

Overview
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BRIEFING ON CURRENT STATUS OF
PACIFIC SALMON COMMISSION NEGOTIATIONS
WITH
SPECIAL EMPHASIS ON CHINOOK SALMON

Prepared for
The Alaska Senate and House
Resources Committees

By the
Commissioner's Office
Alaska Department of Fish and Game

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BRIEF

Legislators, the Governor's Office, and the Commissioner's Office of the Alaska Department of Fish and Game have received numerous letters from Southeast Alaska troll fishermen regarding recent disruptions of their traditional summer troll chinook season. Many of these letters have raised questions regarding, among other things, the Pacific Salmon Treaty and how Treaty ceilings on Southeast Alaska chinook catches have affected conduct of the troll fishery.

In response to these inquiries, the Alaska Senate and House Resources Committees requested that the Department of Fish and Game brief interested legislators on the Pacific Salmon Treaty negotiations. The primary focus of the briefings relate to Treaty provisions regarding chinook salmon and how these impact the Southeast Alaska troll chinook fisheries. This document includes much of the basic information presented during the briefings.

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BRIEF REVIEW OF PRE-TREATY PERIOD

The Pacific Salmon Treaty was signed by the United States and Canada in March 1985. Informal discussions between the two countries regarding salmon problems of mutual concern date back to the 1950s. Formal negotiations initiated during the 1970s culminated in the 1985 Treaty.

When the treaty was signed, fishermen and managers from both sides were concerned about the potential of unknown, and possibly adverse, impacts of such a treaty. These concerns stemmed in part from the fact that it was a "framework" treaty with general principles and objectives which were to be implemented by the Pacific Salmon Commission. It was generally acknowledged, however, that certain major salmon management problems of mutual concern could not be dealt with effectively without a U.S./Canada salmon treaty in place. In the longer term, it was generally believed that treaty benefits would outweigh the costs.

Chinook salmon conservation problems were among the key issues that eventually led both countries to accept the need for a treaty. During the late 1970s and the early 1980s, such problems were widespread from central Oregon through Southeast Alaska. Although Alaska had unilaterally initiated a 15-year rebuilding program for depressed Southeast Alaska chinook stocks in 1981, there was no coordinated program by the United States and Canada on a coastwide basis. It was clear that a coastwide management program would be necessary to effectively conserve north-migrating chinook stocks originating in the Pacific Northwest and Canada.

While not all reasons for the decline in natural chinook stocks were known, several factors were clearly contributing to the problem. Poor natural survivals, and in the case of some Columbia River chinook stocks, abnormally high mortalities associated with inriver migrations by dams, were significant factors. In addition, Canada had substantially expanded its troll fisheries off the West Coast of Vancouver Island during the late 1970s and early 1980s to increase interceptions of chinook and coho salmon bound for the Pacific Northwest. The purpose was to offset U.S. catches of Canadian Fraser River sockeye and pink salmon by Washington fishermen in Puget Sound (even though these fisheries occurred under an existing U.S./Canada Fraser River treaty), and to put pressure on the United States to enter into a coastwide salmon treaty. Ironically, Canada's expanded fisheries were also a major cause of overfishing of Canadian chinook and coho stocks. Aggregate harvest rates by all coastwide fisheries,

combined with poor survivals, were clearly depressing natural spawning chinook salmon stocks below optimum production levels.

The coastwide chinook conservation problem became widely acknowledged in the early 1980s. Expanding problems in several U.S. and Canadian fisheries, operating on other species of intermingling salmon, led to intensified negotiations.

In 1982 a draft treaty was presented by the Canadian and U.S. negotiators to the two governments for consideration. This draft treaty was not ratified by the U.S. Senate, however, due to opposition by Alaska and several Pacific Northwest fishery groups. A revised treaty, supported by Alaska, was subsequently ratified by the United States in 1985. (For a more detailed description of this process, refer to Appendix B: United States-Canada Salmon Treaty Negotiations: The Alaskan Perspective, by Senator Ted Stevens.)

Alaska's support for ratification of the Pacific Salmon Treaty in 1985 was based on an assessment that the overall benefits to Southeast Alaska fishermen and the region's salmon conservation programs would far outweigh disadvantages of treaty participation. In general, benefits anticipated included improved stock conservation and management of intermingling Alaskan, Canadian and, in the case of chinook, southern U.S. stocks through cooperative treaty agreements and programs. Treaty fishery agreements were also expected to limit several Canadian fisheries, in the Dixon Entrance boundary area and the transboundary rivers, which had increased in the late 1970s and early 1980s. Although some Southeast Alaska fisheries harvesting Canadian stocks would also have to be limited, overall an improved stability for the fisheries was expected. Finally, expanded development of Southeast Alaska enhancement programs was also expected as a result of federal funds provided to help mitigate Treaty impacts on Southeast Alaska fisheries.

A current overall assessment of Treaty benefits, particularly in the longer term, would probably result in conclusions similar to those in 1985. There have been instances since the Treaty was signed, however, where substantial disruptions of Southeast Alaska fisheries have occurred. In terms of total fishery impacts, disruptions to the Southeast Alaska summer troll chinook fishery have probably been the greatest, although significant disruptions have also occurred in several Southeast Alaska gillnet and seine fisheries managed under Treaty limits.

TREATY PROVISIONS FOR CHINOOK SALMON

The Pacific Salmon Treaty is composed of a series of articles which establish the basic treaty principles, specify the

organization of the Pacific Salmon Commission (implementing body for the Treaty), and describe the operating procedures for the Commission. Attached to the articles are several annexes, including Annex IV which contains specific fisheries agreements. Appendix C of this document contains the May 1991 Commission Letter of Transmittal and Chapter 3 of Annex IV which describe current Treaty provisions applying to chinook salmon. (Copies of the full Treaty and current fishery agreements are provided under separate cover.)

Chinook Rebuilding Program

The primary provision of the Treaty's chinook "annex" is an agreement to rebuild depressed natural chinook stocks by 1998. This represents a 15-year, or approximately 3-cycle rebuilding program. Three-cycle rebuilding was an important Alaska position during the Treaty negotiations. Rebuilding in one or two cycles, as favored by Washington, Oregon, and the Pacific Northwest Indian Tribes, would have required much more drastic harvest reductions. The severe impacts of a shorter rebuilding period on Southeast Alaska fishermen were simply not acceptable to Alaska.

To rebuild depressed chinook stocks, the United States and Canada agreed to establish chinook catch ceilings for four major mixed-stock fisheries which are dependent, to a large degree, on non-local stocks. These include: Southeast Alaska (all gear), North/Central B.C. (all gear), West Coast Vancouver Is. troll, and Georgia Strait recreational and troll. (Major PSC chinook fishing areas are shown in Figure 1.)

A "pass-through" requirement was established for the remaining non-ceilinged fisheries. Pass-through provisions were intended to ensure that savings of depressed natural stocks resulting from the ceilings would be allowed to pass through the non-ceilinged fisheries and reach the spawning grounds. Subject to the pass-through constraint, these fisheries would, however, be allowed the management flexibility to harvest surplus returns of hatchery stocks and healthy natural stocks returning to local areas. Pass-through fisheries include Washington/Oregon fisheries, and southern B.C. fisheries not included under ceilings.

Ceilings established in the 1985 Treaty were as follows: Southeast Alaska all gear - 263,000; North/Central B.C. all gear - 263,000; West Coast Vancouver Island troll fishery - 360,000; and Georgia Strait recreational and troll fisheries - 275,000. With few exceptions, these Treaty ceilings have remained in effect since 1985 (Table 1).

Similar, but not identical, Treaty provisions have been established for Southeast Alaska and North/Central B.C. fisheries. Fisheries in these two areas had similar historical

patterns of chinook catches and generally harvest a similar mix of far-north migrating chinook stocks.

In 1987, the Commission established a 7.5 percent management range for the ceilinged fisheries to account for management imprecision. Cumulative deviations from the ceilings are to be limited to 7.5 percent; if they exceed that level the managing agency must take action the following year to return the cumulative deviation to somewhere within the management range. Negative deviations are not allowed to accumulate below the lower end of the management range, as it is presumed this would be occurring due to reduced abundance rather than management imprecision. For Southeast Alaska, the management range is equivalent to approximately +/- 20 thousand fish.

Following successful completion of the natural chinook rebuilding program, the Treaty states that the two countries "are to share the benefits of the coastwide rebuilding and enhancement." The Treaty does not specify exactly how this sharing is to occur, but states that it is to be consistent with treaty principles and internal domestic sharing arrangements.

Hatchery Addon

Another important Treaty provision for Alaska is the hatchery "addon" provision. This allows a region with ceilinged fisheries to harvest increases, above pre-treaty levels, in local hatchery chinook salmon in addition to its treaty-established "base" catch ceiling. Southeast Alaska has received hatchery add-ons since 1985, and, to date, is the only region to receive add-ons. In 1991 this provided an additional 66,000 chinook salmon for Southeast Alaska fisheries.

Terminal Area Exclusions

Since 1989, the Commission has allowed North/Central B.C. fisheries to exclude chinook catches in selected terminal areas from its base catch ceiling. The intent is to allow a region with ceilinged fisheries to harvest surplus natural or hatchery chinook in terminal areas and exclude these catches from its base catch ceiling. In 1991, North/Central B.C. received a terminal exclusion of approximately 6,100 chinook. This is the only region that has received a terminal exclusion to date. (Note: In Southeast Alaska, hatchery chinook harvested in terminal areas are included in the hatchery add-on, and thus are excluded from ceiling catches.)

Other Treaty Chinook Provisions

The chinook annex also includes several general provisions. Fisheries regimes in areas of concern to the Commission are to be "structured so as not to affect unduly or to concentrate disproportionately on stocks in need of conservation." Additionally, the two countries have agreed to "minimize the effects" of incidental fishing mortalities. Although specific Treaty language does not exist, these provisions provide general guidance regarding conduct of fisheries.

OVERVIEW OF TREATY FISHERIES AND CHINOOK STOCKS

The purpose of this section is to provide a general overview of trends in chinook abundance in the various PSC areas, catch trends in major PSC fishing areas, and general status of natural chinook stocks contributing to the fisheries.

The Commission's Chinook Technical Committee (CTC) annually compiles information on U.S. and Canadian chinook salmon catches and escapements based on information provided by the various management agencies. A preliminary 1991 catch and escapement report has been provided under separate cover. The report includes several years of catch and escapement data for comparative purposes. The CTC's annual report includes, in addition to basic catch and escapement data, a detailed analysis of rebuilding progress, stock status, and fishery impacts.

Trends in chinook catches have varied substantially between PSC fisheries since treaty implementation in 1985. A major factor contributing to these differences has been the underlying abundance of chinook available to the different fisheries. The Chinook Technical Committee has developed abundance indices for the PSC ceilinged fisheries using a coastwide chinook model which incorporates extensive information available on fisheries and stocks.

Modeled abundance indices express chinook abundance as a ratio of estimated annual abundance to the average 1979-82 "base period" abundance. For example, an abundance index of 2.0 indicates an abundance equal to 2.0 times the average 1979-82 abundance. Annual abundance indices for the four PSC ceilinged fisheries, for 1979-91, are shown graphically in Figure 2, and described in the following sections.

Abundance indices are intended to reflect only relative changes in abundance of chinook stocks contributing to a fishery. They do not reflect changes in "availability" of chinook stocks to a particular fishery which result from, for example, changes in migratory patterns due to changes in oceanographic conditions.

Southeast Alaska and North/Central B.C. Fisheries

As indicated above, catch ceilings established for Southeast Alaska and N/C B.C. fisheries have been the same since 1985, with one exception (Table 1). In 1986, differential adjustments were made to ceilings in response to 1985 ceiling overages and incidental mortalities, and ceilings were set at 254 and 256 thousand respectively for Southeast Alaska and N/C B.C. Ceilings for both fisheries were 263 thousand in 1985, 1987-89 and 1992. Ceilings were increased to 302 thousand in 1990 and 273 thousand in 1991 for both fisheries.

Fisheries in these two areas operate on similar mixes of chinook stocks. Primary stocks contributing to these fisheries are the "far-north" migrating stocks from Oregon, the Columbia River, Washington outside coastal areas, the Fraser River, and the West Coast Vancouver Island. Local N/C B.C. and Southeast Alaska and transboundary river stocks also contribute. Although the stock mix in these two fisheries can vary considerably between years, depending on the relative strength of contributing stocks, overall roughly half are of U.S. origin and half Canadian origin.

The far-north migrating chinook stocks, as a group, have exhibited the greatest improvements since the Treaty was initiated. Most major stocks in this group are natural stocks which have been generally meeting or exceeding escapement goals, or hatchery stocks such as Canada's Robertson Creek Hatchery on Vancouver Island. Some smaller natural stocks in this group, however, have not been meeting rebuilding schedules, and others are only considered to be on--but not ahead--of schedule.

While the general mix of chinook stocks contributing to Southeast Alaska and North/Central B.C. fisheries is similar, there are some differences. This is reflected in the abundance indices for these two fisheries. As seen in Figure 2, relative abundance of stocks contributing to Southeast Alaska fisheries has increased more, relative to the 1979-82 base period, than for N/C B.C. fisheries.

In Southeast Alaska, aggregate chinook abundance began increasing in 1984, peaking in 1988 at nearly two times the 1979-82 average. Abundance has declined somewhat since 1988 but has remained above 1.5 times the base period average. The preseason projection for 1991 was 1.58 times the base period abundance. However, inseason information on troll fishery catch rates suggested higher abundance, or increased availability, or some combination of the two factors. Analysis of 1991 post-season data currently being conducted will hopefully help resolve this apparent discrepancy.

In N/C B.C., aggregate chinook abundance increased in 1984 to about 1.5 times the 1979-82 abundance, but then declined in 1983 and subsequent years to remain at roughly a quarter to a third

above the base period abundance. In particular, the modeled abundance indices for N/C B.C. do not exhibit the substantial increases in abundance reflected in the Southeast Alaska indices during 1988-90.

In spite of differences in the magnitude of increases, chinook abundance in both areas has remained above the 1979-82 base period levels. Base catches, excluding hatchery add-ons and terminal exclusions, have approximated PSC ceilings (Figs. 3 and 4). Fishery restrictions have been required in both areas to limit chinook catches to ceiling levels.

Troll fisheries harvest the majority of chinook in both N/C B.C. and Southeast Alaska. Of the chinook which count against Treaty ceilings, incidental catches by net fisheries targeting on other species account for approximately 20 thousand chinook (a Board of Fisheries target level) in Southeast Alaska, and 40 to 50 thousand in N/C B.C. Since 1985, recreational fisheries in each area have harvested roughly 20 to 40 thousand chinook (excluding hatchery add-ons in Southeast Alaska.)

Troll fisheries in both areas are managed in season to ensure that Treaty all-gear catch ceilings are not exceeded. However, the impact on these fisheries has been quite different.

In N/C B.C., the total allowable troll harvest of chinook salmon is taken during a general summer troll season. This normally extends through July and August. Several factors contribute to the longer N/C B.C. summer troll season, compared to the short summer seasons experienced in Southeast Alaska. These include:

- no winter, or June hatchery-targeted troll fisheries,
- lower chinook abundance and/or availability,
- closure of high chinook abundance areas to slow chinook catch rates,
- transfer of troll effort from chinook to other species such as pink salmon and Fraser sockeye.

Southeast Alaska troll fishery. In Southeast Alaska the troll fishery accounts for the majority of the chinook harvest. In 1991, for example, it harvested approximately 72 percent (264,000) of the total region chinook catch (365,000), and about 77 percent of the Treaty ceiling chinook (Tables 2-3, and Fig. 5). The troll chinook harvest is taken during three fisheries: a winter troll season from October 1 through April 14; a June fishery targeting on Alaska hatchery chinook; and a general summer troll season beginning July 1.

The winter and June fisheries are limited to inside waters, and the June fishery is currently limited to two 2- to 4-day periods plus weekly openings in several small, near-terminal and terminal hatchery areas. The Board of Fisheries has established a limit of 40 thousand chinook, excluding Alaska hatchery chinook, for the June fishery. The winter troll fishery currently has no harvest limit although inclement winter weather provides some natural limit.

The summer troll fishery is limited to the balance of ceiling chinook remaining after recreational, net, winter troll and June troll chinook are taken into account. In 1991, for example, the summer troll harvest was 149 thousand ceiling chinook out of a total all-gear harvest of 299 thousand (Fig. 5).

In 1991, the Southeast Alaska general summer troll chinook season started July 1 and lasted only 7.5 days. This was the shortest season on record. The duration of summer troll chinook seasons has declined since the Treaty was implemented in 1985 (Fig. 6). In 1988 and 1989, the previous shortest seasons, chinook fishing was limited to 12 and 13 days respectively. By comparison, summer seasons ranged from 45 to 65 days during 1982-84, the three years prior to the Treaty.

There are currently some unanswered questions regarding the factors which contributed to the extremely short 1991 summer troll chinook season. Preseason projections of modeled abundance indicated the lowest abundance since 1987 (Fig. 2); however, troll catch rates were the highest since the treaty was implemented (Fig. 7).

The number of chinook available to the summer troll fishery varies from year to year depending on catches in other fisheries. Although the 1991 catch (154,000) was the smallest of the treaty years, it was only about 10 thousand less than in 1988 (165,000) and 1989 (168,000) when 12- and 13-day seasons occurred. At the 1991 catch rate of about 20 thousand per day, an additional 10 thousand chinook would only have added another half day to the 7.5 day season. Yet, modeled abundance for both 1988 and 1989 (the two highest treaty years) was substantially above the 1991 preseason projected abundance.

Although daily catch rates provide a general indication of abundance, the season "average" can be effected to some extent by the length of the season. Catch rates generally begin at high levels and decline as chinook are harvested, thereby reducing the number available for harvest, and general fleet efficiencies decrease. A preliminary analysis adjusting for season length between the three years 1989-91 indicates that the 1991 catch rate was still roughly 50 percent higher than either 1989 or 1990. Abundance indices, however, indicated that 1991 abundance was expected to be less than either 1989 or 1990.

It is entirely possible, of course, that a substantial error exists in the preseason abundance projection. As noted above, a large number of stocks from the Pacific Northwest, Canada, and Southeast Alaska contribute to both the Southeast Alaska and N/C B.C. fisheries. Although extensive information exists for predicting abundance of some stocks preseason, little information is available for others. A cursory review of coastwide catch and escapement data does not suggest an unexpected increase in 1991 abundance across a wide range of stocks. Thus, it appears more likely that abundance of one or two major stocks, or stock groups, may have been substantially greater in 1991 than anticipated.

Preseason projections for 1991 indicated that U.S. stocks would contribute about 45 percent to the total 1991 Southeast Alaska troll catch, and Canadian stocks about 55 percent (Fig. 8). Although a large number of individual stocks make up these contributions, the majority of the harvest is normally due to several major stocks or stock groups. During 1985-88, for example, on average approximately 50 percent of the Southeast Alaska troll harvest came from three major stocks: Columbia upriver brights, the WCVI Robertson Creek hatchery stocks (including the adjoining Somass natural stock), and the Oregon coastal north-migrating stocks (Fig. 9). Adding two more stock groups, N/C B.C. and early Fraser River stocks, would raise the contributions to 75 percent. Significant changes in the abundance of any of these major stocks could significantly affect abundance in Southeast Alaska fisheries.

Complete coastwide information on catches, escapement and coded-wire tag recoveries associated with these stocks is required to assess possible abundance changes in 1991. Similar information is necessary to develop estimates of contributions to various fisheries. Although this information, and the necessary analysis, is not available, some preliminary conjectures can be made.

A substantial amount of information exists for the Columbia upriver bright chinook. Depressed during the early 1980s, this stock recovered and increased greatly during the first several years of the Treaty. Inriver returns increased from less than 100 thousand during 1980-83 to over 400 thousand in 1987 before declining back to approximately 100 thousand in 1991. The preseason projection for 1992 is about 70 thousand. This information does not suggest that a large increase in abundance of brights occurred in 1991.

The Robertson Creek stock complex (hatchery plus Somass naturals) was a large contributor to Southeast Alaska fisheries in the late 1970s and early 1980s. Following precipitous declines in the mid to late 1980s, production recovered. Estimated contributions to

the Southeast Alaska summer troll fishery increased from about 11 thousand in 1989 to nearly 50 thousand in both 1990 and 1991. Declines in this stock during the late 1980s were offset, to some extent, by increases in the Columbia River brights; the opposite now appears to be occurring.

Some inseason information suggested that the Robertson Creek stocks (hatchery plus Somass natural) could have contributed as much as half of the 1991 Southeast Alaska summer troll chinook catch. Preliminary postseason analysis indicates, however, that these stocks probably contributed about 30 percent (47,000) to the summer troll fishery. This percent is very similar to contribution estimates associated with the preseason modeled abundance index.

Unfortunately, very limited information is currently available on the remaining major stocks which could have contributed to the apparent high abundance in the 1991 Southeast Alaska troll fishery. One can look at escapements of north-migrating Oregon coastal, early Fraser, and N/C B.C. stocks as a general indication of returning run size. However, 1991 escapements were generally lower than in 1990, suggesting no unusual abundance in 1991. Escapements to several larger N/C B.C. chinook stocks, such as the Skeena and Nass, did increase substantially during the early years of the Treaty, and larger returns would have been expected in 1991. This can not be confirmed, however, due to a lack of coded-wire tagging of these natural stocks.

One additional factor--availability--could have contributed to the high chinook catch rates experienced during the 1991 Southeast Alaska summer troll fishery. Oceanographic conditions during the 1991 season may have modified chinook migratory patterns, thereby making fish more available to the troll fleet by concentrating them in certain fishing areas. El Nino weather patterns are known to have begun sometime during the summer of 1991, and have continued into the 1991/92 winter. These major weather changes, which occur periodically, significantly affect oceanographic conditions and have been known to change salmon migratory patterns in some cases.

It is possible, of course, that some combination of the above factors, rather than a single one, contributed to the high catch rates in the 1991 Southeast Alaska summer troll fishery. Analysis of complete coastwide information on chinook stocks may eventually provide more insight into the underlying causes. However, it is very likely that some questions will remain even after the final analysis.

West Coast Vancouver Island Troll Fishery

Treaty catch ceilings have been set at 360 thousand chinook for the West Coast Vancouver Island (WCVI) troll fishery since 1985. Net fisheries in this area were not included in the ceiling as they are limited to Barkley Sound where they target primarily on surplus chinook returning to Robertson Creek hatchery. In 1985, when the treaty was signed, recreational fisheries also occurred primarily in this same area and targeted on hatchery stocks; they were also excluded from the ceiling. In recent years, however, recreational fisheries have expanded to outside areas of Vancouver Island, and the United States has expressed concern about potential impacts on chinook originating in Pacific Northwest rivers.

Major stocks contributing to the WCVI troll fishery include lower Columbia River hatchery "tule" stocks, and late Fraser/Harrison fall stocks. These are north migrating--as opposed to far-north migrating--stocks which contribute little to the two northern ceilinged fisheries. The far-north migrating Columbia upriver brights are also a major contributor in some years. Medium contributors include other far-north migrating stocks from the Pacific Northwest and southern B.C., plus some Puget Sound stocks. Overall, U.S. origin chinook stocks generally contribute roughly 60 to 80 percent of the WCVI troll chinook harvest.

During the past several years, aggregate abundance of major hatchery and natural chinook stocks contributing to the WCVI troll fishery has declined significantly. This appears to be due primarily to reduced survival rates of major stocks. As shown in Figure 2, WCVI abundance indices for 1989-91 have declined to only slightly more than half the 1979-82 base level.

As a result, WCVI troll catches during the past three years have fallen significantly short of the 360 thousand Treaty ceiling. Catches have been 204, 296, and 196 thousand for 1989, 1990, and 1991 respectively (Fig. 11). The 1989 shortfall was partly due to ceiling overages in 1987-88, and coho management constraints associated with a PSC coho ceiling for the fishery. However, the ceiling shortfalls have been primarily due to reduced aggregate abundance and conservation actions implemented for Canada's Fraser/Harrison chinook stocks.

Although official Treaty ceilings have remained at 360 thousand for the WCVI troll fishery, Canada has unilaterally implemented management measures to limit harvest rates on Fraser/Harrison chinook stocks. These stocks are important contributors not only to the WCVI troll fishery, but to Canada's Georgia Strait and Fraser River fisheries as well. Management actions taken in the WCVI troll fishery to protect the Fraser/Harrison stocks, which tend to be widely intermingled with other chinook stocks off Vancouver Island, have contributed to the ceiling shortfalls.

These ceiling shortfalls have raised other concerns within Canada. The WCVI troll fishery is considered by Canada to be an "equity" fishery in which Canadian catches of Pacific Northwest chinook and coho help balance southern U.S. catches of Fraser sockeye and pink salmon. To the extent that ceiling shortfalls reflect reduced Canadian catches of U.S. chinook, Canada believes that the equity balance is offset in the favor of the United States.

Georgia Strait Recreational and Troll Fisheries

The Treaty established a catch ceiling of 275 thousand chinook salmon for Canadian recreational and troll fisheries in Georgia Strait. These fisheries are generally located on the inside of Vancouver Island. Recreational fisheries currently account for roughly 80 percent of the ceiling catch while the troll fishery harvests about 20 percent.

Major stock groups contributing to the Georgia Strait fisheries include upper and lower Georgia Strait natural and hatchery stocks, Fraser/Harrison fall stocks, and Puget Sound natural and hatchery stocks. Although Canadian stocks contribute the majority of the harvest to these fisheries, U.S. stocks contribute roughly a quarter to a third of the harvest.

This group as a whole has shown the least response to Treaty conservation measures. In fact, aggregate abundance, as measured by modeled chinook abundance indices, has continued the decline which began prior to 1985 (Fig. 2). At present, abundance is estimated to be roughly a quarter to a third of the 1979-82 base period abundance. Natural chinook stocks contributing to these fisheries are generally among the most depressed stocks monitored by the Commission.

Chinook catches by Georgia Strait recreational and troll fisheries have reached the 275 thousand ceiling level only once since the Treaty was implemented; that was in 1985, the first year of the Treaty (Fig. 12). Since 1987, catches have ranged around 150 thousand, or a little more than half the official ceiling. Ceiling shortfalls have been the result of low overall chinook abundance and conservation measures implemented by Canada. The current outlook for improvement in stocks contributing to these fisheries remains poor.

Washington and Oregon Fisheries

Washington and Oregon chinook fisheries are not limited by Treaty catch ceilings but fall under the Treaty's pass-through provisions. These fisheries must be managed so that "the bulk of depressed stocks preserved by the conservation program..."

principally accrue to the spawning escapement." In other words, the various fisheries must be structured so as to allow the majority of depressed natural stocks saved by the ceilinged fisheries to pass through to the spawning grounds. Within that constraint, fisheries may be conducted to harvest surplus returns of healthy natural and hatchery stocks. This is normally achieved through selected time/area regulations.

Fisheries in this area which harvest chinook of interest to the Pacific Salmon Commission include Puget Sound fisheries, ocean recreational and troll fisheries off Washington and northern Oregon, inside fisheries along the Washington and northern Oregon coasts, and Columbia River fisheries. In addition to general conservation and harvest sharing objectives, many of these fisheries must be managed to take into account court-mandated harvest sharing between tribal and non-tribal fishermen.

The vast majority of chinook harvested in these fisheries originate from Pacific Northwest systems. (Small numbers of Canadian origin chinook are harvested in northern Washington and Puget Sound fisheries.) Local stocks originating in these areas are often categorized into several general groups: Puget Sound (north and south), Washington coastal, Columbia River (lower and upper river), and Oregon coastal. Each group contains individual spring, summer and fall run stocks, and a mix of natural and hatchery stocks. The major far-north migrating stocks are the Oregon coastal and Columbia upriver bright fall stocks. Smaller far-north migrating stocks include several Columbia River natural and hatchery stocks and some Washington coastal stocks.

Rebuilding status of natural chinook originating in Washington and Oregon is currently mixed. Far-north migrating stocks such as Washington coastal, Columbia upriver brights and Oregon coastal stocks remain healthy and are generally achieving or exceeding escapement goals in spite of declining production in the last several years. Columbia upriver spring and summer stocks remain depressed and have shown limited improvements since the Treaty was implemented. Puget Sound stocks have shown mixed responses but are generally considered to be lagging expected rebuilding progress.

Abundance of chinook returning to Washington and Oregon has varied substantially since the Treaty was implemented in 1985. Although there is currently no modeled abundance index for these fisheries, similar to those for the ceilinged fisheries, changes in abundance is generally reflected in the annual catches. The vast majority of catches in the fisheries described above are of local north and far-north migrating chinook. (Chinook stocks originating in southern Oregon and California, for the most part, migrate southward and are harvested in fisheries of southern Oregon and California.)

Combined chinook catches for all Washington and northern Oregon fisheries initially increased from pre-treaty levels of between 600 and 700 thousand during the first half of the 1980s to approximately 1.2 million in 1988 (Fig. 13). Following the peak in 1988, catches declined in each subsequent year with the preliminary 1991 catch being reported at 657 thousand chinook salmon. This is similar to catches during the years immediately preceding the Treaty. Initial preseason projections for 1992 returns are mixed; however, it would appear that 1992 catches will be similar to those of 1991.

As shown in Figure 13, the substantial increases in chinook catches by Washington/Oregon fisheries was due primarily to increases in Columbia River fisheries. Catches in all fisheries, except the Columbia River, have remained in a relatively narrow range of roughly 500 to 600 thousand since 1985. Columbia River catches, on the other hand, increased from 128 thousand in 1984 to nearly 600 thousand in 1988, then decreased to 190 thousand in 1991.

Two major stock groups contributed to the surge in Columbia River catches during 1987-89. Lower river "tule" chinook are produced primarily in several lower river hatcheries. The majority of these stocks migrate only as far north as Vancouver Island where they are significant contributors to the WCVI troll fishery. Only small contributions are made to N/C B.C. fisheries, and virtually none to Southeast Alaska fisheries.

The second major stock contributing to the increase in Columbia River fisheries during 1987-89 was the Columbia upriver "bright" stock. This is the largest naturally spawning chinook stock in the Columbia River. In recent years, this stock has also been augmented by hatchery production. Columbia River brights are far-north migrating chinook, and generally are among the major contributors to N/C B.C. and Southeast Alaska fisheries. They are also important contributors to the WCVI fisheries. The brights increased from very depressed levels during the early 1980s to become one of the major coastwide producers during the first several years of the Treaty (Fig. 10).

Both the Columbia lower river tule stocks and the upriver brights are currently experiencing reduced production. This is reflected in the recent declines of overall chinook catches in Columbia River fisheries (Fig. 13). Declines to date have not prevented achievement of escapement goals for Columbia brights; goals have been achieved or exceeded each year since 1983 (Fig. 10).

CURRENT OUTLOOK FOR TREATY NEGOTIATIONS

What is the current outlook for treaty negotiations and can they realistically be expected to provide substantial increases for Southeast Alaska chinook catch ceilings in the near term?

Treaty chinook catch ceilings have already been established for the 1992 season. Negotiations will begin in the fall of 1992 to develop ceilings for 1993. Status of the Treaty's chinook rebuilding program and catch trends in coastwide chinook fisheries at that time will be the key factors determining what, if any, adjustments will be made to the 1993 ceilings.

The Commission is currently considering alternative management approaches to the fixed ceiling approach. There is general agreement within the Commission that a management approach which allows ceilings to fluctuate in response to changes in chinook abundance would probably be preferable to the current approach. However, there are a number of different methods for implementing such an approach, and there is currently no agreement on which is the best method. A Chinook Workgroup has been established to investigate several different approaches and provide some options to the Commission for consideration this fall. The goal is to implement such a system for the 1993 season.

At this point it is not possible to predict the outcome of efforts to develop an alternative, abundance based approach to determine ceiling levels for 1993. If this task is not completed in time for the 1992/93 negotiations, the 1993 ceilings will have to be negotiated in a manner similar to previous years. Past negotiations have taken into account the general status of natural chinook stocks contributing to the various fisheries and projections for future abundance. Harvest sharing between the various fisheries is also taken into account by the Commission.

Regardless of the approach used by the Commission to determine chinook catch ceilings during the 1992/93 negotiations, based on the current information, it is unlikely that significant increases will be made in chinook ceilings for any fisheries in 1993. While N/C B.C. and Southeast Alaska fisheries would remain the most likely candidates for ceiling increases, given the current status of major stocks contributing to these fisheries, any ceiling adjustments would have to take into account information available after the 1992 season. At this point, it is not possible to predict what that information will indicate.

TABLES AND FIGURES

TABLE 1
 CHINOOK SALMON GUIDELINE HARVEST RANGES
 FOR SOUTHEAST ALASKA FISHERIES, 1980-84,
 AND
 PACIFIC SALMON TREATY CEILINGS FOR
 SOUTHEAST ALASKA AND CANADIAN FISHERIES
 1985 TO PRESENT

I. GUIDELINE HARVEST RANGES (THOUSANDS), 1980-84

YEAR	S.E. ALASKA COMMERCIAL FISHERIES ONLY	
1980	286-320	Note: Guideline harvest ranges established by Alaska Board of Fisheries and North Pacific Fisheries Management Council; ranges included allowances for Alaska hatchery chinook.
1981	243-286	
1982	243-286	
1983	243-272	
1984	243-272	

II. PACIFIC SALMON TREATY CEILINGS (THOUSANDS), 1985 TO PRESENT

[Note: S.E. Alaska ceilings do not include hatchery add-on;
 N/C B.C. ceilings do not include terminal exclusions.]

