debate about the overall effectiveness of transportation and, more importantly, its long term effects.²⁹⁷ First, positive responses to transportation are most likely a function of river flow, as opposed to the effectiveness of the transportation program.²⁹⁸ Studies on adult return rates show that during low flow years, with low return rates for all salmon, more transported salmon return than untransported.²⁹⁹ However, in high flow years, with high return rates for all salmon, untransported fish return in equal or higher numbers than transported fish.³⁰⁰ Thus, the transportation program alone is insufficient to improve overall survivals, and is unnecessary in some years.³⁰¹

In addition, affecting the long term viability of salmon, the transportation program selects against certain species types and life histories as well as contributing to delayed mortality.³⁰² Because different species and stocks of salmon migrate at different ages, and utilize different parts of the water column, some salmon are more likely to be transported and survive transportation. At the collection stage, steelhead and older fish are more likely to be successfully diverted away from the turbines and subyearlings are more likely to end up in the turbine chambers where mortality is greatest.³⁰³ Next, for those subyearlings "fortunate" enough to be diverted into collection and transportation facilities, they face higher rates of stress related mortalities than older yearlings. For example, transported subyearlings suffer more from high temperatures in the screen bypass systems and crowded conditions in the transport vehicles.³⁰⁴ Finally, shortening migration times from over a month to a day or two, subyearlings reach the ocean too small for long term survival.³⁰⁵ Consequently, the transportation program, which is "unnecessary" in some years, further contributes to diminishing the genetic variability of salmon stocks.

296. See 1995 BiOp, *supra* note 215, at 57.

297. See e.g., PHILLIP R. MUNDY ET AL., TRANSPORTATION OF JUVENILE SALMONIDS FROM HYDROELECTRIC PROJECTS IN THE COLUMBIA RIVER BASIN: AN INDEPENDENT PEER REVIEW, FINAL REPORT (1994).

298. See RETURN TO THE RIVER, *supra* note 221, at 328.

299. See *id.*

300. See *id.*

301. See *id.* at 329.

302. See *id.* at 62.

303. See SPIRIT OF THE SALMON, *supra* note 2, at 5B-26; INTERIM STATUS REPORT, *supra* note 277, at 4-7.

304. See SPIRIT OF THE SALMON, *supra* note 2, at 5B-26; MIGHETTO & EBEL, *supra* note 14, at 122.

305. See SPIRIT OF THE SALMON, *supra* note 2, at 5B-26.

Not surprisingly, recent scientific review of the transportation program questions its overall effectiveness. As early as 1994, an independent peer reviewed panel convened by NMFS, the U.S. Fish and Wildlife Service, state fisheries agencies, and the Tribes, concluded that "[a]vailable evidence is not sufficient to identify transportation as either a primary or supporting method of choice for salmon recovery in the Snake River Basin."³⁰⁶ The panel noted that transportation fails to protect salmon from persistent mortalities due to the system wide degradation of the Columbia Basin,³⁰⁷ and contributes to salmon mortality by inflicting stress, adversely affecting genetic variability, increasing disease, and reducing homing ability.³⁰⁸ Moreover, a few years later, the ISG, reported that, "Transportation benefits are incompletely substantiated and assumptions of benefits are based on surprisingly few complete studies."³⁰⁹ However, the federal government's continuing investment in the transportation program further diminishing chances for salmon recovery by precluding study of in-river migration options.³¹⁰

At dams without transport facilities, the Army Corps attempts to avoid passing salmon through the turbines by spilling large numbers of fish over the dams.³¹¹ In controlled spills, that do not produce gas supersaturation, mortalities can be as low as 0% to 2% plus downstream predation.³¹² However, if a forced spill occurs, as they often do when the hydropower system is being operated for other goals,³¹³ gas supersaturation levels preclude using spills as a mitigation measure. Because the water from one dam spills into the stagnant reservoir of the next dam, gas supersaturation quickly limits the use of spills.³¹⁴ Thus, spill might be more effective at individual dams if free-flowing conditions are restored downstream by removing some dams. Nevertheless, while spills may resemble a natural waterfall, like other mitigation attempts, they do nothing to reestablish essential habitat functions which sustain salmon during their migration down the mainstem Columbia and Snake Rivers.

306. MUNDY ET AL., *supra* note 297, at viii, 117-18.

307. *See id.* at 83.

308. *See id.* at 101-02, 108-09, 114.

309. RETURN TO THE RIVER, *supra* note 221, at 61.

310. *See* SPIRIT OF THE SALMON, *supra* note 2, at 5B-27 (recommending a halt on the transportation program to allow for complete testing of flow augmentation, spills, and/or drawdowns).

311. *See* 1995 BiOp, *supra* note 215, at 45.

312. *See* RETURN TO THE RIVER, *supra* note 221, at 281.

313. *See* INTERIM STATUS REPORT, *supra* note 277, at 4-14.

314. *See* RETURN TO THE RIVER, *supra* note 221, at 60.

Figure 3

Finally, through flow augmentation the Army Corps attempts to counteract adverse reservoir conditions by increasing juvenile migration times.³¹⁵ Because of hydropower operations, irrigation withdrawals, and flood control, the Basin's flow has been severely regulated, see figure 3.³¹⁶ It is thought that without high spring flows, juvenile salmon must expend more metabolic resources to successfully pass through the reservoirs.³¹⁷ Thus, through flow augmentation, the Army Corps hopes to reduce migration times and increase survival. However, a clear relationship between high flows and survival has not been established.³¹⁸

While adding any amount of water to the system could benefit salmon, flow augmentation is another mitigation effort which oversimplifies salmon requirements and migration behavior in the mainstem Columbia and Snake Rivers.³¹⁹ Historical high spring flows were accompanied by functioning alluvial habitats that provided salmon with riparian vegetative cover, calm water pools, and complex food webs. These habitats supported migrating salmon as they spiraled out of the high flows to rest and feed near the shore.³²⁰ Treating the mainstem rivers as simply a migration corridor, the Army Corps simplified this habitat and eliminated supportive shoreline functions. Consequently, without reestablishing necessary floodplain habitat,

315. See 1995 BiOp, *supra* note 215, at 38.

316. See SPIRIT OF THE SALMON, *supra* note 2, at 5B-27 fig.5B.3.

317. See RETURN TO THE RIVER, *supra* note 221, at 52.

318. See *id.* at 195.

319. See *id.*

320. See *id.* at 198-200. See also discussion *supra* Part V.A.

augmented flows flush juveniles through the system to the ocean.³²¹ Thus, while migration times may be reduced, young salmon arrive at the mouth of the Columbia under developed for long term survival in the ocean.

