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The Pacific Salmon Treaty: The 1999 Agreement and Renegotiation of Annex IV

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Summary

The Pacific Salmon Treaty (PST) of 1985 requires the United States and Canada to develop periodic bilateral agreements to implement the PST's conservation and harvest-sharing principles. Beginning in 1993, long-standing disputes prevented such an agreement from being concluded. On June 30, 1999, after many years of heated diplomatic struggles, U.S. and Canadian officials reached a new comprehensive agreement. The 1999 Agreement (1) established abundance-based fishing regimes for the Pacific salmon fisheries under the jurisdiction of the PST; (2) created two bilaterally managed regional restoration and enhancement endowment funds to promote cooperation, improve fishery management, and aid stock and habitat enhancement efforts; and (3) included provisions to enhance bilateral cooperation, improve the scientific basis for salmon management, and apply institutional changes to the Pacific Salmon Commission (PSC). Annex IV to the 1999 Agreement outlines, in detail, the fishery regimes to be followed by Canada and the United States in cooperatively managing the six species of anadromous Pacific salmon and trout. Before it expires at the end of 2008, the terms of Annex IV are to be renegotiated.

The 1999 conservation and harvest-sharing agreement was of interest to Congress for several reasons. Most notably, a congressional appropriation of $140 million was required to establish the agreement's two regional restoration and enhancement endowment funds. Provisions of the 1999 Agreement were implemented thorough additional authorizing language and amendment of the Pacific Salmon Treaty Act (16 U.S.C. §§3631, et seq.). The 1999 Agreement under the PST regime has been implemented in accordance with existing U.S. laws pertaining to salmon conservation (e.g., Magnuson-Stevens Fishery Conservation and Management Act; Endangered Species Act). In addition, the agreement's implementation determines the quantity of fish available for commercial, recreational, and subsistence fisheries as well as Indian treaty allocations.

Many complex issues continue to challenge the PSC and the parties; several of these will likely be addressed in the renegotiation of the expiring Annex IV fisheries regimes. Many participants believe that the most difficult issue associated with the renegotiation concerns the fishery regime for chinook salmon found in Chapter 3 of Annex IV. The problems arising from the status (e.g., U.S. endangered and threatened species listing) of certain runs of chinook salmon in Washington, Oregon, Idaho, and perhaps British Columbia may pose particular challenges for the negotiators.

This report provides historical background about the PST, discusses issues that created difficulties in the regime, summarizes the 1999 accord, and analyzes issues that are likely to be considered during the impending renegotiation of Annex IV. The 110th Congress will likely conduct oversight of the renegotiation process and its results. This report will be updated as circumstances warrant.

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Introduction

On June 30, 1999, U.S. and Canadian officials signed a new comprehensive agreement to resolve long-standing disputes and to ensure implementation of the conservation and harvest-sharing principles of the 1985 Pacific Salmon Treaty (PST). After years of failed negotiations, a combination of resource management studies, joint-fishery restrictions to protect wild salmon stocks, and the involvement of high-level government negotiators helped ease tensions between the United States and Canada over the shared harvest of Pacific salmon. Moreover, the two nations recognized that failure to reach a long-term conservation and harvest-sharing agreement was in no one's best interest. The provisions in this agreement's Annex IV outline, in detail, the fishery regimes to be followed by Canada and the United States in cooperatively managing the five species of Pacific salmon. Annex IV generally applies through 2008,[1] and discussions have begun on its renegotiation. This report provides historical background about the PST, discusses issues that created difficulties in the regime, summarizes the 1999 salmon accord, and analyzes issues related to the renegotiation of Annex IV.

The 1999 Agreement (1) established abundance-based fishing regimes for the Pacific salmon fisheries under the jurisdiction of the PST; (2) created two bilaterally managed regional restoration and enhancement endowment funds to promote cooperation, improve fishery management, and aid stock and habitat enhancement efforts; and (3) included provisions to enhance bilateral cooperation, improve the scientific basis for salmon management, and apply institutional changes to the Pacific Salmon Commission (PSC).

Pacific salmon have long been a matter of common concern to the United States and Canada. In the 1800s, with the advent of canning technologies, extensive commercial salmon fisheries developed in both countries. Since their inception, salmon fisheries have experienced strong fluctuations in catch and stock abundance. Periods of great plenty were often followed by years of low returns. By the 20th century, it had become obvious that the combined effects of fishing and natural variability in abundance could lead to overharvest. The United States and Canada recognized that some form of cooperation would be necessary for the sake of the resource.

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[1] Chapter 4 of Annex IV, Fraser River Sockeye and Pink Salmon, applies thorough 2010.

For many years, piecemeal agreements were forged to protect specific fisheries, such as Fraser River sockeye and pink salmon.[2] However, because of the diversity in salmon fisheries and recurring disagreements over how best to address the *interception* problem,[3] these agreements proved inadequate. In 1985, the PST[4] created an arrangement for cooperative management, research, and enhancement of all intercepted Pacific salmon stocks. The goal of the PST is coordinated management of Pacific salmon throughout their range to ensure sustainable fisheries and maximize long-term benefits to the parties.

Despite the PST, some salmon stocks continued to decline.[5] Interceptions strained diplomatic relations between the United States and Canada, and the parties fundamentally disagreed on how to achieve the conservation and harvest-sharing goals established by the PST. After a long-term harvest agreement expired in 1992, Canada argued strongly that the United States was exceeding its share of the catch under the PST's "benefits equivalent" provisions.[6] In contrast, the United States argued that Canadian interceptions of Pacific Northwest (Washington, Oregon, and Idaho) coho salmon and chinook salmon were further damaging these depleted stocks.[7]

In years following 1992, a unstated assumption of both parties — that they would both abide by conservation measures — allowed the two countries to manage their fisheries. In 1997, bilateral stakeholder talks were held in an attempt to resolve the impasse. Ultimately, these negotiations failed to forge an agreement. In August 1997, the United States and Canada appointed William Ruckelshaus and David Strangway, respectively, to conduct a joint investigation and to make recommendations for ending the controversy. In addition, Washington State and Canada agreed to restrict several of their fisheries to help protect wild salmon stocks. However, failure to reach a long-term conservation and harvest-sharing agreement harmed several salmon stocks and hampered the ability of Washington, Alaska, and

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[2] The Fraser River Convention, discussed below.

[3] *Interception* means the capture of salmon originating in one country by the fishing fleets of another. Salmon intermingle as they migrate from the North Pacific Ocean back to their natal rivers, crossing the international boundaries of the United States and Canada. Some salmon returning to spawn in Canadian rivers are incidentally captured ("intercepted") in U.S. fisheries, and some returning to U.S. rivers are intercepted in Canadian fisheries.

[4] *Treaty Between the Government of the United States of America and the Government of Canada Concerning Pacific Salmon*, TIAS 11091 (Ottawa, Canada: 1985).

[5] In the 1990s, many salmon stocks in Washington, Oregon, California, and Idaho were at or near historically low levels of abundance. Listings under the Endangered Species Act of 1973 (16 U.S.C. §§1361, et seq.) confirmed the depleted status of some of these stocks. For more information, see CRS Report 98-666 ENR, *Pacific Salmon and Anadromous Trout: Management Under the Endangered Species Act*, by Eugene H. Buck.

[6] In the late-1990s, Canadians asserted that the United States was taking an annual average of about 9 million more Canadian-origin fish than Canada was harvesting of U.S.-origin salmon, representing lost value to Canada in the hundreds of millions of dollars.

[7] M. Drouin and B. Warren, "U.S./Canada: Progress or Politics?" *Pacific Fishing*, vol. XX, no.6 (June 1999): 37.

British Columbia fishermen to plan fishing seasons and budget expenses because, without a harvest-sharing agreement, year-to-year salmon allocations were unpredictable.[8] Thus, the 1999 Agreement represented a major breakthrough in a longstanding contentious resource issue.

Historical Background[9]

Pacific salmon are among the world's most highly migratory anadromous fish.[10] They spawn in fresh water, often hundreds of miles from the ocean, migrate to the sea as juveniles, and then disperse into the open ocean. From one to several years later, they return to their natal rivers to spawn and complete their life cycle. Along the Pacific Coast of North America, many juvenile salmon travel north after they enter the ocean, migrating freely across the national boundaries of the United States and Canada and into international waters (see **Figure 1**).

There are six species[11] of anadromous Pacific salmon and trout: chinook (king) salmon (*Oncorhynchus tshawytscha*), sockeye (red) salmon (*O. nerka*), coho (silver) salmon (*O. kisutch*), pink (humpy) salmon (*O. gorbuscha*), chum (dog) salmon (*O. keta*), and steelhead trout (*O. mykiss*). Migration patterns widely vary among the species.[12] Because of their value and importance to U.S. and Canadian fisheries, three species — chinook, sockeye, and coho — are of particular interest.[13]

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[8] Ibid.

[9] Much of this information was derived from the PSC at [http://www.psc.org]; and Trout Unlimited USA and Trout Unlimited Canada, *Resolving the Pacific Salmon Treaty Stalemate* (Seattle, WA: 1999).

[10] Anadromous fish begin their lives in freshwater rivers and lakes, migrate while immature to the open ocean where they feed and grow, and return to freshwater (often to their natal rivers) to spawn. Anadromous species include Atlantic and Pacific salmon, shad, eulachon (Columbia River smelt), and striped bass.

[11] Cherry salmon (*Oncorhynchus masou*) is also a Pacific salmon, but primarily occurs on the Asian coast, so it is not a concern under the PST.

[12] Migration patterns of salmon are determined by using coded-wire tags (CWT). Juvenile salmon can be implanted with CWT specific to their drainage of origin. When a tagged salmon is caught in the ocean, encoded information on the CWT reveals the drainage from which the fish originated. Plausible migratory routes between the location of marine capture and the drainage of origin can be identified and further clarified as additional tag recoveries of fish from the same drainage are recorded along the population's entire migratory route.

[13] This report focuses on the salmon species covered by the PST. However, other international agreements pertaining to Pacific salmon fisheries exist, e.g., the North Pacific Anadromous Fish Commission, which was established under the *Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean*, signed on February 11, 1992 and entered into force on February 16, 1993 (Senate Treaty Doc. 102-30, 102nd Congress, 2nd Session). Parties to this Convention include Canada, Japan, the Russian Federation, and the United States. The goal of this Convention is to promote the conservation of anadromous stocks in the North Pacific Ocean [http://www.npafc.org/].

Figure 1. Major Coastal Waters and Drainages Affected by the PST

Chinook salmon from central and northern Oregon coastal rivers, the Columbia River system, and drainages entering Puget Sound generally swim north as juveniles, some migrating as far as the waters off northern British Columbia and Alaska. Coho salmon stocks generally do not migrate as far north and the southern coho stocks (fish originating in Washington/Oregon and southern British Columbia) generally do not mingle with the northern stocks (originating in northern British Columbia and Alaska), which frequently migrate through the waters off southeast Alaska. Because of this natural segregation, the northern and southern coho stocks are addressed separately in the PST. Sockeye salmon from British Columbia's Fraser River move in different patterns depending on ocean conditions. In years when *El Niño* climatic events occur, Fraser River sockeye are more prevalent in southeast Alaskan waters,

returning to the Fraser River through Johnstone Strait off the west coast of the British Columbia mainland. In other (non-*El Niño*) years, Fraser River sockeye exhibit a somewhat more southerly distribution and return through the Strait of Juan de Fuca.[14]

As a result of these migration patterns, fishermen in the United States and Canada intercept fish originating in and returning to rivers of the other country, often in substantial numbers. Canadian commercial troll fisheries[15] off the west coast of Vancouver Island (WCVI) often catch chinook and coho salmon bound for the rivers of Oregon and Washington, including some threatened and endangered stocks. WCVI trollers and recreational anglers also harvest Puget Sound chinook. Fishermen in southeast Alaska catch salmon returning to rivers in Canada and the Pacific Northwest. In some years, Washington State commercial fisheries, both tribal and non-tribal, may catch large numbers of Fraser River sockeye as they migrate through the Strait of Juan de Fuca. For many years, these interceptions caused tension between the United States and Canada. Thus, salmon migration patterns and interceptions complicate negotiations.[16]

Fraser River Convention

A 1937 arrangement between the United States and Canada to conserve and equitably divide the harvest of Fraser River sockeye salmon was an early success story in the management of shared salmon stocks. The Fraser River lies wholly within Canada, but sockeye salmon generally pass through U.S. waters as they return to spawn. Thus, Fraser River sockeye supported large fisheries in both the United States and Canada, setting the stage for an international drama.