YEAR		S.E. AK ALL-GEAR	N/C BC ALL-GEAR	W. COAST VANC. IS. TROLL	GEO. STR. SPORT & TROLL
1985 (N-2)	1/	263	263	360	275
1986	2/	254	256	360	275
1987 (N-2)	3/	263	263	360	275
1988		263	263	360	275
1989 (N-1)		263	263	360	275
1990 (N-1)		302	302	360	275
1991 (N-2)		273	273	360	275
1992		263	263	360	275

- Notes: 1/ (N-x) designates year ceilings were negotiated and duration of the annexes.
 2/ Ceilings for 1986 were adjusted to take into account overages and incidental mortalities in 1985; these adjustments were not made on a fish-per-fish basis.
 3/ The Commission established cumulative 7 1/2% management ranges for ceilings beginning in 1987.

[FEB. 22, 1992; FILE: CEILINGS.92; DISK: MCS92-1]

Table 2 Chinook salmon harvest in Southeast Alaska by year, by gear, 1965 to 1991

	Net Gear	Troll Gear	Sport	Total
1965	28,207	308,902	13,000	350,109
1966	25,959	282,083	13,000	321,042
1967	26,260	274,678	13,000	313,938
1968	27,056	304,455	14,000	345,511
1969	23,844	290,168	14,000	328,012
5 Yr Avg	26,265	292,057	13,400	331,722
1970	17,713	304,599	14,000	336,312
1971	22,558	311,439	15,000	348,997
1972	44,544	242,282	15,000	301,826
1973	35,980	307,806	16,000	359,786
1974	24,469	322,099	17,000	363,568
5 Yr Avg	29,053	297,645	15,400	342,098
1975	13,365	287,342	17,000	317,707
1976	10,523	231,239	17,000	258,762
1977	13,443	271,735	17,449	302,627
1978	25,492	375,919	16,639	418,050
1979	28,455	339,151	16,581	384,187
5 Yr Avg	18,256	301,077	16,934	336,267
1980	20,114	299,872	20,213	340,199
1981	18,951	248,791	21,300	289,042
1982	48,999	242,315	25,756	317,070
1983	19,655	269,790	22,321	311,766
1984	32,366	235,629	22,050	290,077
5 Yr Avg	28,023	259,279	22,328	309,631
1985	35,469	216,066	24,658	276,193
1986	22,302	237,557	22,551	282,410
1987	15,539	242,025	24,324	281,888
1988	21,450	231,281	26,160	278,891
1989	24,278	235,731	31,071	291,078
5 Yr Avg	23,807	232,536	25,793	282,136
1990	27,666	287,931	51,200	366,827
1991	32,737	263,756	68,400	364,893

Table 3 Chinook salmon harvest in Southeast Alaska minus fish produced by Alaskan hatcheries, by year, by gear, 1965 to 1991

	Troll Total Minus Hatchery	Net Total Minus Hatchery	Sport Total Minus Hatchery	All Total Minus Hatchery
1965	308,902	28,207	13,000	350,109
1966	282,083	25,959	13,000	321,042
1967	274,678	26,260	13,000	313,938
1968	304,455	26,934	14,000	345,389
1969	290,168	23,844	14,000	328,012
5 Yr Avg	<u>292,057</u>	<u>26,241</u>	<u>13,400</u>	<u>331,698</u>
1970	304,599	17,713	14,000	336,312
1971	311,433	22,558	15,000	348,997
1972	242,232	44,395	15,000	301,677
1973	307,806	35,955	16,000	359,761
1974	322,099	24,454	17,000	363,553
5 Yr Avg	<u>297,645</u>	<u>29,015</u>	<u>15,400</u>	<u>342,060</u>
1975	287,342	13,362	17,000	317,704
1976	231,239	10,478	17,000	258,717
1977	271,735	13,369	17,449	302,553
1978	375,433	25,295	16,639	417,367
1979	338,319	28,116	16,581	383,016
5 Yr Avg	<u>300,814</u>	<u>18,124</u>	<u>16,934</u>	<u>335,871</u>
1980	299,872	19,934	20,213	340,019
1981	248,791	18,650	21,300	288,741
1982	242,315	47,859	25,756	315,930
1983	269,790	19,461	21,449	310,700
1984	235,629	32,162	20,146	287,937
5 Yr Avg	<u>259,279</u>	<u>27,613</u>	<u>21,773</u>	<u>308,665</u>
1985	207,986	32,315	21,486	261,787
1986	227,657	19,348	17,541	264,546
1987	225,425	12,707	19,216	257,348
1988	211,508	15,622	20,615	247,745
1989	216,805	14,675	24,720	256,200
5 Yr Avg	<u>217,876</u>	<u>18,933</u>	<u>20,716</u>	<u>257,525</u>
1990	257,052	14,354	34,588	305,994
1991	224,569	17,415	41,700	283,684

Table 4 Southeast Alaska Troll Fishery
Chinook Salmon Catches by Season, 1965-1991

(updated 10/23/91)
TROLL FISHERY

YEAR	Winter Troll	Terminal Troll	Exp Troll	Hatch Access	Summer Troll	Total Troll
1965	15,000	0	0	0	293,902	308,902
1966	15,721	0	0	0	266,362	282,083
1967	16,813	0	0	0	257,865	274,678
1968	15,498	0	0	0	288,957	304,455
1969	8,298	0	0	0	281,870	290,168
1970	8,294	0	0	0	296,305	304,599
1971	4,560	0	0	0	306,879	311,439
1972	6,587	0	0	0	235,695	242,282
1973	8,630	0	0	0	299,176	307,806
1974	9,029	0	0	0	313,070	322,099
1975	9,794	0	0	0	277,548	287,342
1976	11,083	0	0	0	220,156	231,239
1977	8,761	0	0	0	262,974	271,735
1978	8,367	0	0	0	367,046	375,433
1979	5,123	0	0	0	333,196	338,319
1980	8,059	0	0	0	291,813	299,872
1981	9,607	0	0	0	239,184	248,791
1982	12,618	0	0	0	229,697	242,315
1983	31,128	0	0	0	238,662	269,790
1984	32,838	0	0	0	202,791	235,629
1985	22,463	0	0	0	193,623	216,086
1986	22,871	0	0	0	214,686	237,557
1987	28,625	0	4,400	0	209,000	242,025
1988	60,450	0	6,032	0	164,742	231,224
1989	34,298	1,088	2,291	30,355	167,577	235,609
1990	33,128	16	7,200	34,806	211,945	287,092
1991	42,447	6,003	13,915	46,418	154,020	262,803

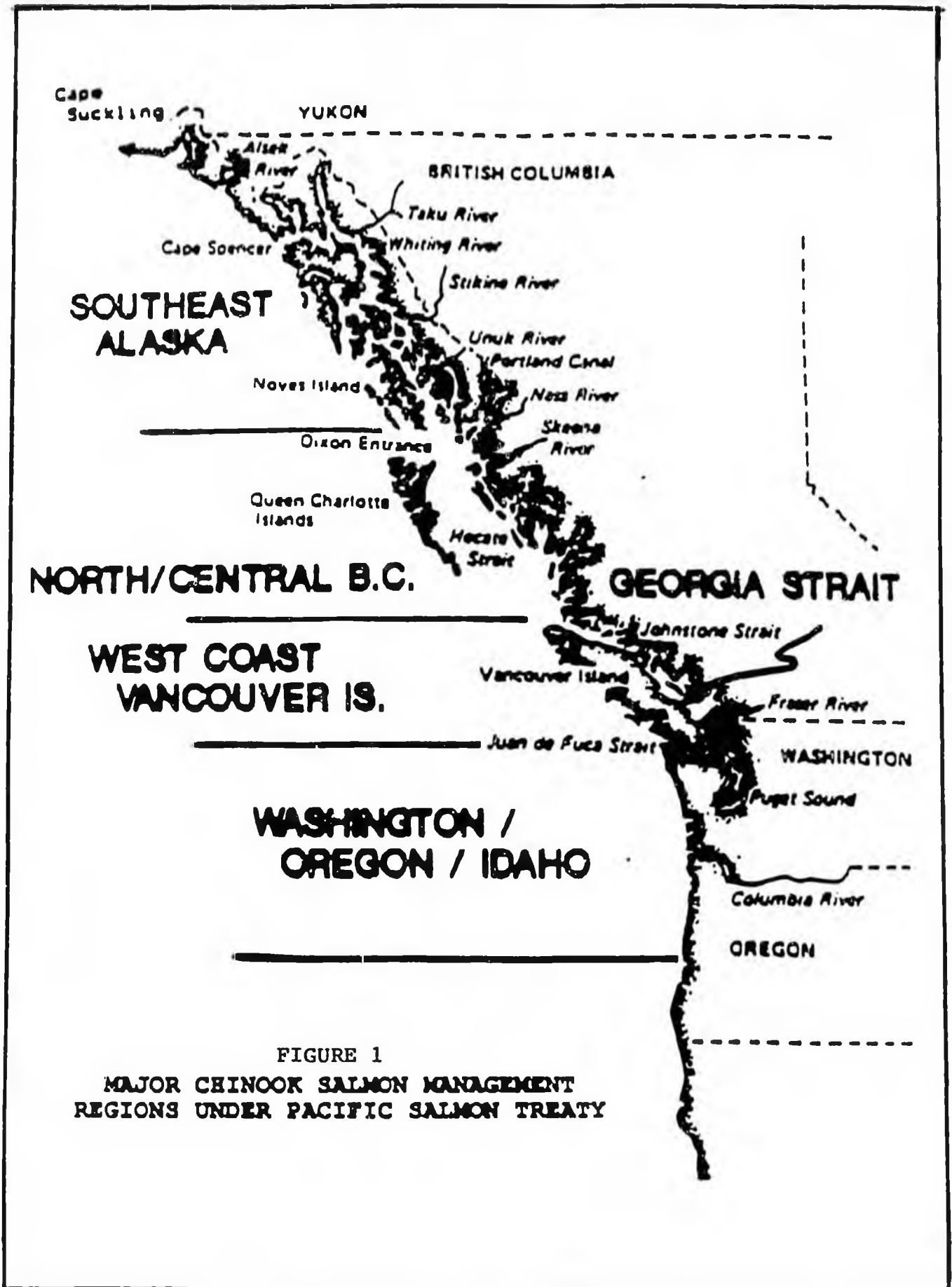
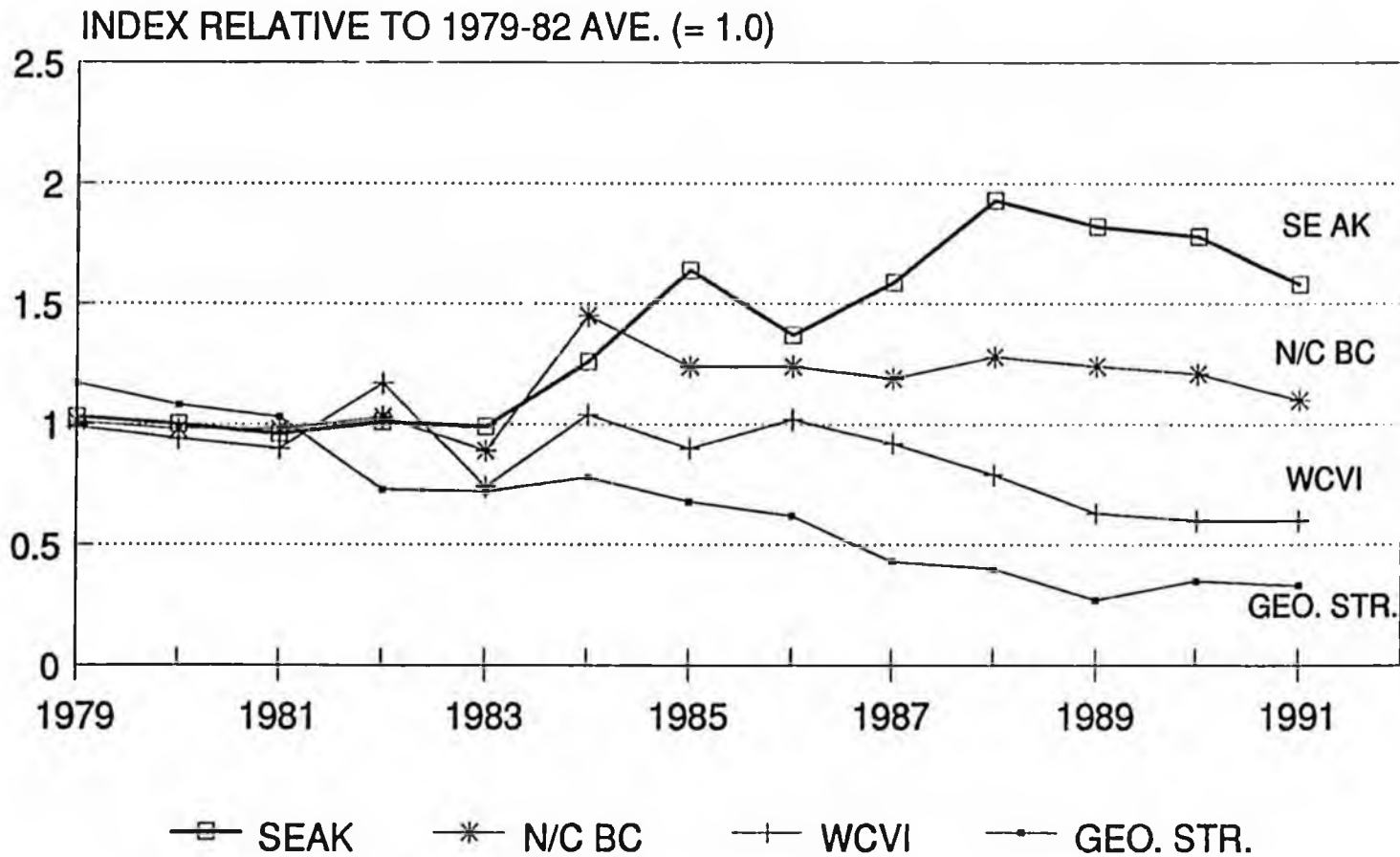


FIGURE 1
MAJOR CHINOOK SALMON MANAGEMENT
REGIONS UNDER PACIFIC SALMON TREATY

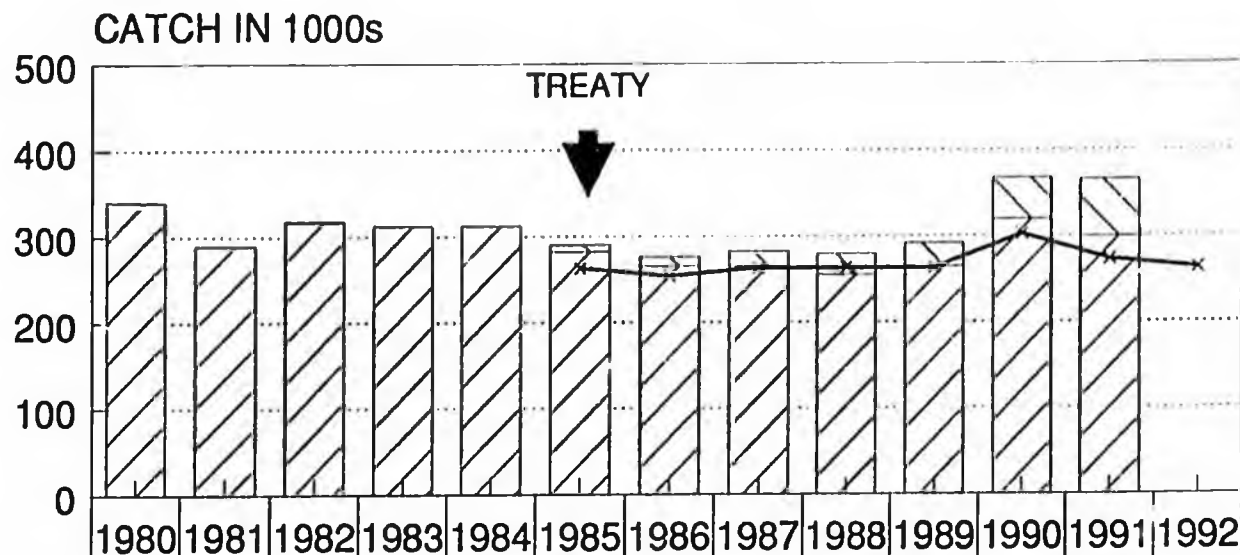
FIG. 2. MODELED CHINOOK ABUNDANCE INDICES FOR PSC CEILINGED FISHERIES
(PRESEASON 1991 PROJECTIONS SHOWN)

22



SOURCE: CTC/AWG 3/5/91
(FILE:INDEX2.CHT; DISK:MCS92-1)

FIG. 3. S.E. ALASKA ALL-GEAR CHINOOK CATCHES, 1980-91

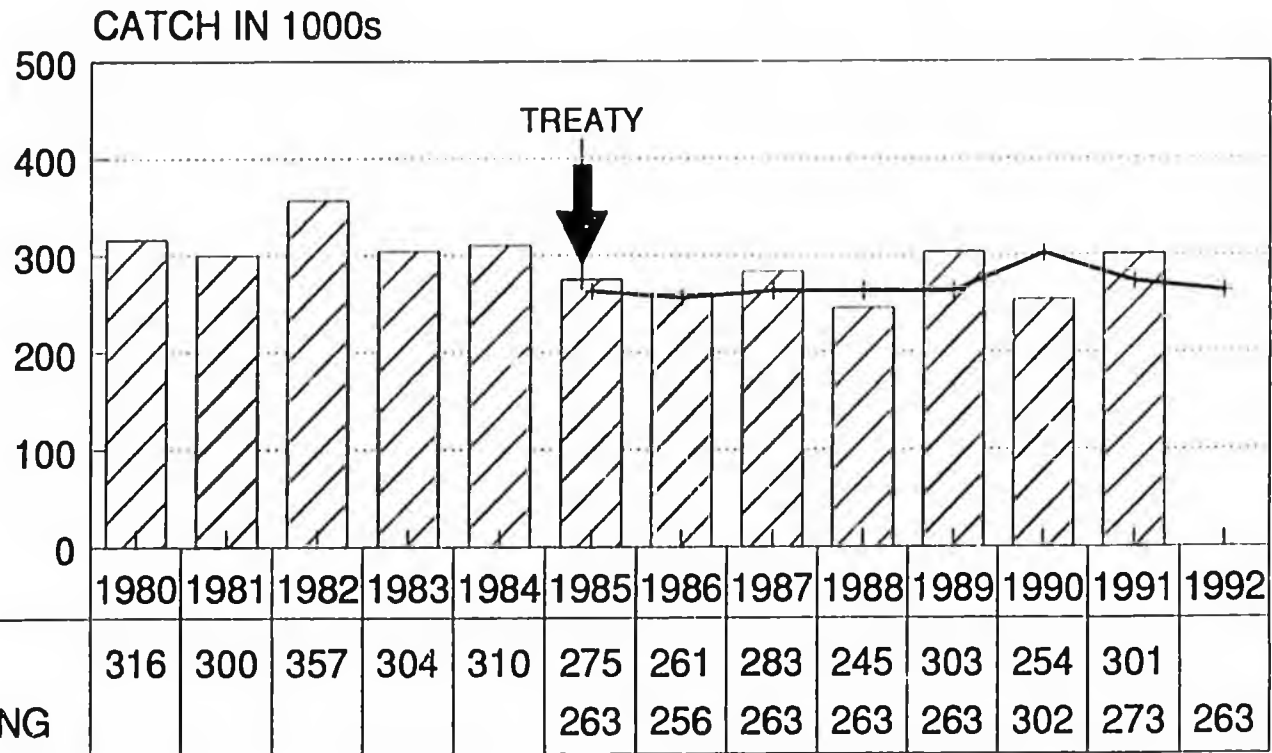


	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
BASE CEILING						263	254	263	263	263	302	273	263
HAT. ADDON						8	11	17	24	27	48	66	
BASE CATCH	340	289	317	312	312	282	265	265	255	264	319	299	
TOTAL CATCH	340	289	317	312	312	290	276	282	279	291	367	365	

BASE CATCH
 HAT. ADDON
 * BASE CEILING

FIG. 4. N/C B.C. ALL-GEAR CHINOOK CATCHES, 1980-91

(INCLUDES TERMINAL EXCLUSION)

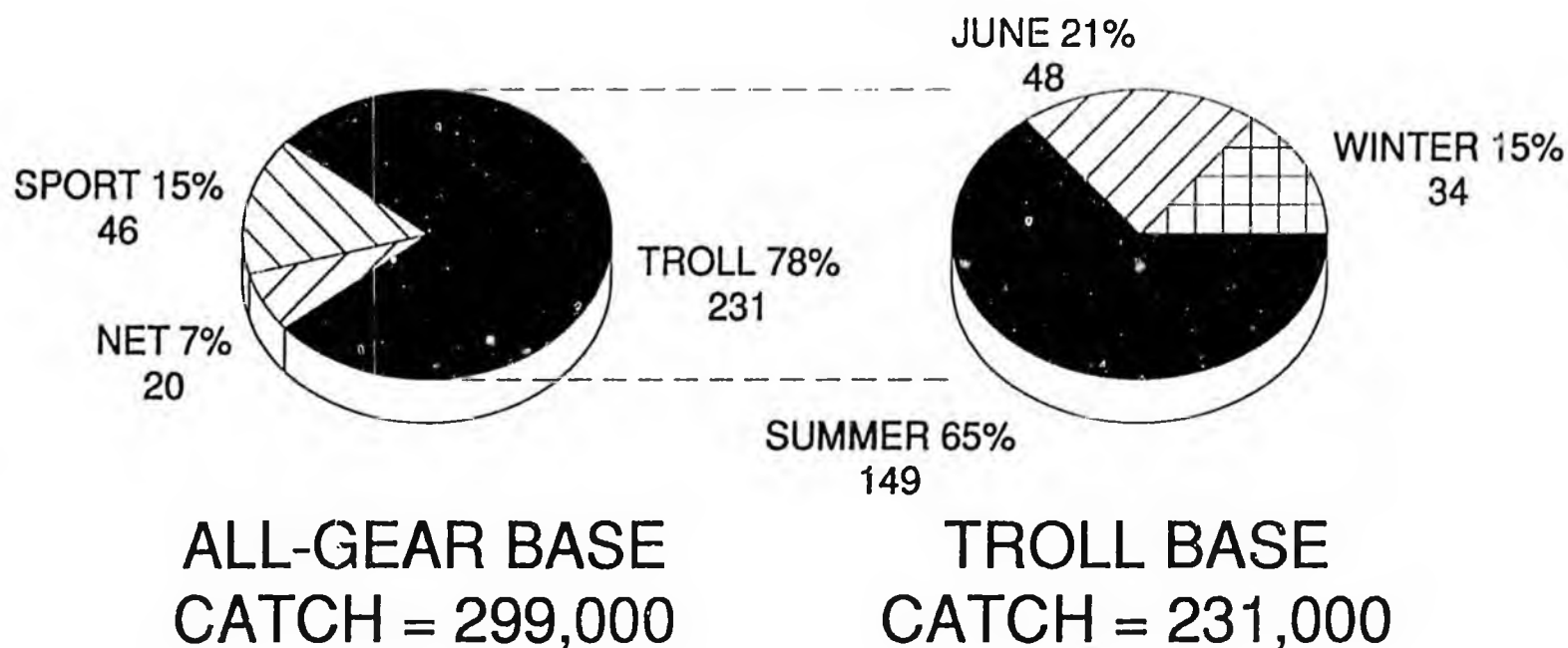


	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
CATCH	316	300	357	304	310	275	261	283	245	303	254	301	
PSC CEILING						263	256	263	263	263	302	273	263

CATCH

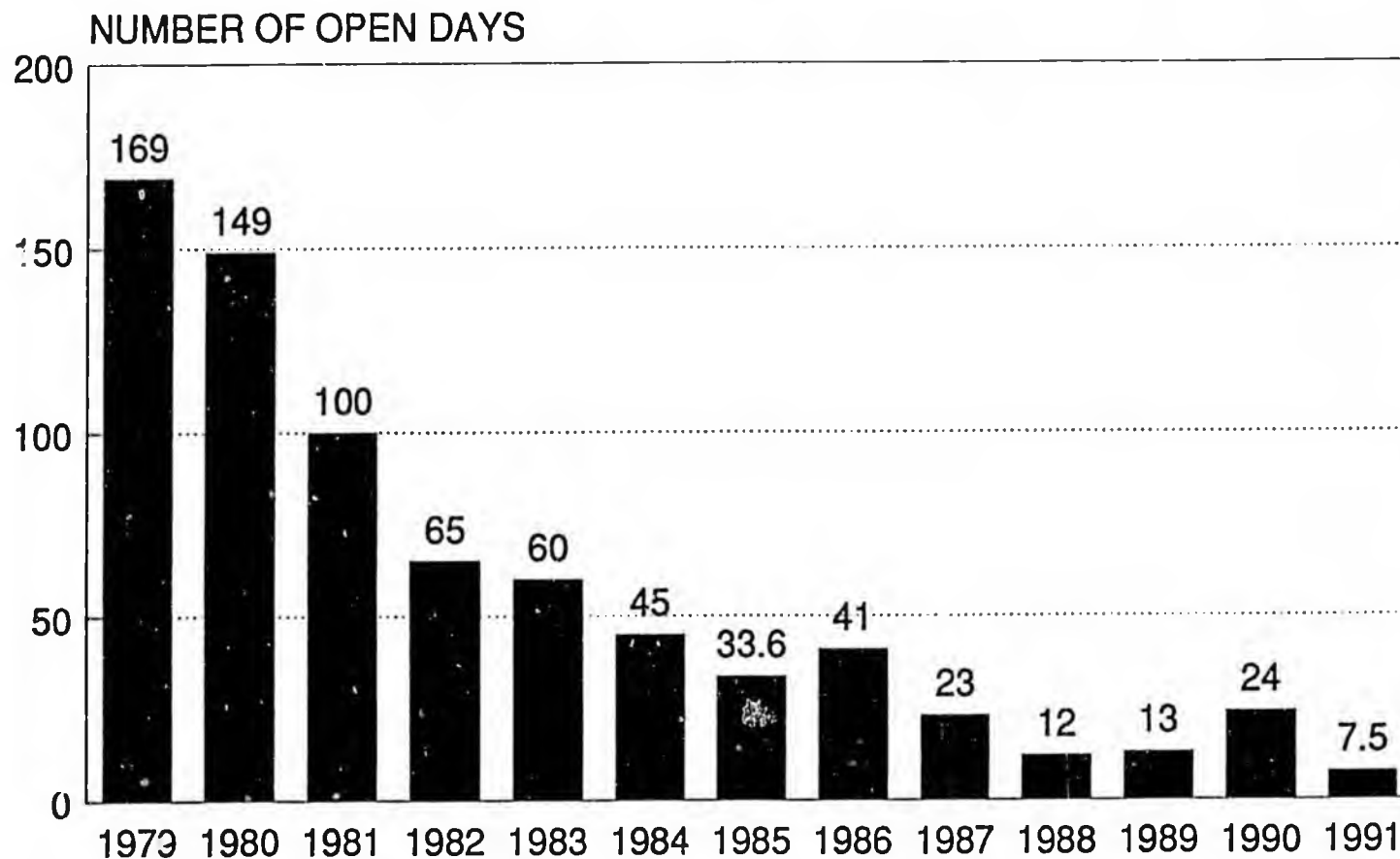
 PSC CEILING

FIG. 5. PRELIM. 1991 SOUTHEAST ALASKA CHINOOK CATCHES WHICH COUNT AGAINST THE PSC "BASE" CATCH CEILING



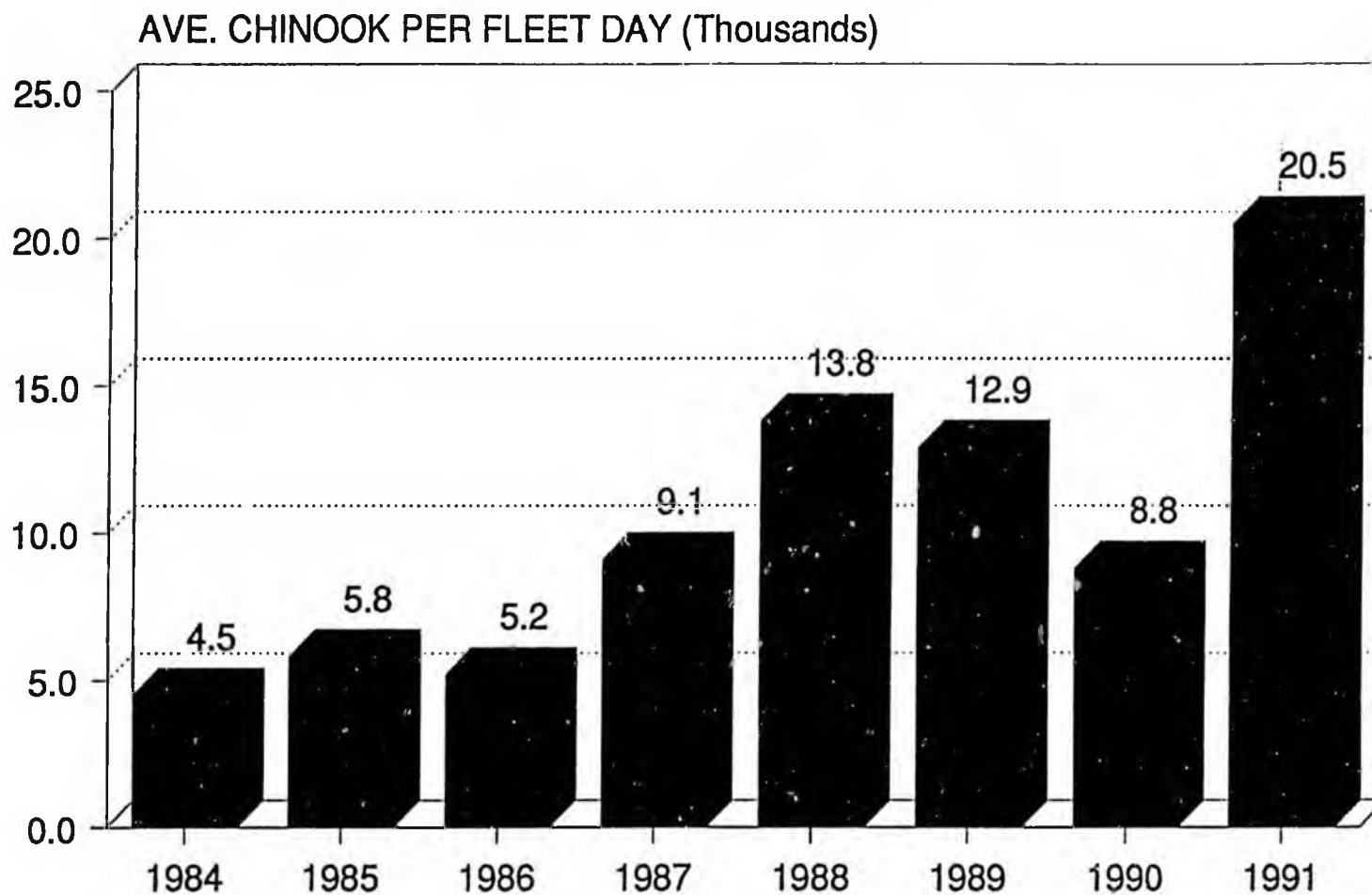
NOTE: HATCHERY ADDON FISH EXCLUDED.
 [FILE:SEAK91.CHT; DISK: MCS92-1]

FIG. 6. NUMBER OF DAYS S.E. ALASKA
GENERAL SUMMER TROLL SEASON OPEN
FOR CHINOOK, 1979 TO PRESENT



[FILE: DAYS1.CHT; DISK: MCS91-1]

FIGURE 7. CHINOOK SALMON CATCH RATES FOR THE S.E. ALASKA SUMMER TROLL FISHERY, 1984 TO PRESENT



[FILE: RATES2.CHT; DISK: MCS92-1]

FIG. 8. EST. CONTRIBUTIONS TO 1991
S.E. ALASKA TROLL CHINOOK CATCH
(PRESEASON ESTS. EXCEPT AK HATCHERY)