In addition, flow augmentation without supportive habitat also selects against some salmon life histories. Observations of salmon behavior demonstrate that two separate life histories occupy the mainstem rivers.³²² Fall chinook, spawn and rear in the mainstem, while many other species spawn and rear in tributaries and then migrate through the mainstem.³²³ Thus, flushing the rivers with additional water to increase the migration times of some fish, may also induce early migration in younger fall chinook.

Finally, because none of these mitigation measures address the most significant impacts of hydropower operations, habitat degradation, U.S. mitigation policy must rely on hatchery production to provide some semblance of a salmon population.³²⁴ In fact, hatchery expenditures have always accounted for the majority of all salmon recovery spending in the Columbia Basin.³²⁵ Currently, hatchery production accounts for about 80% of the Snake River stocks and 75% of the Columbia River stocks.³²⁶ Despite this incredible investment, hatcheries have failed in their attempt to replace or mitigate for lost natural reproduction of salmon and contribute to the decline of wild stocks.³²⁷

Recent research demonstrates some of the detrimental effects of hatchery production on wild salmon. First, to obtain any surviving adults, hatchery fish must be released in such high numbers that they pose a substantial drain on already degraded food and habitat resources. Prior to 1850, the NPPC estimated that the Columbia Basin supported an annual smolt abundance of 264 million juveniles.³²⁸ Recently, however, annual releases of approximately 250 million hatchery juveniles, plus 145 wild juveniles, have resulted in a total of 395 smolts migrating and inhabiting the Columbia Basin.³²⁹

It is also noted that artificially propagated salmon reduce the genetic viability of wild salmon. Under normative conditions, straying between

321. See RETURN TO THE RIVER, *supra* note 221, at 214.

322. See *id.* at 197-98.

323. See *id.* at 198.

324. See NMFS PROPOSED RECOVERY PLAN, *supra* note 217, at V-4-4.

325. Prior to 1981, and at least until 1991, hatcheries have accounted for 40% or more of all recovery spending in the Columbia Basin. See RETURN TO THE RIVER, *supra* note 221, at 388A (citing a 1992 GAO report on distribution of expenditures for salmon restoration in the Columbia River prior to 1981 and from 1981-1991).

326. See INTERIM STATUS REPORT, *supra* note 277, at 2-9.

327. See RETURN TO THE RIVER, *supra* note 221, at 66, 397.

328. See INTERIM STATUS REPORT, *supra* note 277, at 2-9 (citing NORTHWEST POWER PLANNING COUNCIL, COMPILATION OF INFORMATION ON SALMON AND STEELHEAD LOSSES IN THE COLUMBIA RIVER BASIN (1986)).

329. See INTERIM STATUS REPORT, *supra* note 277, at 2-9.

salmon populations promotes reestablishment of diminishing populations and reinforces the viability of the entire metapopulation.³³⁰ However, because the majority of the remaining salmon derive from hatchery stocks, even if a small proportion strays, they can overwhelming the genetics of wild populations and diminish their long term survival.³³¹ To avoid these effects, hatchery production should be limited and used on a smaller scale.³³² As the ISG commented, after 100 years of artificial propagation, "it is instructive to note that the most productive stock in the basin is the fall chinook population that spawns naturally in the free-flowing Hanford Reach portion of the mainstem Columbia."³³³

Despite the example set by the free-flowing Hanford Reach, the Corps has attempted to "improve" in-river passage conditions since the 1970s with bypass facilities, extended-length bar screens, transportation, flip-lips, debris removers, and improved turbine operations. Unfortunately, this same period has also seen a substantial increase in annual salmon mortalities from which populations have been unable to recover.³³⁴ Indeed, the extent of the region's investment in technological fixes is not a sign of mitigation success, rather it indicates how lethal the current river system is to salmon. Unfortunately, even under the ESA, NMFS has shown little movement away from debilitating river conditions, and ineffective mitigation measures.

C. Status Quo Management under the Endangered Species Act

In 1991, the first stock of Columbia Basin salmon was listed under the ESA.³³⁵ Nearly a decade later, NMFS has listed a total of ten salmon stocks under the ESA, and designated the mainstem Columbia River and all accessible portions of the Snake Basin as critical habitat for these endangered and threatened species.³³⁶ Under the ESA, NMFS is required to implement

330. See RETURN TO THE RIVER, *supra* note 221, at 66.

331. See *id.* at 66, 390.

332. For example, the Tribes recommend using hatcheries in specific instances to supplement lost or declining wild stocks. Contrary to large scale hatchery production that can easily overwhelm wild stocks, supplementation works with existing stocks to rebuild populations in their current environment. See SPIRIT OF THE SALMON, *supra* note 2, at 5B-14, 5B-16.

333. See RETURN TO THE RIVER, *supra* note 221, at 395.

334. See NMFS PROPOSED RECOVERY PLAN, *supra* note 217, at V-2-3.

335. See Endangered Status for Snake River Sockeye, 56 Fed. Reg. 58,619 (1991).

336. See Threatened Status for Two ESUs of Steelhead in Washington and Oregon, 64 Fed. Reg. 14,517 (1999) (listing mid-Columbia River steelhead); Threatened Status for Two ESUs of Chum Salmon in Washington and Oregon, 64 Fed. Reg. 14,508 (1999) (listing a Columbia River Stock); Threatened Status for Three Chinook Salmon Evolutionary Significant Units (ESUs) in Washington and Oregon, and Endangered Status for One Chinook Salmon ESU in Washington 64 Fed. Reg. 14,308 (1999) (listing Lower Columbia River and Upper Columbia River Spring stocks); Threatened Status for Two ESUs of Steelhead in Washington, Oregon, and California 63 Fed. Reg. 13,347 (1998) (listing a lower Columbia River stock); Listing of Several Evolutionary Significant Units (ESUs) of West Coast Steelhead 62 Fed. Reg. 43,937 (1997) (listing upper

a program "for the conservation and survival of endangered species and threatened species."³³⁷ As a part of these plans, NMFS has recognized that its recovery efforts must fulfill U.S. treaty obligations to the Tribes.³³⁸ In its preliminary statement on salmon recovery, NMFS wrote, "The Proposed Recovery Plan will address all sources of salmon mortality and will include measures to rebuild the stocks so as to meet both the requirements of the ESA and the federal government's treaty obligations and trust responsibilities to the Indian people. . . ."³³⁹ Nevertheless, after nearly a decade of management under the ESA, NMFS has not implemented any changes to overcome the miserable river conditions created by the dams. To comply with its 1855 treaty obligations, and the ESA, NMFS must stop preserving the status quo and begin reducing U.S. development in the Columbia Basin.