In the late 1800s, Canadian fishermen dominated the Fraser River sockeye fishery. By 1900, with the expansion of U.S. purse seine fisheries, U.S. harvest quickly surpassed the Canadian harvest. From 1900 through 1934, U.S. fisheries produced from 61% to 70% of the sockeye salmon canned from the Fraser River

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[14] K. A. Thomson, et al., "The influence of ocean currents on the latitude of landfall and migration speed of sockeye salmon returning to the Fraser River," *Fisheries Oceanography*, v. 1, no. 2 (1992): 163-179.

[15] Trolling is a vessel fishing technique whereby multiple lines with hooks are pulled behind moving vessels to catch fish.

[16] For example, upper Columbia River chinook stocks (along with Oregon and Washington coastal chinook) are predominantly wild fish that migrate far north. These fish are caught in southeast Alaska and northern British Columbia. Lower Columbia River chinook stocks are predominantly hatchery fish, which typically do not migrate north of Vancouver Island. These fish are caught in southern British Columbia and in oceanic Washington fisheries. Thus, U.S. hatchery salmon are caught by Canadian fisheries off the west coast of Vancouver Island, while Alaskan and Canadian fisheries compete for upper Columbia River wild stocks. Because depleted wild stocks, unlike hatchery stocks, cannot withstand substantial fishing pressure, competitive fishing begets problems for the United States concerning conservation, Indian treaty allocation, and the U.S. Endangered Species Act. Canada recognizes these concerns and, in the past, has exploited these circumstances to influence the U.S. negotiating position.

run.[17] In 1913, crews blasting a railroad right-of-way through the canyon walls above the Fraser River triggered a massive rock slide that choked the river canyon.[18] The effects of the slide were most detrimental at a narrow section of the river known as Hell's Gate, blocking access to spawning areas upstream from the slide.[19] United States and Canadian harvest of sockeye salmon dropped dramatically.[20] By 1918, with substantial U.S. assistance, the Hell's Gate reach was restored, and sockeye salmon could again move upstream to spawn.

The rise of competing U.S. and Canadian fisheries, natural fluctuations in salmon stock abundance, and the events at Hell's Gate provided impetus for negotiations between the United States and Canada over the cooperative management of the sockeye salmon stocks. In 1937, after seven years of negotiation,[21] the Fraser River Convention[22] was ratified. The Convention established the International Pacific Salmon Fisheries Commission, with principal responsibility for protecting, preserving, and extending the sockeye salmon fisheries of the Fraser River (pink salmon were later added to the Convention).[23] The commission operated under two objectives: (1) restore Fraser River sockeye runs; and (2) equally divide the catch, within practical limits, between U.S. and Canadian fishermen.[24] In 1946, the commission recommended that regulations be implemented to:

- provide closures designed to permit adequate escapement of all races of salmon comprising the run;
- protect in the greatest possible degree the most seriously depleted runs;
- divide the total catch as equally as might be possible between the fishermen of the two countries; and

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[17] D. Gilbert, *Fish for Tomorrow* (Seattle, WA: University of Washington, School of Fisheries, 1988), p. 10.

[18] T.C. Jensen, "The United States-Canada Pacific Salmon Interception Treaty: An Historical and Legal Overview," *Environmental Law*, vol. 16, no. 3 (1986): 373.

[19] Gilbert, *supra* note 17. p. 27

[20] Jensen, *supra* note 18.

[21] U.S. fishermen dependent on Fraser River salmon objected to ratification. Before 1934, U.S. sockeye harvest far exceeded Canadian harvest. After 1935, strict Washington state fishing regulations (eliminating certain gear types) greatly reduced U.S. sockeye harvest, and the U.S. perspective on the Convention quickly changed. Jensen, *supra* note 18. p. 374, note 24. "In 1936, the British Columbia catch was more than triple that of Puget Sound." J.A. Crutchfield and G. Pontecorvo, *The Pacific Salmon Fisheries: A Study of Irrational Conservation* (Baltimore, MD: The Johns Hopkins Press, 1969), p. 141.

[22] *United States-Canada Convention for the Protection, Preservation and Extension of the Sockeye Salmon Fishery in the Fraser River System*, signed May 26, 1930, 50 Stat. 1355 (1930) 8 UST 1058, TIAS No. 3867.

[23] Gilbert, *supra* note 17. p. 83.

[24] Crutchfield and Pontecorvo, *supra* note 21. p. 141.

- permit the largest catch possible consistent with attainment of these objectives.[25]

However, because of the diversity in salmon fisheries and recurring disagreements over how best to address the interception problem, the 1937 agreement eventually proved inadequate.[26] The Fraser River Convention was an ambitious experiment, which unquestionably met its twofold mandate to rebuild and equally allocate Fraser River sockeye and pink salmon. However, a much broader forum was necessary to solve the overall problem of U.S. and Canadian salmon interceptions. It would be nearly half a century before the two countries agreed to terminate the Fraser River Convention and replace it with an expanded institution.[27]

The Pacific Salmon Treaty

In 1985, after several decades and a great deal of international and regional deliberation, the United States and Canada successfully completed negotiations on the Pacific Salmon Treaty (PST).[28] The PST created an arrangement for cooperative management, research, and enhancement of shared Pacific salmon stocks to ensure sustainable fisheries and maximize long-term benefits to both parties. In the absence of a fish-sharing arrangement, benefits derived from unilateral conservation and enhancement efforts are diminished by another nation's interceptions. The PST created a regime aimed at ensuring sustainable fisheries through conservation and enhancement, and optimizing benefits to each party.

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[25] Gilbert, *supra* note 17, p. 82. It should also be noted that, while the commission had no power to enforce limits on fishing, in practice its recommendations were implemented by the United States and Canada. See also Crutchfield and Pontecorvo, *supra* note 21, p. 142.

[26] Several changes in the United States and Canada created new pressures, which eroded the footings provided by the 1937 agreement. These include (1) the Boldt Decision (*United States v. Washington*, 384 F. Supp 312 (W.D. Wash 1974), *aff'd*, 500 F. 2d 676 (9th Cir. 1975), *cert. denied*, 423 U.S. 1086 (1976)) which entitled certain U.S. treaty tribes to 50% of the U.S. harvest of salmon passing through "usual and accustomed waters;" (2) the rise of the recreational fishing industry, which increased pressure on coho and chinook salmon; (3) the advent of salmon aquaculture as a powerful economic and political force; (4) the increased Canadian harvest of sockeye outside of Convention Waters made possible by new technologies that allowed Canadian trollers to efficiently catch sockeye in the ocean; and (5) the increased catch of Canadian net fisheries in northern British Columbia, also outside of Convention Waters. Because of these latter two points, while sockeye catch in Convention Waters was shared equally, fish caught outside of these waters (and not counted under the sharing-agreement) reduced the U.S. share from 50% to about 41%. Many U.S. fishermen, who had already lost half of their share to treaty Indians, were concerned that their share would continue to decline further as Canadians increased fishing outside of Convention Waters. Thus, these U.S. fishermen were easily persuaded that a new treaty could be in their best interests.

[27] Jensen, *supra* note 18. p 375.

[28] Ibid., p. 363.

Pacific Salmon Treaty
Article III — Principles

1. With respect to stocks subject to this Treaty, each Party shall conduct its fisheries and its salmon enhancement programs so as to: a) prevent overfishing and provide for optimum production; and b) provide for each Party to receive benefits equivalent to the production of salmon originating in its waters.

2. In fulfilling their obligations pursuant to paragraph 1, the Parties shall cooperate in management, research, and enhancement.

3. In fulfilling their obligations pursuant to paragraph 1, the Parties shall take into account: a) the desirability in most cases of reducing interceptions; b) the desirability in most cases of avoiding undue disruption of existing fisheries; and c) annual variations in abundance of the stocks.

The PST established a commission (the PSC) to make recommendations to the parties concerning management of the salmon fishing regime. The PSC meets annually to review fishing activities in the previous year, to advise the PST parties on the status of the fishery, and to suggest any necessary adjustments to the regime. The PSC is divided into two national sections, each with four commissioners and four alternate commissioners.[29] Voting structure was defined for the United States by the Pacific Salmon Treaty Act, as discussed below.

The PST's fundamental principles are to "a) prevent overfishing and provide for optimum production [of salmon]; and b) provide for each party to receive benefits equivalent to the production of salmon originating in its waters."[30] In addition, parties are to take into account the desirability of reducing interceptions, the desirability of avoiding disruption of existing fisheries, and annual variations in stock abundance. For many years, the parties strongly disagreed over the meaning of *benefits equivalent to the production of salmon originating in its waters,* as specified in Article III of the PST, most notably in terms of what *benefits* should be considered. Canada stated that *benefits equivalent* should be interpreted strictly on a fish-for-fish basis. That is, either Canada harvests the salmon produced in its rivers or harvests an amount of U.S. fish equal to the number of Canadian salmon intercepted in U.S. fisheries.[31] The United States has viewed this interpretation as an oversimplification, believing that all of the PST's principles must be considered in unison, and that there is no simple definition of *benefits equivalent*. For example, who benefits when salmon are caught in Alaska but processed in Canada?[32] And, how are the issues of protecting fish habitat by forgoing

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[29] In practice, all eight commissioners from each section have attended commission meetings and been involved in all decision-making.

[30] PST, Article III (1).

[31] Daniel D. Huppert, *Why the Pacific Salmon Treaty Failed to End the Salmon Wars*, SMA 95-1 (Seattle, WA: University of Washington, 1995), p. 12.

[32] Ownership and residency also complicate this issue. Many companies operating in Alaska and British Columbia are either owned by or are subsidiaries of the same parent company.
(continued...)

development opportunities (e.g., logging, mining, petroleum development) to be balanced?

The Memorandum of Understanding (MOU),[33] which elaborated on elements within the PST, provided minimal guidance. It stated that because data on salmon interceptions and total production by rivers of origin are imprecise, each nation's method for determining *benefits equivalent* may differ. Thus, the MOU stated that complete and comprehensive implementation of Article III (1)(b) would not be possible until some time in the future (without identifying a date or timeline). The MOU stated that, in the short term, annual fishery regimes *shall* be conducted in an equitable manner and that "the Commission's decisions take into account changes in the benefits flowing to each of the parties through alteration in fishing patterns, conservation actions, or as the result of changes in the abundance of the runs."

For the long term, "if it is determined that one country or the other is deriving substantially greater benefits than those provided from its rivers, it would be expected that the parties would develop a phased program to eliminate the inequity within a specified time period, taking into account the provisions of Article III, paragraph 3, of the PST (i.e., the desirability in most cases of reducing interceptions), avoiding undue disruption of existing fisheries, and accounting for annual variations in abundance of stocks. The MOU also stated that correcting imbalances is a *national* responsibility and may involve adjusting fishing effort or enhancement projects on a regional basis, and that the party with the advantage *shall* propose corrective measures to the PSC.[34]

Despite the joint commitment embodied in the PST to conserve and protect the shared salmon stocks, the United States and Canada spent many years in a diplomatic stalemate, and the health of the salmon stocks suffered as a result.[35] After the initial disagreements over the equitable sharing of intermingled stocks in the early 1990s, a number of mechanisms were employed to resolve this issue. In 1993 and 1994, Canada and the United States appointed new negotiators to address the *benefits equivalent* principle. By 1995, government-to-government negotiations proved unsuccessful and New Zealand Ambassador Christopher Beebe was appointed to guide a mediation of the PST's equity (*benefits equivalent*) principle. When this failed, the parties established two stakeholder panels, composed of fishermen from both countries, in an attempt to settle the controversy. While stakeholder

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[32] (...continued)
Many permit holders for southeast Alaska commercial fisheries are not residents of Alaska, and a large number of U.S. citizens participate in Canadian recreational fisheries.