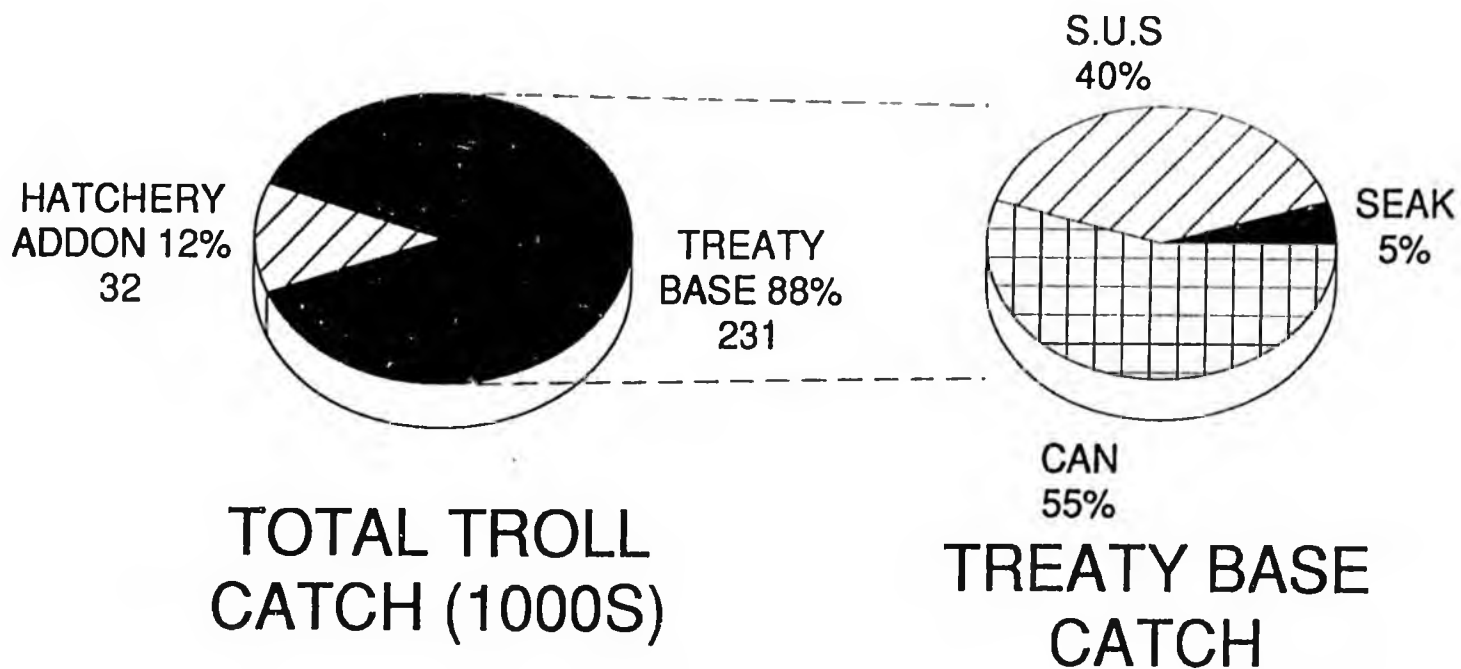
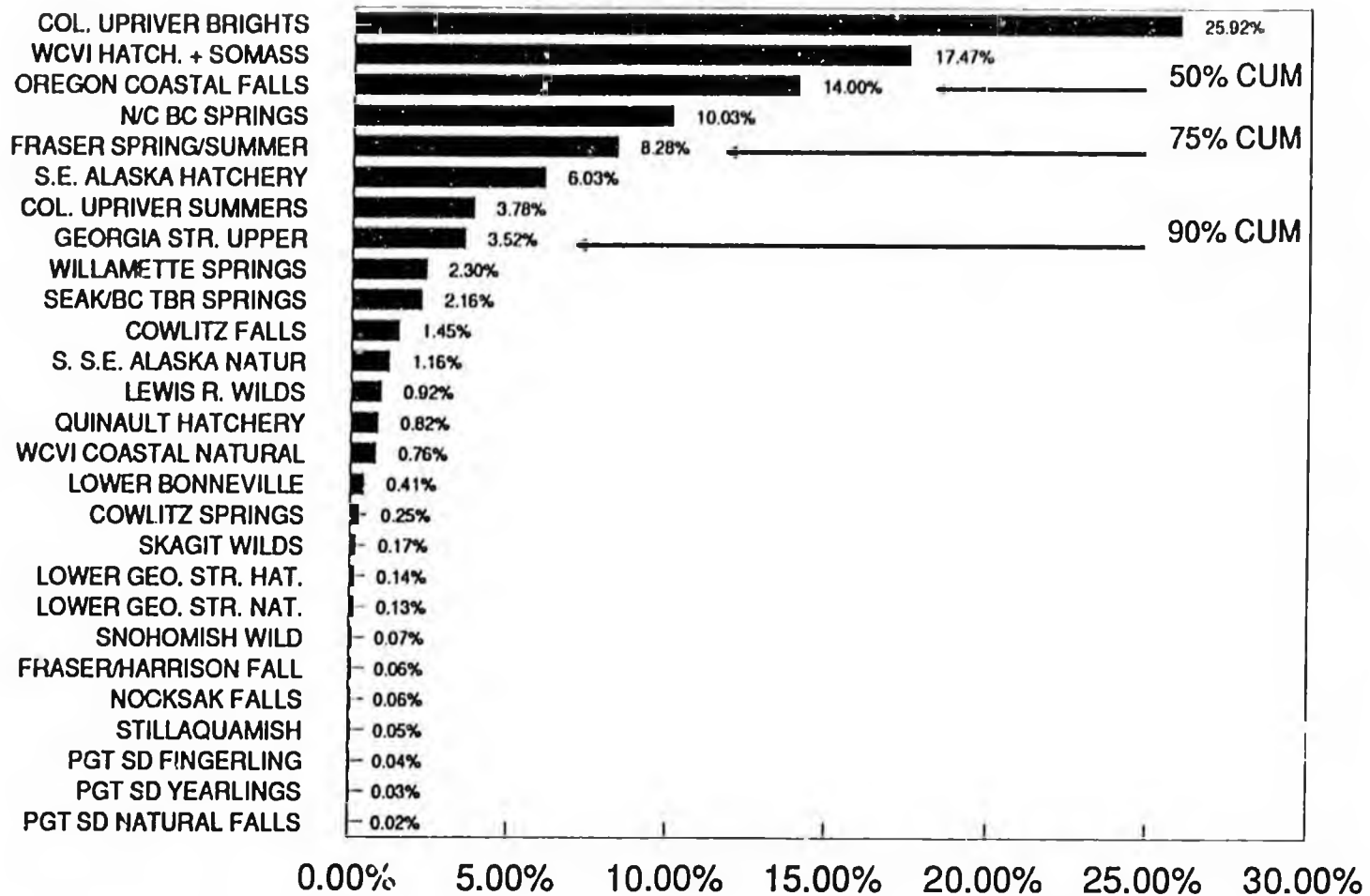
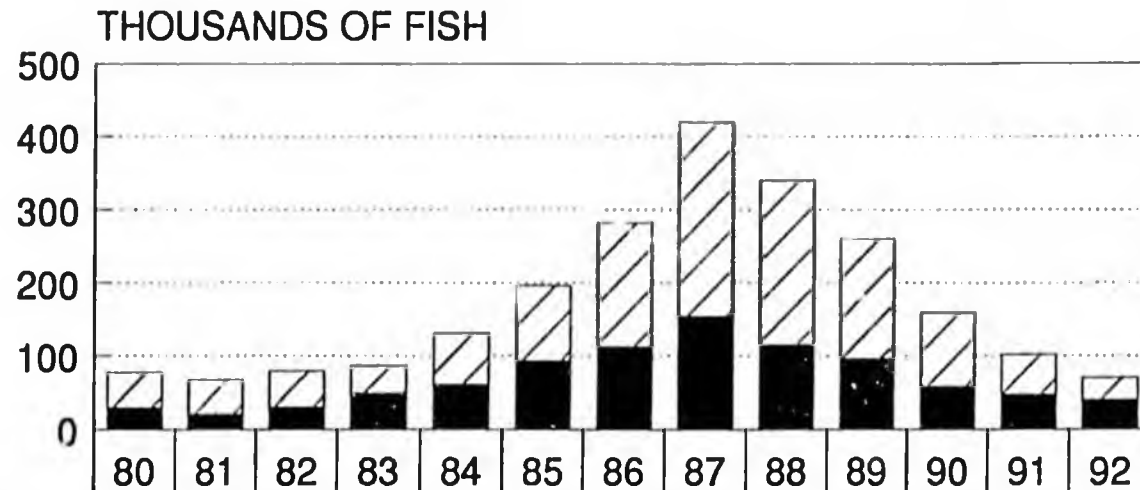


FIG. 9. AVERAGE CONTRIBUTIONS
OF CHINOOK SALMON STOCKS TO
S.E. ALASKA TROLL FISHERY, 1985-88



[FILE:SEAKCOM1.CHT; DISK:MCS92-1; 2/92]

FIG. 10. COLUMBIA UPRIVER BRIGHT CHINOOK SALMON INRIVER RETURNS FOR 1980 TO PRESENT



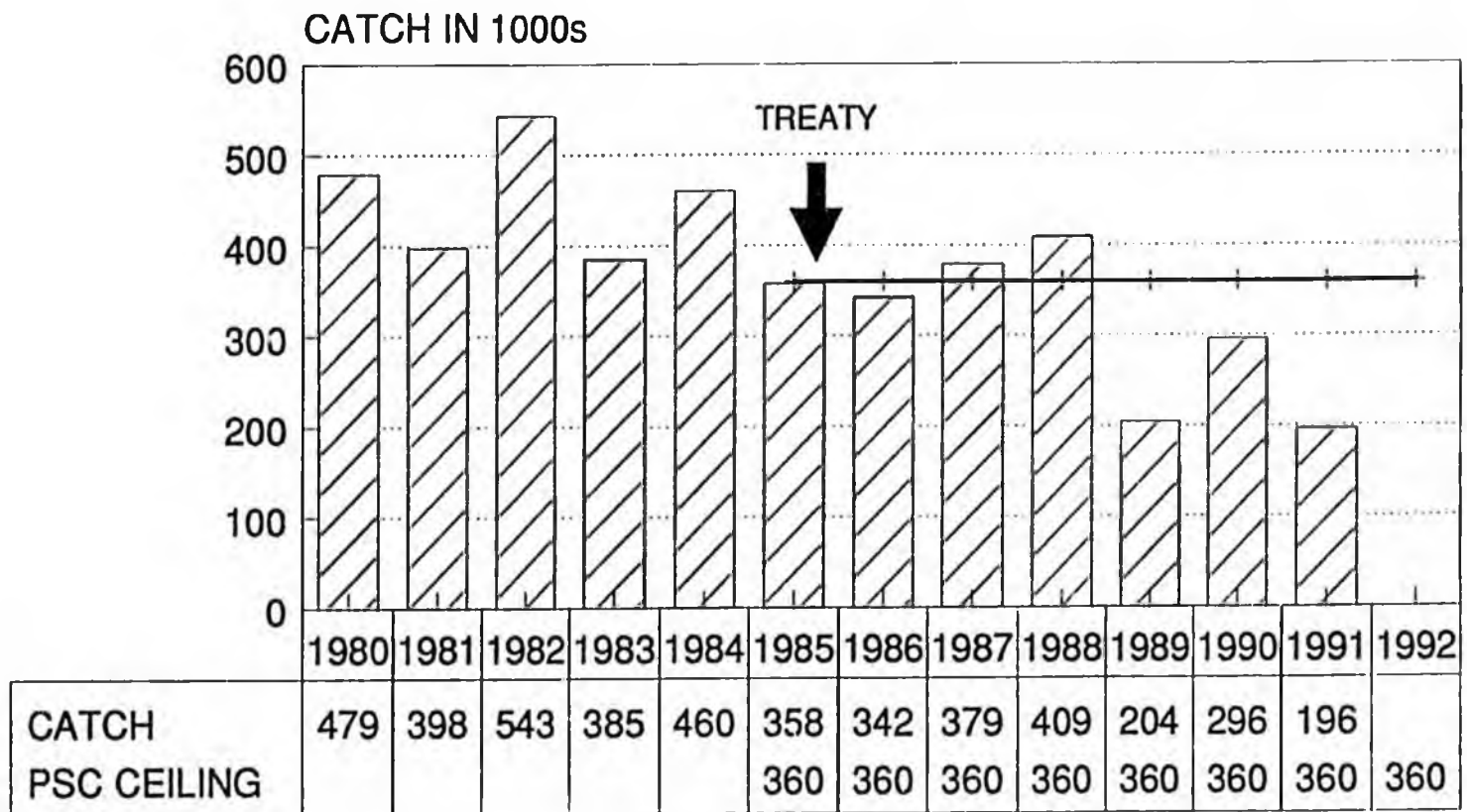
	80	81	82	83	84	85	86	87	88	89	90	91	92
INRIVER RETURN	77	67	79	86	131	196	282	419	340	260	159	102	70
INRIVER CATCH 2/	47	46	48	37	70	103	169	265	225	164	101	55	30
ESCAPEMENT 1/	30	21	31	49	61	93	113	154	115	96	58	47	40

[1992 = PROJECTION]

ESCAPEMENT 1/
 INRIVER CATCH 2/

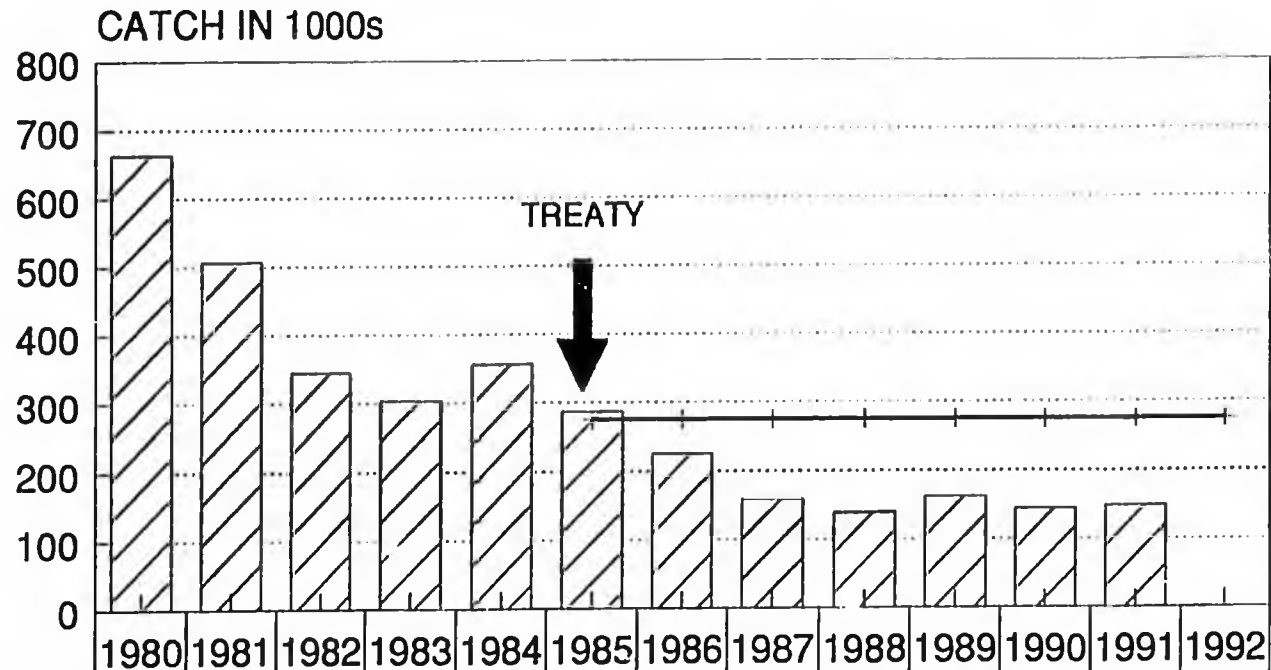
1/ ESCAPEMENT OVER MCNARY DAM
 2/ INRIVER CATCH INCLUDES SOME DAM LOSS
[FILE: BRITE1; DISK: MCS91-1; 2/26/92]

FIG. 11. W. COAST VANCOVER IS. TROLL CHINOOK CATCHES, 1980-91



 CATCH
  PSC CEILING

FIG. 12. GEORGIA STRAIT SPORT & TROLL CHINOOK CATCHES, 1980-91



CATCH	663	507	345	303	357	287	226	159	139	162	144	148	
PSC CEILING						275	275	275	275	275	275	275	275



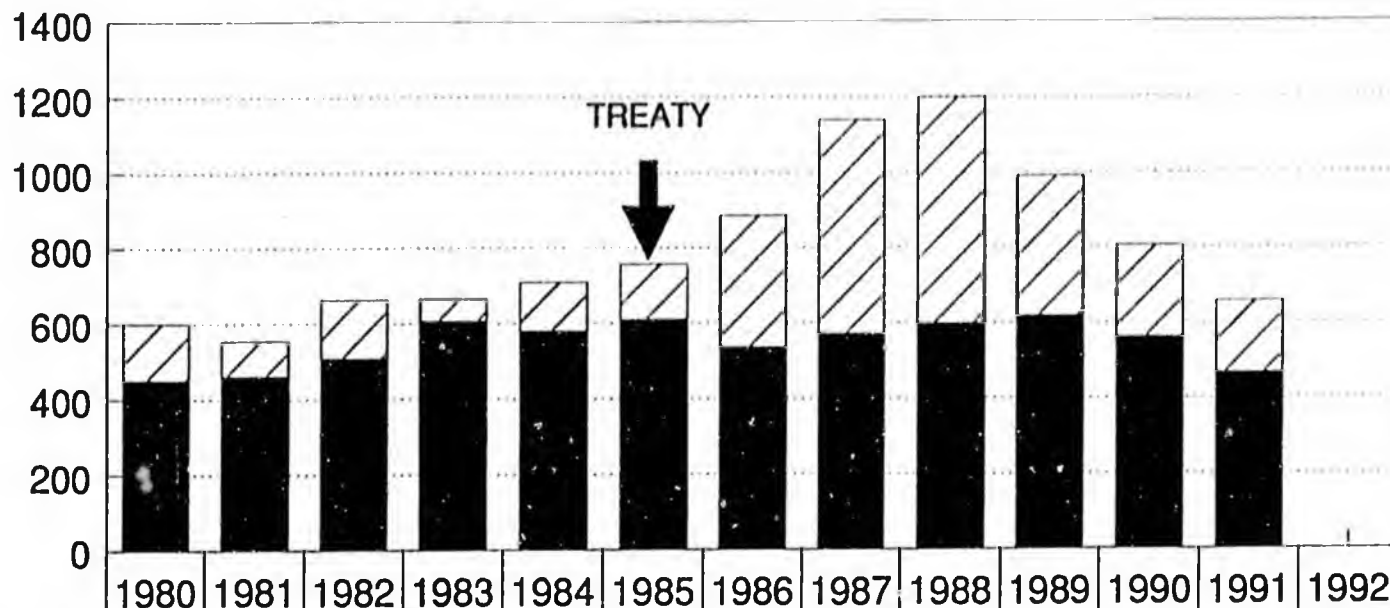
 CATCH
  PSC CEILING

FIG. 13. WASH/ORE N. CAPE FALCON ALL-GEAR CHINOOK CATCHES, 1980-91



	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
COL. R.	150	95	155	58	128	146	349	567	599	372	242	190	
OTHER	450	460	509	607	581	610	536	572	599	617	562	467	
TOTAL	600	610	664	665	709	756	885	1139	1198	989	804	657	

OTHER
 COL. R.

APPENDIX A

LIST OF ALASKA COMMISSIONERS AND
PANEL MEMBERS FOR THE PACIFIC SALMON COMMISSION

PACIFIC SALMON COMMISSION
ALASKA MEMBERSHIP LIST
(Updated 09/17/91)

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APPENDIX B

UNITED STATES-CANADA SALMON TREATY NEGOTIATIONS:
AN ALASKAN PERSPECTIVE, BY SEN. TED STEVENS

UNITED STATES-CANADA SALMON TREATY NEGOTIATIONS: THE ALASKAN PERSPECTIVE

BY
TED STEVENS*

The final ratification of the 1985 United States-Canada Pacific Salmon Treaty came as a result of Alaska's support for the Treaty. The initial Treaty, while tentatively approved, was opposed by Alaskan fishermen in general and Senator Stevens in particular. The Treaty as ultimately accepted by Canada and the United States provides for Alaska's fishery conservation practices and addresses the concerns of Alaskan fishermen regarding intercepting fisheries near the Canadian-Alaskan transboundary rivers. Senator Stevens explains his opposition to the draft 1982 Treaty, his support for the 1985 Treaty, and concludes that the final Treaty is a fair, reasonable document that equitably spreads the burdens of Pacific salmon restoration amongst Canada, the Northwest, and Alaska.

In December 1982, both the United States and Canada initiated a draft of the United States-Canada Pacific Salmon Treaty signifying their tentative approval of the Treaty.¹ While the Treaty negotiations were designed in large measure to revamp the 1930 Fraser River Convention,² the scope of the 1982 Treaty was extended to include all intercepting salmon fisheries. Many Alaskans criticized the detailed chinook provisions in the Treaty because if enacted, they would have had a devastating impact on southeast Alaska fishermen. Moreover, at the time of the 1982 draft, there was no implementing legislation available to consider in conjunction with the Treaty and Alaska fishermen faced the threat of treaty fishing rights litigation from Pacific Northwest

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1. Treaty Between the Government of Canada and the Government of the United States of America Concerning Pacific Salmon (Negotiators Draft) (Dec. 22, 1982) [hereinafter cited as 1982 Agreement].

2. 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 U.S.T. 1058, T.I.A.S. No. 3867 [hereinafter cited as Fraser River Convention].

Indian tribes.³

When it became apparent that the concerns of Alaskan fishermen were not addressed in the Treaty, Alaska's congressional delegation opposed final approval and ratification.⁴ This delegation wanted both the Canadian and United States Governments to reconsider the Treaty's impact upon Alaska. The ultimate result was a modified and improved Treaty, ratified in March 1985,⁵ in conjunction with the enactment of implementing legislation,⁶ and settlement of the pending treaty fishing rights litigation.⁷

The proposed 1982 Treaty provided some protection for Washington and Oregon fishermen operating in the Fraser River System by including the waters outside of the Fraser River Convention area in the management structure of the Treaty.⁸ But there was no guarantee that United States fishermen could continue fishing at reasonable levels for an appreciable period of time. The 1982 version of the Treaty also contained an accelerated rebuilding cycle for Columbia River chinook salmon which favored the fishermen of Canada and the Pacific Northwest United States.⁹ However, many of the concessions which formed the basis of the initialed 1982 agreement were burdens on Alaskan fishermen. The 1985 Treaty, while not perfect, has corrected this imbalance.¹⁰

During the many long years of negotiations with Canada, Alaskan fishermen made many unilateral sacrifices in conjunction

3. The tribes would have sued the State of Alaska to restrict Alaska harvest of Pacific Northwest salmon, particularly chinook. See *Confederated Tribes and Bands of the Yakima Indian Nation v. Baldrige*, 605 F. Supp. 833 (W.D. Wash. 1985).

4. My colleagues in the Alaska congressional delegation are Senator Frank Murkowski and Representative Don Young.

5. *Treaty Between the Government of the United States of America and the Government of Canada Concerning Pacific Salmon*, Treaty Doc. No. 99-2 (ratified Mar. 7, 1985) (entered into force Mar. 18, 1985) [hereinafter cited as 1985 Treaty].

6. *Pacific Salmon Treaty Act of 1985*, Pub. L. No. 99-5, 99 Stat. 7 (1985) (codified at 16 U.S.C.A. §§ 3631-3644 (West 1985)).

7. *Confederated Tribes and Bands of the Yakima Indian Nation v. Baldrige*, 605 F. Supp. 833 (1985).

8. See 1982 Agreement, *supra* note 1, at Annex IV, ch. 4, para. 1.

9. See 1982 Agreement, *supra* note 1, at Annex IV, ch. 3 (entitled *Conservation Measures for Chinook Salmon*).

10. See 1985 Treaty, *supra* note 5, at Annex IV, ch. 3.

with the State of Alaska's effort to reverse the decline of the chinook salmon.¹¹ This was exemplified by the Alaska Department of Fish and Game's actions in 1980-1984 to reduce catch ceilings for southeast Alaska trollers and the incidental catch rates for other fisheries.¹² During that period, however, Canadian fishermen actually increased their harvest of southbound chinooks, thereby negating Alaska's attempts to enhance escapement for the benefit of all Pacific coast salmon fishermen.

The 1982 agreement did not reflect the conservation effort already being carried out by Alaska. A two cycle rebuilding period of ten years for chinooks to enhance the Columbia River stocks was contemplated by the 1982 agreement,¹³ but there was no reasonable transition for southeast Alaska fishermen. Reductions in catch levels for the southeast troll fishery necessary to sustain such a short rebuilding period, in addition to the limits already imposed by the Alaska Department of Fish and Game,¹⁴ would

11. For example, the Alaska Department of Fish and Game implemented many conservation measures to protect chinook salmon in southeast Alaska. These measures included: closure of waters west of Cape Suckling to trolling (1974); limited entry for power trollers (1975); restrictions on sport fishing bag and possession limits (1975); elimination of directed net fisheries for chinook (1975-1977); closure of terminal areas to trolling (1975-1977); closures of inside areas to protect immature chinook (1975-1977); a 28-inch minimum size limit for chinooks (1977); closure of outside waters to hand trolling (1978-1980); establishment of eight-day opening/six-day closure fishing periods (1979); prohibition of sport fishing from commercial vessels (1979); reduced line limits for power and hand troll fisheries (1980); moratorium on entry into the hand troll fishery (1980) and limited entry for hand trollers (1981); establishment of a guideline harvest level of 320,000 chinook (1980) and then reduction of the guideline harvest level to 285,000 chinook (1981); prohibited use of any hooks other than single hooks (1981); reduced chinook fishing seasons in coastal and offshore waters from April 15 - October 30 to May 15 - September 20 (1981); closed entire troll fishery from April 15 to May 15 (1981); closed the troll fishery in-season to protect chinook and coho twice during 1980 and three times during 1981; and required fishermen to report catches before transporting fish out of state (1981). Alaska Dep't of Fish and Game, Commercial Fisheries Div., Conservation Measures Taken by Alaska to Protect Chinook Salmon in Southeast Alaska (unpublished data) (Mar. 12, 1982).

12. See Alaska Dep't of Fish and Game, Southeast Region Fisheries Div. Staff, Draft Preliminary Report on 1985 Southeast Alaska Chinook Salmon Catch and Escapement (unpublished report prepared for U.S.-Canada Pacific Salmon Comm'n) (Jan. 1986) [hereinafter cited as Alaska Salmon Catch Report].

13. See 1982 Agreement, *supra* note 1, at Annex IV, ch. 3 (entitled *Conservation Measures for Chinook Salmon*).

14. See *supra* note 9.

have forced almost all southeast Alaska fishermen out of the fishery, resulting in severe economic dislocations for Alaskan coastal communities.¹⁵

The 1985 Treaty, in contrast, takes into account the deep Alaskan commitment to conservation. It allows for an extended rebuilding period with protection against a sudden reduction of Alaskan harvests in order to achieve a gradual recovery of the Columbia River chinook stock without destroying the troll fishery.¹⁶

Although the 1982 agreement would have imposed restrictive quotas on all facets of the United States intercepting chinook fisheries, it did not include comprehensive restrictions on the Canadian fishery off of the west coast of Vancouver Island. As a practical matter, this "loophole" would have allowed Canadian fishermen to shift their efforts from restricted fisheries to the Vancouver Island fishery. The 1985 Treaty closed this loophole by imposing specific quotas on all significant Canadian intercepting chinook fisheries.¹⁷

Alaska's continuing effort to bolster the declining chinook stocks was incorporated into the 1985 Treaty. While the 1982 agreement would not have credited Alaskan fishermen for any future gains derived from the State of Alaska's restoration programs, the Treaty as adopted takes into account any demonstrated contributions of enhancement activities.¹⁸ This is particularly relevant to Alaska, because the State has already embarked on a comprehensive enhancement program which will provide over 200,000 additional chinooks by 1990.¹⁹

The establishment of a fishery regime in the northern boundary region between British Columbia and southeast Alaska was

15. Almost all communities in southeast Alaska rely on salmon for economic sustenance. See, e.g., G. ROGERS & R. COOLEY, *ALASKA'S POPULATION AND ECONOMY: REGIONAL GROWTH, DEVELOPMENT AND FUTURE OUTLOOK* 168-72 (Mar. 1962) (salmon account for 80% of total value of commercial fisheries; "southeast Alaska generally produced the largest portion of the total commercial fishery values during the decade . . .").

16. See 1985 Treaty, *supra* note 5, at Annex IV, ch. 3 (entitled *Chinook Salmon*).

17. See 1985 Treaty, *supra* note 5, at Annex IV, ch. 3, para. (d)(i)-(vi).

18. *Id.* at Annex IV, para. 2.

19. See ALASKA DEP'T OF FISH AND GAME, *PRE-SEASON MANAGEMENT PLAN FOR 1985 SOUTHEAST ALASKA CHINOOK FISHERIES* 7 (Apr. 1985). See also Alaska Salmon Catch Report, *supra* note 12, at 10-14.

also an integral element of the negotiations.²⁰ The critical issue involved the need to limit fishing effort in a way that would prevent high incidental catches of each Nation's salmon stocks by the other Nation. Early in the negotiations it was recognized that unreasonable limitations on United States harvests of Canadian sockeye would significantly impede the ability of southeast Alaska fishermen to harvest the Alaskan pink salmon resource. In spite of these concerns, the 1982 agreement imposed strict limitations on the sockeye catch at Noyes Island and Tree Point.²¹ These limitations would have forced United States fishermen to forego harvesting millions of pink salmon of United States origin.

The 1985 agreement moderated this adverse impact by permitting United States fishermen an incidental catch of 480,000 sockeye at Noyes Island for a four year period and 130,000 sockeye per year at Tree Point.²² The principle is clearly established that interception limits will not prevent the United States from harvesting its own fish.²³ The agreement does permit a larger Canadian incidental harvest of pink salmon, but the Canadian troll fishery will close down in the northern part of the boundary area upon reaching an incidental catch of 300,000 pinks.²⁴

The key feature of the Treaty which resulted from the prolonged negotiations on the northern boundary area,²⁵ is the recognition by all parties that the fish stocks should be managed to permit fishermen of each nation to continue "targeting" on stocks originating in their own waters.²⁶ The specific restrictions embodied in the 1985 agreement reflect that understanding.

The transboundary river controversy was another issue of

20. See 131 Cong. Rec. S2687 (daily ed. Mar. 7, 1985) (statement of Sen. Lugar referring to the 1985 Treaty, *supra* note 5, at Annex IV, ch. 2).

21. See 1982 Agreement, *supra* note 1, at Annex IV, ch. 2 (entitled *Northern British Columbia-Southeastern Alaska Boundary Area*), para. 2(i) & (ii).

22. See 1985 Treaty, *supra* note 5, at Annex IV, ch. 2 (entitled *Northern British Columbia Southeastern Alaska*), paras. 2 & 3.

23. *Id.* at para. 4 ("the Parties shall implement appropriate management measures which will take into account the expected run-sizes and permit each country to harvest its own stocks").

24. *Id.* at para. 3(c).

25. This is the boundary between the United States and Canada in southeast Alaska. See *supra* note 18 and accompanying text.

26. See 131 Cong. Rec. S2687 (daily ed. Mar. 7, 1985) (statement of Sen. Lugar).

concern for Alaska during the negotiations. Canada's increased harvests on the transboundary rivers located in southeast Alaska, especially the Stikine and the Taku Rivers, appear to have been promoted for the purpose of Canada's obtaining additional leverage in the overall negotiations. There were no traditional or viable commercial Canadian fisheries on these rivers before the negotiations. In fact, the Canadian Government had to subsidize the Taku River fishery to maintain a claim for future Canadian fishery development there.

The 1982 agreement called for an allocation regime that might have established an economically viable Canadian fishery for sockeye and coho on the Stikine and Taku Rivers.²⁷ For the years 1983 and 1984, the Canadians would have been allowed a sockeye harvest approximating fifty percent of the total allowable catch.²⁸ There was a dispute over whether Canada would be allowed thirty-five percent of the catch or fifty percent of the catch after 1984. That coho harvest was included at the last minute in the allocation scheme.²⁹

Many southeast Alaskan fishermen have traditionally depended on Stikine and the Taku River harvests. In the 1982 agreement, the benefits of the State of Alaska's strict conservation regime designed to restore these runs would have passed on to a previously non-existent Canadian fishery. The final Treaty moderates the impact of a transboundary allocation scheme on Alaskan fishermen. It expressly provides that the Canadians will be entitled to only thirty-five percent of the sockeye on the Stikine River,³⁰ and fifteen percent of the sockeye on the Taku River.³¹ The Canadians are also limited to 2000 coho on the Stikine and an incidental catch on the Taku.³²

The 1985 Treaty and agreed understandings largely resolved the questions presented by the "equity" principle.³³ The Canadi-

27. See 1982 Agreement, *supra* note 1, at Annex IV, ch. 1 (entitled *Transboundary Rivers*).

28. *Id.* at Annex IV, ch. 1, para. 3.

29. *Id.* at para. 3(b).

30. See 1985 Treaty, *supra* note 5, at Annex IV, ch. 1, para. 3(a).

31. *Id.* at para. 3(b).

32. *Id.* at para. 3.

33. See Jensen, *The United States-Canada Pacific Salmon Interception Treaty: An Historical and Legal Overview*, 16 ENVTL. L. 363, 400 n.106; see also Memorandum of Understanding, para. A, accompanying the 1985 Treaty, *supra*

ans were, and still are demanding that they receive disproportionate compensation for Canadian fish caught by United States fishermen. It was contemplated that this compensation would come in the form of increased fishery allocations to be decided by the Commission. The 1985 Treaty allows the United States to assert its position forcefully, although Canada will doubtless keep up the pressure to obtain its claimed share.

The process of implementing the Treaty into domestic law has also served to protect United States interests. The Reagan Administration recognized the need to restore the salmon stocks by enhancement as soon as resources permitted in order to mitigate any economic dislocation resulting from the Treaty fishing limits.³⁴ The United States Department of State specifically stated that it would support funding for an enhancement program in Alaska.³⁵ The implementing legislation also mandates Commission positions³⁶ and provides veto authority for northern and southern delegations as a safeguard against unjustifiable tradeoffs between the north and the south.³⁷

The implementing process also put to rest the issue of whether the fishery allocation regime, established by Judge Boldt in *United States v. Washington*³⁸ applies to chinook harvests off Alaska. The "Boldt decision" held that the Pacific Northwest Indian Tribes, which are protected by the Stevens and Palmer Treaties, are entitled to fifty percent of all harvestable anadromous fish passing through their traditional fishing grounds.³⁹ Due

note 5.