Under section 7 of the ESA, federal agencies proposing actions that may jeopardize a listed species, i.e. the FCRPS, must consult with the relevant fish and wildlife agency, in this case NMFS, to insure that their actions are "not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of such species. . . ."³⁴⁰ As a result of this consultation, NMFS must issue a Biological Opinion (BiOp) describing whether federal actions will jeopardize a listed species and alternative actions that must be taken to avoid any potential jeopardy.³⁴¹ However, the BiOp's issued by NMFS have endorsed the United States' failed mitigation policy and have not required any significant changes to the current system.³⁴²

In 1992, NMFS issued its first BiOp for the FCRPS and concluded that the operation of the dams would not jeopardize the species listed under the ESA.³⁴³ NMFS's "no jeopardy" decision was primarily based on a last

Columbia and Snake River stocks); Designated Critical Habitat; Snake River Sockeye Salmon, Snake River Spring/Summer Chinook, and Snake River Fall Chinook, 58 Fed. Reg. 68,543 (1993); Threatened Status for Snake River Spring/Summer Chinook Salmon, Threatened Status for Snake River Fall Chinook Salmon, 57 Fed. Reg. 14,653 (1992); Endangered Status for Snake River Sockeye, 56 Fed. Reg. 58,619 (1991).

337. Endangered Species Act § 4, 16 U.S.C. § 1533(f) (1998).

338. See NMFS PROPOSED RECOVERY PLAN, *supra* note 217, at 1-12; 1995 BiOp, *supra* note 215, at 2.

339. 1995 BiOp, *supra* note 215, at 2.

340. Endangered Species Act § 7, 16 U.S.C. § 1536(a)(2).

341. 16 U.S.C. § 1536(b)(3)(A).

342. See Michael C. Blumm et al., *Saving Snake River Water and Salmon Simultaneously: The Biological, Economic, and Legal Case for Breaching the Lower Snake River Dams, Lowering John Day Reservoir, and Restoring Natural River Flows*, 28 ENVTL. L. 997, 1002 (1998) [hereinafter *Biological, Economic, and Legal Case*].

343. See NATIONAL MARINE FISHERIES SERV., ENDANGERED SPECIES ACT — SECTION 7 CONSULTATION/ CONFERENCE BIOLOGICAL OPINION: 1992 OPERATIONS OF THE FEDERAL COLUMBIA RIVER POWER SYSTEM 50 (1992).

minute change to the NPPC's Fish and Wildlife Program.³⁴⁴ At the end of 1991, the NPPC responded to the listing of Snake River sockeye salmon on the ESA by deceptively promising to increase Snake River flows for the first time since the NPPC's Fish and Wildlife Program was created under the NPA in 1982.³⁴⁵ However, the promised water only made it more likely that the Snake River would meet its original water budget, leading one scholar to comment, "In other words, according to NMFS, implementation of the Northwest Power Act [in 1982] satisfied the ESA."³⁴⁶ Moreover, because the "improved" flows were still far from biologically based flows, the 1992 BiOp endorsed the Army Corps' continued reliance on barging and trucking.³⁴⁷

In 1993 when NMFS issued another "no jeopardy" decision based on the same conclusions, the federal District Court in Oregon struck down the 1993 BiOp as "arbitrary and capricious."³⁴⁸ Expressing a surprising level of frustration with the agency's decision making process, the court stated that,

[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 action agencies have narrowly focused their attention on what the establishment is capable of handling with minimal disruption.³⁴⁹

Consequently, the district court directed NMFS to re-initiate its section 7 consultation and produce a BiOp consistent with the ESA.³⁵⁰

After four years and a stern rebuke from the federal district court, NMFS finally determined that operation of the FCRPS would jeopardize salmon stocks.³⁵¹ However, despite its "jeopardy" decision, NMFS's resulting 1995 BiOp currently governing the FCRPS continues to rely on unproven mitigation measures and only proposes to study improving in-river conditions through reservoir drawdowns.³⁵² Attempting to "spread the risk,"³⁵³ the

344. See *Amphibious Salmon*, *supra* note 295, at 664.

345. See *id.* at 663-64. See also discussion *supra* Parts III.C.

346. *Amphibious Salmon*, *supra* note 295, at 664.

347. See *Saving Idaho's Salmon*, *supra* note 93, at 693.

348. See *Idaho Dept. of Fish and Game v. Nat'l Marine Fisheries Serv.*, 850 F. Supp. 886, 900 (D. Or. 1994).

349. *Id.*

350. See *id.* at 900-01.

351. See 1995 BiOp, *supra* note 215, at 90-91.

352. See *id.* at 50, 54, 94-128; see also *Beyond the Parity Promise*, *supra* note 130, at 62-76 (discussing implementation of the 1995 Biological Opinion).