[33] Treaty Between the Government of the United States of America and the Government of Canada Concerning Pacific Salmon. *Memorandum of Understanding*. §A. Implementation of Article III, paragraph 1(b) (Ottawa, Canada: 1985).

[34] In developing such proposals, imbalances should be addressed where possible through enhancement programs rather than adjustments in established fisheries. See Richard Lugar, *Congressional Record*, vol. 31, part 4 (Mar. 7, 1985): 4772.

[35] Trout Unlimited USA and Trout Unlimited Canada, *Resolving the Pacific Salmon Treaty Stalemate* (Seattle, WA: 1999), p. 1.

negotiations provided considerable progress, this process also eventually broke down.[36]

In August 1997, the United States and Canada appointed William Ruckelshaus and Dr. David Strangway, respectively, to conduct a joint investigation of the controversy and to make recommendations for ending it. Their report,[37] published in January 1998, contained four specific recommendations:

1. The governments should cause to be adopted interim fishing-sharing arrangements for up to two years, stressing that it was incumbent on the governments to ensure that these arrangements are developed and implemented.

2. During the two-year period, both parties should develop a practical framework for implementing Article III (i.e., leading to establishment of long-term fishing arrangements.)

3. The stakeholder process should not be reconvened.

4. The parties should also undertake a comprehensive review of the PSC and dedicate themselves to making it a functional institution for preserving and managing Pacific salmon.[38]

They concluded that to accomplish their recommendations, "meaningful compromises of positions strongly held will be necessary." Moreover, to ensure long-term sustainability of the shared resource, "rules must be established for the preservation of the [salmon] and time is not on their side."[39]

Disparate efforts to protect and conserve salmon habitat, which contributed to the relatively weak southern stocks and more robust northern stocks, may be equally to blame for the lack of stability in the PST regime. Southern boundary stocks (e.g., Pacific Northwest chinook salmon) have suffered extensively from habitat degradation. Most salmon stocks in the Pacific Northwest (and a few in some areas of southern British Columbia) have been subjected to major habitat damage from dams, irrigation projects, agriculture, logging, ports, and pollution. Such habitat damage can degrade salmon production without the damaging activity bearing any of the related costs of resource conservation. A significant problem with the PST was that the framers did not anticipate the magnitude of harm caused by non-fishing activities on Pacific Northwest stocks (and some isolated Canadian chinook stocks).[40]

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[36] Ibid., p. 5.

[37] David W. Strangway and William D. Ruckelshaus, *Pacific Salmon Report to the Prime Minister of Canada and the President of the United States* (Ottawa, Canada: Department of Fisheries and Oceans, 1998).

[38] Ibid., p. 8.

[39] Ibid.

[40] The gauntlet presented by dams, river channelization, agriculture, and pollution causes (continued...)

As noted previously, after the long-term harvest agreement expired in 1992, Canada and the United States argued over equitable harvest-sharing and conservation of salmon stocks. After years of failed negotiations, cooperative studies (e.g., Ruckelshaus-Strangway), joint-fishery restrictions to protect wild stocks, and the involvement of high-level government representatives (e.g., Lloyd Cutler, Senior White House Representative on Pacific Salmon) helped to ease tensions between the United States and Canada in the late 1990s. Moreover, the two nations recognized that failure to reach a long-term conservation and harvest-sharing agreement was in no one's best interests. In 1999, these factors permitted U.S. Negotiator James Pipkin and Canadian Negotiator Don McRae to overcome years of failed negotiations.

On June 3, 1999, Lloyd Cutler, Canadian Fisheries Minister David Anderson, Alaska Governor Tony Knowles, Oregon Governor John Kitzhaber, Washington Governor Gary Locke, and Tribal Negotiator Ted Strong announced that, after intensive negotiations extending over several years, U.S. and Canadian officials had reached a comprehensive agreement to resolve their long-standing dispute relating to Pacific salmon and the PST.[41] On June 30, 1999, the United States and Canada formally signed the 1999 Agreement on Pacific Salmon. Terms of the agreement are discussed below.

The Pacific Salmon Treaty Act of 1985 and U.S. Decision-Making

The 1999 Agreement was reached within the framework of the Pacific Salmon Treaty Act of 1985 (P.L. 99-5, 99 Stat. 7; 16 U.S.C. §§3631-3634). This act implemented PST provisions and established the institutional framework for U.S. negotiations. The structure of the U.S. Section was a critical element in framing negotiations between the United States and Canada. Because this institutional framework is likely to affect future PST negotiations, a brief discussion of the Pacific Salmon Treaty Act of 1985 is warranted.

The Pacific Salmon Treaty Act of 1985 is the implementing legislation for the PST. Section 3 defines the composition of the U.S. Section to the PSC, the voting requirements for the U.S. Section, and other matters necessary for U.S. participation in the PST. The U.S. Section is composed of four members: a non-voting representative of the U.S. government, and three voting members from Alaska,

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[40] (...continued)
significant harm (some say as much as 90% of human-caused mortality) to certain chinook salmon stocks. However, these diversified industries, that benefit from the activities or conditions that cause substantial salmon mortality, are not involved in PST negotiations. While the PST is unable to address these threats to salmon stocks, many U.S. salmon stocks have received protection under the authority of the Endangered Species Act.

[41] Attributable in large measure to Canadian domestic politics, British Columbia was excluded from the negotiations leading to the 1999 Agreement.

Oregon or Washington, and the "treaty Indian tribes."[42] Subsection (g) defines the voting requirements for the U.S. Section, which operates "with the objective of attaining consensus decisions in the development and exercise of its single vote within the PSC.[43] A decision of the U.S. Section shall be taken when there is no dissenting vote."[44] In the event that the U.S. Section is unable to arrive at a consensus, §3(g) of the act authorizes the creation of a Conciliation Board to assist in resolving disputes.[45] The Secretary of State, when concerned that the United States is in jeopardy of not fulfilling international obligations pursuant to the PST because of disputes within the U.S. Section, is empowered to refer these matters to the President.[46] If state or tribal actions or omissions place the United States in jeopardy of not fulfilling its international obligations under the PST, the Secretary of Commerce may take steps to supersede state or tribal fishery regulations.[47]

It is of concern to some that the structure of the U.S. Section could offer the opportunity for U.S. politics to paralyze the PSC.[48] In contrast to the Canadian Section, where the Canadian federal government decides the position to be taken by its section, the U.S. position is shaped by the state and tribal representatives in the U.S. Section as defined by the act. There is no U.S. federal government position, and the U.S. position is based solely on unanimity among its three voting commissioners.[49] However, the interests of Alaska, Washington/Oregon, and the treaty tribes are often competing and, in the past, have impaired the ability of the U.S. Section to arrive at a unified position.[50] Observers of the process suggest that an

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[42] Treaty Indian tribes are defined in §2 of the act.

[43] "All decisions of the commission must be made by a unanimous vote, and clearly this will ensure that the views of each will be heard and will also mean that the commissioners will have to work closely to arrive at decisions that will protect the interests of all parties." Frank H. Murkowski, in: Senate Committee on Foreign Relations, *Pacific Salmon Treaty*, S. Hrg. 99-19 (Washington, DC: U.S. GPO, Feb. 22, 1985). See also: Ted Stevens, "United States-Canada Salmon Treaty Negotiations: The Alaskan Perspective," *Environmental Law*, v. 16 (1986): 423-424.

[44] 16 U.S.C. §3632(g)(1). However, this language does not say that no decision may be taken by the U.S. Section when there is a dissenting vote.

[45] Although use of the conciliation provision has been discussed, the Conciliation Board has not been convened to resolve disputes within the U.S. section.

[46] This step has never been taken. The President has both the power and duty to take whatever actions are necessary to carry out and enforce U.S. obligations under the PST, including preemption of the U.S. section if conflict threatens salmon conservation.

[47] 16 U.S.C. §3635.

[48] See Robert J. Schmidt, Jr., "International Negotiations Paralyzed by Domestic Politics: Two-Level Game Theory and the Problem of the Pacific Salmon Commission," *Environmental Law*, vol. 26 (1995): 108.

[49] In addition, if an alternate commissioner disagrees on an issue, the U.S. section vote would not be unanimous. Although informal, this practice is generally followed.

[50] Robert J. Schmidt, Jr., "International Negotiations Paralyzed by Domestic Politics: Two-Level Game Theory and the Problem of the Pacific Salmon Commission," *Environmental*

(continued...)

overarching difficulty that hindered past attempts to reach consensus is the lack of a requirement compelling the U.S. and Canadian parties to reach an agreement. Related to this is the absence of any penalty for non-resolution. Because both countries could continue to fish in the absence of an agreed harvest regime, there is no incentive to reach agreement and the parties can abandon negotiations without fear of consequences.

In sum, because the U.S. Section is required by law to work by consensus, the PSC cannot make recommendations to the parties without the approval of all voting members of the U.S. Section. The PST's salmon fishing regimes are based entirely on the recommendations of the PSC.[51] Many believe that the PST negotiation process has been hampered by the structure of the U.S. Section, in which dissent by any single voting member can bring PST negotiations to a halt.

The 1999 Agreement[52]

On June 30, 1999, U.S. and Canadian officials signed a comprehensive agreement to resolve long-standing disputes relating to Pacific salmon and the PST. The agreement established *abundance-based* fishing regimes for the Pacific salmon fisheries under the jurisdiction of the PST. These regimes, which allow fishery harvest to vary from year to year, are designed to implement the conservation and harvest-sharing principles of the PST. That is, larger catches will be allowed when salmon abundance is higher, and catches will be significantly constrained in years when stock abundance is lower. It was believed that this type of regime would be more responsive to the conservation requirements of salmon than the *fixed-catch ceilings*[53] that existed under the original PST arrangements.[54]

Additionally under the agreement, two bilaterally managed regional restoration and enhancement endowment funds were established. These funds are used to

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[50] (...continued)
Law, vol. 26 (1995), p. 122.

[51] The Pacific Salmon Treaty, § IV(5).

[52] Compiled from the U.S. Department of State, information available at [http://www.state.gov/www/global/oes/oceans/990630_salmon_index.html]; and the Canadian Department of Fisheries and Oceans.

[53] Fixed-catch ceilings were specific upper limits on salmon catch that, over time, came to be regarded as guaranteed quotas. With such a view, fishermen perceived a right to catch these "quotas" regardless of whether the stocks could sustain that level of fishing. Such practice, in a period of fluctuating stock abundance and declining ocean productivity, contributed to the deterioration of many stocks.

[54] However, while generally supportive of abundance-based management, for this approach to work, both nations needed to develop better scientific methods for pre-season estimates of stock abundance (fishery managers in the past have tended to over-estimate stock abundance). It was a questionable management presumption that reductions in catch and improvements in habitat would actually occur.

promote bilateral cooperation, improve fishery management, and aid stock and habitat enhancement efforts to improve the status of weakened salmon stocks.

The agreement also included provisions to enhance bilateral cooperation, improve the scientific basis for salmon management, and apply institutional changes to the PSC. At the heart of the new accord was agreement between the parties to focus on conservation and habitat protection, rather than division of shared salmon stocks. The 1999 Agreement:

- renewed cooperation between the United States and Canada concerning the management of salmon;
- ensured that the conservation and harvest-sharing principles of the 1985 PST were realized;
- stabilized the management regime; and
- provided a firm and complementary base for other salmon recovery efforts, such as habitat restoration, underway in both countries to restore depleted stocks of salmon.