34. See *Hearings Before the Subcomm. on Fisheries and Wildlife Conservation and the Environment of the House Comm. on Merchant Marine and Fisheries*, 99th Cong., 1st Sess. 102-03 (1985) (colloquy between U.S. Negotiator Kronmiller, Rep. Lowry, and State Dep't Counselor Derwinski).

35. See Letter from Secretary of State George Shultz to Senator Ted Stevens (Mar. 7, 1985) (discussing the United States-Canada Salmon Treaty), reprinted in 131 CONG. REC. S2875 (daily ed. Mar. 7, 1985).

36. See 16 U.S.C.A. § 3632(a)-(h).

37. *Id.* § 3632(g). It should be noted that "north" means Alaska and "south" means everyone else except Canada.

38. 384 F. Supp. 312 (W.D. Wash. 1974), *aff'd*, 500 F.2d 676 (9th Cir. 1975), *cert. denied*, 423 U.S. 1066 (1976). See *Washington v. Washington State Commercial Passenger Fishing Vessel Ass'n*, 443 U.S. 658 (1979).

39. See, e.g., Comment, *Empty Victories: Indian Treaty Fishing Rights in the Pacific Northwest*, 10 ENVTL. L. 413 (1980); Harrison, *The Evolution of a New Comprehensive Plan for Managing Columbia River Anadromous Fish*, 16 ENVTL.

to the ongoing, managerial nature of *United States v. Washington*, the issue of the tribal right to protection of the fishery resource throughout its range remained unresolved in 1982. In an effort to promote their positions in the Salmon Treaty negotiations, the Treaty tribes threatened to seek a court ruling which would have included Alaskan harvests under the Boldt decision.

In the final analysis, that tactic proved beneficial for both Alaska and the tribes. The tribes extracted a provision for equal representation on the United States Section of the Pacific Salmon Commission.⁴⁰ In exchange for supporting ratification of the Treaty and participation by the tribes, the State of Alaska obtained a legal commitment on the part of the Tribes not to seek inclusion of Alaskan harvests of Pacific Northwest salmon in the *United States v. Washington* allocation scheme as long as the 1985 Treaty remains intact.⁴¹

The 1985 Pacific Salmon Treaty imposes harsh burdens on many of southeast Alaska's fishermen, but there is a widespread perception in Alaska that sacrifices must be made in order to rebuild the salmon resources. Alaskans are willing to share part of this burden; however, it was necessary to ensure that the burden was spread fairly among all parties. The 1985 Treaty succeeded in achieving this goal.

L. 706 (1986) (discussion of equal share). See generally F. COHEN, *HANDBOOK OF AMERICAN INDIAN LAW* 220-28 (1982). The various Stevens Treaties are given in Holt, *Can Indians Hunt in National Parks? Determinable Indian Treaty Rights and United States v. Hicks*, 16 *ENVTL. L.* 207, 217 n.66 (1986).

40. See 16 U.S.C.A. § 3632(e)(3).

41. See *Confederated Tribes and Bands of the Yakima Indian Nation v. Baldrige*, 605 F. Supp. 833, 836-37 (1985).

APPENDIX C

PACIFIC SALMON COMMISSION MAY 1991 LETTER OF
TRANSMITTAL AND CHINOOK ANNEX



PACIFIC SALMON COMMISSION

ESTABLISHED BY TREATY BETWEEN CANADA
AND THE UNITED STATES OF AMERICA
MARCH 17, 1985

500 1155 ROBSON STREET
VANCOUVER B.C. V6E 1B9
TELEPHONE (604) 684-8081
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May 17, 1991

The Honorable James A. Baker, III
Secretary of State
U.S. Department of State
2201 C Street N.W.
Washington, D.C. 20520

Dear Sir:

I have the honor to report to you on understandings that have been reached by the Pacific Salmon Commission and to recommend changes in Annex IV of the Pacific Salmon Treaty.

In accordance with Article XIII, Paragraph 2 of the Treaty, the Commission recommends that Chapters 3, 5, and 6 of Annex IV be amended. The entire text of Annex IV as proposed by the Commission is attached (Attachment 1). Pursuant to Article XIII, Paragraph 3 of the Treaty, amendments to the Annex may be implemented through an exchange of notes between the Governments. The Commission recommends that an exchange of notes occur implementing these proposals as soon as possible. The Commission expects that the relevant management agencies will manage fisheries under their responsibility consistent with these agreements.

The amended chapters are of two years duration, consistent with the intent of the Commission to provide the time necessary to develop longer-term approaches to addressing the needs of the Parties.

The Commission has also reached the following understandings as to the implementation of the Pacific Salmon Treaty:

- 1) With respect to Annex IV, Chapter 3, the Commission agrees that:
 - a) in 1991 and 1992, the Southeast Alaska all gear catch shall consist of the base ceiling, with a ceiling adjustment for 1991 only, as specified in Annex IV, Chapter 3, plus a catch of new Alaska hatchery add-on chinook to be calculated in-season using the procedures approved by the Commission for the 1990 add-on and as described in Alaska's February 4, 1991 report to the Commission; the preseason expectation of the 1991 hatchery add-on is 57,800 chinook salmon;



the U.S. agrees to continue tagging and catch sampling rates which provide precision of hatchery contribution estimates similar to that of recent years and provide a report to the Commission in November 1992 describing the results of the 1991 and 1992 hatchery add-on programs;

the Commission agrees to consider a reduced risk adjustment level for 1992 based upon evaluation and review by the Chinook Technical Committee of the following information to be provided by the United States by November 1991:

- i) the computational procedures for estimating the coefficient of variation associated with the add-on;
 - ii) the effects of hatchery add-on fisheries, if any, on the rebuilding of wild stocks including information on the stock composition of chinook catches in the June fisheries and on the duration of subsequent chinook non-retention periods;
- b) with respect to terminal exclusions, the Commission agrees that the Chinook Working Group with the assistance of the Chinook Technical Committee and the findings reported in TCCHINOOK (91)-2, shall recommend standards and criteria to the Commission by January 1993, to govern consideration for future proposals for terminal exclusions. With regard to the exclusion of selected terminal area chinook catches from the Northern and Central B.C. catch ceiling, the Commission agrees to the provisions detailed in Attachment 2;
- c) with respect to the west coast Vancouver Island troll fishery, and in light of the below average forecast of chinook abundance in 1991, Canada will manage this fishery in a manner consistent with the spirit and intent of the Treaty and the rebuilding program. Prior to the start of each season, Canada will provide the U.S. with details regarding its plans and intentions for this fishery;



- d) with respect to the adjustments in catch ceilings for the 1991 Southeast Alaska and Northern and Central B.C. fisheries, the Parties agree that the overage/underage policy set forth in Chapter 3, paragraph 1(e)(vii) is to be applied to the base ceiling levels of 263,000 chinook;
- e) with respect to the Strait of Georgia fisheries, Canada agrees to provide a report to the Commission on the evaluation of the effectiveness of the management measures taken in 1988, 1989 and 1990 to reduce the harvest rates on depressed chinook stocks following completion of Canada's Pacific Stock Assessment and Review Committee and domestic review processes; and,
- f) the Parties remain committed to evaluating management regimes for chinook that might better address the Parties' long term objectives and are consistent with the fundamental principles established in Article III of the Pacific Salmon Treaty.

To this end, in January 1991, the Parties held a workshop to explore alternative chinook management approaches. There was an overall view among the participants that the Workshop was a good forum for exploring new management ideas and for understanding problems that jurisdictions face implementing management approaches. The participants identified information needs and policy issues that must be resolved before completing development of alternative management approaches. Accordingly, the Commission agreed that the Chinook Work Group, in cooperation with the Chinook Technical Committee, shall:

- i) develop operational definitions for policy issues such as rebuilding, rebuilt, pass through, and stocks of concern which are necessary components of a longer term chinook management approach;
- ii) advise the Commission on processes to ensure active participation by the Panels in the development of options for a long term chinook management approach;



- iii) identify technical tasks that need to be addressed before the management approaches can be fully evaluated, and a timetable for completion of these tasks; and,
- iv) consistent with paragraph 1(b) of Annex IV, Chapter 3, present the Commission with management options to respond to short-term variations in abundance in a manner consistent with the conservation and equity principles of the Treaty.

The Chinook Work Group will provide a progress report to the Commission in November 1991 containing a proposed workplan and a prioritized schedule for completion of these assignments with a view toward completion of the work for consideration by the Commission at the 1993 annual meeting.

2) With respect to Annex IV, Chapter 4, the Commission agrees to the provisions of Attachment 3: "Establishment of Fraser Sockeye and Pink Salmon Escapement Goals for 1991 and 1992 for the Purposes of Computing the Total Allowable Catch; and Attachment 4: "Fraser Panel Agreement on Sockeye Escapement Add-On Computation";

3) With respect to Annex IV, Chapter 5, the Commission agrees:

- a) For 1991 and 1992, Canada will not conduct a directed coho net fishery in Area 20 and the U.S. may conduct a directed coho fishery in Areas 7 and 7A subject to U.S. domestic management processes;
- b) Although the Parties hold differing views on the appropriateness of the directed coho fishery in Areas 7 and 7A, they agree that the enhancement based approach proposed by the U.S. appears to be a positive step forward and agree to explore the merits of this approach to address the Areas 7 and 7A directed coho issue. In doing so, both Parties have agreed to clarify the technical and procedural questions which will form the basis for making an informed decision on the proposed approach;



The parties have also identified the need to jointly develop a time frame and methodology for the purpose of assessing how well the average annual contributions of new specified U.S. production to Canadian fisheries compare to the average interceptions that may occur in directed Areas 7 and 7A coho fisheries;

- c) that, with respect to the 1990 directed coho fishery in Areas 7 and 7A:
- i) to jointly estimate the level of interceptions that occurred in the 1990 Areas 7 and 7A directed coho fishery (recognizing that the estimates generated for this purpose may not necessarily reflect improved stock composition estimates that will eventually be available to the Parties when currently on-going joint technical studies are completed);
 - ii) to establish a base period and level of production from which the new increased production could be measured and clarify which Canadian fisheries would receive benefits from the new specified U.S. production. (It is recognized the Parties have differing opinions on whether it is appropriate to apply actions taken prior to 1991);
 - iii) that the U.S. will not harvest the cumulative Areas 7 and 7A chum salmon shortfall through 1990 (as provided in Annex IV, Chapter 6, Paragraph 5); and,
 - iv) that if the above steps are determined not to adequately address compensating measures for the 1990 Areas 7 and 7A directed coho fishery, the Parties will consider and agree to appropriate additional compensating measures by no later than the February 1992 annual meeting of the Pacific Salmon Commission;



- d) to complete discussions on compensating measures for the 1990 Area 7/7A fishery and assess the merits of the long term enhancement based approach. Results of these discussions will be provided to the Commission in February 1992;
- e) to initiate discussions on coho within the Southern Panel area with a view toward clarifying and improving understanding of the conservation concerns and the management approaches of the Parties; and,
- f) to adjust the date of the workshop on southern coho issues to January 1992 and to report the findings to the Commission during the January 1992 meetings of the Commission.

4) With respect to Annex IV, Chapter 6, the Commission agrees to initiate discussions on chum within the Southern Panel area with a view toward clarifying and improving understanding of the conservation concerns and the management approaches of the Parties.

5) With respect to implementation of Article III, Paragraph 1 of the Pacific Salmon Treaty, the Commission agrees that:

The Parties are committed to developing a mutually acceptable approach to identify and resolve equity issues in a timely manner. In the revised (February 1991) "Understanding Between the Canadian and United States Sections of the Pacific Salmon Commission Concerning Equity Related Issues" (Attachment 5), Item 7 identifies that the Parties will "hold a bilateral workshop in September 1991 for the purpose of exchanging alternative technical approaches for determining each Party's benefits in relation to salmon production and interceptions." To coordinate this workshop, the Commission has established a Steering Group which will meet in June 1991 to develop a schedule, agenda, attendance requirements, and format for the workshop. Workshop discussions will be structured around selected topics and papers identified in advance by the Parties.



At the conclusion of the workshop, the Steering Group, supported by Commission staff, will compile the papers, work products, discussion comments, and a summary of the workshop and provide these to the Commission by October 1991.

The Commission respectfully requests your approval of these recommendations.

Yours truly,

Pacific Salmon Commission

A handwritten signature in dark ink, appearing to read "P.S. Chamut". The signature is written in a cursive, somewhat stylized font.

P.S. Chamut, Chair

Note: Treaty articles and
other Annex IV chapters
have been provided under
separate cover.

Chapter 3

CHINOOK SALMON

1. Considering the escapements of many naturally spawning chinook stocks originating from the Columbia River northward to southeastern Alaska have declined in recent years and are now substantially below goals set to achieve maximum sustainable yields, and recognizing the desirability of stabilizing trends in escapements and rebuilding stocks of naturally spawning chinook salmon, the Parties shall

- (a) instruct their respective management agencies to establish a chinook salmon management program designed to meet the following objectives:
 - (i) halt the decline in spawning escapements in depressed chinook salmon stocks; and,
 - (ii) attain by 1998, escapement goals established in order to restore production of naturally spawning chinook stocks, as represented by indicator stocks identified by the Parties, based on a rebuilding program begun in 1984;
- (b) continue the chinook working group to clarify policy issues relating to the execution of this Chapter; for example, the definition of pass-through, and the development of common procedures for adjusting catch ceilings in response to changes in abundance, positive incentives and enhancement add-ons; the chinook working group will develop options for consideration by the Commission and Panels as appropriate;
- (c) jointly initiate and develop a coordinated chinook management program;
- (d) maintain a Joint Chinook Technical Committee (Committee) reporting, unless otherwise agreed, to the Northern and Southern Panels and to the Commission, which inter alia, shall

- (i) evaluate management actions for their consistency with measures set out in this Chapter and for their potential effectiveness in attaining these specified objectives;
 - (ii) evaluate annually the status of chinook stocks in relation to objectives set out in this Chapter and, consistent with paragraph (d) (v) beginning in 1986, make recommendations for adjustments to the management measures set out in this Chapter;
 - (iii) develop procedures to evaluate progress in the rebuilding of naturally spawning chinook stocks;
 - (iv) recommend strategies for the effective utilization of enhanced stocks;
 - (v) recommend research required to implement this rebuilding program effectively; and,
 - (vi) exchange information necessary to analyze the effectiveness of alternative fishery regulatory measures to satisfy conservation objectives;
- (e) ensure that
- (i) in 1991, the all-gear catch in Southeast Alaska shall not exceed the base ceiling of 263,000 chinook salmon plus 10,000; in 1992, the all-gear catch in Southeast Alaska shall not exceed 263,000 chinook salmon; these catches exclude the Alaska hatchery add-on as described in the letter of transmittal, in 1991 and 1992 Alaska shall open its general summer troll fishery on July 1; the June fishery shall not exceed 40,000 chinook salmon (excluding the Alaska hatchery add-on) taken in a manner similar to 1989 and 1990; and areas of high chinook abundance shall be closed during chinook non-retention periods to reduce incidental mortalities;
 - (ii) in 1991, the all-gear catch in Northern and Central B.C. shall not exceed the base ceiling of 263,000 chinook salmon plus 10,000; in 1992, the all-gear catch in Northern and Central B.C. shall not exceed 263,000 chinook salmon; these catches

exclude a portion of the catch in extreme terminal areas as described in the letter of transmittal.

- (iii) in 1991 and 1992, the annual troll catch off the west coast of Vancouver Island shall not exceed 360,000 chinook salmon;
- (iv) in 1991 and 1992, the total annual catch by the sport and troll fisheries in the Strait of Georgia shall not exceed 275,000 chinook salmon; Canada will undertake management measures to achieve the target of rebuilding Lower Georgia Strait and Fraser River chinook stocks by 1998;
- (v) adjustments to the ceilings may be made in response to reductions in chinook abundance so that the indicator stocks are rebuilt by 1998;
- (vi) fishing regimes are reviewed by the Committee and structured so as not to affect unduly or to concentrate disproportionately on stocks in need of conservation;
- (vii) starting with the 1987 season, a 7.5 percent management range is established above and below a catch ceiling. On a continuing basis, the cumulative deviation (in numbers of fish) shall not exceed the management range. In the event that the cumulative deviation exceeds the range, the responsible Party shall be required in the succeeding year, to take appropriate management actions to return the cumulative deviation, plus any penalty assessed, to a level within the established management range. Negative cumulative deviations shall not accumulate below the management range. It is the intent of this section to insure that, on average, the annual catch in ceilinged fisheries is equal to the agreed target ceiling; and,
- (viii) in 1987 and thereafter, the United States will continue to monitor fisheries in Juan de Fuca Strait (Areas 4B, 5, 6A, 6C) and the outer portions of Puget Sound (6B, 7, 7A, 9) so as to assess the levels and trends in the interceptions of Canadian chinook salmon;

- (f) maintain the following program, recognizing that associated fishing mortalities can affect the rebuilding schedule. The Parties shall
 - (i) minimize the effects of such mortalities;
 - (ii) monitor, assess, and report associated fishing mortalities.
 - (iii) provide the information required by the Chinook Technical Committee to estimate the magnitude and assess the impacts of associated mortalities on an on-going basis;
 - (iv) beginning in 1989, the Chinook Technical Committee shall
 - a. review reports provided by the Parties on an annual basis, unless directed by the Commission, and estimate the magnitude of all quantifiable sources of associated fishing mortalities;
 - b. evaluate their impact on the rebuilding schedule and recommend management actions that will achieve the objectives of the chinook rebuilding program, taking into account the effects of all fishing mortalities; and
 - c. develop technical procedures and standardize methodologies to quantify the magnitude of associated fishing mortalities, including savings of fish, and assess their impacts upon the rebuilding program, including pass-through commitments;
 - (v) the Commission shall annually take into account, starting in 1988, the impacts of fishing mortalities, as determined by the Chinook Technical Committee, in establishing regional fishing regimes and may adjust allowable catches accordingly, to assure rebuilding by 1998;
- (g) manage all salmon fisheries in Alaska, British Columbia, Washington and Oregon, so that the bulk of depressed stocks preserved by the conservation program set out herein principally accrue to the spawning escapement;

(h) establish, at the conclusion of the chinook rebuilding program, fishery regimes to maintain the stocks at optimum productivity and provide fair internal allocation determinations. It is recognized that the Parties are to share the benefits of coastwide rebuilding and enhancement, consistent with such internal allocation determinations and this Treaty; and,

(i) exchange annual management plans prior to each season.

2. The Parties agree that enhancement efforts designed to increase production of chinook salmon would benefit the rebuilding program. They agree to consider utilizing and redirecting enhancement programs to assist, if needed, in the chinook rebuilding program. They agree that each region's catches will be allowed to increase above established ceilings based on demonstrations to the Commission and assessment by it of the specific contributions of each region's new enhancement activities, provided that the rebuilding schedule is not extended beyond 1998, and provisions of Subsection 1(e)(vi) of this Chapter are adhered to.

3. The Parties shall submit a report to the Commission by December 1991 which presents

(a) joint recommendations for chinook salmon escapement goals in the transboundary rivers;

(b) given the goals recommended in 3(a), a jointly accepted assessment of progress toward rebuilding chinook stocks in these transboundary rivers based on escapement data available through 1991, and the likelihood of achievement of these goals by 1998 and,

(c) cooperatively developed management actions to be identified by December 1991 and initiated in 1992 and following seasons to ensure rebuilding of chinook stocks in the transboundary rivers which are identified in 3(b) as requiring further management actions.

**PACIFIC SALMON COMMISSION
CHINOOK TECHNICAL COMMITTEE**

REPORT TCCHINOOK (92)-2

**CHINOOK TECHNICAL REPORT ON
PRELIMINARY 1991 CATCH AND
ESCAPEMENT**

FEBRUARY 13, 1992

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1.0 1991 CHINOOK SALMON CATCHES IN FISHERIES WITH CEILINGS

Estimates of 1991 catch for each fishery managed under a harvest ceiling established by the Pacific Salmon Commission (PSC) are presented below. These data are preliminary, but major changes are not expected. Catches in all chinook fisheries of interest to the PSC are documented in Table 1.

(numbers x 1,000) Compiled with information available as of February 3, 1992.

Area/Fisheries a/	Ceiling	Catch	Difference	
			Numbers	Percent
S.E. Alaska (T,N,S) b/	273	299.3	+26.3	+9.6%
North/Central B.C. (T,N,S) c/	273	301.4	+28.4	+10.4%
West Coast Vancouver Island (T)	360	195.7	-164.3	-45.6%
Strait of Georgia (T,S)	275	144.3	-130.7	-47.5%

a/ T=Troll; N=Net; S=Sport

b/ The actual total catch was 364,900 chinook, including a hatchery add-on of 65,500.

c/ Excludes 6,057 chinook caught in terminal areas in 1991, which Canada proposes to exclude from the ceiling.

2.0 CUMULATIVE DEVIATIONS FROM CATCH CEILINGS

A 7.5% cumulative management range was established by the PSC in 1987. Annual catches (without add-on) and deviations from catch ceilings since 1987 are as follows:

(numbers x 1,000) Compiled with information available as of February 3, 1992.

Area/Fisheries	Ceiling	Catch					Total Deviation	Cumulative Deviation	
		1987	1988	1989	1990	1991		Numbers	Percent
S.E. Alaska (T,N,S) a/	263 b/	265.2	255.2	264.4	318.5	299.3	+38.6	+38.6	+14.7% c/
North/Central B.C. (T,N,S) d/	263 b/	283.0	245.6	303.0	254.0	301.4	+23.0	+23.0	+8.7% c/
West Coast Vancouver Island (T)	360	378.9	408.7	203.7	295.5	195.7	-318.0	-27.0	-7.5% c/
St. of Georgia (T,S)	275	159.0	138.7	162.0	144.3	147.5	-623.5	-20.6	-7.5% c/

a/ S.E. Alaska catches exclude hatchery add-ons of 16,700, 23,700, 26,700, 48,300, and 65,500 for 1987, 1988, 1989, 1990, and 1991 respectively.

b/ The 1990 ceiling was 302,000, and the 1991 ceiling was 273,000.

c/ These overages exceed the 7.5% management range.

d/ Catches exclude 4,819, 5,549, and 6,057 chinook caught in terminal areas in 1989, 1990, and 1991, respectively, for a total of 16,425.

e/ Negative deviations below the 7.5% management range can not be accumulated.

3.0 REVIEW OF FISHERIES WITH CATCH CEILINGS

3.1 S.E. Alaska Fisheries

In 1991, S.E. Alaska fisheries were managed under the following provisions established by the Pacific Salmon Commission:

- (1) an all gear base catch ceiling of 263,000 plus 10,000 chinook salmon;
- (2) an Alaska hatchery add-on calculated on the basis of coded wire tag sampling;
- (3) a 7.5% management range, calculated in numbers of fish, for cumulative deviations from the base catch ceiling since 1987; this is equivalent to +/- 19,700 chinook salmon for a 263,000 base catch ceiling; and
- (4) a limit of 40,000 chinook, excluding Alaska hatchery add-on, to be taken in June fisheries.

Preliminary data for 1991 indicate the following:

- (1) The total all gear catch (commercial and recreational) was 364,900 chinook salmon, including a hatchery add-on of 65,500.
- (2) The preliminary estimate of the 1991 Alaska hatchery add-on, calculated on the basis of coded-wire-tag recoveries, was 65,500. The add-on was calculated as the estimated total Alaska hatchery harvest of 79,500 reduced by 5,000 for pre-Treaty hatchery harvest and by 9,000 (preliminary) for the risk adjustment.
- (3) The deviation of the 1991 S.E. Alaska chinook salmon catch from the catch ceiling was +26,300. The total cumulative deviation is +38,600 (+14.7% of the catch ceiling). This overage exceeds the 7.5% management range.

Troll Fisheries: The 1991 total troll harvest of chinook salmon was 263,700 of which 38,200 were of Alaskan hatchery origin.

The winter troll fishery was open from October 1, 1990 to April 14, 1991; 42,400 chinook salmon were harvested. A total of 10,100 (23.8%) of these chinook were produced by Alaskan hatcheries. The winter troll fishery takes place entirely within the surfline. Both effort and catch have been low, often due to poor weather and the short number of hours available each day for trolling. The catch has averaged less than 15% of the total annual troll harvest.

During June, experimental, hatchery access, and terminal troll fisheries were conducted. The experimental fisheries are designed to increase the harvest of chinook salmon

produced in Alaskan hatcheries by allowing trolling for 2 to 3 days per week in small areas in the migratory path close to the hatchery. The hatchery access fishery was designed to increase the harvest of Alaskan hatchery chinook salmon while providing general access to wild S.E. Alaska stocks. Terminal fisheries occurred directly in front of hatcheries or remote release sites

The June fisheries were managed in-season to maximize the catch of Alaskan hatchery chinook and to comply with a limit of 40,000 non-Alaskan hatchery chinook.

Eight different areas were open 9 days each for the experimental fishery. A total of 13,900 chinook salmon were harvested of which 6,600 (47.5%) were produced in Alaskan hatcheries. This was the largest catch since the inception of the fishery in 1986.

The first hatchery access opening in 1991 occurred from June 5 through 7. However, those waters just east of the surfline (in Districts 103 and 113) were open only 2 days. A total of 22,500 chinook salmon were caught during this period, of which 6,000 (26.7%) were from Alaskan hatcheries. The second opening was scheduled for just 1.5 days in all waters. During this period, a total of 23,900 fish were harvested, of which only 3,100 (13.0%) were from Alaskan hatcheries.

A total of 6,000 chinook salmon were harvested in terminal areas. All of these fish are assumed to be of Alaskan hatchery origin.

The total June catch was 66,300 of which 21,700 (32.7%) were from Alaskan hatcheries. A total of 44,600 chinook salmon harvested in June were not of Alaskan hatchery origin. This was 4,600 chinook over the 40,000 limit stipulated in the Treaty.

The general summer troll season began on July 1 and continued through noon on July 8 (7.5 days). A total of 154,000 chinook salmon were harvested, of which 6,400 (4.2%) were from Alaskan hatcheries. Following the closure of the chinook salmon harvest, areas of high chinook salmon abundance were closed. There was also a 10 day closure of all trolling in mid-August. Trolling for all species closed on September 20. There were a total of 64.5 days of chinook non-retention.

An additional 1,000 chinook were taken in the Annette Island troll fishery, throughout the October 1 through September 30 catch accounting period.

Net Fisheries: Net fisheries had a guideline harvest of 20,000 chinook salmon plus Alaska hatchery add-on. Catches of chinook salmon in the net fisheries are incidental to the harvest of other species and constitute only a fraction (< 1%) of the total net harvest. Purse seine and set net fisheries are managed by non-retention periods. Retention in the purse seine fishery occurs during periods of expected high pink salmon abundance. Night closures are used in the drift fill net fishery to slow down the harvest. In 1991, the net fisheries harvested a total of 32,700 chinook salmon of which 10,900

were Alaskan hatchery chinook harvested in terminal fisheries and 3,800 were Alaskan hatchery chinook harvested in non-terminal fisheries.

Recreational Fisheries: There is no guideline harvest level established for recreational fisheries. These fisheries are managed under a 2 fish-per-day bag limit and a 28" minimum size limit. An estimate of the final harvest will not be available until mid-1992; however, the preliminary projection is 68,400 chinook salmon, of which 26,700 are estimated to be from Alaskan hatcheries. The recreational harvest has increased tremendously during the last several years with harvests of 26,200, 31,100, and 51,200 in 1988, 1989 and 1990, respectively.

3.2 Canadian Fisheries

The minimum size limit for troll fisheries remained at 62 cm fork length in the Strait of Georgia and at 67 cm fork length in all other areas. Catch statistics for commercial fisheries are based on sales slips accumulated through December 31, 1991. These data are preliminary.

North/Central B.C.: The 1991 North/Central B.C. fisheries were managed under the following provisions:

- (1) an all gear base catch ceiling of 263,000 plus 10,000 chinook salmon; and
- (2) a 7.5% management range, with cumulative deviations calculated since 1987. Based on preliminary 1990 catch estimates and terminal exclusion calculation procedures, the cumulative deviation at the beginning of the 1991 season was estimated at -5,400.

The preliminary 1991 all-gear catch was 301,400, excluding terminal exclusions of 6,057. These preliminary catch statistics indicate a 1991 catch deviation of +28,400, and a cumulative deviation through 1991 of +23,000 chinook (+8.7% of the catch ceiling). This overage exceeds the 7.5% management range.

Terminal exclusions, as allowed in the Letter of Transmittal, are calculated as follows:

Area	Base	1991 Catch	1991 Exclusion
Skeena	2,900	7,283	4,383
Bella Coola	2,950	4,624	1,674
Kitimat	2,400	2,305	0
Total			6,057

Troll Fisheries: The 1991 troll fishery opened for all species on June 28. There was a four day closure from August 7 through August 10, prior to opening for retention of Fraser River bound sockeye. The management objective for the troll fishery in 1991 was a chinook catch ceiling of 203,300. A number of management actions were taken during the troll fishery to meet this objective, including:

- (1) The west coast of Queen Charlotte Islands south of Buck Point and Areas 107-2, 107-3, 108-111 and 11 were closed to all trolling August 20-24.
- (2) On August 27 all of Area 2W, Area 142, and the area known as the "Red Line" in Area 1 were closed to trolling to slow the chinook catch rate.
- (3) On September 3, the entire North Coast (Areas 1-11, 30) was closed to possession and retention of chinook.
- (4) Also, on September 3 a large portion of Hecate Strait was closed to prevent chinook shaking problems.

Trolling for all species closed on September 30, for a total of 27 days of chinook non-retention. The preliminary catch of chinook in North/Central B.C. troll fisheries was 219,967 (data to Dec. 1, 1991).

Net Fisheries: Catch of chinook in North/Central areas was 54,750. Catches by fishery were 6,430 in the Queen Charlotte Islands, 31,870 for the Skeena/Nass and 16,450 in the Central Coast. These catches are the preliminary total catches of chinook >5 lb. including the catch eligible for terminal exclusion.

Recreational Fisheries: The tidal water sport fishery catch of chinook was 32,700. Catch by fishery was 15,200 for the Queen Charlotte Islands, 4,300 for the Skeena/Nass and 13,200 for the Central Coast.

West Coast Vancouver Island (WCVI) Troll:

In light of the below average forecast of chinook abundance to the WCVI troll fishery in 1991, Canada's main objective for the WCVI troll fishery was to manage the fishery in a manner consistent with the intent of the treaty and the rebuilding program. In addition, due to Canada's concern for the Harrison River chinook stock, the intent was to manage the fishery to maintain the 1985-87 average harvest rate. It was estimated that a fishery of approximately 77 days open for chinook retention would maintain the 1985-87 average harvest rate. The fishery opened on June 28 with all areas open except Areas F1, G and S (same areas as Fig. 1, page 11, TCCHINOOK (91)-3). There were four major area/time closures on the west coast of Vancouver Island in 1991:

- (1) Areas F1 and G closed from June 28 to July 14. This area closure was implemented in order to moderate the coho catch rate early in the fishery. Area F1 opened July 14. Area G opened for the duration of the sockeye fishery only (August 11 through August 20).
- (2) Complete closure to all trolling from August 7 through August 10 (4 days) prior to the sockeye fishery.
- (3) Complete closure to all trolling from August 21 through August 23 (3 days) following the sockeye fishery.
- (4) Areas F1, G and the waters easterly of Loran-C line 5990-Z-14740 closed August 24. This action was taken initially to slow coho catch rate. Following closure for coho retention on September 6, the area closure was maintained in order to prevent coho shaking problems.

Trolling closed on September 18, for a total of 76 days open to chinook fishing. There was no chinook non-retention period in 1991. Chinook catch in 1991 for the WCVI troll fishery was 195,700.

Strait of Georgia:

Troll: The management objective was a domestic catch ceiling of 31,000 chinook. The ceiling was reduced to this level in 1988 to achieve a 20% harvest rate reduction, relative to 1987 levels, as part of a conservation plan for lower Strait of Georgia chinook.

The troll fishery opened for chinook retention on June 27 and continued until August 1 without interruption. When an early season troll ceiling of 29,000 was reached, chinook non-retention and non-possession with single barbless hooks was implemented (August 2 through August 9). While the sockeye fishery was open, August 10 through August 19, barbed hooks were allowed, but non-retention and non-possession of chinook was still in effect. On August 20, retention of chinook salmon was again permitted. The objective was to allow for incidental chinook catch during the remainder of the 1991 season. The chinook catch rate proceeded at a faster rate than anticipated and the ceiling of 31,000 was obtained September 12. Beginning September 13 and continuing until the season closed September 30, chinook non-possession and non-retention was in effect. There were a total of 36 chinook non-retention days. Chinook catch by trollers was 32,000.

Recreational: The 1991 management objective for the Strait of Georgia recreational fishery was to maintain a 20% harvest rate reduction, relative to 1987 levels, on lower Strait of Georgia chinook. Consequently, the management plan implemented in 1989 was continued in 1991. This plan consists of the following management actions:

- (1) An annual bag limit of 15 chinook and a size limit of 62 cm was implemented for the area north of Cadboro Point (north of Victoria in Statistical area 19B), including Johnstone Strait. These measures represent an increase in the bag limit (from 8 to 15) for the Strait of Georgia recreational fishery compared to 1988.
- (2) For Johnstone Strait, the daily bag limit was reduced from 4 to 2 chinook, the season limit was reduced from 30 to 15, and the size limit was increased from 45 cm to 62 cm, relative to 1988.

The estimated 1991 catch in the creel survey area (including the Victoria area but excluding Johnstone Strait) was 115,500. Effort in 1991 totalled 466,700 boat trips, which is about 20% less than the 1986-90 average effort level.