353. See 1995 BiOp, *supra* note 215, at 112, 131; see also *Beyond the Parity Promise*, *supra*

1995 BiOp attempts to increase river flows and spills for migrating juveniles, while also continuing to transport most of the collected juvenile fish around the dams.³⁵⁴ Yet, as with earlier attempts to increase river flows, actual implementation fell far short of the promised increases.³⁵⁵ Because river flows remain unimproved and rarely allow spilling the fish over the dams, federal agencies continue to rely heavily on transportation to pass migrating juveniles.³⁵⁶

As a further indication of the dismal state of river operations, the 1995 BiOp also authorizes dam-related mortality of up to 86% for juvenile sockeye and spring/summer chinook and up to 100% of juvenile fall chinook.³⁵⁷ However, when brought before the same Judge who had called for a "major overhaul" in 1994, Justice Marsh was unable to prevent continued implementation of the 1995 BiOp.³⁵⁸ Finding that the ESA did not impose risk tolerance limits, and noting that principles of judicial review required his deference to agency technical expertise, Justice Marsh could only criticize the program for incorporating questionably high levels of risk.³⁵⁹

Finally, apparently recognizing the inadequacy of current operations and the "improvements" suggested by its 1995 BiOp, NMFS stated, "Without major modifications to the Snake and Columbia River dams, it is unlikely survivals can be sufficiently improved to ensure that the operation of the [FCRPS] does not impede the survival and recovery of listed Snake River salmon."³⁶⁰ However, rather than beginning to implement any "major modifications," the 1995 BiOp merely proposes to study structural changes such as spillway crest drawdown, natural river drawdown, or surface collectors.³⁶¹ Thus, the only "reasonable and prudent alternative" actually implemented by the 1995 BiOp to prevent the FCRPS from jeopardizing the

note 130, at 63.

354. See 1995 BiOp, *supra* note 215, at 91-104, 110-12.

355. See *Beyond the Parity Promise*, *supra* note 130, at 84-98.

356. See *id.* at 94-95.

357. See 1995 BiOp, *supra* note 215, at 159. Page 159 appears to contain a typographical error. The 1995 BiOp was for three listed species: Snake River sockeye salmon, Snake River spring/summer chinook salmon, and Snake River fall chinook salmon. However, in listing incidental take limits for these three species, the BiOp lists Snake River spring/summer chinook twice. Following the order of the rest of the BiOp, the third species on the list should probably read "Snake River fall chinook."

358. See *American Rivers v. Nat'l Marine Fisheries Serv.*, No. 96-384-MA, slip op. at 26 (D. Or. Apr. 3, 1997).

359. See *id.*

360. See 1995 BiOp, *supra* note 215, at 81.

361. *Id.* Similar modifications were suggested by the Tribes and state fishery agencies, but NMFS rejected them as inconsistent with the basic assumptions of the juvenile passage model used by the NMFS to support most of its 1995 Biological Opinion. See generally 1995 BiOp, *supra* note 215, at 84-85, 111.

listed species is the study of future modifications to the dams. While studying the alternatives will delay salmon recovery almost ten years since invocation of the ESA, the resulting studies finally confirm that dam removal is the only option capable of resorting salmon populations.

D. Returning Salmon to the River through Dam Removal

To prevent the extirpation of remaining salmon runs, and to rebuild self-sustaining populations NMFS must implement a recovery plan that reduces U.S. development of the Columbia Basin. Since 1993, at least thirteen studies of the biological, technical, and economic issues have concluded that salmon recovery requires halting the current transportation based program and restoring free-flowing rivers through reservoir drawdowns or dam removal.³⁶² Five of these studies are comprehensive scientific assessments written by or for the primary bodies governing Columbia Basin salmon and hydropower: the Tribes, the NPPC, the Army Corps, the State of Idaho, and NMFS.³⁶³ Eliminating the last remaining scientific support for the current

362. See COLUMBIA BASIN INDIAN TRIBES AND STATE & FEDERAL FISH & WILDLIFE AGENCIES, DETAILED FISH OPERATING PLAN WITH 1994 OPERATING CRITERIA 2-23 (1993) (recommending seasonal drawdowns and use of transportation only as a last resort); MUNDY ET AL., *supra* note 297, at 116 (concluding that transportation could not prevent the decline and extirpation of listed salmon species); NORTHWEST POWER PLANNING COUNCIL, COLUMBIA RIVER BASIN FISH AND WILDLIFE PROGRAM 5-46 (1994) (suggesting seasonal drawdowns and warning that transportation should not be regarded as a substitute to restoring the river ecosystem); NATIONAL RESEARCH COUNCIL, UPSTREAM: SALMON AND SOCIETY IN THE PACIFIC NORTHWEST 4, 241 (1995) (giving only qualified endorsement of transportation and recommending long term reliance on natural river functions); SPIRIT OF THE SALMON, *supra* note 2, at 5B-24 to 5B-31 (recommending permanent drawdowns and halting transportation); RETURN TO THE RIVER, *supra* note 221, at xx, 5, 506, 509 (criticizing transportation and supporting restoration of normative river conditions); HARZA REPORT, *supra* note 279, at 1-9 (concluding that dam removals are the best choice biologically and economically); IDAHO DEP'T OF FISH & GAME, REPORT TO THE DIRECTOR, IDAHO'S ANADROMOUS FISH STOCKS: THEIR STATUS AND RECOVERY OPTIONS 8-11 (1998) (supporting dam removal and concluding that transportation could not meet recovery standards) [hereinafter IDAHO'S ANADROMOUS FISH STOCKS]; PHILIP S. LANSING & EVE VOGEL, RESTORING THE LOWER SNAKE RIVER: SAVING THE SNAKE RIVER SALMON AND SAVING MONEY 4 (n.d.) (concluding that the net economic benefits of the lower Snake River dams are less than their total operation and maintenance costs including salmon mitigation); EBAN GOODSTEIN, DAM ECONOMICS: OVERVIEW AND APPLICATION TO THE LOWER SNAKE RIVER C-17 to C-18 (1998) (finding the economic costs and benefits of removing the four lower Snake River dams to be roughly equal, but noting that the "existence value" of salmon clearly overwhelmed the additional electricity); NORTHWEST POWER PLANNING COUNCIL, ANALYSIS OF THE BONNEVILLE POWER ADMINISTRATION'S POTENTIAL FUTURE COSTS AND REVENUES 6-8 (1998) (stating that the primary economic variable was electricity costs, not any particular recovery option); PLAN FOR ANALYZING AND TESTING HYPOTHESES (PATH), PATH FINAL REPORT FOR FISCAL YEAR 1998, at 24 (D.R. Marmorek et al. eds., 1998) (concluding that natural river drawdowns give all salmon stocks the best chance of recovery) [hereinafter PATH FINAL REPORT]. For a summary of these reports and others, see *Biological, Economic, and Legal Case*, *supra* note 342, at 1012-31.