Abundance-Based Management

The cornerstone of the new fishing accord was *abundance-based* management. Under this management approach, harvest rates for each salmon stock are set relative to stock abundance. The objectives of abundance-based management are to:

- sustain wild stocks;
- prevent overfishing;
- set a predictable framework for sharing the burdens of conservation and benefits of stock recovery;
- provide cost-effective, responsive fishery management; and
- establish a common basis for stock assessment, fishery monitoring, and performance evaluation.

The parties to the PST believed that the new management regimes would be more responsive to natural stock fluctuations and more environmentally responsible. To be effective, this approach requires an informed pre-season and a responsive in-season approach to fishery management. The parties surmise that by matching harvest levels to actual salmon abundance, this management scheme reduces the tendency to overfish, removes mortality resulting from ineffective live-release practices, and prevents unnecessary loss of fishing opportunities. They also believed that, under the 1999 accord, curtailment in fishing would be shared proportionately among fishermen in all areas covered under the PST.

Fishery Regimes

Most elements of the agreement were contained in several new chapters that replaced earlier expired versions of Chapters 1-6 of Annex IV of the PST. Additionally, an understanding was reached regarding management of certain northern fisheries affecting coho salmon, a topic not specifically covered in previous agreements.

Most of the fishery arrangements are in effect through 2008, except that for Fraser River sockeye, which will be in effect through 2010. The United States and Canada agreed that the new fishery regimes were consistent with all the principles of the PST, and that compliance with those regimes would constitute satisfaction of all obligations under those principles.

Transboundary Rivers. This agreement specified arrangements for sockeye, coho, chinook, and pink salmon management for several rivers that flow from Canada to the Pacific Ocean through southeast Alaska, including the Stikine, Taku, and Alsek Rivers. The United States and Canada agreed to establish a Transboundary Rivers Panel within the PSC to address transboundary river issues. Ongoing programs for joint enhancement of sockeye salmon in the Taku and Stikine Rivers would be continued.

Northern British Columbia and Southeast Alaska. This agreement addressed the management of sockeye and pink salmon fisheries in southeast Alaska and northern British Columbia. The agreement specified how the fisheries would be managed to achieve conservation and fair sharing of salmon stocks that intermingle in the border area between British Columbia and southeast Alaska. The fixed-catch ceilings contained in previous agreements were replaced with abundance-based provisions that allow harvests to vary from year to year depending on the abundance of salmon. Several provisions, because they address long-contentious issues, were particularly noteworthy. These provisions affect Alaska's purse seine fisheries near Noyes Island and gillnet fishery at Tree Point; and Canada's troll fishery for pink salmon and various marine net fisheries.

Chinook Salmon. Because they pass through fisheries regulated by many jurisdictions in both the United States and Canada, chinook salmon were the focus of concern and controversy. Although some chinook populations were relatively healthy, other chinook salmon stocks had been so diminished that they have been listed as threatened or endangered under the U.S. Endangered Species Act. Many factors, in addition to harvest, contributed to the decline of these stocks, including habitat destruction, water diversion, hydroelectric dams, and oceanic and climatic change. The parties believed that the conservation-based fishery regimes established by the 1999 Agreement would help to ensure the effectiveness of public and private investments in habitat restoration and other aspects of salmon recovery.

The 1999 chinook salmon regime encompassed marine and certain freshwater fisheries in Alaska, Canada, Washington, and Oregon. All chinook salmon fisheries were to be managed based on abundance, rather than the fixed-catch quotas that applied previously. Two types of fisheries were designated: (1) those that would be managed based on the *aggregate abundance* of chinook salmon present in the fishery, and (2) those that would be managed based on the status of *individual stocks* or stock groups in the fishery.

The three fisheries designated for aggregate abundance-based management (AABM) were ocean fisheries that occur in large areas and affect a complex aggregation of many stocks. These were:

- southeast Alaska troll, net, and sport fisheries;
- northern British Columbia troll and Queen Charlotte Islands sport fisheries; and
- west coast Vancouver Island troll and sport fisheries.

Each of these AABM fisheries would be managed to achieve a specific harvest rate that varied based on an index of abundance of salmon present in that particular fishery for that particular year. Because each fishery is comprised of a different group of stocks that have different survival rates, the allowable catch would vary between fisheries and between years. Larger catches would be allowed when abundance was greater and, importantly, catches would be increasingly constrained when abundance is diminished. Table 1 in Chapter 3 of the 1999 Agreement's Annex IV provided maximum catch targets for each of the 3 AABM fisheries through the range of chinook abundance indices.

All other ocean and freshwater fisheries targeting chinook salmon were designated for individual stock-based management (ISBM). Fisheries in this category included, but were not limited to:

- central British Columbia troll, net, and sport fisheries;
- southern British Columbia marine troll, net, and sport fisheries (other than the west coast Vancouver Island troll and sport fisheries); and
- all troll, net, and sport marine and freshwater fisheries in Oregon, Washington, and the Snake River basin in Idaho.

The ISBM fisheries generally occurred in marine waters closer to the rivers of origin, or directly in the rivers. These fisheries often are aimed at harvesting hatchery-produced salmon or species other than chinook. The catch in these fisheries is comprised of a relatively small number of chinook salmon stocks, some of which were depleted. Accordingly, these fisheries fell under a "general obligation" that specified certain reductions in exploitation rates relative to a 1979-1982 base period. This general obligation required Canada to maintain at least a 36.5% reduction in fishing mortality on chinook salmon stock groups identified as depleted relative to the base period. This general obligation required the United States to maintain at least a 40% reduction relative to the same base period. In those cases where the general obligation was insufficient to achieve escapement objectives for natural stocks, additional reductions were to be taken as necessary to meet agreed escapement objectives or, when taken with the general obligation, were at least equivalent to the average reduction for the specific chinook stock group during the years 1991-1996.

The 1999 Agreement provided a degree of flexibility, allowing U.S. and Canadian management agencies to decide how best to distribute harvest across their various fisheries to reflect domestic fishery priorities, provided the over-all reductions were achieved. For some chinook stocks, the reduction would have to be much greater than the general obligation, due to the need to provide extra protection for certain very depleted stocks. The general obligation did not apply to hatchery

stocks or healthy natural stocks that were achieving escapement objectives and could support harvest.[55]

In addition to predetermined harvest schedules, the 1999 Agreement specified conditions (e.g., failure of a stock to meet agreed escapement objectives for 2 consecutive years) under which even greater harvest reductions would apply. These so-called "weak stock" provisions serve as a safety valve to afford additional protection to stocks that may fail to respond to broader recovery programs. Finally, the United States and Canada agreed to implement by 2002, subject to improvements in technical information, a total mortality approach to chinook fisheries, taking into account indirect or incidental mortality. This would provide more accurate information on which to make fishery management decisions. These arrangements introduced incentives to reduce incidental fishing mortality and harvest more selectively.

Fraser River Sockeye and Pink Salmon. The U.S. Department of State noted that, although much of the structure of previous agreements relating to the Fraser River was retained, the 1999 Agreement required a substantial reduction in the U.S. share of Fraser River sockeye. This reduction was phased in over three years and completed by the 2002 fishing season. When this reduction was completed, the U.S. share taken in Washington State fisheries was 16.5% of the total allowable catch. (In contrast, the U.S. share of Fraser River sockeye, as specified in the original Annex IV to the 1985 PST, was approximately 26%.)

To mitigate the effect of the reduced share on commercial fishermen in Washington state, the Washington State Legislature and the U.S. federal government were to be asked to contribute to a fishing vessel license buy-back program.[56] This program resulted in the removal of a significant portion of the Washington sockeye fishery. Because the buy-out affected only the non-Indian share, the usual 50/50 sharing rule (per the *Boldt Decision*)[57] in Washington was altered. The shares resulting from the revised sharing rule were 68% for the treaty tribes and 32% for the non-tribal fishermen. This revised sharing rule applied only to U.S. harvest of Fraser River sockeye. The U.S. share of Fraser River pink salmon was 25.7% of the total allowable catch.[58]

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[55] Neither these stocks nor how *health* was to be determined were specified in the information provided by the U.S. Department of State or the Canadian Department of Fisheries and Oceans.

[56] NMFS officials believed §312(b) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §1861a(b)) provided sufficient authority to implement this buy-back program.

[57] See *supra* note 26.

[58] Because pink and sockeye salmon are often caught in the same fishery, the rules affecting one fishery may also affect another. It is unclear whether catching the allocated amount of one species will halt the entire fishery, which could result in forgone catch of the other species.

Coho Salmon. The coho agreement essentially provided a strategy and specifications (i.e., biological criteria) for a conservation-based regime covering border area fisheries in southern British Columbia and Washington State. The specifics of the regime were cooperatively and bilaterally developed for implementation in 2000. The coho regime included rules establishing harvest limits in specified border area fisheries. These rules were designed to limit exploitation rates on natural coho stocks to sustainable levels, taking into account all fisheries affecting the stocks, and thereby improving the long-term prospects of sustainable, healthy fisheries in both countries.

For southern coho stocks, abundance-based management reduced catches to sustainable levels as the United States and Canada worked to rebuild these depressed stocks. Specifically, the coho management program:

- constrained fishing to enable natural coho stocks to produce long term sustainable harvests while maintaining genetic and ecological diversity;
- responded to the status of stocks, was cost-effective and flexible enough to take advantage of technical capabilities and information;
- provided a predictable framework for planning fishery impacts on natural stocks; and
- established an objective basis for monitoring, evaluating and modifying the management regimes.

For northern coho stocks in times of low abundance, certain fisheries were curtailed to assist conservation of these stocks. These closures include:

- southeast Alaskan troll fishery for 10 days from July 25 when early season catch indicators show a low abundance (less than 1.1 million total catch);
- border area[59] Alaskan fisheries for three weeks starting in statistical week 31,[60] when the catch-per-unit of fishing effort (CPUE) does not reach 10;
- border area Alaskan fisheries for two weeks starting in statistical week 31 when CPUE does not reach 14; or
- border area Alaskan fisheries for 10 days starting in statistical week 31 when CPUE does not reach 22.

Comparable curtailments were applicable to Canadian border fisheries.

Southern British Columbia and Washington State Chum Salmon. This agreement incorporated refinements to provisions that trigger adjustments to chum salmon fisheries in the Strait of Georgia and Puget Sound. These refinements

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[59] This area includes the southern portions of Alaska Commercial Fishing Districts 101, 102, 103, and 104, and all of District 152.

[60] Statistical weeks in Alaska's state fisheries begin on January 1, with statistical week 1 ending on the first Saturday in January. Statistical week 31 is, approximately, the last week in July.

had only a minor impact on catch allocation, but improved the effectiveness of the regime. Additionally, at the request of the United States, Canada agreed to require the live release of chum salmon in certain Canadian net fisheries in southern boundary areas at those times of the year when "summer chum" (components of which have been listed as threatened under the U.S. Endangered Species Act) might be present in the area. Specifically, from August 1 to September 15, Canadian purse seine vessels targeting sockeye and pink salmon in the Strait of Juan de Fuca were required to release chum salmon to protect threatened U.S. salmon stocks.

Regional Endowment Funds

The two endowment funds established by the 1999 Agreement are managed bilaterally and address science, restoration, and enhancement needs relating to salmon production. The Northern Boundary and Transboundary Rivers Restoration and Enhancement Fund (Northern Fund) addresses needs in northern and central British Columbia, southeast Alaska, and the Alsek, Taku, and Stikine Rivers. The Southern Boundary Restoration and Enhancement Fund (Southern Fund) addresses needs in southern British Columbia, the states of Washington and Oregon, and the Snake River basin in Idaho.