An evaluation of the lower Strait of Georgia chinook conservation program is currently in progress.

4.0 REVIEW OF OTHER FISHERIES

4.1 Canadian Fisheries

Transboundary Rivers: Chinook catch in the Canadian gillnet fishery was: Taku River, 1,177 chinook adults and 432 jacks, and Stikine River, 850 chinook adults and 400 jacks. The catch of chinook in these rivers is limited to incidental catch during catch of the allowed harvest of sockeye salmon.

Southern B.C. Commercial Net:

Area (Stat. Area)	Catch (chinook > 5 lb.)
Johnstone Strait (11-13)	13,000
Strait of Georgia (14-19)	1,200
Fraser River (28,29)	13,100
Juan de Fuca Strait (20)	7,000
Barkley Sound (23)	54,000
Other WCVI (21,22,24-27)	200

The catch of chinook in all of these net fisheries is limited to their incidental catch during fisheries on sockeye, pink, or chum, with the exception of the August/September

gillnet fishery in Alberni Inlet (Area 23). This fishery is a terminal gillnet fishery for returns to the Robertson Creek Hatchery. Small numbers of chinook may also be harvested incidentally during gillnet and seine fisheries on sockeye salmon in Barkley Sound in July. Management of southern B.C. net fisheries has an objective to reduce the base period harvest rate on chinook by 25% (an obligation in the PSC chinook rebuilding program). Further, the Johnstone Strait net fisheries have the added objective of reducing harvest rates since 1987 by an additional 20% as part of the conservation program for chinook stocks in the lower Strait of Georgia.

In all the fisheries, regulations and research programs are attempting to limit the incidental mortality of juvenile chinook and coho. Fishing time, location, and gear are limited in southern B.C. net fisheries to conserve juvenile and adult chinook salmon. In Johnstone and Juan de Fuca Straits, known areas of high chinook vulnerability are closed and minimum depth strata are set to reduce the catch of juvenile chinook and coho. In Juan de Fuca, a maximum number of juvenile chinook and coho salmon per set has been established, beyond which the fishing area is further restricted or even closed. Chinook catch in the Fraser River area is usually limited to gillnet fishing and chinook catch is incidental.

Exploitation rate analyses reported by the Chinook Technical Committee in 1991 (TCCHINOOK (91)-1, Feb. 8, 1991) indicated that southern B.C. net fisheries (i.e., non-ceiling B.C. fisheries) have successfully reduced their aggregate exploitation rate on indicator chinook stocks.

Area 12 Troll: Catch is reported as 1,200 chinook. This fishery is a small localized group of trollers at the southern limit of Queen Charlotte Sound. The fishery is limited to a catch ceiling of 2,000 chinook.

Tidal Recreational: The catch estimate for the 1991 Barkley Sound recreational fishery is 80,200, of which 43,400 were taken in the terminal fishery inside Alberni Canal and 36,800 in Barkley Sound. The survey period covered from July 15 through September 30. The early to mid-summer fishery primarily occurs in outer Barkley Sound and is limited by size limit, catch per day, and possession limits. The Alberni Canal portion occurs primarily in August and is directed on returns to the Robertson Creek hatchery. Catch estimates for sport fisheries in Johnstone Strait are not yet available, although a creel survey was conducted last year. Catch estimates for sport fisheries off WCVI are not available.

Non-tidal Recreational: Non-tidal recreational fisheries occur in most B.C. rivers, including the Alsek, Skeena, Nass, Kitimat, Bella Coola, Somass and Fraser Rivers and various streams on the east coast of Vancouver Island. Most of these fisheries are small, localized fisheries to provide the local public with some access to salmon fishing. Recent fisheries in the upper Fraser have been limited to the larger chinook populations which

have responded well to the chinook rebuilding program. Each localized fishery in the Fraser has an established catch ceiling.

Chinook catch was estimated at 388 in the Alsek, 8,000 in northern B.C. rivers (Areas 1-10), and 1,500 in the Upper Fraser only. Chinook fisheries occurred in 7 areas of the Upper Fraser River (Bowron, Quesnel, Bridge, Clearwater, Shuswap, South Thompson, Thompson). Sport catches also occur in the Vedder-Chilliwack River and Lower Fraser mainstem, but were not assessed in 1991 due to inadequate resources.

Indian Food Fisheries:

Fishing Area	Adult Catches	Jack Catch
North/Central B.C.	23,800	-
Somass River	23,800	-
Fraser River	16,854	-
Stikine	753	310
Alsek	336	-
Cowichan	200	-
Squamish	1,095	-

The 1991 Fraser River catch was equal to the 1980-89 average of 16,700. Catches in the Cowichan and Squamish Rivers were down 23% from the 1,676 reported for 1990 and about equal to the 1989 catch level.

Each of these fisheries involves directed chinook fishing periods and the incidental catch of chinook during fisheries on other species. Small portions of the catch may be taken in marine waters, with the exception of the Stikine and Alsek catches. Catch in these fisheries is mostly limited by fishing time, but allocation to meet Native food fishing requirements is the first priority use of allowable catches.

4.2 U.S. Fisheries

Strait of Juan de Fuca: As in previous years, management measures were taken in the Strait of Juan de Fuca and other mixed stock areas to protect depressed spring chinook stocks. No directed spring chinook fisheries were permitted and no commercial fisheries were permitted during the spring chinook management period (April 15-June 15). Recreational fisheries were also restricted by a maximum size limit of 30 inches. Further actions were taken in all mixed stock areas to protect depressed summer/fall stocks from Puget Sound. It was recognized that the combined actions for chinook salmon should

also serve to protect depressed Canadian-origin chinook stocks (primarily Fraser River runs).

Preliminary estimates of 1991 net catch in the Strait of Juan de Fuca total 3,100 chinook, compared to 5,200 in 1990. These fisheries take chinook incidental to harvest of other species. Preliminary estimates of 1991 tribal troll catch in the Straits (Areas 4B, 5, and 6C) total 34,800 chinook compared to 45,700 caught in 1990. This is a chinook directed fishery. Note that tribal troll catch estimates from this area do not include tribal catch in Area 4B during the May 1-September 30 PFMC management period; catches during this period are included in the North of Cape Falcon troll summary.

Recreational catch estimates for 1991 and 1990 in Areas 5 and 6 are not available at this time. In 1991, about 400 chinook were caught in the Area 4B state waters fishery, after the PFMC fishery, compared to 400 in 1990. Preliminary 1989 recreational chinook catch for Areas 5 and 6 is estimated at 52,300, compared to 39,300 in 1988.

San Juan Islands: Preliminary 1991 estimates of chinook net catch in the San Juan Islands total 13,700, compared to 9,300 in 1990. Recreational catch estimates for 1991 and 1990 in Area 7 are not available at this time. Preliminary 1989 recreational chinook catch for Area 7 is estimated at 9,500, compared to 9,400 in 1988.

Puget Sound: The status of Puget Sound spring chinook stocks continued to be poor in 1991. As in past years, recreational and commercial fisheries in Puget Sound were regulated by time and area closures to avoid all direct harvest and minimize incidental harvest of these depressed stocks. Some directed harvest was allowed on a few Puget Sound summer/fall stocks. However, several terminal areas, including Area 8 (located near the mouth of the Stillaguamish and Snohomish Rivers), did not have directed chinook net fisheries in order to protect depressed summer/fall stocks.

Preliminary estimates of 1991 net catch in Puget Sound marine areas total 69,100 chinook, compared to 150,300 in 1990. Preliminary estimates of 1991 catch in Puget Sound freshwater areas total 18,100 chinook, compared to 28,700 in 1990.

Puget Sound recreational catch estimates for 1991 and 1990 are not available at this time. Recreational fisheries were managed in the same general manner as in recent years. Preliminary recreational chinook catch for 1989 in Areas 8-13 is estimated at 66,500, compared to 59,600 in 1988.

Washington Coast: In 1991, terminal runs of northern Washington coastal stocks were above minimum spawning levels, allowing both commercial and recreational directed chinook fisheries in terminal areas. Preliminary 1991 estimates of Grays Harbor and Willapa Bay net catch total 42,300 chinook, compared to 41,600 in 1990. Preliminary 1991 estimates of commercial net fisheries in north coastal rivers total 11,800 chinook, compared to 16,300 in 1990.

A small recreational fishery has historically occurred in the Grays Harbor estuary. In 1991, effort and catch in this fishery increased significantly in response to the large coho run returning to Grays Harbor. This fishery was sampled through September 29, and the estimated catch is approximately 400 chinook. Catch from this fishery is not included in Table 1.

Ocean Fisheries North of Cape Falcon: In 1991, ocean commercial and recreational fisheries operating in the Pacific Fisheries Management Council (PFMC) region north of Cape Falcon were constrained by domestic quotas for both chinook and coho salmon. Chinook quotas were established taking into account the need to protect several severely depressed chinook stocks, particularly Upper Columbia River runs. Separate quotas were established for the tribal troll and non-tribal fisheries.

Under PFMC quota management, ocean fisheries are terminated either when coho or chinook quotas are achieved or when seasons expire. Overall, in 1991, chinook catch success was poor, consistent with 1991 pre-season expectations for low abundance of key stocks. Fisheries closed when coho quotas were reached and chinook quotas were not fully harvested. Preliminary estimates of 1991 tribal troll chinook catch total 21,400, 65% of the 33,000 chinook quota and down from 31,400 in 1990. Preliminary recreational catches are estimated at 13,500 (1,000 Oregon and 12,500 Washington), about 34% of the 40,000 chinook quota and down from 33,100 in 1990. Preliminary estimates of non-tribal troll chinook catch total 29,700 (900 Oregon and 28,800 Washington), about 74% of the 40,000 chinook quota and down from 33,100 in 1990. Approximately 27,300 of these non-tribal troll caught chinook were taken during the early season chinook fishery (May 1 through June 15, 1991).

In 1991, there was no experimental fishery conducted in the inside ocean waters north of Destruction Island to Cape Alava. In 1990, this fishery harvested a total of 11 chinook.

Columbia River: Since 1988, all in-river management of Columbia River fish runs and fisheries has been directly based on the Columbia River Fish Management Plan (CRFMP). "The purpose of this management plan is to provide a framework...to protect, rebuild, and enhance upper Columbia River fish runs while providing harvest for both treaty Indian and non-Indian fisheries" (CRFMP, 1988, p.2). The CRFMP specifies management goals, season timing, catch limits, and maximum incidental impacts for all depressed upriver runs of anadromous fish in the Columbia River.

The preliminary 1991 in-river commercial catch of spring and fall chinook is 109,834, compared to 147,000 in 1990 and 274,500 in 1989. Total freshwater recreational catch in 1991 (including a Buoy 10 catch of 11,600) is estimated to be 80,220 compared to 94,820 in 1990 and 96,878 in 1989.

The 1991 total catch of upriver spring chinook was 6,427 fish, consisting of 2,433 caught in the non-Indian sport and commercial fisheries and 3,994 caught in tribal Ceremonial

and Subsistence (C&S) fisheries. The CRFMP limits harvest impacts on upriver spring chinook run sizes between 50,000 and 128,800 to 4.1% of the run in the lower river non-Indian catch and 7.0% of the run in tribal C&S fisheries. The estimated 1991 impacts were 4.1% and 6.7% respectively.

There has not been a targeted in-river fishery on upriver summer chinook since 1964. In the past, incidental harvest of summer chinook has occurred during commercial sockeye fisheries. However, no commercial sockeye fisheries have occurred since 1988. There is a very small C&S catch of summer chinook. The total catch in 1991 is believed to be less than 50 fish.

Commercial catch of fall chinook in 1991 totaled 93,220 (41,550 in lower river non-Indian fisheries above Bonneville Dam). Management constraints imposed by the CRFMP included achieving the Spring Creek hatchery escapement goal of 8,200 adult chinook, an adult escapement of 40,000 Upriver Bright (including a Snake River component) chinook over McNary Dam, and providing a 50% share of the harvestable portion of the upriver fall chinook run to the treaty Indian fisheries. The Upriver Bright escapement goal for in-river management was increased by 5,000 chinook to 45,000 adults for 1990 and 1991 on an interim basis by agreement of the CRFMP parties to account for increased broodstock hatchery needs and because of concern for the Snake River wild component.

Ocean Fisheries Cape Falcon to Humbug Mountain: Ocean fisheries off Oregon's central coast primarily harvest a mixture of southern chinook stocks not involved in the PSC rebuilding program; these stocks do not migrate north into PSC jurisdiction to any great extent. Some stocks that spawn in Oregon coastal streams do migrate into PSC fisheries, including the Northern Oregon Coastal (NOC) stock aggregate. These north migrating stocks are harvested incidentally (probably < 10%) in Oregon ocean fisheries. The only troll fishery that predominately harvests the NOC stock aggregate is the late season near-shore fishery off the mouth of the Elk River. In both 1990 and 1991, this Elk River fishery was not conducted due to conservation concerns. Recreational catch estimates for 1991 are not available at this time.

5.0 PRELIMINARY REVIEW OF 1991 ESCAPEMENTS

Many chinook escapement estimates are still being calculated at this time. A brief overview is presented below and in Table 2, summarizing the information that is currently available. This information should be considered very preliminary.

5.1 S.E. Alaska and Non-Annex Transboundary Rivers

In 1991, the ADF&G estimated the total escapement for 30 of the 31 chinook salmon systems in S.E. Alaska (does not include the 3 annex transboundary rivers and excludes

the Chilkat River this year, as the survey methods are under review). The total escapement in these systems in 1991 was 12,600 chinook salmon. This is 77% of the total escapement goal of 16,470 chinook salmon. Of the 30 stocks for which escapement is estimated, 7 are used as CTC indicator stocks.

The 5 S.E Alaska indicator stocks (Table 2) had a total escapement of 2,466 chinook salmon in 1991. This is 67% of the total escapement goal for these rivers. Of the 5 stocks, only the Situk was above the escapement goal, the remaining escapements ranged from 30% to 85% of their respective escapement goals.

The 2 non-annex transboundary indicator stocks (Table 2) were both below escapement goals in 1991. Estimated escapement in the Unuk River increased over 1990 while the escapement decreased in the Chickamin relative to 1990.

5.2 Annex Transboundary Rivers

Following the review of chinook spawning escapements by the Transboundary Technical Committee (TCTR(91)-4, 11/27/91), ADF&G and CDFO have revised the escapement goals for the Alsek, Taku, and Stikine Rivers. In each river, an index stream or streams (6 in the Taku) have been selected and rebuilding escapement goals established for these indices. The selection of the index streams was based on the availability of the most accurate and most consistently collected data on spawning escapement.

In the Alsek River, a counting weir on the Klukshu River is used. The number of spawners is estimated by subtracting the Native catch above the weir from the weir count. The escapement goal now used (4,700) is the average between previous U.S. and Canadian goals for this tributary.

In the Taku River, aerial surveys of escapement have been conducted fairly regularly on six tributaries. The Taku escapement index is now the sum of the counts on these six streams. When data are missing for one stream, the index sum would be increased based on the historical proportion of the index represented by the stream with the missing data. The escapement goal (13,200) was determined as the sum of the largest escapements recorded in each stream between 1965 and 1981.

In the Stikine River, chinook escapement to the Little Tahltan River was selected as the escapement index. Escapements have been counted by aerial surveys since 1975 and using a weir since 1985. The escapement goal now used (5,300) was determined as the average between previous U.S. and Canadian goals (following revision of the U.S. goal by applying the agreed expansion factor of 2.0 to convert aerial counts to weir counts).

The 1991 escapements to the Annex Transboundary Rivers were similar to recent years. Compared to 1990, slight increases occurred in the Klukshu and Little Tahltan Rivers and a decrease for the combined Taku index.

5.3 Northern B.C. (Areas 1, 3, and 4)

In 1991, a substantial decrease in chinook escapements was observed to the Nass area, dropping below even the base period average. The basis for this drop is being investigated but likely resulted from increased Native catch in the Nass River and other fisheries in Statistical Area 3. Skeena chinook stock escapement was also slightly down from 1990, but still well above the escapement goal.

5.4 Central B.C. (Areas 6-10)

Since 1988, index escapements for Area 6 and Area 8 have been adjusted by eliminating rivers with substantial hatchery contributions. The escapement goals for these systems have been adjusted accordingly. Chinook escapements to Kitimat area (Area 6 Index) streams increased compared to 1990 but was still below escapements previous to 1990. Escapement to the Bella Coola area (Area 8 Index) natural streams in 1991 was up slightly from 1990 but still well below the escapement goal. Rivers Inlet was up from 1990 levels but the estimation procedure was changed in 1991 (a mark-recovery program has been implemented). The mark-recovery estimate is being used since Departmental staff were confident that chinook abundance had increased. Further, escapement estimates for the past few years at Rivers and Smith Inlets are under review because of a change in the Fishery Officer collecting the data; the present officer does not expand his visual counts of chinook whereas previous officers had. Chinook escapement to Smith Inlet was about the same as in 1990.

5.5 Southern B.C. (outside the Fraser River)

Chinook escapement to upper Strait of Georgia was up for the Nimpkish and Devereux River indicator stocks in 1991. The Nimpkish River increased to 1,800 from the 1990 escapement level of 1,200 and the Devereux increased from 250 in 1990 to 500 in 1991. The Wakemen and Kakweiken two other Upper Strait of Georgia indicator stock remained at the same level as 1990 with 300 and 150 spawners, respectively. The final indicator streams from upper Strait of Georgia, Kingcome, decreased to 250 in 1991 from the 1990 level of 300. Overall, chinook escapements were up slightly in 1991 from the 1990 level for upper Strait of Georgia but were still below average escapements for the mid to late 1980's, only slightly greater than the base level, and well below the goal.

The estimates of returns to the Lower Strait of Georgia stock increased substantially in the Cowichan and Squamish rivers but were down in the Nanaimo River. The return to the Cowichan River was the largest since 1979. Escapement increased in the Squamish but was associated with increased returns of enhanced chinook. The proportion enhanced and their distribution in the river will be reviewed.

The 1991 reported returns to west coast of Vancouver Island stocks increased slightly from 1990. The primary reason for this increase was due to returns to the Burman and Tahsis Rivers. The 1991 escapement estimate to the Burman River was 2,500 compared to 1,100 in 1990, and for the Tahsis was 1,400 versus 300 in 1990. However, the Marble River was down considerably to 1,000 spawners compared to 2,000 in 1990 and 4,500 in 1989.

5.6 Fraser River

The escapement of Fraser River indicator stocks showed small decreases in 1991 compared to 1990, with the exception of the Harrison River stock which had a substantial drop in escapement from 177,375 in 1990 to 86,500 in 1991. The Middle Fraser escapement estimate remained slightly above its escapement goal, but the Upper Fraser and Thompson stocks were below their goals. Although returns to the Harrison were about one half of the 1990 return, they were better than expected pre-season.

5.7 Puget Sound

Preliminary 1991 spawning escapement estimates are not yet available for most stocks. In 1990, escapements were up slightly for most Puget Sound stocks but below goal for all but the Skagit summer/fall and Green River fall stocks. It is expected that 1991 escapements will continue to be depressed. The preliminary 1991 escapement estimate for Skagit spring chinook is below that for 1990 and only 50% of the goal.

5.8 Washington Coast

The northern Washington coastal chinook stocks from the Quillayute (except summer run), Hoh, and Queets Rivers are managed on the basis of escapement floors and terminal area fishery harvest rates. Terminal area abundance for these stocks in 1991 was sufficient to allow directed harvest. Preliminary indications are that spawning escapement levels exceeded the established floors. Final escapement estimates for most stocks are not available at this time. The preliminary 1991 estimate for Grays Harbor spring chinook is slightly below the goal.

5.9 Columbia River

Escapement of Upriver Spring chinook over Bonneville Dam (adjusted for Zone 6 and C&S catch above the dam) was 53,000 adults, the lowest since 1984. Separation of the run into hatchery and wild components has not yet been accomplished. As an approximation, applying the 1986-90 average percent wild (35.8%) yields an estimate of 19,100 wild spring chinook, slightly down from the 1990 escapement of 20,100.

Escapement of Upriver Summer chinook continued to decline in 1991 from the peak count of 31,800 in 1987. The Bonneville Dam count was 18,800 adults, the lowest count since 1983, and a 25% reduction from the 1990 escapement of 25,000.

Upriver Bright fall chinook escapement over McNary Dam, while above the escapement goal of 40,000, continued to decline from the 1987 high of 154,100. Escapement totaled 46,600 adults through October 31, down 19% from the 1990 escapement of 57,600.

5.10 Oregon Coast

Spawning escapements into the 10 standard Oregon Coastal index streams were lower than the last three years, as indicated by counts of the peak number of live and dead fish seen during foot surveys of the spawning grounds. The spawner abundance index for the aggregated north migrating stocks was 93 fish per mile in 1991. This compares with 125 fish per mile in 1990, 150 fish per mile in 1989, and 221 fish per mile in 1988. The abundant 1984 brood year of this stock aggregate has completed its life cycle and subsequent broods have not survived as well, resulting in decreased spawner abundance in 1990 and 1991. Continued lower stock sizes are anticipated

TABLE 1. Summary of the 1988-1991 Chinook catches in fisheries relevant to the U.S./Canada Pacific Salmon Treaty (numbers in thousands of fish). Note: Catches for 1991 are preliminary (estimates as of 3-Feb-92).

Area	Troll				Net				Sport				Total			
	1991	1990	1989	1988	1991	1990	1989	1988	1991	1990	1989	1988	1991	1990	1989	1988
S.E. ALASKA a/	264	288	236	231	33	28	24	21	68	51	31	26	365	367	291	278
BRITISH COLUMBIA b/c/																
North/Cent. Coast	220	181	225	182	48	41	42	44	33	32	36	19	301	254	303	245
U. Vanc. Island d/	196	296	204	409	55	29	40	15	80	61	48	33	331	386	292	457
Georgia St./Fraser e/	32	32	29	20	14	15	24	8	116	112	133	119	162	159	186	147
Johnstone St.	1	2	2	2	13	18	29	6	10	10	10	10	24	30	41	18
Juan de Fuca Strait	0	0	0	0	7	7	22	4					7	7	22	4
sub-total	449	511	460	613	147	110	157	77	239	215	227	181	825	836	844	871
WASHINGTON INSIDE f/																
Strait (mar) g/	35	46	65	49	3	5	10	10	NA	NA	52	39	NA	NA	127	98
San Juans (mar) h/	0	1	1	0	14	9	16	32	NA	NA	9	9	NA	NA	26	41
Other PS (mar+fw) i/	0	0	0	0	130	179	156	133	NA	NA	70	63	NA	NA	226	196
Coastal (mar+fw) i/	0	0	0	0	54	58	85	74	NA	NA	6	7	NA	NA	91	81
sub-total	35	47	66	49	201	251	267	249	NA	NA	137	118	NA	NA	470	416
COLUMBIA RIVER j/k/	-	-	-	-	110	147	275	489	80	95	97	110	190	242	372	599
WA/OR N OF FALCON l/	51	65	75	108	0	0	1	3	14	33	21	19	65	98	97	130
OREGON																
Inside Waters m/	0	0	5	4	-	-	-	-	NA	38	45	49	NA	38	50	53
GRAND TOTAL	799	911	842	1005	481	536	724	839	NA	NA	558	503	NA	NA	2124	2347

- a/ Southeast Alaska troll chinook catches shown for Oct. 1 - Sept. 30 catch counting year.
- b/ British Columbia net catches includes only fish over 5 lb. round weight. Native food fishery catches are not included. 1989, 1990, and 1991 exclude catch from terminal gillnet fisheries (3 year total of 16,425) which are excluded from the catch ceiling.
- c/ Sport catches are for tidal waters only.
- d/ Estimates of WCVI tidal sport catches are from creel surveys in Barkley Sound only. Survey times and areas may vary from year to year.
- e/ Georgia Strait sport catches include Juan de Fuca Strait sport catches.
- f/ All WA inside sport numbers adjusted for punch card bias. See "1988 WA State Sport Catch Report" for details.
- g/ Strait troll catch includes all catch in areas 5 and 6C and catch in area 4B outside of the PFMC management period (Jan.- May and Oct.- Dec.).
- h/ San Juan net catch includes catch in areas 6, 6A, 7 and 7A; sport catch includes area 7.
- i/ Coastal and Puget Sound sport catches include marine and freshwater, but only adults in freshwater.
- j/ Columbia River net catches include Oregon, Washington and treaty catches, but not ceremonial.
- k/ Columbia River sport catches include adults only, for Washington, Oregon, Idaho and Buoy 10 anglers.
- l/ North of Falcon troll catch includes catch in area 4B during the PFMC management period (May-Sept.).
- m/ Troll = late season troll off Elk River mouth (Cape Blanco); sport = estuary and inland (preliminary for 1990).

TABLE 2. Summary of the 1987-1991 escapement of Pacific Salmon Commission Chinook Escapement Indicator Stocks. Escapements for 1991 are very preliminary (estimates as of 3-Feb-92).

Production Unit	Stock Type	Ave Esc. Base a/	Esc. Goal	1987 Esc.	1988 Esc.	1989 Esc.	1990 Esc.	1991 Esc.	1991 % Base	1991 % Goal
S.E. Alaska										
Situk	Spring	1,299	600	1,884	885	652	700	875	67%	146%
King Salmon	Spring	92	250	193	206	238	168	134	146%	54%
Andrew Creek	Spring	379	750	1,042	752	848	1,062	640	169%	85%
Blossom	Spring	163	1,280	2,158	614	550	411	382	234%	30%
Keta	Spring	325	800	1,229	920	1,848	970	435	134%	54%
Transboundary Rivers Not Addressed in Treaty Annexes										
Unuk (U.S.)	Spring	1,469	2,880	3,157	2,794	1,838	946	1,221	83%	42%
Chickamin (U.S.)	Spring	338	1,440	1,560	1,258	1,494	902	779	231%	54%
Transboundary Rivers Addressed in Treaty Annexes										
Klukshu R. (Alsek)	Spring	2,696	4,700	2,615	2,018	2,456	1,915	2,489	92%	53%
Taku Index	Spring	4,582	13,200	5,743	8,626	9,480	12,249	10,153	222%	77%
Little Tahltan (Stikine)	Spring	1,945	5,300	4,783	7,292	4,715	4,392	4,500	230%	85%
B.C. North Coast										
Yakoun River	Summer	788	1,580	2,000	2,000	2,800	2,000	1,900	241%	120%
Nass area	Spr/Sum	7,944	15,890	11,431	10,000	12,525	12,103	4,017	51%	25%
Skeena area	Spr/Sum	20,883	41,770	59,120	68,705	57,202	55,976	52,753	253%	126%
B.C. Central Coast										
Area 6 Index	Summer	2,760	5,520	1,566	3,165	998	281	709	26%	13%
Area 8 Index	Spring	2,725	5,450	1,456	1,650	2,535	2,385	2,470	91%	45%
Rivers Inlet	Spr/Sum	2,475	4,950	5,239	4,429	3,265	4,039	6,500	263%	131%
Smith Inlet	Summer	1,055	2,110	1,050	1,050	225	510	500	47%	24%
West Coast Vancouver Island Indicator Stocks										
Fraser River	Fall	5,832	11,670	3,545	5,725	7,720	6,110	6,440	110%	55%
Upper River	Spring	12,229	24,460	39,420	34,248	25,310	35,907	21,757	178%	89%
Middle River	Spr/Sum	9,216	21,130	27,330	24,164	15,095	26,060	21,255	231%	101%
Thompson River	Summer	22,059	55,710	36,730	47,103	37,975	41,995	36,307	165%	65%
Harrison River	Fall	120,837	241,700	78,038	35,116	74,685	177,375	86,500	72%	36%
Georgia Strait										
Upper	Sum/Fall	2,546	5,100	5,700	3,300	6,600	2,200	2,850	112%	56%
Lower	Fall	11,139	22,280	2,530	6,914	6,830	7,605	11,645	105%	52%
Puget Sound										
Skagit	Spring	1,217	3,000	2,108	1,988	1,853	1,902	1,495	123%	50%
Skagit	Sum/Fall	13,265	14,900	9,647	11,954	6,776	17,206	NA		
Stillaguamish	Sum/Fall	817	2,000	1,321	717	811	842	NA		
Snohomish	Sum/Fall	5,028	5,250	4,689	4,513	3,138	4,209	NA		
Green	Fall	5,723	5,800	10,338	7,994	11,512	7,035	NA		
Washington Coast										
Hoh	Spr/Sum	1,325	NA b/	1,700	2,600	4,800	3,900	NA		
Queets	Spr/Sum	925	NA b/	600	1,800	2,600	1,800	NA		
Grays Harbor	Spring	425	1,400	900	3,500	2,100	1,600	1,289	303%	92%
Grays Harbor	Fall	8,575	14,600	18,800	28,200	26,100	17,475	NA		
Quillayute	Summer	1,275	1,200	600	1,300	2,200	1,300	NA		
Quillayute	Fall	5,850	NA b/	12,400	15,200	10,000	13,700	NA		
Hoh	Fall	2,875	NA b/	4,000	4,100	5,100	4,200	NA		
Queets	Fall	3,875	NA b/	6,000	7,600	8,900	10,100	NA		

TABLE 2 continued.

Production Unit	Stock Type	Ave Esc. Base a/	Esc. Goal	1987 Esc.	1988 Esc.	1989 Esc.	1990 Esc.	1991 Esc.	1991 % Base	1991 % Goal
Columbia River										
Upper River	Spring	28,050	84,000	41,400	35,100	27,000	20,100	19,100	c/ 68%	23%
Upper River	Summer	23,100	85,000	31,800	30,100	28,700	25,000	18,800	81%	22%
Lewis River	Fall	13,021	NA	12,900	12,100	21,200	17,500	12,000	92%	
Upriver Bright	Fall	28,325	40,000	154,100	114,700	96,500	57,600	46,600	165%	117%
Oregon Coast										
Aggregate Index d/	Fall	91	NA	131	221	151	125	93	101%	

a/ Base period for Alaskan and Transboundary stocks 1975-80; base for all other stocks 1979-82.

b/ Stocks managed on the basis of an escapement floor and fixed harvest rates.

c/ Based on average wild proportion of total adult escapement.

d/ Oregon coastal north-migrating chinook stocks are assessed in terms of spawners per mile survey units.

CHINOOK SALMON FISHERIES AND HARVESTS IN SOUTHEAST ALASKA

Informational Report to the Alaska Board of Fisheries

January, 1992

Prepared By:

Alaska Department of Fish and Game

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SYNOPSIS

On November 21, 1991, the Alaska Trollers Association submitted a request to the Alaska Board of Fisheries for a change of agenda. The Alaska Trollers Association asked specifically to consider 5 AAC 33.365, The Southeast Alaska-Yakutat Chinook and Coho Salmon Troll Fisheries Management Plan and 5 AAC 33.311 Fishing Seasons and Periods for Troll Gear. The request asks that 5 AAC 33.365 be amended by "allocating a percentage of the U.S./Canada Salmon Treaty chinook salmon quota to the commercial troll fleet" and that 5 AAC 33.311 be amended by "granting the Department, in consultation with affected fisherman, the authority to make specific modifications to the June troll fishery".

The request to consider modifications to 5 AAC 33.365 stems from a recent trend of a decrease in the portion of the Southeast Alaska chinook salmon all gear harvest ceiling established by the Pacific salmon Commission, going to trollers. Currently, only the net groups have received an allocation by the Board of Fisheries (20,000 base plus Alaskan hatchery add-on). The recreational harvest has no board specified limit and is restricted only by bag and size limits. A projection of the recreational harvest is made each year prior to the general summer troll season (beginning July 1). This number, along with the net allocation is subtracted from the all-gear PSC ceiling. The number is further adjusted for any prior years' ceiling overages or underages and the troll fishery is then managed to target this amount. This request would establish a percentage of the all gear PSC ceiling for the trollers and indirectly establish one for the recreational fishery.

The request to consider modifications to 5 AAC 33.311 results from a desire to keep as many chinook salmon as possible available for the general summer fishery. Currently, the June fisheries are designed primarily to harvest returning Alaska hatchery chinook salmon and to provide some general access to Southeast Alaska wild stocks. During 1991, there was a 40,000 non Alaskan hatchery chinook ceiling, established by the Board, placed on the June fisheries. During 1991, a large portion of the June harvest occurred in areas with low percentages of Alaska hatchery chinook salmon and the 40,000 ceiling was exceeded by 6,000. This request would seek to limit both the open area and ceiling for the June fisheries.

BACKGROUND

Chinook salmon fisheries have occurred in Southeast Alaska since the 1890's. The troll and net fisheries have been the primary harvesters although trap fisheries harvested chinook salmon until statehood (and still do at Annette Island) and recreational fisheries undoubtedly took place throughout the whole period. Until the 1970's, there was only minimal management action on any of these fisheries. Active management programs to rebuild depressed native Alaskan stocks began during the mid 1970's and included closures of the troll fishery for coho salmon, closure of directed gill net chinook salmon fisheries and establishment of a size limit on recreational chinook salmon beginning in 1976. Later during the early 1980's, commercial harvests became limited by ceilings, first by the North Pacific Fisheries Management Council (NPFMC) (Table 1). This was soon followed by further limitations by the Alaska Board of Fisheries (Board). Finally, since 1985, the fisheries have been managed under chinook harvest ceilings established by the Pacific Salmon Commission (PSC) under terms of the Pacific Salmon Treaty (PST).