363. See SPIRIT OF THE SALMON, *supra* note 2, at 5B-24 to 5B-31; RETURN TO THE RIVER, *supra* note 221, at xx, 5, 506, 509; HARZA REPORT, *supra* note 279, at 1-9 (1996); IDAHO'S

mitigation program, the report prepared for NMFS refutes the technical modeling results NMFS relied on for its 1995 BiOp.³⁶⁴

The first of these five reports was the Tribes' 1995 salmon restoration plan, *Wy-Kan-Ush-Mi Wa-Kish-Wit (Spirit of the Salmon)*, which forged the path that is now followed by most state and federal agencies governing hydropower operations. The Tribes broke the cycle of endless mitigation by prioritizing "respect and reverence" for the salmon who "unselfishly gave of itself for the physical and spiritual sustenance of humans."³⁶⁵ Contrary to the United States' mitigation policy, the tribal plan takes a "gravel-to-gravel" approach encompassing the entire salmon life cycle.³⁶⁶ This approach shifts the focus of recovery efforts away from technological fixes toward providing salmon habitat and ecological functions supportive of salmon populations.

The Tribes' recommendations included permanent drawdowns, habitat restoration, and careful supplementation of salmon populations.³⁶⁷ Like the recovery plans that would follow, the Tribes recommended permanent drawdowns of the Snake River reservoirs through dam removal and some drawdown of John Day reservoir.³⁶⁸ The Tribes support permanent dam removals, as opposed to seasonal drawdowns, because permanent drawdowns would allow for reestablishment of shoreline vegetation, and would restore substantial spawning areas for threatened salmon stocks.³⁶⁹ Restoring these and other habitat functions, which are essential to self-sustaining salmon populations, is an underlying foundation of the Tribal recovery plan.³⁷⁰ In addition, recognizing that hatchery propagation has become indispensable for maintaining salmon populations, the Tribes advocated refining the program to reduce some of its inherent risks.³⁷¹ Instead of mass rearing hatchery bred fish or captive breeding, the Tribes would carefully reintroduce or supplement lost and diminishing stocks, utilizing the as much of each stock's

ANADROMOUS FISH STOCKS, *supra* note 362, at 8-11; PATH FINAL REPORT, *supra* note 362, at 24.

364. See PATH FINAL REPORT, *supra* note 362, at 24 (examining all fish passage models and uncertainties and concluding that natural river drawdown produces higher biological benefits regardless of the model used); 1995 BiOp, *supra* note 215, at 84-85 (discussing the respective assumptions of the passage models and relying on the model which tends to produce results shows that transporting the salmon in barges and trucks produces the highest rates of survival).

365. SPIRIT OF THE SALMON, *supra* note 2, at ii.

366. See *id.* at iv.

367. See *id.* at x.

368. See *id.* at 5B-30.

369. See *id.*

370. Conversely, U.S. mitigation policies have devoted few resources to habitat restoration or protection. See RETURN TO THE RIVER, *supra* note 221, at 388A (calculating that less than 1% of total recovery expenditures were allocated to habitat restoration prior to 1981, and only 7% was allocated from 1981 to 1991).

371. See SPIRIT OF THE SALMON, *supra* note 2, at x.

natural environment as possible.³⁷² Finally, the Tribes call for an end to the failed transportation program, so that restoration agencies can begin "putting the fish back in the river."³⁷³

Next, in 1996, two reports prepared for the federal bodies primarily responsible for salmon conservation and hydropower operations affirmed dam removal as the most biologically and economically responsible recovery method. One study was prepared for the NPPC, the federal body originally charged with overseeing salmon conservation under the NPA.³⁷⁴ This report was written by the ISG, an independent and peer reviewed team of scientists contracted by the NPPC. The group was asked to develop a scientifically based conceptual foundation to guide further recovery efforts and to conduct a comprehensive review of the science underlying the NPPC's Fish and Wildlife Program.³⁷⁵ First, determining that the reestablishment of "normative ecosystem conditions" should be the foundation for any successful recovery measures, the ISG criticized the NPPC for adopting the flawed "machine metaphor" to guide its conservation program.³⁷⁶ This view, dominating Pacific Northwest fisheries management and salmon recovery for over a century, perpetuates economic extraction of natural resources through the belief that a technological system can be engineered to sustain salmon populations in isolation from the degraded ecosystem.³⁷⁷ In contrast, the ISG "recommended that the region move from a strategy of 'fixing' ecosystem damage to one that places greater reliance on re-expression of the natural biological and physical processes of the Columbia River salmon-bearing ecosystem."³⁷⁸

Thus, the ISG noted, "The key to salmon productively in the future will be the degree to which normative ecosystem conditions are re-introduced into the Columbia River Basin."³⁷⁹ "For example," they elaborated, "an approach whose goal is a normative ecosystem would highlight restoration of life history diversity, rather than more technological approaches, such as transporting fish in barges or producing them in hatcheries."³⁸⁰ Consequently, similar to the Tribes' plan, the ISG supported drawdowns of the lower Snake River and either John Day or McNary reservoirs to reestablish free-flowing conditions. The ISG concluded that such action

372. *See id.* at 5B-14 to 5B-24.

373. *Id.* at x, 5B-27

374. *See* discussion of the NPA *supra* Part III.C.

375. *See* RETURN TO THE RIVER, *supra* note 221, at xiv.

376. *Id.* at 506-08.

377. *See id.* at 507.

378. *Id.* at xxiii.

379. *Id.* at xxiv.

380. *Id.* at xxv.

would result in salmon productivity similar to the Hanford Reach which supports one of the last self-sustaining salmon stocks.³⁸¹

The other report released in 1996 was prepared by HARZA Northwest for the Army Corps who operates the FCRPS. The Army Corps asked that HARZA assess the biologic and economic feasibility of salmon recovery options.³⁸² First, HARZA unequivocally supported the biological conclusions of the previous two studies. HARZA stated,

Quite simply, dam removal is the biological option of choice if salmon and ecosystem restoration is the primary goal. Removal of four Snake River dams will increase salmon survival by about 72 percent above existing in-river levels. Dam removal plus improvements to lower Columbia River dams included would about double annual salmon population production.³⁸³

Moreover, if return rates for Columbia Basin salmon continue at their present rate, less than 1%, HARZA concluded, "[I]t will not be possible to recover Snake River salmon using transportation or with the dams in place. Only dam removal will provide sufficient benefits to have any chance for reversing decline."³⁸⁴

Second, HARZA's economic assessment further supported dam removals. Based on the mitigation measures authorized by NMFS's 1995 BiOp, the cost of transporting, spilling and flow augmentation was estimated at \$200 million.³⁸⁵ In contrast, depending on when dam removal is initiated, HARZA estimated that removing the four lower Snake River dams would cost between \$75 and \$153 million.³⁸⁶ To achieve the lower of these costs, NMFS would have until the year 2010 to implement dam removal, more than a decade from its original 1999 decision date when the Final Recovery Plan was originally slated for release.