The United States contributed $75 million and $65 million to capitalize the two funds, respectively, over a four-year period. In tacit recognition that U.S. fishermen have, for years, taken more than their fair share of salmon and would continue to do so under the 1999 Agreement, Canada was compensated through majority capitalization of these funds by the United States.[61] Either country, as well as third parties, may contribute to the funds in the future, upon agreement of the parties.

For each of the regional funds, a bilateral committee composed of three representatives appointed by each of the two countries is responsible for approving expenditures of the funds. Annual expenditures are not to exceed the annual earnings from the invested principal of each of the funds; only the interest generated by the funds is spent. Expenditures will be suspended upon the expiration of the relevant chapters of Annex IV, and may continue only after new fishing arrangements are agreed to by the parties.

The funds are used to (1) improve resource management information (including data acquisition) and scientific understanding of factors affecting salmon production; (2) rehabilitate, restore, and/or improve natural habitat to enhance the productivity and protection of Pacific salmon; and (3) enhance wild stock production using "low-technology" methods.

Cooperation on Scientific and Institutional Matters

The 1999 Agreement included a commitment by the two countries to improve how scientific information is obtained, shared, and applied to the management of the salmon resource. Among other things, the agreement encouraged staff exchanges

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[61] T. Kenworthy and S. Pearlstein, "U.S., Canada Reach Landmark Pact on Pacific Salmon Fishing," *Washington Post* (June 4, 1999): p. A17.

between management agencies, bilateral workshops, and participation in the public domestic management processes of the other country (e.g., the U.S. regional fishery management councils).

Additionally, a bilateral Committee on Scientific Cooperation was established under the PSC. Composed of two persons each nominated by the two national sections of the PSC, the committee assists the PSC in setting its scientific agenda, advises on research and monitoring needs, and assists in arranging peer review and evaluation of scientific reports. The PSC also was encouraged to resolve scientific issues through its technical committees and asked to elaborate rules and procedures, as necessary, for implementing the process set out in Article XII of the PST for addressing technical disputes.[62]

Habitat

The 1999 Agreement highlighted the importance of habitat protection and restoration to achieving the long-term objectives of the parties. While the primary focus of the agreement was on setting provisions that govern fishery management, it was well understood that achieving optimum production of salmon depended on other initiatives as well. These included, but were not limited to, maintaining adequate water quality and quantity, achieving improved spawning success and migration corridors for adult and juvenile salmon, and other measures that maintained and increased the production of natural stocks. The PSC reports annually to the parties to identify (1) stocks for which measures beyond harvest controls are required and non-fishing factors that limit production; (2) options to address these factors; and (3) progress of the parties in implementing measures to improve production.

This arrangement improved the conservation elements of the PST and extended the PST framework to include coordination on habitat protection objectives. This provision supports the principle that stock conservation and rebuilding goals require coordinated and effective programs in freshwater to maintain productive habitat or restore degraded habitat, particularly, when it constrains sustaining populations at optimum production.

The two Endowment Funds provide tangible capacity to undertake remedial action to enhance the productivity of freshwater habitat. The initiative on habitat was a significant complement to the PSC's overall mandate to coordinate achievement of optimum production of salmon.

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[62] Although most disputes under the PSC relate to technical issues, such as run-size predictions and total allowable catch, the PSC's Article XII provisions for technical dispute resolution have rarely been used. The modifications in the 1999 accord aimed to promote scientific decision-making more independent of political and policy pressures. Prior to the 1999 Agreement, scientists related to the PSC and salmon management appeared, with rare exception, unable to reach objective conclusions, with analyses uniformly supporting their parent agency's desires. This lack of objectivity was apparent when scientists working with identical data uniformly reached different conclusions, that could be viewed as self-serving.

Concerns with the 1999 Agreement

The attention given to several concerns by Congress, other U.S. officials, and fishery managers was believed crucial in determining the degree to which bilateral salmon management under the 1999 Agreement was likely to succeed. These issues, and how they have been addressed, include:

- *Acceptance of the 1999 Agreement.* The 1999 Agreement consisted of more than simple amendments to the PST annex, which the PST provides for acceptance by exchange of notes. Thus, there was ambiguity over whether the PST was a separate treaty requiring Senate action, or merely a supplement to the existing treaty that improved its implementation. In either case, it called for funding that could only come by way of congressional authorization and appropriation.

The 1999 Agreement was determined to be an executive agreement, and thus did not require Senate advice and consent to ratification. See the next item on funding.

- *Congressional appropriation of $140 million for the two Endowment Funds*. Obligations under the 1999 Agreement were contingent upon legislative authority and appropriations from the U.S. Congress for these two funds. The full capitalization of these two funds relied on repeated action by the U.S. Congress to appropriate monies over four years. Any hesitancy in providing this funding might have been seen by Canada as a repudiation of U.S. responsibility for compensating Canada for larger U.S. salmon harvests in the recent past. In addition, the joint diplomatic statement accompanying the 1999 Agreement stated that the agreement would be "suspended" if funds were not available at times certain through FY2003, at least suggesting that, as noted above, acceptance of the agreement was contingent upon appropriation of funds by Congress.

The U.S. Congress appropriated full funding for the two endowment funds within the time prescribed.

- *Allocation of and expenditures from the Endowment Funds*. If these two funds were fully funded and grew at 10% interest, about $14 million would be available for expenditure annually, to be used for salmon restoration and enhancement projects benefitting both countries. If, however, the funds were not capitalized at the anticipated amount, Canada might have regarded the resulting interest insufficient, compared to the perceived damage U.S. fishing had caused Canadian salmon stocks.

In 2006, about $7 million (U.S. dollars) was derived from interest on these funds and allocated to various projects (see "Implementing the Regional Endowment Funds," below).

- *Equity*. Since the 1999 Agreement did not specifically and directly address the issue of salmon interceptions,[63] many Canadians remained skeptical that the 1999 Agreement would result in any improvements toward each party receiving benefits equivalent to the production of salmon originating in its waters. For years, the United States and Canada debated different interpretations of this objective and how it should be measured. In addition, Canadians called on the United States to abide by obligations under the PST's Memorandum of Understanding for implementing Article III, paragraph 1(b), wherein the party with the advantage was to propose corrective measures. However, the 1999 Agreement did not provide any mechanism to reimburse one party if the other overharvested.

Both parties appear comfortable with the equity achieved under harvest regimes of the 1999 Agreement, and no particular concerns related to overharvesting have arisen.

- *Decision-making within the U.S. Section to the PSC*. Section 3632(g)(1) of the Pacific Salmon Treaty Act of 1985 requires consensus among the U.S. Section to the PSC before a decision can be made. Critics of U.S. Section action charge that this requirement has been used as a ploy to paralyze operation of the PST and frustrate rational salmon management. If the inability to reach consensus within the U.S. Section results in fishing activities that threaten the conservation of salmon stocks, the United States could be in breach of its PST obligations. In such circumstances, the federal government is to assume leadership, with the option for intervention and preemption.[64] Past hesitancy of the U.S. federal government (i.e., the President, Secretary of State, and/or Secretary of Commerce) to exercise authority and assume this necessary leadership role had contributed to the erosion of a cooperative relationship with Canada beneficial to Pacific salmon.

No particular problems have arisen within the U.S. Section relative to achieving consensus.

- *Failure to include British Columbia*. The exclusion by Canadian federal negotiators of British Columbia from negotiations leading to the 1999 Agreement could have been a recipe for failure, some contended. They suggested the United States should have requested that British Columbia remain involved since British Columbia is where the majority of the Canadian salmon originate. It is also the location of fishing and other interests affected by the implementation

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[63] For example, particular concerns remain about the southeast Alaska pink salmon fishery in District 4 intercepting increasing numbers of Canadian sockeye salmon after statistical week 31.

[64] Theodore G. Kronmiller, *Pacific Salmon Treaty*, Hearing, Senate Committee on Foreign Relations (Feb. 22, 1985), p. 45.

of the 1999 Agreement. For the 1999 Agreement to work, it had to address regional interests pertaining to salmon as perceived by British Columbia, in addition to Canadian interests as perceived by the federal government in Ottawa. The cooperation of British Columbia fishing interests was probably essential to achieving rational management of Pacific coastal salmon stocks.

This does not appear to be a current issue, as Canada appears sensitive and responsive to regional concerns.

- *Perception by some Canadians of the 1999 Agreement as a sellout of Canadian interests*. Some Canadians felt the United States had been, and continued to be, the principal transgressor in failed salmon management, and always achieved the better outcome in any bilateral dealing. For example, many Canadians perceived that the United States had the ability to force Canada to curtail fisheries to address U.S. conservation concerns (e.g., Juan de Fuca summer-run chum salmon), but that Canada lacked any mechanism to force Alaska to do the same when Canada was concerned about conservation (e.g., southeast Alaska harvest restrictions are triggered by low U.S. coho abundance, not low Canadian coho abundance).[65] Such attitudes focused considerable attention on how the United States conducted itself in implementing the 1999 Agreement, particularly appropriations for and allocations from the two Endowment Funds.

Canadians do not appear to harbor intense emotions in response to how equitably the 1999 Agreement's implementation and funding of the endowment funds has been perceived.

- *Absence of any penalty for the non-resolution of disputes between the two parties*. The 1999 Agreement did not specify salmon harvest limits, but was a very complex blueprint for the parties to follow in promulgating harvest limits and taking other actions to conserve salmon fisheries. As such, it opened the door to considerable dispute. Canada has repeatedly sought the inclusion of binding arbitration as an option under the PST. However, the 1999 Agreement did not provide any additional incentive to settle differences (e.g., it did not prohibit both nations from fishing when no accord was reached). In addition, no enforcement mechanism was provided in the PST to guide action if one country should be out of compliance with the agreement or the PST.

No serious disputes have arisen, so this aspect has not posed any concerns.

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[65] Canadians were concerned about what they referred to as liberal trigger mechanisms regarding this coho fishery. Some claimed that if the formula in the 1999 Agreement were applied to past years, it would have resulted in only one 10-day pause in Alaska fishing in the previous two decades.

- *Technical dispute resolution*. The potential for technical disputes could have increased under the 1999 Agreement, since harvest levels were to be based on the determination of stock abundance levels. However, only Chapter 5 of the new Annex IV on coho salmon required resolution of technical disputes under the provisions of Article XII of the PST. No similar provision was made for other fisheries in the 1999 Agreement, and even the Article XII provisions appear to have been ineffective in the past. Thus, a broad-based and readily enforceable means of resolving disputes applicable to all technical disputes may be lacking.

Again, no serious disputes have arisen, so this aspect has not posed any concerns.

- *Reliability of PSC science*. Abundance-based management works when the supporting science is accurate, particularly as regards salmon abundance forecasts. Both nations may gain from committing themselves to promoting greater objectivity and cooperation in the conduct of their scientists.

The objectivity and reliability of PSC science has been widely accepted by both parties.

- *Use of selective fishing methods*. Canada asserted that its future salmon fisheries would operate differently than in the past, with harvestable fish being selectively targeted to avoid undesired bycatch of wild or weak stocks. Fin marking[66] by U.S. management agencies also was employed to promote selective fishing. The degree to which selective fishing practices are used in mixed-stock fisheries by both nations to protect weaker, wild stocks could minimize conflicts between fishing and the laws and programs seeking to protect threatened and endangered species.

This appears an emerging arena of potential conflict due to what some consider to be significant Canadian harvest of salmon from several populations listed under the U.S. Endangered Species Act.

Renegotiating Annex IV: Framework and Concerns

Renegotiation Timeline

The U.S. Section to the PSC envisions that the renegotiations will take place within the framework of the PSC process, rather than on a "government-to-government" basis, as occurred in 1999. Due to the improved atmosphere of

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[66] Prior to releasing juvenile salmon from a hatchery, the adipose fin of each fish is removed (i.e., clipped) to permit quick visual identification of the usually more abundant hatchery fish when they return as adults. During a selective fishery, non-marked (i.e., wild stock) fish that are caught can be released in a manner that minimizes mortality.

cooperation that now exists within the PSC, both parties are cautiously optimistic that this approach can succeed.