The Commission-established ceilings apply to all gears combined, including all commercial and recreational fisheries. Allocations between gear types are left to the discretion of the Alaska Board of Fisheries. Alaska hatchery produced chinook salmon may be harvested in addition to the "base" ceilings. [Note: In the remainder of this discussion, unless otherwise noted, chinook harvests and ceilings will refer to "base" harvests and ceilings exclusive of Alaska hatchery chinook.]

Treaty ceilings are also established for a number of Canadian fisheries. Non-ceilinged fisheries in Canada and the Pacific Northwest are managed under Treaty "pass-through" provisions. These require that the bulk of savings of depressed natural chinook stocks resulting from imposition of ceilings be passed through intervening fisheries to spawning grounds. The purpose of the Treaty's ceilings and pass-through provisions are to rebuild depressed natural chinook stocks over a 15-year period, or by 1998.

Current Treaty provisions for chinook salmon apply through the 1992 season; new agreements must be renegotiated prior to the 1993 season. Negotiations will begin in November 1992 and are scheduled to be completed by February 1993, however, additional negotiations may be required. The Commission is considering alternative management approaches for chinook salmon which, if implemented, would automatically adjust ceilings based on variations in annual chinook abundance.

CURRENT CHINOOK AGREEMENT

The current two-year chinook annex establishes all-gear base harvest ceilings of 273,000 and 263,000 for Southeast Alaska fisheries in 1991 and 1992 respectively. As noted above, Alaska hatchery chinook may be taken in addition to these base ceilings. The Treaty also requires that cumulative deviations from the harvest ceilings since 1987 be limited to no more than 7 1/2% of 263,000 chinook, or about 20,000 fish. If cumulative deviations exceed this management range, harvests must be reduced the following year to bring the cumulative deviation back within the management range. The Treaty establishes no penalty for such an overage provided it is not allowed to exceed the range for more than one year.

SOUTHEAST ALASKA CHINOOK HARVESTS AND CEILING OVERAGES

Excluding Alaska hatchery chinook harvests, the 1991 "base" harvest of 299,000 chinook by all Southeast Alaska fisheries exceeded the 273,000 ceiling by 26,000 fish. Combined with a 1987-90 cumulative deviation of about 12,000, this resulted in a cumulative overage through 1991 of about 38,000 fish. These overages were a result of greater than expected harvests in the recreational fishery which were not reported until October, 1991. This exceeds the 7 1/2% or 20,000 management range by 18,000 fish. (This is the first year since 1987, when the management range was established, that ceiling overages in Southeast Alaska have exceeded that range.) Treaty provisions require that the 1992 Southeast Alaska base harvest be reduced below the established 263,000 ceiling by at least 18,000 chinook to compensate for past deviations.

From a practical management standpoint, the Department will have to target the 1992 chinook harvest somewhat below the maximum allowable Treaty harvest of 245,000 (= 263,000 - 18,000). This is necessary to ensure that, as a result of unavoidable management variations, the maximum allowable Treaty harvest for 1992 is not exceeded. If that occurs, the cumulative deviation will exceed the 7 1/2% management range for a second consecutive year, and this would represent non-compliance with the Treaty provisions. To prevent this, the Department will need to target the harvest inseason to a level at least 10,000 to 15,000 below the maximum allowable Treaty harvest. This would represent a 1992 inseason target range of no more 230,000 to 235,000 chinook for the base harvest by all commercial and recreational fisheries.

Because the Treaty intent is "to insure that, on average, the annual harvest in ceilinged fisheries is equal to the agreed target ceiling", future cumulative deviations for Southeast Alaska fisheries will have to be reduced so as to generally fluctuate around zero.

OTHER TREATY ISSUES

There are two other Treaty-related issues which could arise as a result of recent changes in the Southeast Alaska fisheries. Commission attention focused on these issues during the 1992/93 negotiations is likely to increase if recent Southeast Alaska fishing patterns continue in 1992.

Fishery Impacts on Depressed Chinook Stocks

The Treaty chinook annex requires that the fishery regimes of the two countries be "structured so as not to affect unduly or to concentrate disproportionately on stocks in need of conservation." The composition or mix of chinook stocks in inside waters is different from that in the outer coastal areas. Thus, any changes in harvest methods or areas affects the final stock composition of the harvest. For example, it is known that the proportion of Canadian origin chinook in inside Southeast Alaska waters is generally higher than in outer coastal areas. Conversely, the proportion of southern U.S. origin chinook found in outer coastal areas is generally higher than in inside waters. Both the June troll fisheries and the recreational fishery harvest chinook salmon primarily in inside waters. A quantitative analysis of these effects, particularly in relationship to depressed natural stocks, has not yet been conducted. However, this issue could be raised in future Commission discussions.

Incidental Fishing Mortalities

The second Treaty issue which could arise is that of incidental fishing mortalities. These are non-harvest mortalities resulting from such causes as hook and release of sub-legal size chinook in troll and recreational fisheries, catch and release of legal-size chinook during chinook non-retention fisheries, or other fishery related activities. Recognizing that incidental fishing mortalities can affect the chinook rebuilding program, the two countries are instructed to "minimize the effects of such mortalities." While the term "minimize" has not been defined in a quantitative sense by the Commission, attention generally focuses on changes in fishing patterns which have the potential to significantly increase incidental mortalities.

When the allowable harvest of chinook salmon for the general summer troll season (beginning July 1) is reduced, the chinook non-retention period can be expected to increase. Chinook non-retention regulations are implemented after the allowable chinook harvest has been reached, and the troll fleet continues to fish for coho and other non-chinook species. A longer chinook non-retention period will increase incidental hook and release mortalities.

In 1992 the allowable summer troll harvest will be reduced both by harvest reductions required to compensate for previous ceiling overages, and the likely continuation of higher recreational chinook harvests. The length of chinook non-retention periods is also affected by the relative abundance and availability of chinook salmon, however, no projections for the 1992 season are available yet.

Since the treaty began, the number of chinook salmon non-retention days has ranged from 42 in 1986 to 65 in 1991. With the current starting date for the general summer troll opening, there are only 82 days of trolling (July 1 through September 20). Since 1980, there has been a 10 day closure each year of the troll fishery for coho salmon conservation and allocation purposes. Even if chinook salmon caught in the June and recreational fisheries (88,000 chinook salmon that would count towards the base in 1991) were included for the general summer troll fishery, only a few to several more days of trolling would be added to the summer season at 1991 harvest rates. However, the timing of chinook salmon non-retention days is important. A chinook salmon non-retention day in late August or September results in fewer chinook salmon mortalities. This is a result of lower abundance of chinook salmon and lower troll effort in later in the season.

These issues are not expected to affect the Treaty provisions for Southeast Alaska fisheries in 1992, which are already in place. Regarding provisions for 1993 and beyond, however, it is not now possible to anticipate exactly how either of these issues might affect Alaska's ability to renegotiate future Treaty chinook agreements. Shifting a greater proportion of the Southeast Alaska chinook harvest to inside waters is likely to generate more of a negotiating problem with Canada. Increasing incidental hook and release mortalities in the troll fishery will be a negative factor in Alaska's negotiations with both Canada and the southern U.S. jurisdictions.

TREATY SUMMARY

Because Treaty chinook ceilings apply to all Southeast Alaska fisheries in aggregate, changes in internal allocations between user groups do not directly affect Alaska's performance under the Treaty. If, however, allocation changes result in significant changes in overall fishery impacts, such as increased incidental mortalities or increased impacts on certain depressed natural stocks, then the Commission may take these into account when negotiating future fishery agreements.

The fact that cumulative deviations between Treaty-established ceilings and actual harvests by Southeast Alaska fisheries exceeded the 7 1/2% management range in 1991 does not put Alaska out of compliance with Treaty provisions. Alaska is required, however, to reduce its 1992 harvest below the established ceiling by an amount sufficient to bring the cumulative deviation back within the management range. A jurisdiction is out of compliance if cumulative deviations exceed the management range for two consecutive years.

HARVEST

Records documenting commercial harvest (including Alaskan hatchery produced chinook salmon) of chinook salmon in Southeast Alaska exist as far back as 1890 (Figure 1). The commercial all gear harvest peaked during the 1930's with a decade average of slightly more than 600,000 chinook salmon. The decade average declined steadily through the 1960's, increased during the 1970's and decreased to the lowest level since 1900's during the 1980's. The low levels during the 1980's are partially due to ceilings imposed by the NPFMC, the Board and the PST. Harvests by gear type exist only since statehood. Only results since 1965 are presented.

Troll

Since 1965, the troll harvest of chinook salmon, including the chinook salmon produced in Alaskan hatcheries, has ranged from 216,086 in 1985 to 375,433 in 1978 (Figure 2, Appendix Table 1). The highest 5 year average harvest occurred from 1975 through 1979 with an average of 300,814 chinook salmon. During 1985 through 1989, the first 5 years of the treaty, the harvest averaged 232,500 chinook salmon, the lowest since statehood. The 1990 and 1991 average was 274,947 chinook salmon. However, if fishing had been regulated to achieve the specified harvest ceiling, the harvest would have been only 255,847.

The troll harvest of chinook salmon excluding those produced in Alaskan hatcheries since the treaty began has ranged from 207,986 in 1985 to 257,052 in 1990 (Figure 3, Appendix Table 2). However, if fishing had been regulated to achieve the ceiling exactly, the 1990 harvest would have only been 245,052.

Nets

There are currently no chinook salmon directed net fisheries in Southeast Alaska except for terminal hatchery harvests. Chinook salmon taken in mixed stock net fisheries are taken incidental to the harvest of targeted pink, sockeye, chum and coho salmon. The total net harvest includes purse seine, drift gill net and set gill net and includes harvests in the traditional and terminal fisheries. Since 1965, the total net harvest, including the chinook salmon produced in Alaskan hatcheries, has ranged from 10,478 in 1976 to 47,859 in 1982 (Figure 2, Appendix Table 1). The highest 5 year average harvest occurred from 1970 to 1974 with 29,015 yearly average. The 1990 and 1991 average of 29,361 was higher than previous 5 year high.

The net harvest of chinook salmon excluding those produced in Alaskan hatcheries since the treaty began has ranged from 12,707 in 1987 to 32,315 in 1985 (Figure 3, Appendix Table 2). The Board mandated ceiling for the net fisheries did not start until 1986.

Recreational

Annual sport harvests of chinook salmon, including Alaskan hatchery salmon, in Southeast Alaska from 1977 to 1984 averaged about 20,300 fish, while from 1985 to 1989 harvests increased about 27% to an average of about 25,800 fish (Table 2, Figure 2). In 1990, the estimated sport harvest increased by about 20,000 fish from the 1989 total of 31,100 fish to about 51,200 fish. Total estimates of sport harvests of chinook salmon for years previous to 1977 are not available because 1977 was the first year postal surveys were used to estimate total statewide sport harvests of fish by species and area.

The Juneau and Ketchikan boat sport fisheries are the largest sport fisheries in the southeast region. During the period from 1977 to 1989, nearly 60% of the total harvest of chinook salmon occurred in these two fisheries combined. In 1990, however, only about 45% of the harvest occurred in these two fisheries as harvests increased greatly in the Petersburg/Wrangell, Sitka, and other areas.

On-site creel surveys were used in 1991 to monitor in-season harvest and performance of the Juneau and Ketchikan marine boat sport fisheries. Chinook salmon harvest of the 1991 Ketchikan fishery was estimated to be 12,730 fish of which slightly less than 6,000 were taken by charter boats (Figure 4) while the Juneau fishery was estimated to have taken 12,234 fish with slightly less than 3,000 taken by charter boats. Both of these estimates are historic highs for the fisheries and are more than double the long term averages for the fisheries. Estimates from these surveys were used to project a total regional sport harvest of a record 68,400 chinook salmon in 1991 (final estimate will not be available until sometime later in 1992). This total would constitute about 18% of the combined sport and commercial harvest.

The recreational harvest excluding chinook salmon produced in Alaskan hatcheries since 1985 has ranged from 17,541 in 1986 to a projected 41,700 in 1991 (Figure 3, Appendix Table 2).

All Gear

Due to the various limits placed upon the chinook fisheries throughout the 1980's, the overall harvest has remained relatively steady (Figure 2, Appendix Table 2). Increases in 1990 and 1991 are due primarily to increases in the quota (39,000 in 1990 and 10,000 in 1991) increases in the production of Alaskan hatchery chinook salmon and to the overages in each year (38,200 overall overage).

The total all gear harvest excluding Alaskan hatchery produced salmon has remained steady except for the

ceiling increases and overages in 1990 and 1991 (Figure 3, Appendix Table 2).

EFFORT

Commercial

All commercial fisheries harvesting chinook salmon in Southeast Alaska are under limited entry. The power troll and all net fisheries first came under limited entry provisions in 1975. The hand troll fishery did not come under limited entry until 1980. In general, the number of permits fished each year is less than the total number of permits. The number of the available power troll permits fished has increased slowly since 1975. Of the 957 permits available for 1991, only 854 were actually fished. The number of hand troll permits actually fished has declined steadily since 1980. During 1991, 697 of the 1,784 permitted to fish actually made a delivery. With a fixed number of permits, effort is best viewed by the number of days in the general summer season. Since 1979, the number of days of fishing during the summer has decreased from 169 (a full summer season) to 7.5 days in 1991 (Figure 5). The 1989, 1990 and 1991 totals do not include 6 inside days in June in 1989 and 1990 and 4.5 inside days in 1991.

Effort for net gear is not presented since they are currently under limited entry and are receiving an allocation of chinook salmon. There are also no net fisheries targeting chinook salmon.

Recreational

The total amount of sport fishing effort in the marine waters of southeast Alaska has increased fairly steadily since the late 1970's. From 1977 to 1979, the average saltwater effort was about 184,000 angler-days, but average effort had increased 67% to an average of 307,000 angler-days for the period from 1985 to 1989 (Figure 6). In 1990, saltwater effort totaled about 375,000 angler-days, over twice that recorded in the late 1970's. The greatest increases in marine fishing effort for chinook salmon occurred in the Prince of Wales, Petersburg, Wrangell, and Sitka areas. Charter boats on average, have accounted for less than 50,000 days of effort in Juneau (Figure 7). In Ketchikan, the effort by charter boats averaged approximately 50,000 through 1990. In 1991, it jumped to approximately 100,000. This amounts to approximately 10% of the effort and 20% to 30% of the harvest in Juneau. In Ketchikan, this amounts to 20% to 35% of the effort and 45% to 50% of the chinook salmon harvest (Figure 8).

Although data have not yet been finalized, it appears that about 385 charter boats were registered regionwide in 1991, an increase of 7% from the 360 registered in 1990.

HARVEST RATES

Commercial

The troll fleet harvest rate of chinook salmon during the general summer season has varied from less than 5,000 per day in 1984 to 21,500 per day in 1991 (Figure 9). This high abundance, along with increases in the recreational harvests and shifts of harvest to the winter and June troll fisheries have led to a 7.5 day general

summer troll season in 1991 (Figure 5).

Recreational

Recreational harvest rate data (chinook salmon per angler hour of salmon effort) exists from 1987 on (Figure 10). In Juneau, the non-charter CPUE has been steadily increasing since 1988. The charter CPUE has varied, but was highest in 1991. In Ketchikan, in general, the non-charter CPUE has been increasing since 1987 (1988 was slightly higher than 1989), while the charter CPUE has varied with the highest CPUE in 1990.

Consistent long-term harvest rate data are only available for the Juneau marine sport fishery (Figure 11). The non-targeted (includes effort for halibut) chinook salmon harvest rate for the Juneau fishery during the 1991 season was the highest since 1969. Harvest rates for chinook salmon were generally much higher during the 1960's and early 1970's, probably because there was no minimum size limit during this time.

ALASKA HATCHERY CHINOOK SALMON PROGRAM

Although releases of chinook salmon from Alaskan hatcheries began in 1977 they took on a significant increased importance with the signing of the treaty in 1985. It was thought that the decrease of chinook salmon harvested under terms of the treaty could be mitigated with releases of Alaskan hatchery chinook salmon and the add-on program to document them in the harvest. The goal of the program is to add 100,000 chinook salmon to the troll harvest.

Releases were small in 1977 (Figure 12). Significant releases did not begin until approximately 1981 when approximately 100,000 age 1 smolt were released. Beginning in 1983, effort shifted to release of age zero smolts. The number of age zero smolts released rose quickly and peaked in 1986. At this time, it was determined that the success initially seen with age zero smolts was not being repeated. The program then concentrated on releases of age 1 smolts. The largest release of age 1 smolts occurred in 1988 with a release of more than 9,000,000. When all facilities are at full capacity, the total release of age 1 smolts will be approximately 12,000,000. Recent work has also indicated a greater hope for age zero smolts. However, at full capacity, slightly less than 4,000,000 will be released annually.

Survival of hatchery produced chinook salmon is highly variable and production methods are constantly being reviewed and improved. It should be noted that the 1991 harvest of 79,546 Alaskan hatchery produced chinook salmon came from releases of the 1986 and 1987 brood years. Production should continue to increase during the coming years.

ALASKA HATCHERY CONTRIBUTIONS

The contribution of chinook salmon produced in Alaskan hatcheries is documented since 1983. The contribution has steadily increased from 872 in 1983 to a total of 79,546 in 1991 (Figure 13, Appendix Table 3). The largest number have been taken each year by the troll fleet, followed by the recreational harvest.

As a percent of the harvest, the contribution of Alaskan hatchery chinook is most important to the net fisheries. Approximately 46% of the 1991 total net chinook salmon harvest was composed of fish from Alaska hatcheries. Alaska hatchery produced chinook salmon comprised 40% of the 1991 recreational harvest and 15% of the 1991

troll harvest.

PERCENT OF HARVEST BY GEAR GROUP

U.S./Canada chinook salmon ceilings imposed since 1985 have had an effect upon the percentage of the total harvest taken by each gear group. Prior to the imposition of any quotas in 1980, the troll fleet, in general harvested from 88% to 90% of the total harvest (Figure 14). Since the imposition of quotas, the percent taken by the troll fleet has been less particularly in 1982, 1984 and 1985 due to large harvests by the net groups. Since 1986, the net groups have been limited to 20,000 base harvest. With the nets capped, the recreational harvest began to increase and the troll percentage decreased to less than 80% in 1989 through 1991.

If the troll harvest is adjusted in 1990 and 1991 to reflect the number that should have been harvested in order to prevent a ceiling overage, then the percent of the base harvest harvested by the troll fleet approaches 70% in 1991 (Figure 15).

Practically, the Alaska hatchery portion of the total harvest cannot be allocated since it is impossible to accurately project the total return. Only the base portion of the harvest can be allocated. If just the portion of the base harvest is graphed, then the troll portion has dropped to approximately 80% (Figure 16). If the troll harvest is adjusted in 1990 and 1991 to reflect the number that should have been harvested in order to prevent an overage, then the percent of the harvest drops to approximately 77% (Figure 17).

JUNE TROLL FISHERIES

Prior to 1981, the starting date of the general summer troll season was April 15. Since 1981, the starting date has been delayed until 1988 when it became July 1. The delay in starting dates was done originally to decrease the harvest of wild Alaskan chinook stocks which return to spawn in May and June. It was further delayed in order to reduce harvest of some Canadian and Southern U.S. stocks and to reduce the number of days during which chinook salmon could not be retained.

However, in order to harvest mature chinook salmon from Alaskan hatcheries, fisheries needed to be established prior to the July 1 date. The experimental fisheries were the first to target these fish. Several small areas were open in 1986 to accomplish this. The areas and time expanded and in 1991, there were 8 experimental fisheries open for 9 days in June and 3 terminal fisheries open continuously during June (Figure 18). In addition, there was an additional experimental fishery open to target on pink and chum salmon.

Prior to 1991, these fisheries never exceeded 7,000 chinook salmon. During 1991, the expansion in time and area allowed a total harvest of approximately 20,000. Of these, only about half were from Alaskan hatcheries.

During the 1989 Board meeting, an additional fishery, the hatchery access, was created to help increase the harvest of Alaskan hatchery chinook and to provide some general access to wild Alaskan stocks which were rebuilding. During 1989 and 1990, the fishery occurred in inside waters for 3 days in early June and 3 days in late June. In 1990, the U.S./Canada treaty specified a limit of 30,000 non-Alaskan hatchery fish for June. In 1991, the fishery was modified to a 40,000 cap and the Department was given flexibility to adjust time in the fishery. The area was also decreased (Figure 19).

Harvests by district and the percent of Alaskan hatchery fish during the period is shown in Table 3. In general, the outside districts, District 103 and 113, have had high harvests with relatively low percentages of Alaskan

hatchery fish.

1992 SEASON

In 1992, the treaty all-gear harvest ceiling for Southeast Alaska drops back to 263,000. If the 1991 projection of the recreational harvest is used for 1992 (42,000 base harvest), and a net base harvest of 20,000 and an adjustment of 28,000 for overage and 11,000 for risk adjustment and pre treaty production, this leaves only 162,000 non Alaskan hatchery produced chinook salmon for the troll fleet. Currently, the winter fishery has taken approximately 22,000 base chinook salmon. This is the second highest harvest for this period. Projecting a final winter harvest of 35,000 non Alaskan hatchery and a June harvest of 40,000 non Alaskan hatchery produced chinook salmon, there would only be 87,000 base chinook salmon available for harvest during the general summer opening. In the past, the Alaska hatchery component of the general summer troll fishery has averaged approximately 5%. This would bring the total amount of chinook salmon available for harvest to 91,000. This is far less than that available in previous years (Figure 20). If the abundance of chinook salmon and troll fleet harvest rates in 1992 are similar to the 20,000 per day in 1991, this would imply a 1992 summer troll season of only 4 to 5 days.

ADDITIONAL ISSUES AND QUESTIONS

If the Board should decide to accept this agenda change request, there are related issues that need to be considered. Issues that the department is aware of include:

1. If a specific allocation is given to the troll fleet this will in effect give the recreational fishery an allocation and regulations in 5 AAC 46 and 49 would have to change in order to restrict the recreational harvest. This could include reduction of the bag and possession limit, reducing time and/or area and/or making methods and means more restrictive. The board may also want to consider if regulations should differ between anglers staying at lodges and going out on charter boats and anglers out on private boats.
2. Reductions in the recreational chinook salmon harvest may lead to reductions in effort for chinook that will shift to other species such as coho, steelhead, halibut and rockfish.
3. A reduction in the number of days during the general summer troll opening for chinook salmon will result in more effort on other salmon species, primarily coho salmon.
4. A permanent reduction in the sport harvest of chinook salmon may lead to protests by qualified subsistence users throughout Southeast by denying them the only legal means (rod and reel sport fishing bag and possession limits) of obtaining chinook salmon used for personal consumption. Any public notice should include 5 AAC Chapter 1.
5. What portions of 5 AAC 33.365 should be considered? Should the current net allocation be reconsidered? Since the concerns focus on the length of the general summer troll season, should other methods of lengthening the season be considered? Should the focus be on just the 1992 season or longer?
6. Would the Board generate a specific proposal or a generic proposal similar to the board generated statewide proposals? Or would it be a set of specific proposals that covers a range of options or allocations levels for public review and comment. Would public proposals be called for? What would

be the time schedule and where would the meeting be held? It is very unlikely that any regulations adopted would be in place in time for the 1992 June and summer troll seasons.

7. If the Board chooses to consider this issue, the Department is prepared to develop the following reports and/or any others the Board would choose.
 - a. Harvest and effort information from commercial fish tickets and the Statewide Harvest Survey and dockside creel surveys.
 - b. Descriptions of the various components of the recreational fishery (ie. marine and freshwater fisheries, charter boat operations, lodges, nonchartered anglers).
 - c. Breakdown of commercial harvests by base and Alaskan hatchery harvests and by gear and type of fishery (ie. terminal, troll experimental, troll hatchery access, winter troll, summer troll).
 - d. Economic projections of the Southeast Alaska recreational fishery based on the 1988 Jones and Stokes report.
 - e. Landed value of the commercial harvest.
 - f. Hatchery contribution rates by fishery.
 - g. Harvest rates in commercial and recreational fisheries.
 - h. Participation by resident and non-resident.
 - i. A report on non-commercial salmon harvest and use by residents of rural Southeast Alaska communities.

Table 1. Southeast Alaska chinook salmon guideline harvest levels (1980 to 1984) and treaty ceilings for Southeast Alaska and Canadian Fisheries (1985 to present).

I. State of Alaska and North Pacific Fishery Management Council Guidelines

Year	Southeast Alaska Commercial	
	1980	286,000 - 320,000
1981	243,000 - 286,000	
1982	243,000 - 286,000	
1983	243,000 - 272,000	
1984	243,000 - 272,000	

II. Pacific Salmon Treaty Chinook Salmon Harvest Ceilings

Year	Southeast Alaska	North Coast B.C.	West Coast Vancouver Is	Georgia St Sport and Troll
	All Gear	All Gear	Troll	Troll
1985	263,000	263,000	360,000	275,000
1986	254,000	256,000	360,000	275,000
1987	263,000	263,000	360,000	275,000
1988	263,000	263,000	360,000	275,000
1989	263,000	263,000	360,000	275,000
1990	302,000	302,000	360,000	275,000
1991	273,000	273,000	360,000	275,000
1992	263,000	263,000	360,000	275,000

Table 2. Annual sport harvests of chinook salmon in southeast Alaska by selected fisheries, 1977-1991. Data for 1977-1990 were taken from Statewide Harvest Surveys.

Year	Juneau Marine ^a	Ketchikan Marine	Petersburg-Wrangell Marine	Sitka Marine	Haines Marine	Other	Total
1977	5,815	4,672	2,671	1,738	471	2,082	17,449
1978	5,348	3,845	2,109	1,841	769	2,727	16,639
1979	5,626	4,165	2,173	2,054	664	1,899	16,581
1980	6,518	5,415	3,495	1,489	792	2,504	20,213
1981	6,901	5,683	2,906	1,955	1,372	2,483	21,300
1982	9,169	6,215	4,076	1,781	1,592	2,923	25,756
1983	4,797	7,968	3,332	2,108	1,426	2,690	22,321
1984	7,751	5,063	3,067	2,251	1,313	2,605	22,050
1985	9,451	6,170	4,060	1,430	2,041	1,706	24,858
1986	6,355	6,197	3,906	1,902	2,054	2,137	22,551
1987	8,679	5,826	3,534	2,537	1,419	2,329	24,324
1988	6,573	7,422	4,668	3,539	789	3,169	26,160
1989	8,244	7,642	4,702	5,569	750	4,156	31,071
Mean 77-84	6,491	5,378	2,979	1,902	1,050	2,489	20,289
Percent	32%	27%	15%	9%	5%	12%	100%
Mean 85-89	7,860	6,651	4,174	2,995	1,412	2,699	25,793
Percent	30%	26%	16%	12%	5%	10%	99%
1990	10,178	12,784	10,185	8,041	1,809	8,221	51,218
	20%	25%	20%	16%	4%	16%	101%
1991 PRELIMINARY PROJECTION							68,400

^a Only includes Doty Cove to Berners Bay boat and shoreline, not entire Juneau area as listed in postal surveys.

Table 3. The Harvest and percent Alaska hatchery contribution by district in the June hatchery access fisheries, 1989 - 1991.

District	Harvest	Percent	Harvest	Percent	Harvest	Percent	Harvest	Percent	Harvest	Percent	Harvest	Percent
	during first period	from Alaska Hatchery	during second period	from Alaska Hatchery	during first period	from Alaska Hatchery	during second period	from Alaska Hatchery	during first period	from Alaska Hatchery	during second period	from Alaska Hatchery
	1989				1990				1991			
101	433	0.0	1,184	79.1	945	17.3	2,624	83.0	1,535	32.2	1,077	42.5
102	974	46.0	527	18.9	1,056	19.5	2,006	55.2	3,311	31.1	1,946	24.0
103	1,192	6.0	1,959	2.6	1,021	18.8	4,255		3,166	14.7	3,742	7.8
105	327	0.0	544	1.3	166	0.0	1,382		506	0.0	221	17.2
106	456	16.1	728	50.5	300	38.2	657	95.2	1,131	40.7	690	29.7
107	478	13.1	309	6.2	517	18.7	435	44.8	593	41.0	207	30.9
109	4,226	16.7	5,306	20.8	1,377	15.9	2,354	21.5	2,968	28.8	1,160	20.0
110	1,769	33.5	706	24.5	1,753	33.5	3,009	29.7	2,585	55.5	1,243	21.7
112	331	66.2	464	45.6	42		588	88.5	971	30.9	408	48.3
113	1,573	8.0	3,948	0.1	1,148	4.8	6,347	11.7	3,210	4.0	11,448	3.1
114	2,162	12.0	1,266	23.5	470	16.7	2,301	5.8	2,470	20.9	1,544	27.1
183									83	0.0	123	0.0

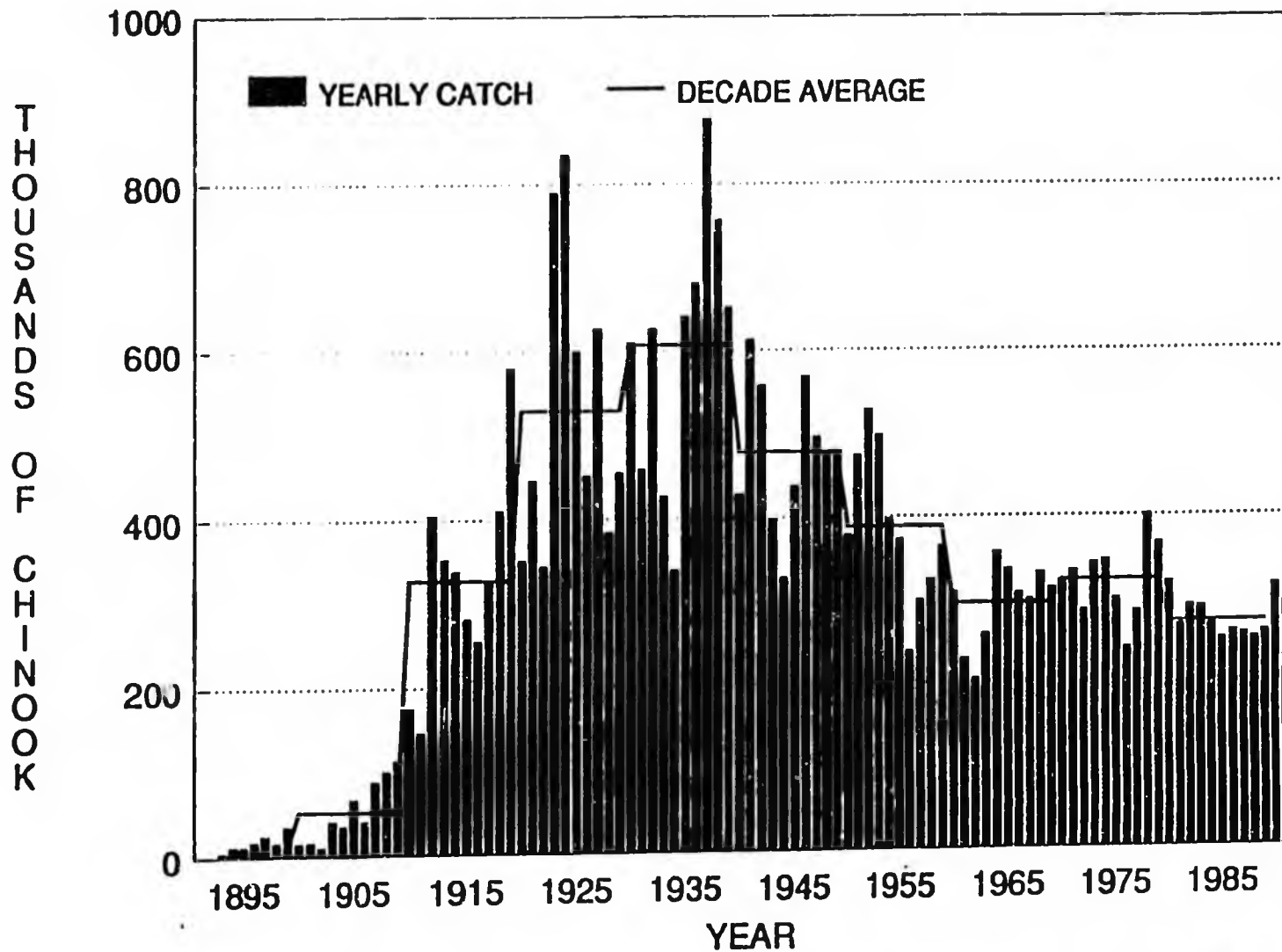


Figure 1. Commercial ALL-GEAR chinook salmon harvest (includes Alaska hatchery chinook salmon) in Southeast Alaska, 1890 to 1991.