Thus, as early as 1996, the federal agencies primarily responsible for hydropower operations and salmon conservation in the Columbia Basin, had been directly advised that dam removal, not mitigation, would recover salmon populations. Moreover, the Tribes, to whom the federal government must defer with regard to salmon conservation,³⁸⁷ had previously submitted their comprehensive plan incorporating dam removal. In 1998, the state of Idaho with potentially the most invested in maintaining the lower Snake River dams, and in removing them, also came out in favor of dam removals.

381. *See id.* at 268.

382. *See* HARZA REPORT, *supra* note 279, at 1-1.

383. *Id.* at 1-16 (emphasis removed).

384. *Id.* at 1-17.

385. *See id.* at 1-14.

386. *See id.* at 1-14, 1-18.

387. *See* Northwest Power Act, § 839b(h)(5) (1998); *see also* discussion *supra* Part III.C.

Idaho is home to many of the salmon species currently listed on the ESA, and is also one of the few beneficiaries of the lower Snake River Dams.³⁸⁸ In the face of these disparate influences, the Idaho Department of Fish and Game supported dam removals as "the best biological choice" among the options being considered for the 1999 decision date.³⁸⁹

Relying entirely on feasibility and biological criteria, Idaho judged recovery options based on their ability to sustain a 2%-6% smolt-to-adult survival rate.³⁹⁰ Noting that there "is no scientific basis" for assuming the current transportation program can meet these survival standards, Idaho considered the possibility of an enhanced transportation program versus permanent drawdowns of the lower Snake River.³⁹¹ However, because transportation enhancements remain untested, and questionable flow augmentation would still be required, Idaho could find no scientific support for continuing or improving the mitigation program.³⁹² On the other hand, the state determined that natural river drawdown "has a strong scientific basis" and would remove the "primary factor" limiting salmon recovery.³⁹³

Finally, in the development of its Final Recovery Plan, NMFS is attempting to eliminate or refine remaining uncertainties regarding whether dam removals or a mitigation program based on transportation is the best option to recover endangered salmon. These uncertainties are being considered through a peer reviewed interagency working group of twenty-five scientists created by NMFS's 1995 BiOp.³⁹⁴ Specifically, the Plan for Analyzing and Testing Hypotheses (PATH) is charged with the ominous task of examining all the existing evidence as it identifies, addresses, and reduces uncertainties in the fundamental biological issues surrounding recovery of endangered Columbia Basin salmon stocks to self-sustaining levels.³⁹⁵ After its exhaustive study, in late 1999, PATH was contracted to advise NMFS in its development of a Final Recovery Plan for endangered Columbia Basin salmon.

388. The lower Snake River dams allow Lewiston, Idaho, 471 miles from the ocean, to be an inland seaport. This navigational channel provides some of the most subsidized transportation in the country. See *Biological, Economic, and Legal Case*, *supra* note 342, at 125. Moreover, the lower Snake River dams were originally conceived as post-World War II make-work projects whose economic costs outweighed any economic benefits. See PETERSEN, *supra* note 94, at 119-25. Approximately, 30 years later, the Snake River dams provide no flood control, less than 5% of the region's hydropower, subsidized irrigation for 13 corporate farms, and dubious navigation benefits. See *Biological, Economic, and Legal Case*, *supra* note 342, at 125.

389. IDAHO'S ANADROMOUS FISH STOCKS, *supra* note 362, at 16.

390. See *id.* at 6. This is the same standard used by NMFS and represents stock productivity observed in the 1950s and 1960s prior to completion of the lower Snake River dams.

391. See *id.* at 13-15.

392. See *id.* at 13-14.

393. See *id.* at 14-15.

394. See 1995 BiOp, *supra* note 215, at 6.

395. See PATH FINAL REPORT, *supra* note 362, at 1.

The PATH study utilizes an intensive four-step modeling process to assess the potential outcomes of seven management options with regard to the listed species.³⁹⁶ The benefits and limits of the management options are explored by incorporating species specific uncertainties into each model run.³⁹⁷ These uncertainties are variable, expressed by a range of alternative hypotheses that describe unknown effects of management actions on fish populations.³⁹⁸ For example, for spring/summer and fall chinook, PATH identified fourteen uncertainties each with an individual set of alternative hypotheses.³⁹⁹ Then, for each salmon species and management option, hundreds and thousands of possible outcomes are produced by running the four-step model with different expressions of the fourteen uncertainties.⁴⁰⁰ Finally, each model outcome, based on one expression of the uncertainties, is tabulated as part of a cumulative frequency distribution of all the outcomes for a particular species and a management option.⁴⁰¹ Plotted against NMFS's survival and recovery standards,⁴⁰² the results show the number of times that a particular management option does or does not recover the listed species.⁴⁰³ Converted to percentages, these results show the probability, in

396. See *id.* at 3. The recovery options explored derive from recommendations in NMFS's 1995 BiOp. Thus far, seven options are being considered: actions authorized under the 1995 BiOp, 1995 BiOp actions plus transportation of all collected fish, 1995 BiOp actions plus transportation of all fish collected with improved fish guidance screens, natural river drawdown of the four lower Snake River reservoirs, two in-river flow augmentation options, and natural river drawdown of the four lower Snake River reservoirs plus John Day reservoir. See *id.* at 18-20. For each recovery plan, PATH first uses a hydro-regulation model to predict how the plan would influence Columbia and Snake River flows. These results are then plugged into two differing passage models which predict salmon survival for transported and non-transported smolts. Next, the smolt survivals predicted by the passage models are combined with historic survival data to produce a survival ratio which more fully refines the variability in survival rates and the factors which affect them. Finally, this information is used to produce spawner abundance numbers generated by two different life-cycle models. See *id.* at 19.