Most of the fisheries regimes set forth in Annex IV expire at the end of 2008 (the only exceptions are the regimes for Fraser River sockeye and pink salmon, which expire at the end of 2010). Following informal discussions over the past year, the U.S. Section has recently proposed to Canada a framework for handling the renegotiation of these regimes in accordance with a timeline designed to allow the parties to bring new fisheries regimes into force no later than the end of 2008. The two sides discussed the proposed framework at the Executive Session of the PSC in mid-October 2006.[67] Recommendations in 2005 and, again, in 2006 on changes to the PST Annex IV arrangements (chapters 1, 4 and 6) attest to the positive relations in the bilateral PSC and between the two countries on Pacific salmon overall.[68]

Implementing the 1999 Agreement

There are a number of different ways to evaluate or measure the effects of the 1999 Agreement as it has been implemented. For example, one could evaluate the Agreement on the basis of its effect on conservation and sharing of the resource, its benefits and costs to the fisheries and the agencies who manage them, and its effect on the many people who rely on salmon for their economic and cultural value.

From the perspective of the Department of State, a salient way to measure the relative success of the 1999 Pacific Salmon Agreement is to compare the nature and tenor of relations with Canada concerning the shared Pacific salmon resource during the period before the conclusion of the 1999 Agreement with the period since.

Throughout much of the 1990s, disputes over Pacific salmon repeatedly became significant irritants in relations between the United States and Canada. The procedures for handling such disputes established by the 1985 Pacific Salmon Treaty, particularly the mechanisms of the Pacific Salmon Commission (PSC), had ceased to work effectively. Antagonism over those disputes provoked incidents that made front-page news. Several different attempts to settle differences essentially failed.

The conclusion of the 1999 Agreement created a new and much improved paradigm for addressing Pacific salmon issues, permitting U.S. and Canadian participants in the PSC process to work together constructively. The two national Sections have reached agreement on many issues concerning the implementation of the 1999 Agreement. For example, since 1999, they have agreed to amend some of the fisheries regimes set forth in Annex IV to take account of new circumstances. They successfully negotiated and implemented a biologically sound management plan for coho salmon in the southern portion of PSC area. They have used the two endowment funds created by the 1999 Agreement to advance useful salmon initiatives in both countries. The two Sections also recently embarked on an effort

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[67] Personal communication with David Balton, Deputy Assistant Secretary of State for Oceans and Fisheries, Oct. 11, 2006.

[68] Personal communication with Helene Belleau, First Secretary, Canadian Embassy, Oct. 13, 2006.

to give better effect to Attachment E to the 1999 Agreement, concerning salmon habitat and restoration.[69]

The Government of Canada highly values the Treaty and the work of the PSC, believing that these legal and institutional features have provided each country with important mutual benefits in the management of shared salmon stocks. The 1999 Agreement ended a seven-year dispute. That agreement launched an era of cooperation and conservation in the management of the Pacific salmon fisheries and a more equitable sharing of catches between the United States and Canada.

Importantly, the agreement also led to improved cooperation on science and management through the establishment of two new joint committees. The bilateral Committee on Scientific Cooperation provides advice to the PSC on its scientific agenda and how to improve cooperation on science issues. As well, the Transboundary Rivers Panel provides advice on management of the Stikine, Taku, and Alsek Rivers. Discussions in the bilateral PSC have been positive and productive since 1999.[70]

Dispute Resolution. The PSC has had to address some difficult issues since implementation of the 1999 Agreement, and has been successful in its negotiations.[71] No formal "disputes" between the United States and Canada have arisen since the advent of the 1999 Agreement.[72]

Issues of Potential Conflict between Alaska and Oregon/ Washington/California. The way the PSC implements the 1999 Agreement has the potential to cause friction between Alaska and the states of Oregon/Washington/ California. The 1999 Agreement established fishing regimes that spanned several years. Multi-year fishing agreements have led to a profound improvement in working relationships between the various interests involved in the PSC processes. The parties have been able to focus on other issues with a spirit of cooperative resolution that would not have been possible under the stresses of the negotiation-driven atmosphere that existed before. Technical committees on chinook and coho, for example, have been able to devote more time to cooperative analysis because the time required to support competitive negotiation of fishing regimes has been reduced.

Although these multi-year regimes have established a set of rules to govern the conduct of fisheries, they can have the effect of shifting the conservation responsibility. The aggregate abundance-based management (AABM) regimes adopted for Alaskan and some Canadian fisheries relieve these fisheries of stock-specific obligations to conserve individual stocks of fish. Consequently, managers

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[69] Personal communication with David Balton, Deputy Assistant Secretary of State for Oceans and Fisheries, Oct. 11, 2006.

[70] Personal communication with Helene Belleau, First Secretary, Canadian Embassy, Oct. 13, 2006.

[71] Ibid.

[72] Personal communication with David Balton, Deputy Assistant Secretary of State for Oceans and Fisheries, Oct. 11, 2006.

of other fisheries are required to bear an increasing share of the responsibility for conservation and meeting jeopardy standards for ESA-listed populations. For example, the annual allowed salmon harvest is calculated in two different manners — under an aggregate abundance off of Canada and Alaska, and a weakest stock calculation off of the Washington Coast. This has caused a reduction in the allowed harvest off of the Washington coast because the limiting (i.e., weakest) stock for Washington has been reduced due to the increase in interception off Canada and Alaska, where the limiting stock for WA is aggregated with other, more abundant, stocks as the basis of aggregate abundance management.

Implementing the Regional Endowment Funds. The U.S. Congress authorized and appropriated $10 million for FY2000 for each Northern and Southern Funds ($20 million total); the money was transmitted to the PSC in late 1999 and early 2000. For FY2001, Congress appropriated a second installment of $20 million for each Fund ($40 million total),[73] which was transmitted to the PSC in February 2001. Congress authorized a similar amount for FY2002. The balance of the total commitment — $25 million to the Northern Fund and $15 million to the Southern Fund ($40 million total)[74] — was authorized in FY2003.[75] In addition to the amounts contributed by the United States, Canada contributed $250,000 (Canadian) to each of the two funds (total of $500,000 Canadian) in November 2000. By 2006, the two endowment funds were generating a total of US$7 million annually to finance projects in Canada and the United States.[76]

Table 1. Expenditures by Project Category (in U.S. dollars)

Southern Fund

Year	Enhancement	Habitat	Improved Information for Management	Total
2004	102,385	243,027	1,664,633	2,010,045
2005	96,388	1,513,180	1,568,761	3,178,329
2006	331,004	1,357,905	2,278,249	3,967,158

Northern Fund

Year	Enhancement	Habitat	Improved Information for Management	Total
2004	664,009	106,448	1,134,869	1,905,326
2005	118,362	136,511	2,626,716	2,881,589
2006	580,458	384,904	2,125,596	3,090,958

[73] In actuality, the appropriated funds were subjected to a Congressionally-mandated across-the-board "hold-back" (rescission) of 0.22%, which reduced the FY2001 amount to $19,956,000 for each fund ($39,912,000 total).

[74] In 2003, a rescission of 0.65% reduced the contribution to the Northern Fund by $162,500 and to the Southern Fund by $97,500.

[75] All funds are in U.S. dollars, unless otherwise stated.

[76] Personal communication with Don Kowal, Executive Secretary, Pacific Salmon Commission, Oct. 27, 2006.

The combined Northern and Southern expenditures by project activity category for 2004-2006 are:

Enhancement	$ 1,892,606	11%
Habitat Restoration	$ 3,741,975	22%
Improved Information for Management	$11,398,824	67%

Several projects have been funded that involve cooperators in both countries. Additionally, the benefits that flow from many of the projects are shared bilaterally, such as projects directed at improving the Fraser River sockeye fishery.

An unintended, but nonetheless real, effect of establishing the Endowment Funds as part of the 1999 Agreement is that there has been a growing temptation to seek financial support from these endowment funds to operate basic agency stock and fishery assessment programs. This tendency has been exacerbated by mounting pressures for fiscal austerity reflected by agency budgets in both countries.

Effect of Chinook Management on Other Fisheries. The effects of different fisheries on chinook salmon vary by stock. The 1999 Agreement relative to chinook salmon has tended to shift the conservation responsibility to fisheries that are not managed under AABM regimes to protect individual stocks. The fishing regime established for fisheries off the west coast of Vancouver Island (WCVI) has had different effects on individual stocks of chinook salmon returning to Puget Sound, the Washington Coast, and Columbia River.[77] When the 1999 Agreement was negotiated, the effects of the ESA were not yet apparent because NMFS had not yet established jeopardy standards. With those standards now in place, the ramifications of the PST's approach to chinook management can be better understood. For Puget Sound stocks, Canadian WCVI fishery harvest rates have not been reduced to the extent anticipated under the 1999 Agreement. Consequently, fisheries that harvest chinook in Puget Sound, including those directed at other species, such as sockeye, have been further restricted to compensate for less-than-anticipated reductions in Canadian fishery impacts. For Snake River fall chinook, the impacts of WCVI fisheries have been reduced more than expected, providing greater flexibility in allocating impacts among U.S. fisheries affecting this stock complex. The magnitude of chinook bycatch in groundfish fisheries directed at other species has not been allocated among individual stocks because data necessary to do so are not available.

Canadian interception of Washington State chinook salmon can be seen as a *quid pro quo* for Alaskan interceptions of Canadian chinook salmon. However, this situation has resulted in Washington State salmon fleets, Tribal and non-tribal alike, feeling that they have been denied an equitable harvest opportunity. Washington salmon fishermen perceive Canada as managing their allowed ocean chinook salmon troll harvest to avoid their domestic stocks and target U.S. stocks. These Washington

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[77] Pacific Salmon Commission, *Report of the Joint Chinook Technical Committee Workgroup on the October 19, 2005, Assignments Given to the Chinook Technical Committee by the Pacific Salmon Commission Regarding the Conduct of Canadian AABM Fisheries*, TCCHINOOK(06)-1 (July 28, 2006).

fishermen see the Canadian use of real time genetic stock analysis, where they sample the harvest and allow more or less harvest in the area depending on the mix of the stocks present, as a violation of the existing treaty where one country is not to target the stocks of the other country.

In addition, Washington's ability to harvest its share of Fraser River sockeye and pink salmon, both of which are managed under the PST, is constrained by the ESA listing of Puget Sound chinook. After Canada's allowable harvest of chinook salmon under the existing chinook regime in Annex IV, combined with the U.S. ESA mandated harvest restrictions on Puget Sound chinook, there is insufficient permissible chinook impacts remaining to satisfy both the treaty and non-treaty commercial sockeye and pink fisheries in Washington State.

U.S. Concerns

Many complex issues continue to challenge the PSC and the parties. The combined implementation of the 1985 PST and the 1999 Agreement continue to pose challenges. Several of these will likely be addressed in the renegotiation of the expiring Annex IV fisheries regimes.

Most participants believe that the most difficult issue associated with the renegotiation concerns the fishery regime for chinook salmon found in Chapter 3 of Annex IV. The problems arising from the status (e.g., U.S. endangered and threatened species listing) of certain runs of chinook salmon in Washington, Oregon, Idaho and perhaps British Columbia may pose particular challenges for the negotiators.[78]

Measures beyond Harvest Control. This issue concerns the PSC's activities relating to Attachment E to the 1999 Agreement, known as the Habitat and Restoration agreement.[79] This attachment includes, among other things, a section requesting the commission to report annually to the parties on the status of natural stocks not producing at optimum production, the non-fishing factors which may be limiting their production, options for addressing these factors, and the progress of the parties in achieving the objective of optimum production for these stocks.