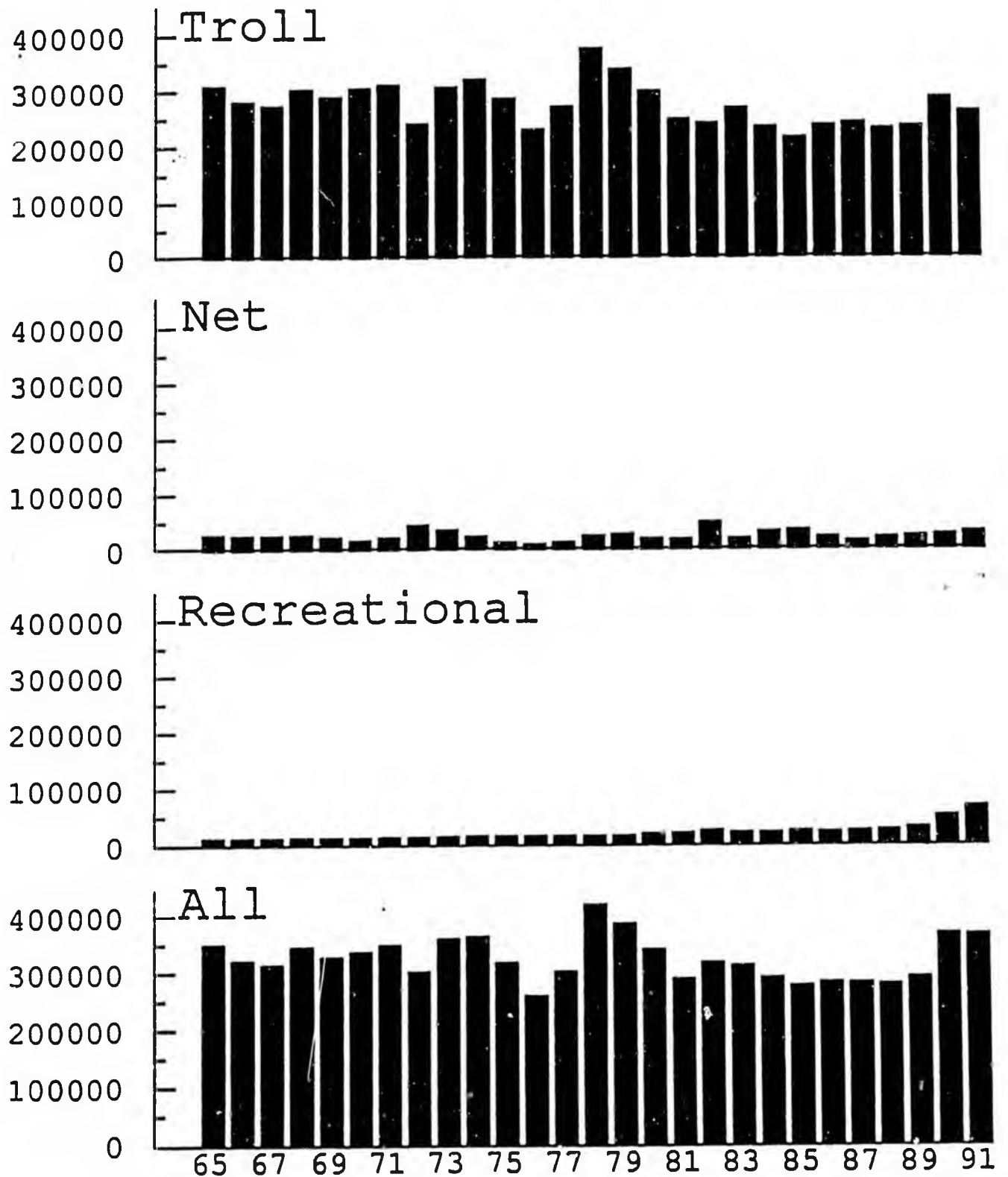


Figure 2. Total chinook salmon harvest (includes Alaska hatchery chinook salmon) by gear, 1965 to 1991.

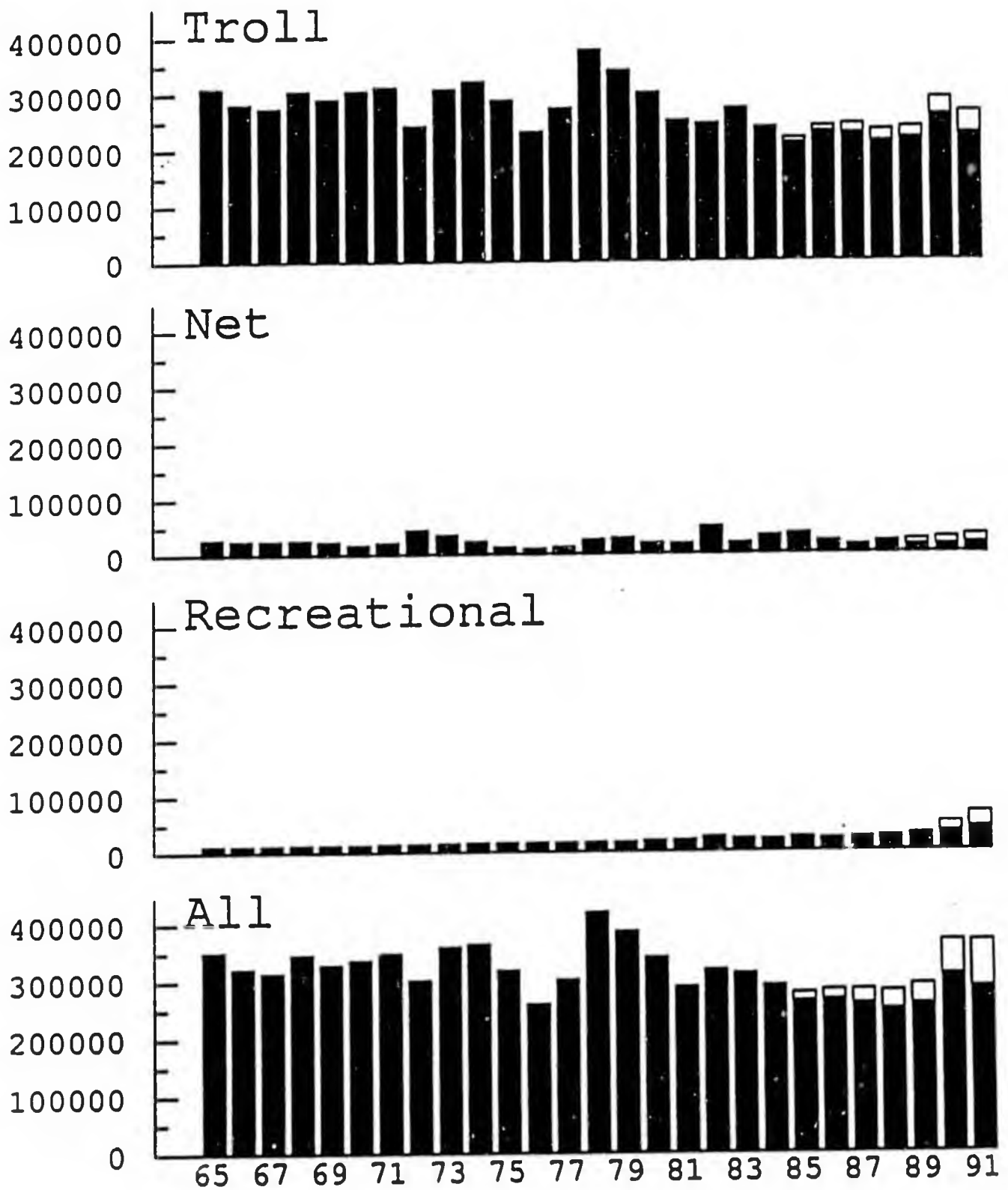


Figure 3. Total chinook salmon catch excluding fish produced in Alaskan hatcheries, by gear, 1965 to 1991. Black bar indicates base catch, white bar Alaska hatchery production.

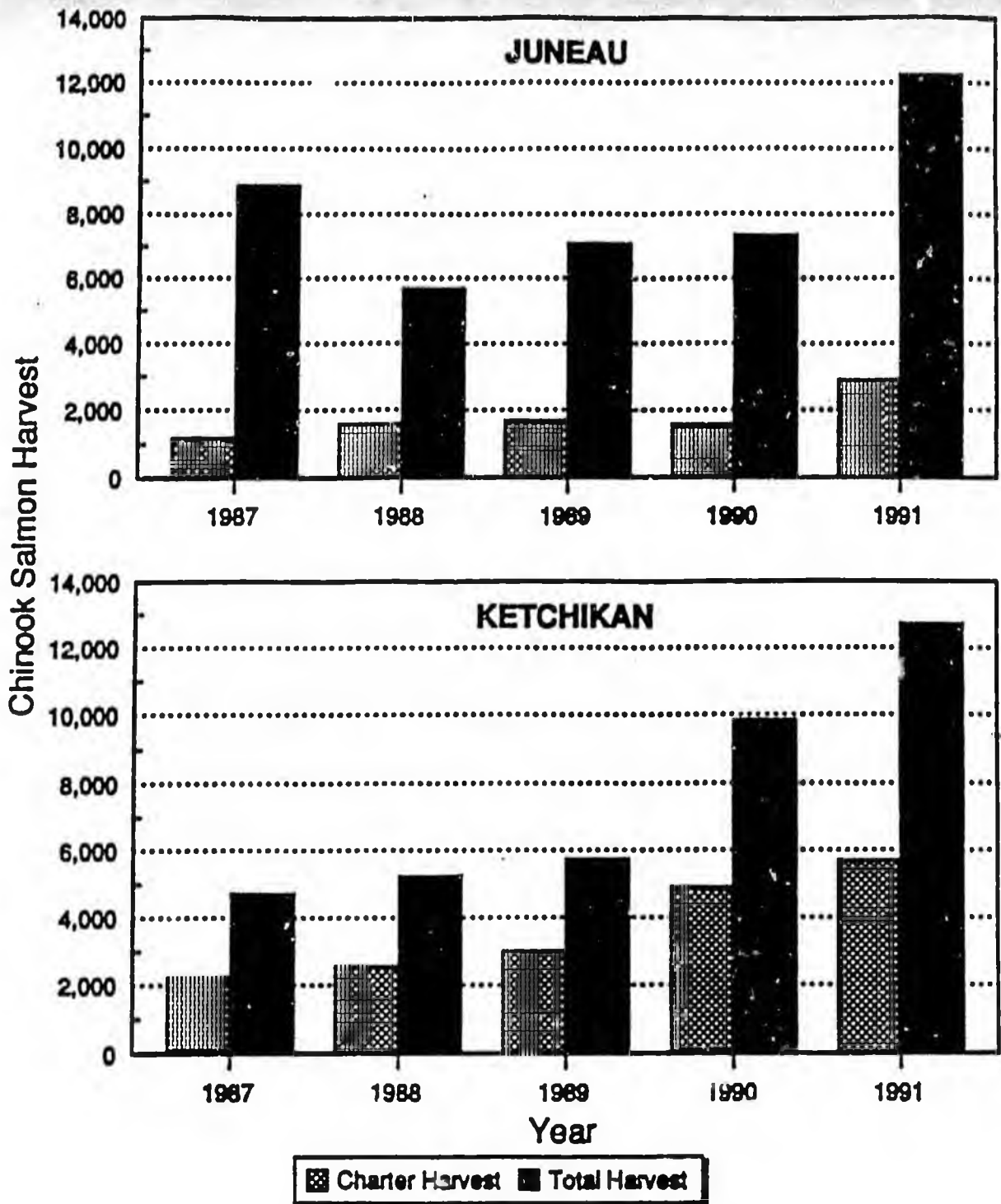


Figure 4. Chinook salmon harvests in the Juneau and Ketchikan marine sport fisheries by the total sport fishing fleet (including charter) and the charter fleet for the years 1987 to 1991. Data are from on-site creel surveys.

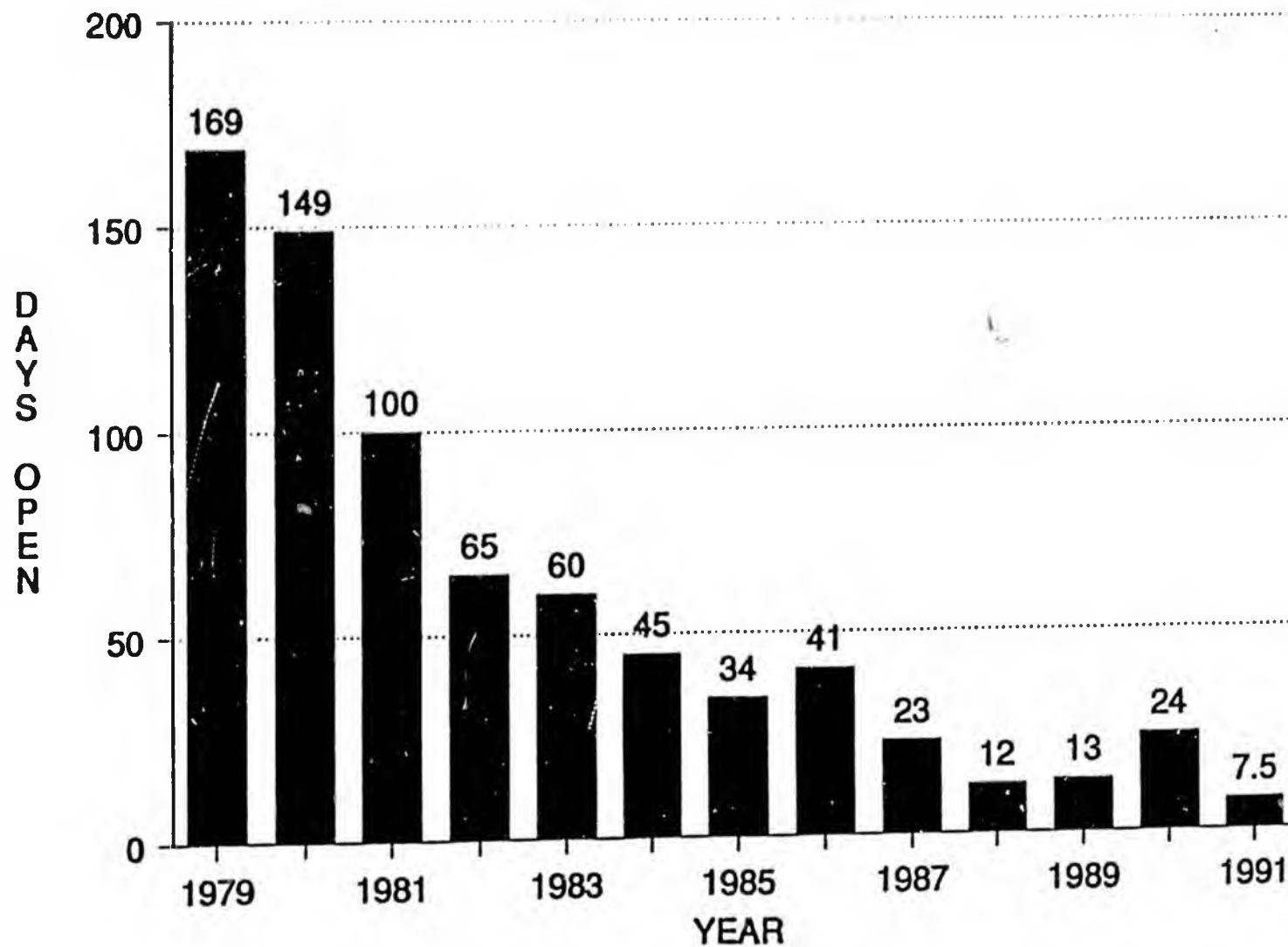


Figure 5. The number of days of chinook salmon trolling during the general summer season, 1979 to 1991.

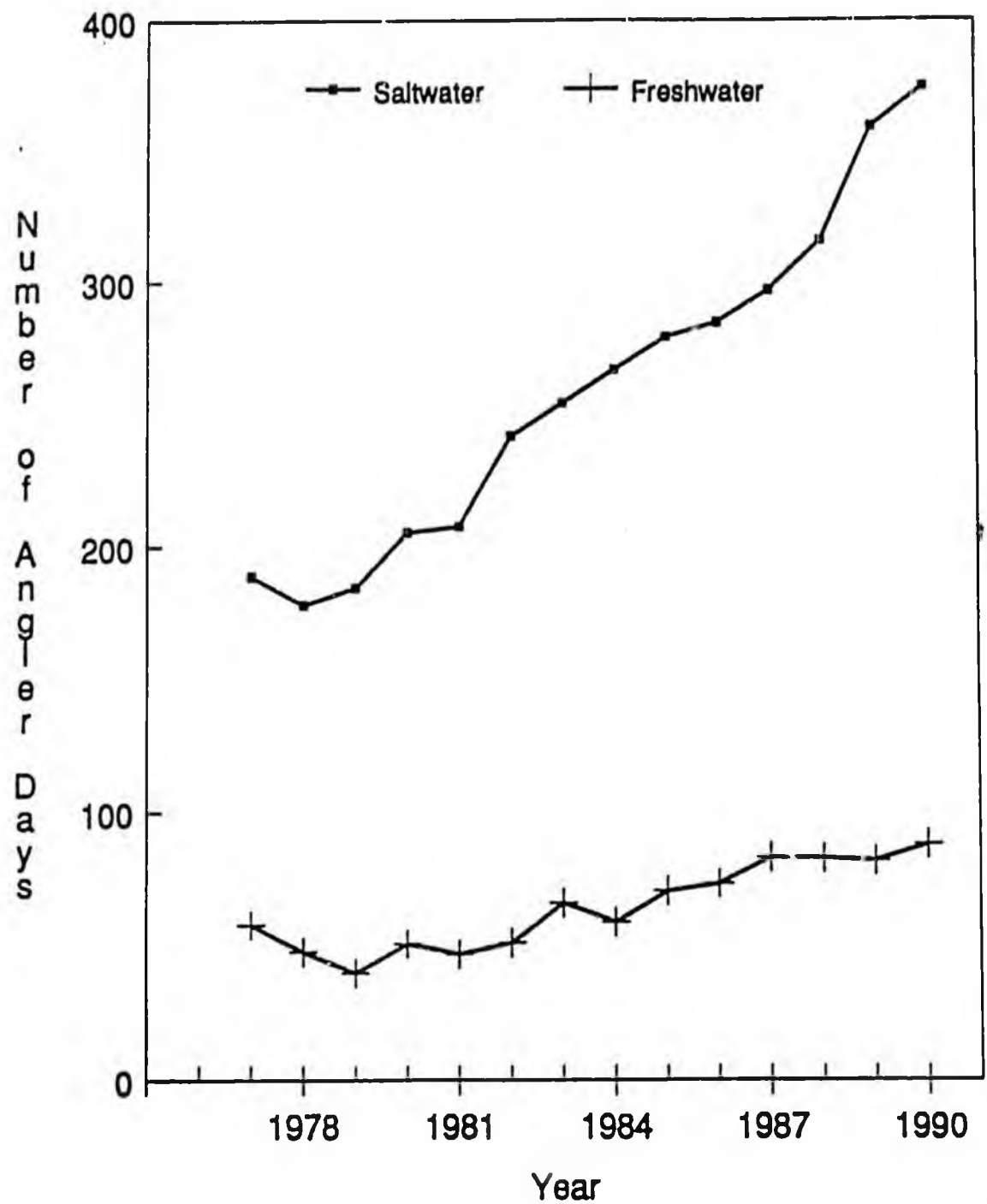


Figure 6. The total number of saltwater and freshwater effort-days in the Southeast Alaska recreational fishery (1977 to 1990).

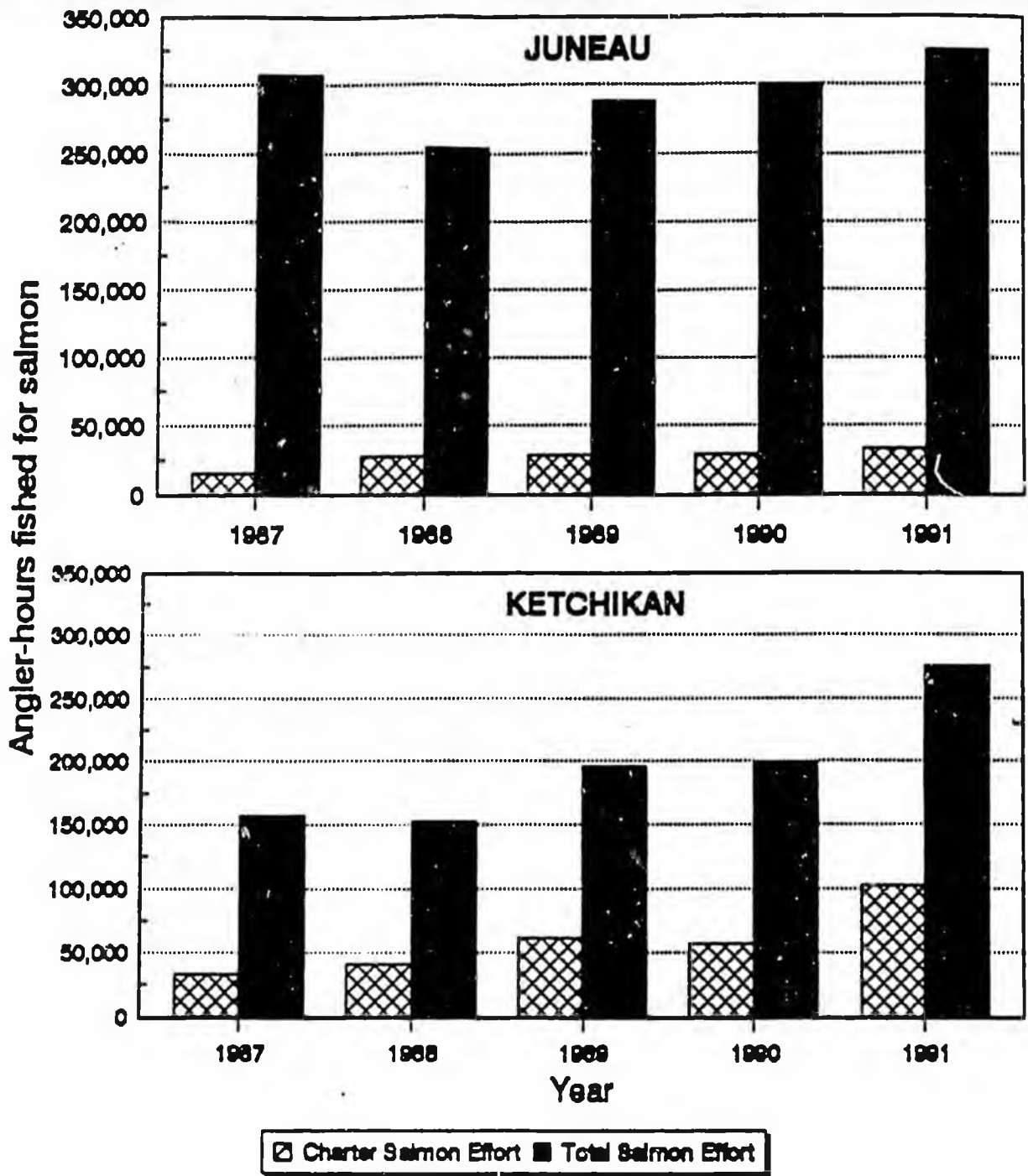
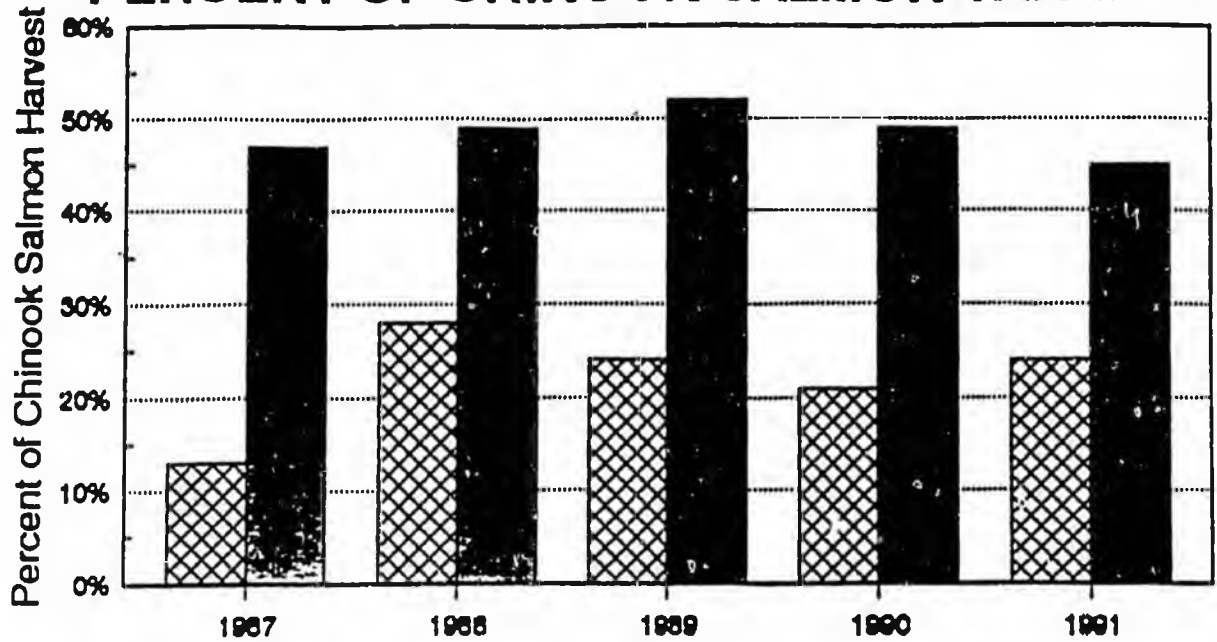


Figure 7. Angler-hours of sport fishing effort in the Juneau and Ketchikan areas targeted on salmon for the total sport fishing fleet (including charter) and for the charter fleet, 1987 to 1991. Data are from on-site creel surveys.

PERCENT OF CHINOOK SALMON TAKEN



CHARTER FLEET SALMON EFFORT

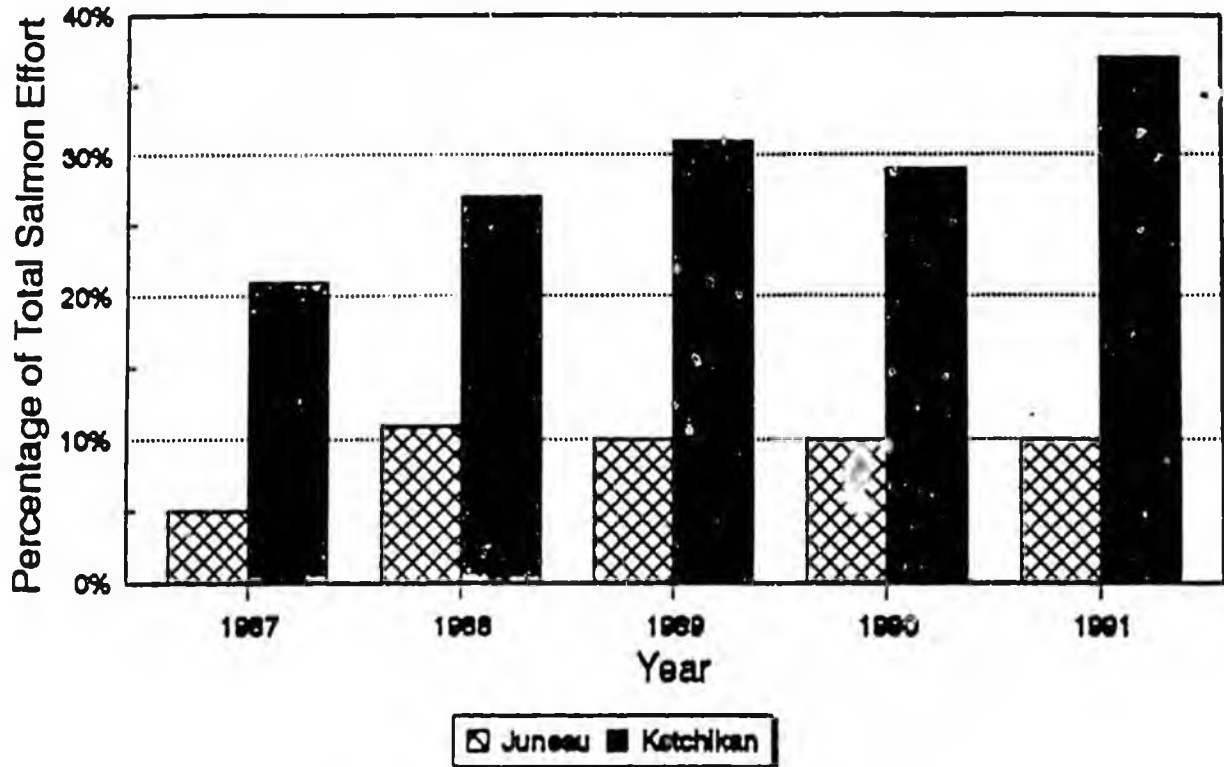


Figure 8. Percentage of chinook salmon taken by the charter fleet and percentage of salmon effort expended by the charter fleet in the Juneau and Ketchikan marine sport fisheries for the years 1987 to 1991. Data are from on-site creel surveys.

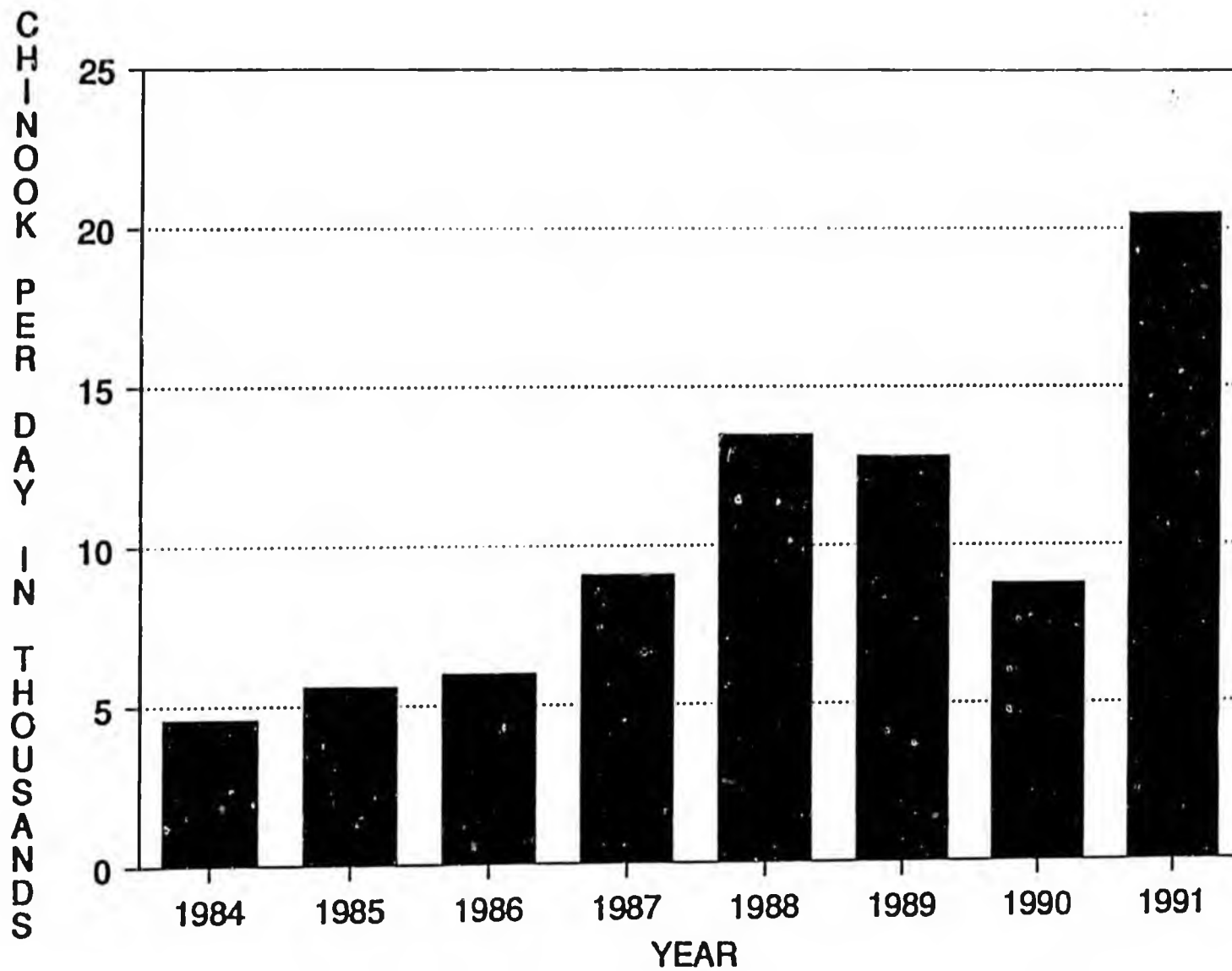


Figure 9. The harvest-per-day of chinook salmon by the troll fleet during the general summer troll opening, 1984 to 1991.