397. See PATH FINAL REPORT, *supra* note 362, at 4.

398. See *id.* at 22-26.

399. See PATH FINAL REPORT, *supra* note 362, at 22-24. Uncertainties considered were: in-river survival assumptions, fish guidance efficiency, turbine/bypass mortality, predator removal effectiveness, duration of pre-dam removal period, long term juvenile survival after drawdown, duration from dam removal until physical and biological equilibrium is reached, transportation assumptions, life-cycle model, mortality occurring outside the migration period/future climate, habitat effects, harvest schedules, additional sources of mortality, adult survival in John Day reservoir after drawdown. See *id.*

400. See *id.* at 26-28. For example, for spring/summer chinook PATH produced 2160 possible outcomes for four of the recovery options. See *id.* at 28 & n.5.

401. See *id.* at 28-29.

402. NMFS survival standards are figured at 24 years, short term, and 100 years, long term. Recovery standards are calculated over 48 years. See *id.* at 5-7.

403. See *id.* at 28-29.

light of all the uncertainties, that a particular management option will promote the survival or recovery of a particular species.⁴⁰⁴

In its preliminary report, PATH directly addressed the most politically and economically charged "uncertainty" created by the two different passage models used to predict juvenile survival during migration.⁴⁰⁵ One model, the Columbia River Fish Passage model (CRiSP), was developed by the Bonneville Power Administration with assistance from the University of Washington.⁴⁰⁶ Not surprisingly, the CRiSP model tends to produce results showing a high level of juvenile survival through transportation with the dams in place.⁴⁰⁷ Contributing significantly to preservation of the status quo, this model was relied on extensively in NMFS's 1995 BiOp.⁴⁰⁸ In contrast, the passage model developed by the region's fishery agencies and the Tribes, Fish Leaving Under Several Hypotheses (FLUSH), produces results favoring in-river migration options.⁴⁰⁹ The 1995 BiOp rejected management options suggested by this model.

Thus, to evaluate the accuracy and appropriateness of the two passage models, PATH ran each management option through both models hundreds and thousands of times incorporating different configurations of the other significant uncertainties.⁴¹⁰ PATH's results demonstrated that despite their respective biases, natural river drawdown was the most promising recovery method regardless of which passage model was used.⁴¹¹ For example, over the short term, the most difficult time period for all the recovery plans, dam removal improved salmon recovery over transportation by 15 to 25% regardless of the model used.⁴¹² Further, over the long term, both models demonstrated that dam removal provided nearly a 100% chance of recovery.⁴¹³ Significantly, these results confirm the general assumptions built into the FLUSH model, but rejected by NMFS's 1995 BiOp, i.e., that in-river migration provides the most promising survival rates.

Next, these preliminary results underwent a challenging peer review by four PATH scientists chosen for their expertise and lack of connection to Columbia Basin agencies.⁴¹⁴ First, addressing the appropriateness of the

404. See *id.* at 9 tbl.1.3.5-1.

405. For a summary of the components of a passage model, see *id.* at 19.

406. The Bonneville Power Administration is a federal entity responsible for marketing the hydropower produced by the dams. See 16 U.S.C. § 832 (1994).

407. See Memorandum from PATH Planning Group to Implementation Team, Corrections to the PATH Preliminary Report vi-ix (Aug. 4, 1998) (on file with author).

408. See 1995 BiOp, *supra* note 215, at 84-85, 111.

409. See *id.*

410. See Memorandum from PATH Planning Group to Implementation Team, Corrections to the PATH Preliminary Report vi (Aug. 4, 1998) (on file with author).

411. See *id.* at ix.

412. See *id.*

413. See *id.*

414. PATH Scientific Review Panel, Conclusions and Recommendations from the PATH

passage models, the reviewers supported the accuracy and appropriateness of the FLUSH model over the CRiSP model relied on by NMFS. Criticizing the CRiSP model they stated that it was "too complex," "overly parameterized," "overly optimistic," required more data manipulation, and contained assumptions which were "not credible."⁴¹⁵ In contrast, the reviewers generally praised the FLUSH model for its simplicity, strong ties to field work and empirical data, "significantly stronger" underlying rational, foundation in "empirical relationships," and ability to explain historic declines without additional unexplained theories.⁴¹⁶

The four reviewers then performed a "sensitivity analysis" to review the accuracy of PATH's preliminary results. The reviewing scientists focused on seven significant uncertainties, including passage mortality whose range of hypotheses is expressed by the two different passage models. Looking at the range of hypothetical outcomes for each uncertainty, the individual scientists weighted each hypothesis based on its credibility.⁴¹⁷ Then, using their individual weighting schemes, the reviewers tested each management option in light of their weighted uncertainties.⁴¹⁸ These weighted results confirmed that natural river drawdown through dam removal was the most promising recovery method.⁴¹⁹ Under the different weighting schemes the two transportation options only met NMFS's survival standards on one occasion over the short term.⁴²⁰ However, the two dam removal options, met or surpassed NMFS's survival standard on five occasions over the short term.⁴²¹ Applying the results to NMFS's recovery standard showed the most difference between the management options.⁴²² For all weighting schemes, dam removal approximately doubled the chances for salmon recovery over transportation.⁴²³

Finally, the most recent PATH report, Final Report for Fiscal Year 1998, continues to confirm the earlier results. Reviewing a total of seven recovery options for multiple species across a broad range of uncertainties, PATH concluded that the natural river options produced the most robust responses from the models. They determined, "For all species, [the natural river options] produce higher biological benefits than the other actions"⁴²⁴ Combining results for NMFS's survival and recovery standards, natural river

Weight of the Evidence Workshop 2 (Sept. 8-10, 1998) (unpublished report on file with author).

415. *See id.* at 10-11.

416. *See id.*

417. *See id.* at 9.

418. *See id.* at 17.

419. *See id.*

420. *See id.* at 17-18.

421. *See id.*

422. *See id.* at 18-19.