The PSC has discussed this provision of the 1999 Agreement bilaterally on many occasions since 1999. However, bilateral progress has been difficult and limited for a number of reasons, some of which stem from differences within the two national sections, as well as between them. The following summary is based on bilateral discussions, and does not attempt to characterize the details of the within-section differences.

Shortly after the 1999 Agreement was concluded, the PSC established a bilateral ad hoc habitat committee to develop options for implementing the habitat provisions

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[78] Personal communication with David Balton, Deputy Assistant Secretary of State for Oceans and Fisheries, Oct. 11, 2006.

[79] Attachment E to the 1999 Agreement, concerning habitat and restoration, does not expire and is not directly a part of the upcoming renegotiation process.

of the agreement. The habitat committee focused its efforts on collating information developed by domestic management agencies that described some of the major habitat factors limiting salmon production in specific watersheds. Upon review of this work, it was concluded that the ad hoc committee's approach was not, at that point, acceptable. The U.S. Section agreed to develop an alternative proposal for implementation of Attachment E for consideration by the PSC. In October 2005, the U.S. Section presented a position to the PSC.

At its February 2006 Annual Meeting, the PSC agreed to establish a bilateral habitat and restoration technical committee that would advise it on matters relating to habitat and restoration, thus potentially enabling it to make additional progress toward implementing the Habitat and Restoration agreement. Both parties recognize that the amount and pace of work that this committee will be able to undertake will be limited by the available funding.

The main purposes of the committee would be, for a list of stocks identified by the PSC, to:

- inform the PSC regarding the status of habitats for naturally spawning stocks subject to the Treaty for which non-fishing factors are limiting production;
- identify non-fishing factors that limit production of specific stocks;
- identify options for addressing the appropriate factors to achieve optimum production for those stocks; and
- facilitate the exchange between the parties of information and best practices associated with habitat protection and restoration.

The bilaterally approved Habitat and Restoration Technical Committee proposal recognized that both parties have embarked on major domestic habitat recovery efforts to address the depressed status of natural stocks of salmon. In both countries, a great deal of effort and millions of dollars has been directed at addressing factors other than fishing. A major source of U.S. funding for habitat restoration has been the six years of congressional appropriations to the Pacific Coastal Salmon Recovery Fund.

Despite the lack of a formal and specific habitat management framework, the PSC has focused significant attention on certain high priority issues involving non-fishing factors limiting production. Most notable of these has been the cooperative bilateral program undertaken to address the problem of the early entry of late Fraser sockeye, an unforeseen and unexplained phenomenon that threatened a fishery of major importance to both parties. Using funds contributed by the parties, several important initiatives were undertaken to address this problem. Bilateral scientific workshops have been held and the PSC has implemented a significant number of research and technical studies and programs with the assistance of the Southern Boundary Restoration and Enhancement Fund.

On an even broader scale, the Northern Boundary Restoration and Enhancement Fund and the Southern Boundary Restoration Fund have contributed a total of several

million dollars to support projects designed to address a myriad of habitat issues in both countries.[80]

Non-Fishing Factors Affecting Productivity and Capacity. U.S. domestic concerns relative to non-fishing factors that affect salmon productivity and fishing capacity will influence the renegotiation of some expiring fisheries regimes of Annex IV, particularly Chapter 3 concerning chinook salmon. Canada has a number of domestic concerns that will similarly affect the renegotiation of fisheries regimes.

Within the United States, a great deal of effort is being expended to address the "four H's" that affect salmon mortality: habitat, hydroelectric power, hatcheries, and harvest. The expiring fisheries regimes of Annex IV deal principally with only the last of these, harvest. The challenge for negotiators will be to find a way to develop provisions for a renegotiated Chapter 3 that take into account domestic efforts in both countries, including efforts to protect individual runs of ESA-listed chinook salmon in the United States and similar concerns in Canada.[81]

Both the United States and Canada are experiencing mounting pressures for competing uses of natural resources which can adversely affect the productivity and capacity of habitat to support salmon. The need to consider effects of water diversion, hydropower, land-use development and management practices, the adequacy and enforcement of environmental regulations, and hatchery operations on production from naturally-spawning populations, for example, has been recognized in recovery planning for ESA-listed stocks in the Columbia River and Puget Sound. In the Fraser River, agriculture and other factors have reduced production of Interior Fraser coho; this has been of concern to the United States because the chronically depressed status of this stock has affected the ability of the United States to harvest its own stocks under the 2002 PSC Coho Agreement.

An additional area where the influence of habitat affects salmon fishery management under the PSC arrangements is through reliance on spawning escapement goals that are tied to the capacity of stocks to produce maximum sustainable harvest (MSH) under current environmental conditions. Over time, as the condition of habitat deteriorates, MSH escapement levels could be reduced to levels so low that stock sustainability is questionable. The PSC, which historically focused its efforts on developing fishing regimes, is now considering measures to implement the habitat provisions of Attachment E to the 1999 PSC Agreement. In the United States, federal actions that affect ESA-listed salmon populations are considered in the context of evaluating effects relative to established jeopardy standards. However, the capacity of both parties to muster the resources and political will to address factors that adversely impact salmon habitat remains questionable.

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[80] Personal communication with Don Kowal, Executive Secretary, Pacific Salmon Commission, Oct. 27, 2006.

[81] Personal communication with David Balton, Deputy Assistant Secretary of State for Oceans and Fisheries, Oct. 11, 2006.

Interaction with U.S. Harvest Policy. This issue concerns the implications of the U.S. Administration's salmon policy, as expressed in the January 25, 2006 speech by White House Council on Environmental Quality Chairman James L. Connaughton, at the "Future of Wild Pacific Salmon" conference at Oregon State University.[82]

The life-cycle and migratory patterns of Pacific salmon, combined with the jurisdictional landscape of North America's west coast, places Canada literally and figuratively in the middle of certain PST issues, with Alaska to the north and several states of the "Lower 48" to the south. As in the past, some of the biggest challenges confronting the participants in the upcoming renegotiations will be to find solutions acceptable to all U.S. stakeholders. Perspectives on the issues raised in Chairman Connaughton's speech tend to differ depending on location within this region. Consider, for example, that chinook salmon originating in the U.S. states of the Pacific Northwest are harvested in all three regions (the Pacific Northwest states, Canada, and Alaska); chinook originating in Canada are harvested primarily in Alaska and Canada; chinook originating in Alaska are harvested only in Alaska. Not surprisingly, stakeholders in each of these regions have different opinions on rules to regulate harvest patterns and practices for chinook salmon.[83]

Chairman Connaughton's speech was directed primarily at the situation of mortality of the Snake River listed stocks. Although there is significantly more mortality in-river on those stocks, he focused on harvest mortality. Setting that discussion aside, Canada ocean fisheries are a significant harvester of the allowed Snake River fall chinook. One approach might consider Snake River fall chinook as an indicator stock to measure recovery.

The current Administration's policy will most likely cause Washington and/or Oregon to attempt to exert more pressure on Alaska to decrease its impacts on southern chinook stocks. It is difficult to see how the United States can expect to obtain much relief from Canada since the United States does not have much to offer Canada in return. Whether Alaska will agree to any thing less than the status quo may ultimately come down to a question of political will. **Table 2** presents NMFS data, indicating that the relative harvest impacts, using the Snake River wild fall chinook stock as an indicator, result less (proportionately) from Alaskan activities than from Columbia in-river fisheries. However, these statistics could be misleading in aggregate. For example, if the WCVI total harvest is ten times that of the Columbia Treaty fisheries, then their aggregate impact would be roughly three times as great, in terms of total number of fish harvested.

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[82] For the text of this speech, see [http://www.salmonrecovery.gov/newsroom/archives/Research_Reports_Pubs/speeches/2006/JLC_Salmon_Speech_1.25.06.pdf].

[83] Personal communication with David Balton, Deputy Assistant Secretary of State for Oceans and Fisheries, Oct. 11, 2006.

Table 2. Estimated Catch of Snake River Wild Fall Chinook Salmon per 1000 Total Catch in Major Ocean and In-River Fisheries[84]

Fishery	1985-2004 Average Number of Fish[85]
Southeast Alaska, all gear	0.8
Northern British Columbia, troll and sport harvest	0.5
WCVI, troll and sport harvest	3.7
Pacific Fishery Management Council, troll and sport	5.1
Columbia River, non-Treaty fisheries	9.7
Columbia River, Treaty fisheries	13.0

Limiting the discussion to harvest may increase tensions unnecessarily. The implications of James Connaughton's comments are that the United States is prepared to pay any price to convince Canada to reduce its harvest of ESA-listed fish in the imminent Annex IV renegotiation. If the position advocated by Connaughton for chinook salmon management is pursued aggressively, intensive controversy and conflict could arise as concessions are sought for a variety of fisheries and species coastwide. For example, a willingness to reduce chinook harvests by Canada would likely be contingent on obtaining restrictions on U.S. access to coho, pink, sockeye, and chum salmon. Concern has been further fueled by Connaughton's concluding remarks: "If agreements cannot be forged through this process, the federal government is nonetheless obligated to proceed with the decision-making entrusted to its discretion under the law." Such efforts could intensify political conflict, and potential repercussions for federal appropriations to support salmon and other priorities might be anticipated.

Others suggest that the views expressed by Chairman Connaughton do not reflect current understanding, recognition, and appreciation for the relative significance of fishing mortalities compared to those caused from hydropower development. For example, on page 3, he states, "However, in the Columbia River, the Snake River fall chinook gives about half of its returning adult population to us....", meaning fishery harvest. This statement fails to acknowledge that the mortality rates for juvenile migrants are approximately 10%-15% for turbines, 5% for by-pass, and 2% for spillways *per dam*. Since Snake River fall chinook pass through eight mainstem dams before they even reach the ocean, as much as 73% of the potential production subject to turbine passage, might be lost due to mortality

[84] NMFS data provided by D. Robert Lohn, Administrator, Northwest Region, NMFS, Seattle, WA, Oct. 4, 2006.

[85] The 1986-2005 average is used for Columbia River fisheries.

from dam passage alone[86] before these fish even reach the ocean. When adults attempt to pass upstream on their spawning migrations, they can suffer an additional mortality of from 2%-5% per dam;[87] so for Snake Rivers fall chinook, from 15% to 34% of the fish that actually live long enough to reach the river on their spawning migration can be lost to dams.

In addition, an extensive system is in place to ensure that harvest impacts on ESA-listed stocks are kept within acceptable constraints as determined by the federal agencies responsible for establishing jeopardy standards. The Independent Science Advisory Board issued its *Report on Harvest Management of Columbia Basin Salmon and Steelhead*[88] describing the management process and evaluating harvest management of Columbia River salmon and steelhead. Further, some maintain that Connaughton's comments on modifying existing agreements for ocean and Columbia River fisheries do not fully consider the consequences of disrupting international and domestic legal arrangements that were developed through difficult negotiations spanning many years.

Hatchery reform on the Columbia River could refocus efforts on in-place, in-kind replacement to mitigate for loss and damage of habitat resulting from dam construction. Unfortunately, too often hatchery operations have been painted with broad-brush generalities.

Chairman Connaughton's January 2006 speech reports figures on the cost of salmon restoration as justification for seeking further reductions of harvest impacts. However, some argue that the cited cost figures are inflated by speculative extrapolations of foregone power/water revenues. Critics maintain that Chairman Connaughton's comments emphasize the effects of harvest and hatcheries on ESA-listed stocks while understating the damages caused by other sources, such as dam passage, water withdrawals, water temperatures, and habitat degradation. From their perspective, any emphasis on reducing harvest even further could increase the difficulty in pursuing cooperative efforts to conserve stocks among Alaska, the rest of the United States, and Canada.

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[86] The actual mortality loss varies considerably by species and will be affected by the proportion of the migrants that are subject to turbine, by-pass, or spillway mortality. These proportions are related to streamflow and power production. When flows are high, as much as 30%-40% of the fish will use spillways and survival rates will be higher; when flows are low, the vast majority will go through turbines and by-pass facilities and survival rates will be reduced.