423. *See id.*

424. PATH FINAL REPORT, *supra* note 362, at 8.

drawdown gave fall chinook a 100% chance of recovery, and a 47 to 65% chance of recovery for spring/summer chinook.⁴²⁵ Meanwhile, maximizing transportation, with the yet undeveloped surface bypass collection system, produced only a 23% to 37% chance of recovery for these species.⁴²⁶

These recent results confirm what nearly every study on salmon recovery has concluded since the ESA was invoked in 1991. To rebuild self-sustaining salmon stocks, it has long been recommended that, "the region move from a strategy of 'fixing' ecosystem damage to one that places greater reliance on re-expression of the natural biological and physical processes of the Columbia River salmon-bearing ecosystem."⁴²⁷ Moreover, in light of the United States' treaty obligations the Columbia Basin Tribes, it is not enough to continue using transportation and mitigation as a band-aid that supports a few unharvestable salmon. Rather, the 1855 treaties, and the ESA, require that salmon populations be returned to harvestable and sustainable levels. To accomplish this mandated recovery, the best available science concludes that the U.S. must reduce its development of the Columbia Basin.

VI. Conclusion

Based on this overwhelming evidence, the U.S. should end its mitigation policy and recover the salmon resources reserved by the Columbia Basin Tribes. Since time immemorial, the Columbia Basin Tribes have derived their daily sustenance and economic livelihood from the salmon that return to the basin each year. The 1855 treaties between the U.S. and the Columbia Basin Tribes, reserved and protected these salmon harvests at economically viable levels. In addition to ensuring a 50% tribal share of salmon harvests, the treaties also impose a development servitude against the U.S. and its citizens. Thus, the U.S. may not develop the Columbia Basin in a way that threatens the economic viability of the Tribes' harvests. To restore viable salmon habitat and promote self-sustaining salmon populations the U.S. must diminish its development of the Columbia Basin. Since 1993, nearly every major salmon recovery plan and study of the FCRPS operations reject current mitigation measures and conclude that dam removal is the only option that will restore habitat functions necessary for salmon survival and recovery.

The two outcomes suggested by this article are not impossibilities. First, the Columbia Basin treaties can be used to reduce or prevent development if that development violates provisions of the agreement. For example, in *Confederated Tribes of Umatilla Indian Reservation v. Alexander*,⁴²⁸ the

425. See *id.* at 9.

426. See *id.*

427. RETURN TO THE RIVER, *supra* note 221, at xxiii, 51.

428. 440 F. Supp. 553 (D. Or. 1977).

court enjoined developing a dam on Cathrine Creek because the dam would "erode" the tribes fishing rights secured by treaty.⁴²⁹ The treaties between the U.S. and Indian Nations are binding agreements whose provisions must be fulfilled under the law. The requirements of these formal written relationships cannot be ignored simply because they are inconvenient to current development schemes.

Even in the Columbia Basin, where one of the United States' largest watersheds is operated as though it were plumbing, the law supports restoring the Tribes' treaty fisheries to economically harvestable levels. As recovery plans are developed under the ESA, policy makers need to be reformed of their treaty obligations to the Columbia Basin Tribes. Congressional legislation and U.S. Supreme Court case law all require that U.S. development limit its impact on the Tribes' treaty reserved fisheries.⁴³⁰

Second, despite the awesome grip that dams and related development have on the collective American conscious, scientific reports, engineering reports, and economic assessments demonstrate that some Columbia and Snake River dams can be removed without devastating consequences.⁴³¹ In this time of economic prosperity, it would be worthwhile to consider our economic choices and promote economies that are sustainable in the long term. While the resource extraction promoted by the dams requires ever-increasing technological investment to sustain itself, the natural processes of a free-flowing river can sustain the valuable salmon resources.

Although the politicians are beginning to raise their own barriers, the science, ecology, and success of dam removal are quite easy to see. Moreover, removing the dams will promote self-sustaining salmon populations. For example, Redfish Lake, nine hundred miles east and 6,500 feet up, from the Pacific Ocean was once home to thousands of Snake River sockeye salmon.⁴³² However, in 1910 the Golden Sunbeam Mining Company constructed a dam across the Salmon River blocking access to Redfish Lake and eliminating the stock by 1927.⁴³³ Then, in 1931, local fishermen blew

429. See *id.* at 555; *Muckleshoot Indian Tribe v. Hall*, 698 F. Supp. 1504, 1515-16 (W.D. Wash. 1988) (preventing construction of a marina on a usual and accustomed fish site).

430. In addition, it appears that the Tribes could file an environmental justice complaint with the U.S. Environmental Protection Agency as hydropower development disproportionately impacts the tribal economies compared the surrounding industrial economies. See 40 C.F.R. § 7.120 (1999). These regulations implement a recent Executive Order requiring that federal actions address environmental justice issues. See Exec. Order No. 12,898, 59 Fed. Reg. 7629 (1994).

431. For an assessment of the economic benefits of dam removal, see HARZA REPORT, *supra* note 279, at 1-10 to 1-14 (concluding that annual costs for mitigation program authorized by NMFS's 1995 BiOp are \$200 million, while annual costs for a four dam permanent drawdown are between \$75 and \$153 million depending on whether drawdown began in 2010 or later). See also Susan Whately & Rocky Barker, *Breaching: A Natural River Saves Fish and Money*, IDAHO STATESMAN, July 20, 1997, at 12A.

432. See PETERSEN, *supra* note 94, at 193.

433. See *id.* at 195; Susan Whately & Rocky Barker, *Breaching: 1990s Solution for a 1960s*

up the dam restoring access to the lake.⁴³⁴ Within ten years of the dam removal, 200 sockeye salmon had returned, and in 1955 the population had climbed to 4,361 sockeye salmon.⁴³⁵ Unfortunately, after 1955 construction of the four lower Snake River dams eliminated so many miles of alluvial salmon habitat, that Redfish Lake populations again declined.⁴³⁶ Recently, depending on the year, there have been seven sockeye salmon spawning in Redfish Lake, and sometimes there are none.⁴³⁷

The rise and fall of the Redfish Lake stock demonstrates that the dams are the principle factor limiting salmon populations in the Columbia and Snake Rivers. Even years after their construction, removing the dams will allow salmon populations to return to self-sustaining levels. Contrary to mitigation efforts, dam removal will restore the ecological functions that sustain salmon populations. Under the agreement reached in 1855 between the U.S. and the Columbia Basin Tribes, these functions must be restored to recover the Tribes' fisheries to economically viable levels.

Problem, IDAHO STATESMAN, July 21, 1997, at 8A-9A.

434. See Whately & Barker, *supra* note 433, at 8A-9A.

435. See *id.*

436. See *id.*

437. See *id.*