[87] Limited data from a small number of adult spring chinook containing passive integrated transponder (PIT) tags was recently reported as indicating a per-dam passage mortality rate as low as 2%; however, other research indicated that mortality rates are several time higher for adults ascending the Snake/Columbia hydrosystem. (See [httpr://cbbulletin.com/free/172679.aspx].) Mortality rates of 2% and 5% per dam would equate to total dam passage mortality rates of 15% and 34%, respectively, when considered for the eight mainstream dams the fish must pass before reaching spawning grounds in the Snake River.

[88] ISAB 2005-4 (June 21, 2005).

Mass Marking and Mark-Selective Fishing. Mass marking (removing the adipose fin) and mark-selective fisheries (harvesting only fish with the adipose fin removed) were implemented by some of the management entities who participate in the PSC process to conserve natural stocks of concern and to sustain fishery opportunities by shifting harvest toward hatchery fish in mixed stock fisheries. However, concerns have arisen that unilateral decisions to implement mass marking and mark-selective fisheries (MSFs) diminish the utility of the coded-wire-tag (CWT) system used by the PSC. Intense fisheries that selectively remove only marked fish violate the fundamental assumption of the CWT system that tagged and untagged fish within a population have equal chance of being harvested during their life cycle.

Under a mass marking program, a fish may be "marked" (i.e., a fin is clipped off) and/or "tagged" with a CWT. Fisheries may differentially affect four groups of fish: marked and tagged, marked and not tagged, not marked but tagged, and neither marked nor tagged. Most chinook and coho salmon produced in hatcheries are marked and a small portion are also tagged with a CWT for monitoring exploitation rates, fishing patterns, and marine survival. To better represent the impact of fishing on local natural populations, a portion of hatchery production is left unmarked and tagged with a different CWT. Comparisons in recovery patterns and exploitation rates between the marked and unmarked CWT fish may be used to estimate the effect of selective fishing.

Estimates of fishery exploitation rates from samples of tagged and marked fish (a small portion of hatchery fish) will still be unbiased estimates of untagged and marked fish, but not of fishery exploitation rates of unmarked fish. Therefore, the marked and CWT tagged hatchery fish can no longer be assumed to be representative of exploitation rates on natural production. If MSFs increase in number and intensity, the discrepancy between the fates of adipose-clipped (marked) fish and unmarked fish will increase. Additionally, MSFs result in non-landed mortalities to unmarked fish, i.e., some of the unmarked fish released by fishermen in a MSF will later die as a result of having been captured and handled. There will no longer be landed catch of the unmarked fish to sample as a basis for directly estimating fishery impacts on specific salmon stocks.

The CWT system is so seminal to the ability to collect stock-specific information on the impacts of fishery regimes on populations of concern to the PSC that a separate memorandum of agreement, committing the United States and Canada to maintain a viable CWT system, was attached to the 1985 PST. In the United States, state and federal legislation has required the mass marking of large numbers of coho and chinook salmon produced by hatchery facilities for the purpose of providing increased harvest access to hatchery fish within the constraints established to protect wild fish. Critics assert that these mass marking developments have reduced the reliability of data derived from the CWT system coastwide, greatly increased the costs of fishery and escapement sampling, diverted funding from other purposes, and required substantial changes to reporting formats and validation protocols.

Issues and concerns regarding adverse effects of mass marking and mark-selective fishing on the CWT system have been repeatedly raised by the PSC's

technical committees. Recently, an expert panel was convened to examine issues and problems associated with the CWT system, including the mass marking and mark-selective fishing.[89] These issues and concerns have been discussed on many occasions within the PSC. In addition, a July, 2005 memo from the Independent Scientific Advisory Board to the Northwest Power and Conservation Council also describes concerns regarding the impacts of mass marking and mark-selective fishing on the scientific basis for salmon management.[90]

The PSC does not have the authority to impose a resolution to the ongoing debate over the merits of mass marking and mark-selective fisheries (MSFs) on any party. Thus it has, in substantial measure, focused its efforts on how best to constructively address the technical issues raised by these new programs, to develop bilateral procedures designed to mitigate the negative impacts of the policy, and to maintain the functionality of the coastwide CWT system. One of the first of such actions was the establishment of a bilateral technical committee — the Selective Fisheries Evaluation Committee — to serve as a technical review and coordination forum for mass marking and mark-selective fisheries proposals.

The current chinook and coho regimes prescribed in the PST are directed at constraining exploitation rates on naturally-spawning stocks to provide a means for sharing harvest and conservation responsibilities. The Chinook Technical Committee (CTC) and Coho Technical Committee (CoTC) are charged with assessing the implementation of these regimes and rely on CWT recoveries to complete the required analyses. The CWT system remains an important tool for salmon conservation and for this reason, the PSC has focused its immediate efforts on assessing the actions needed to implement four of the 15 recommendations made by the Expert Panel in its report. These recommendations focus on work necessary to correct current deficiencies in the CWT system, not all of which are a consequence of mass marking and MSFs. The PSC established a working group comprised of scientists from all the relevant agencies coastwide to advise the PSC and its participating management entities on how to implement the necessary improvements to the existing CWT program. The PSC likely will review the recommendations of the Expert Panel that focus on mass marking and MSFs, including those that call for developing and implementing programs to enhance the capacity to apply genetic or other methods to stock identification. The Expert Panel recommended that the PSC look at developing a coordinated research and implementation plan, while other recommendations suggest that the parties and the PSC consider new fishery management regimes that are less reliant on the kind of data derived from the CWT system. Some of the recommendations will take several years to address, and in

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[89] *Report of the Expert Panel on the Future of the Coded Wire Tag Program for Pacific Salmon*, PSC Technical Report No. 18 (Nov. 2005). Available at [http://www.psc.org/pubs/psctr18.pdf]. This Expert Panel was convened by the PSC in 2004 for the specific purpose of reviewing the status of the CWT program and evaluating the capacity of alternative technologies to provide data to improve assessment of chinook and coho salmon.

[90] Memo available at [http://www.nwcouncil.org/library/isab/2005-4/isab2005-4a.pdf].

almost all cases will involve additional consultation, coordination, and funding to fully implement.[91]

Ambiguity. Ambiguity in Annex IV language allows different interpretations of expectations from individual perspectives. Different perceptions of intent have emerged which become manifest as uncertainty and rhetorical debates over intent. The chinook regime, for example, is technically complex to implement and many details were left to be sorted our later. Another example is the controversy that has emerged with how the U.S. share of Fraser River sockeye is to be harvested; Canada has argued that the United States should harvest its proportional share from each major component of the sockeye run, while the United States argues that the proportion is based on the allowable catch of the total sockeye run, taking into account the relative strength of component populations to the extent practicable. While ambiguity has provided latitude and flexibility to make it easier to reach agreement on fishing regimes, controversy has been experienced in implementation when obligations must be transformed into specific terms. Ambiguities in Annex IV language increase challenges for bilateral technical committees over who and what to evaluate when monitoring performance or compliance.

Planning Fora for Exchanging Information and Perspectives. Implementation of fishing regimes negotiated by the PSC commonly require coordination and collaboration between the fishery managers of Canada and the United States. The meeting schedule and processes of the PSC are not well suited to this purpose. The Fraser Panel convenes several times throughout the season to coordinate fishing plans on sockeye and pink salmon bound for the Fraser River, but coordination among fishery managers for other species is far less formal. For example, the 2002 Southern Coho Agreement includes a provision for the parties to exchange information on abundance forecasts and fishery expectations for preseason management planning through manager-to-manger, policy-technical discussions, but this process has recently been limited to a perfunctory exchange of data through e-mails and conference calls.

The PSC normally convenes three meetings each year. A meeting in January focuses on a review of previous fishing seasons for the purpose of identifying issues for further discussion and making assignments to technical committees. An annual meeting in February is devoted to deliberation and resolution of issues. In the fall, an Executive Session is convened to allow the PSC to review work plans for Panels and Technical Committees and to candidly exchange views regarding issues relating to implementing the PST. However, the lack of fora to foster and facilitate policy-technical exchange for implementing PSC regimes is thought to be a serious impediment to cooperative salmon management between the United States and Canada. Technical information can affect the need for substantive policy deliberation. For example, the investigations of the PSC technical committees include re-evaluation of historical CWT data which could produce results that differ significantly from the data that the United States and Canada relied upon to negotiate stock-specific exploitation rates in the 2002 Southern Coho agreement.

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[91] Personal communication with Don Kowal, Executive Secretary, Pacific Salmon Commission, Oct. 27, 2006.

Funding Reductions. In recent years, funding for participation in joint technical committee processes and to support stock and fishery assessments has become increasingly problematic. The lack of full participation in technical committees impedes the ability to make progress on understanding and addressing issues of concern. Participants maintain that many programs that provide the data required for stock and fishery assessments have been severely reduced or even eliminated. Consequently, these observers maintain that the foundation for science-based management is being eroded at a time when demands for more and increasing precision in salmon management is increasing.

Regulation and Accountability in First Nation Fisheries. Under Canada's allocation policy, after providing for spawning escapement, the first harvest priority is accorded to First Nations. The proportion of Canadian harvest provided to First Nations is expected to increase over time. For some First Nations fisheries, the current accuracy of estimates of harvest and the adequacy of fishery sampling data are highly questionable. Further, concerns have arisen over Canada's reluctance or inability to take action that may interfere with the ability of First Nations to harvest fish, even when other U.S. and Canadian fisheries on the same stocks are not permitted due to conservation concerns.

Canadian Concerns[92]

In general, the Government of Canada has been pleased with the degree of cooperation with the United States on PST issues since the implementation of the 1999 Agreement, and is hopeful that the PSC will be able to provide additional recommendations concerning Annex IV changes as the 2008 expiration date draws closer. The panels, under the direction of the commission, will consider and begin discussions on chapter renewal starting in 2007. Canadian officials anticipate that chinook salmon will be an area of particular interest during the renegotiation of the Annex IV chapters.

Prior to the signing of the 1999 Agreement, Canada had been implementing significant conservation measures to address weak chinook stocks from the west coast of Vancouver Island. As a consequence of these actions, Canada reverted to an historic fishing pattern in this area, moving from a predominately summer fishery to the current spring and winter fishery. These changes met the new AABM regime set in the 1999 Agreement. That agreement also changed both countries' focus on harvesting respective shares of chinook quotas set under the old Treaty arrangements when stocks were abundant, to the conservation and abundance-based approach.

The fishing pattern off west coast Vancouver Island not only met Canada's conservation needs but also reduced Canada's overall harvest of U.S. chinook, particularly Columbia River chinook stocks which includes ESA-listed stocks. As an indirect result of changes in fishing patterns, Canada now harvests other southern U.S. stocks. However, Canada's catch was — and still is — within the parameters of the 1999 Agreement for chinook salmon. Fundamentally, it is impossible for

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[92] Personal communication with Helene Belleau, First Secretary, Canadian Embassy, Oct. 13, 2006.

Canada to harvest its chinook stocks without intercepting southern bound U.S. stocks, whether they are Columbia River or Puget Sound stocks or others. It is important to recognize that Canada is not alone in affecting southern U.S. chinook. Alaska also has a significant harvest of southern U.S. chinook stocks as well as Canadian stocks.

Conservation of Canadian Pacific salmon populations remains a priority and must be consistent with Canada's wild salmon policy. Access to a fair share of salmon under the Treaty arrangements and receipt of the benefits of Canadian stock rebuilding efforts are also important to Canada. Furthermore, obligations to Canadian First Nations must be considered in the renewal of the chapters. The Government of Canada firmly believes that the improved levels of understanding, cooperation, and trust that have emerged through the work of the PSC will contribute decisively toward the successful negotiation of new Annex IV arrangements, and work through the PSC should be strongly supported. crsphpgw