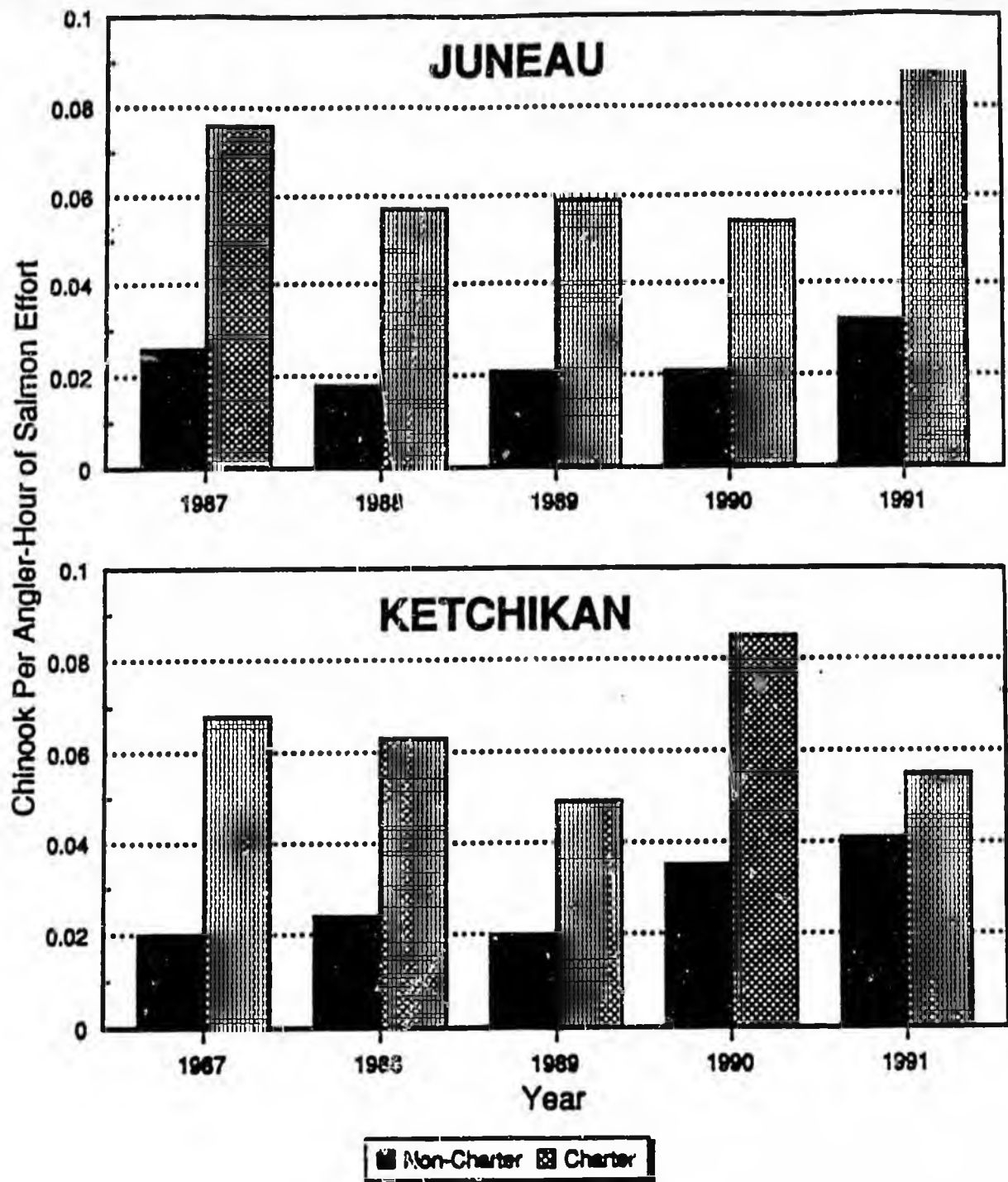


Figure 10. Catch rates for chinook salmon (chinook harvest per angler-hour of salmon effort) for the charter and non-charter portion of the Juneau and Ketchikan marine sport fisheries for the years 1987 to 1991. Data are from on-site creel surveys.

JUNEAU MARINE CHINOOK SPORT FISHERY

(ALL EFFORT 5/01 - 9/03)

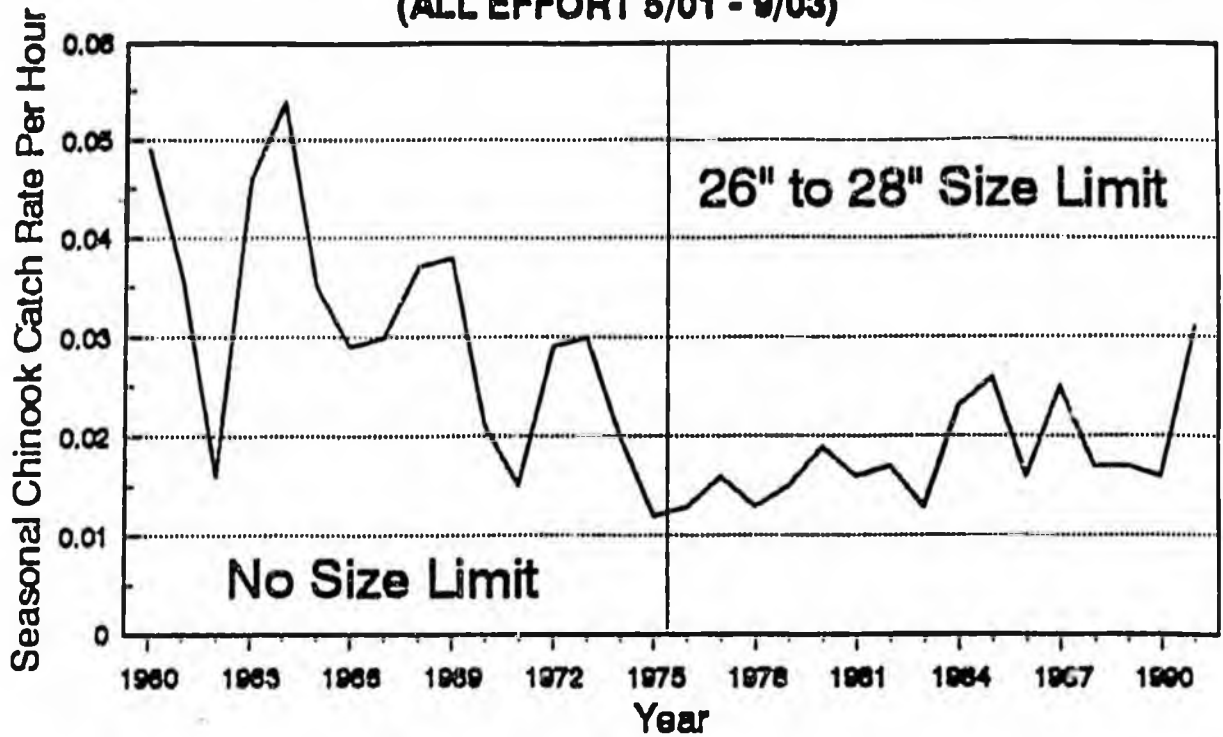


Figure 11. Seasonal catch rates for chinook salmon (chinook harvest per angler-hour of all effort) for the Juneau marine sport fishery from 1960 to 1991. Data are from on-site creel surveys.

S.E. ALASKA CHINOOK SALMON RELEASES
 HATCHERY PRODUCTION OF CHINOOK SALMON

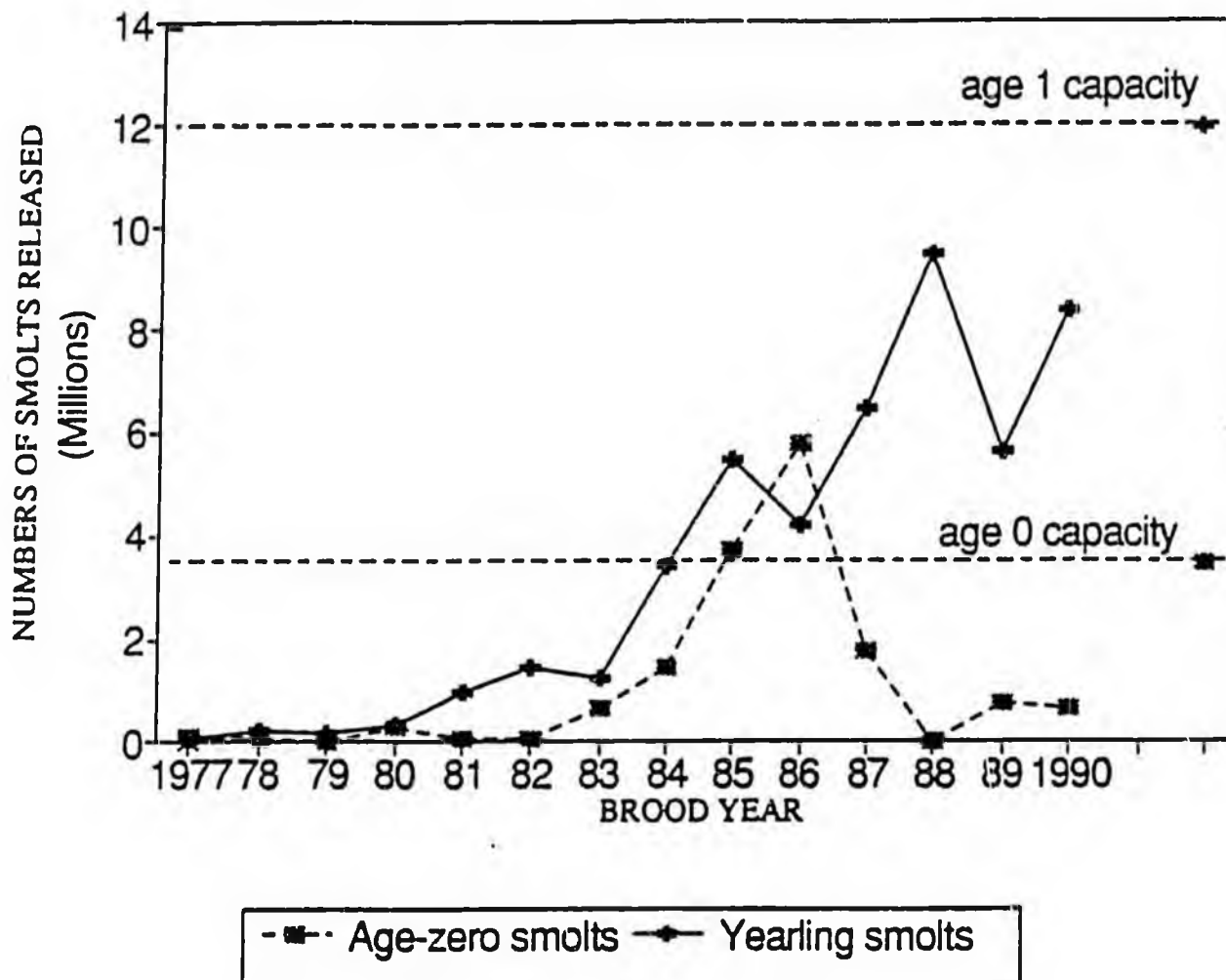


Figure 12. The number of age-0 and age-1 chinook salmon smolts released from hatcheries in Southeast Alaska, by brood year, 1977 to 1990.

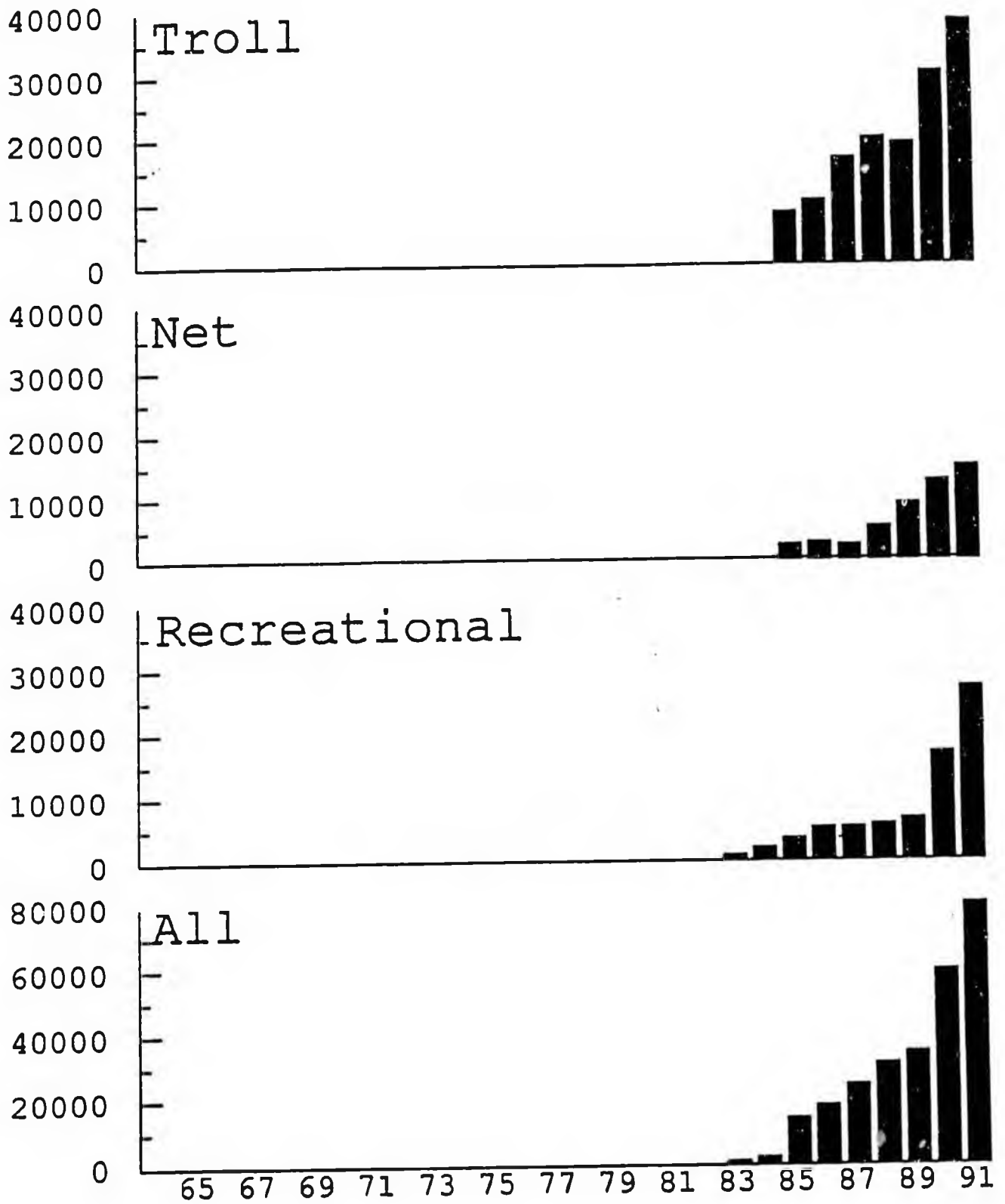


Figure 13. The number of Alaska hatchery chinook salmon harvested by gear group, 1965 to 1991.

% of the Total Chinook Salmon
Catch by Gear, Not Adjusted

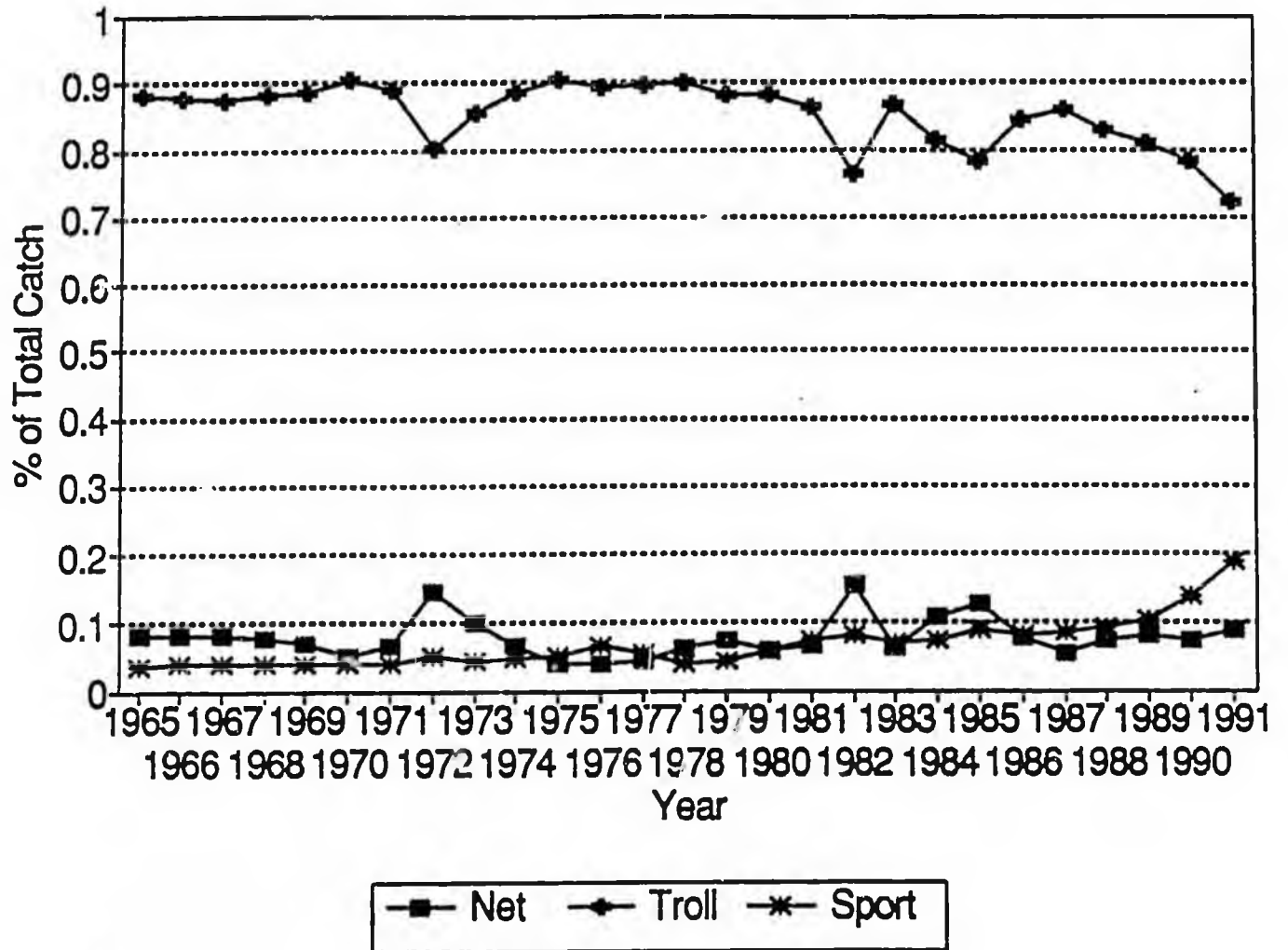


Figure 14. The annual percent of the total catch of chinook salmon (including Alaska hatchery fish) by gear, 1965 to 1991.

% of the Total Chinook Salmon
Catch by Gear, 90,91 Adjusted

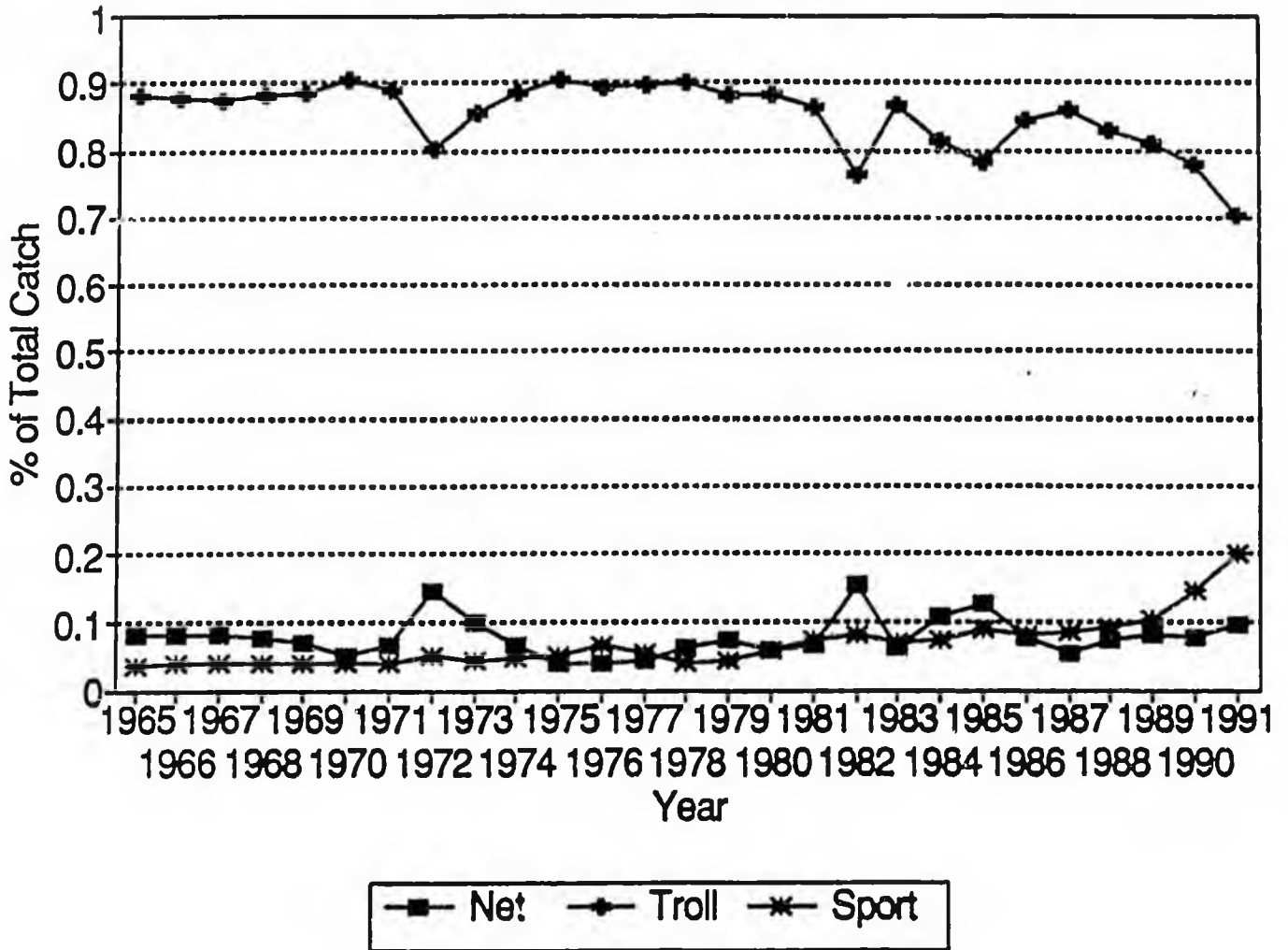


Figure 15. The annual percent of the total catch of chinook salmon (including Alaska hatchery fish) by gear, 1965 to 1991. The 1990 and 1991 troll harvests have been reduced 12,000 and 20,000 respectively in order to reflect the percentage that would have been taken without an overage.

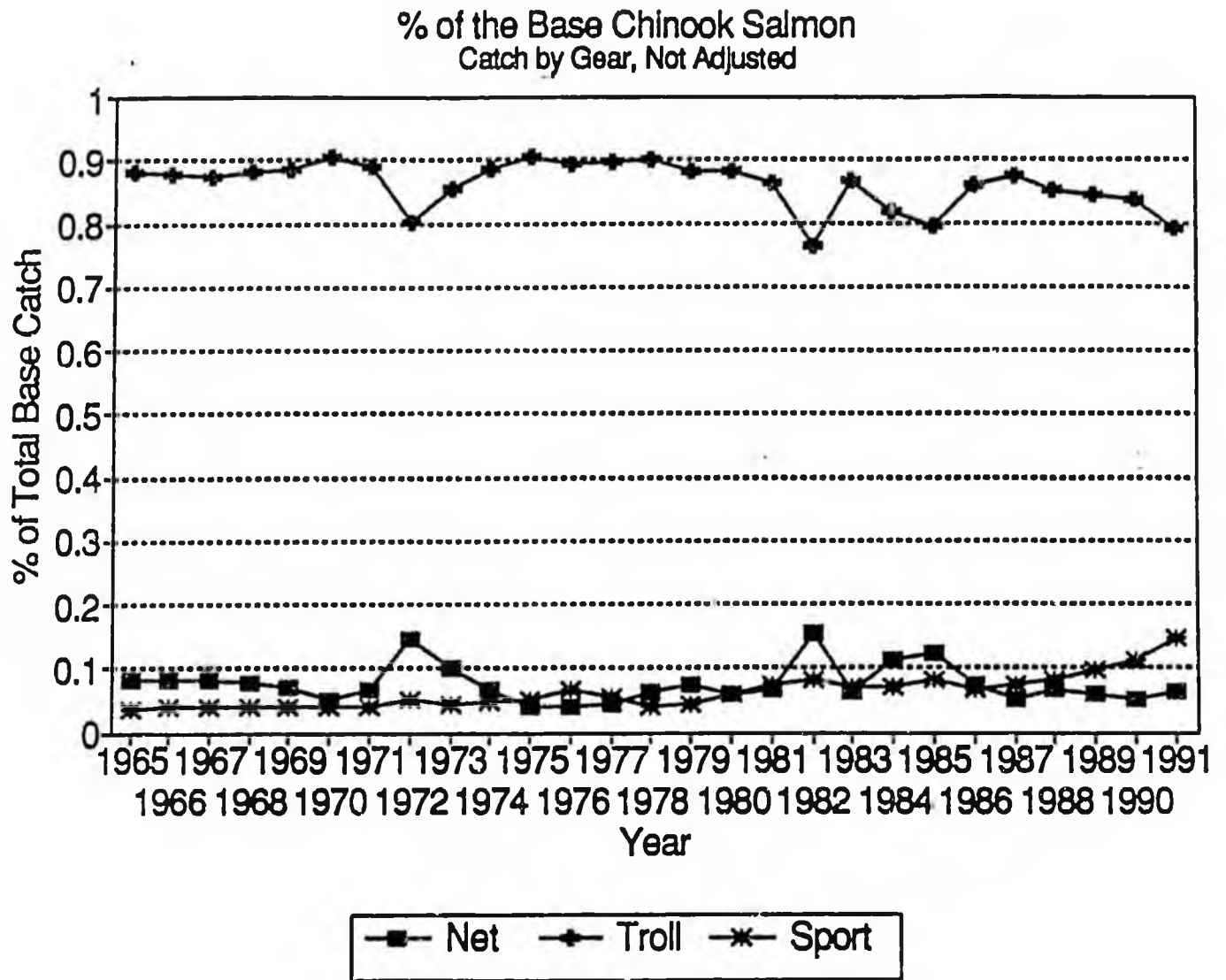


Figure 16. Annual percentage of the total base catch of chinook salmon (does not include Alaska hatchery fish) by gear, 1965 to 1991.

% of the Base Chinook Salmon
Catch by Gear, 90,91 Adjusted

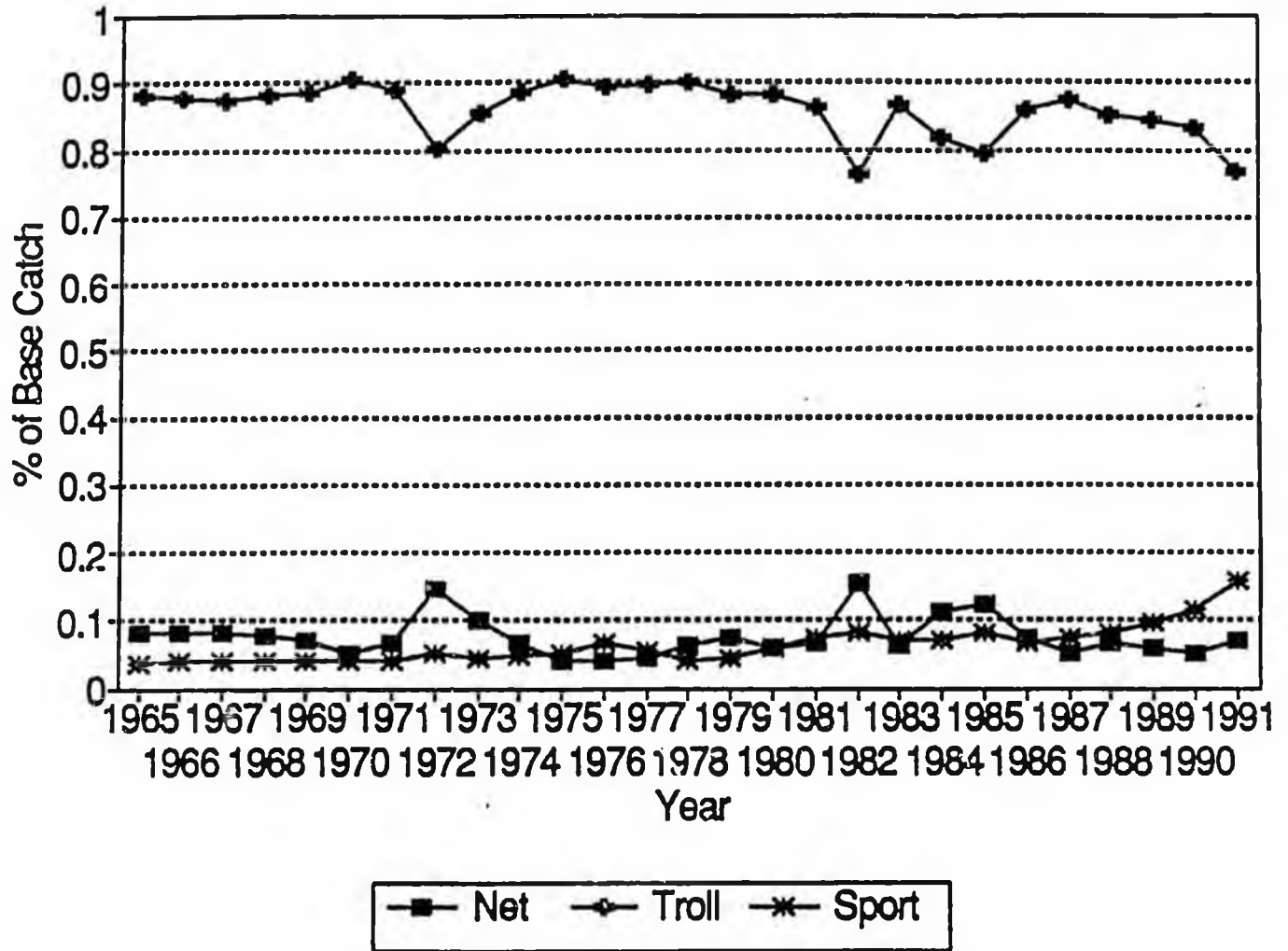


Figure 17. Annual percentage of the total base catch of chinook salmon (does not include Alaska hatchery fish) by gear, 1965 to 1991. The 1990 and 1991 troll catches have been reduced by 12,000 and 20,000 respectively, in order to reflect the percentage that would have been taken with no overage.

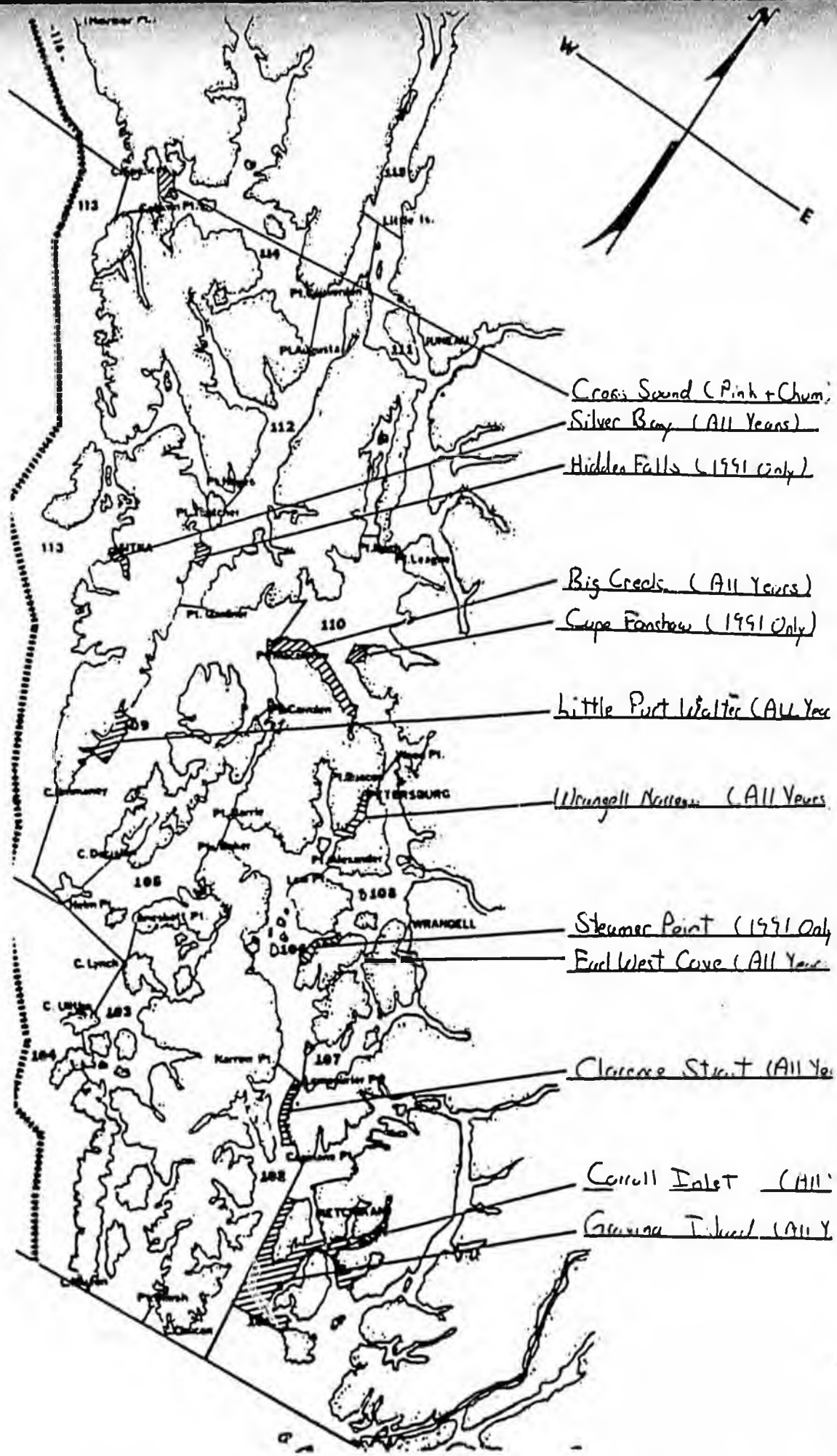


Figure 18. Location of Experimental and Terminal chinook salmon troll fisheries in 1991.

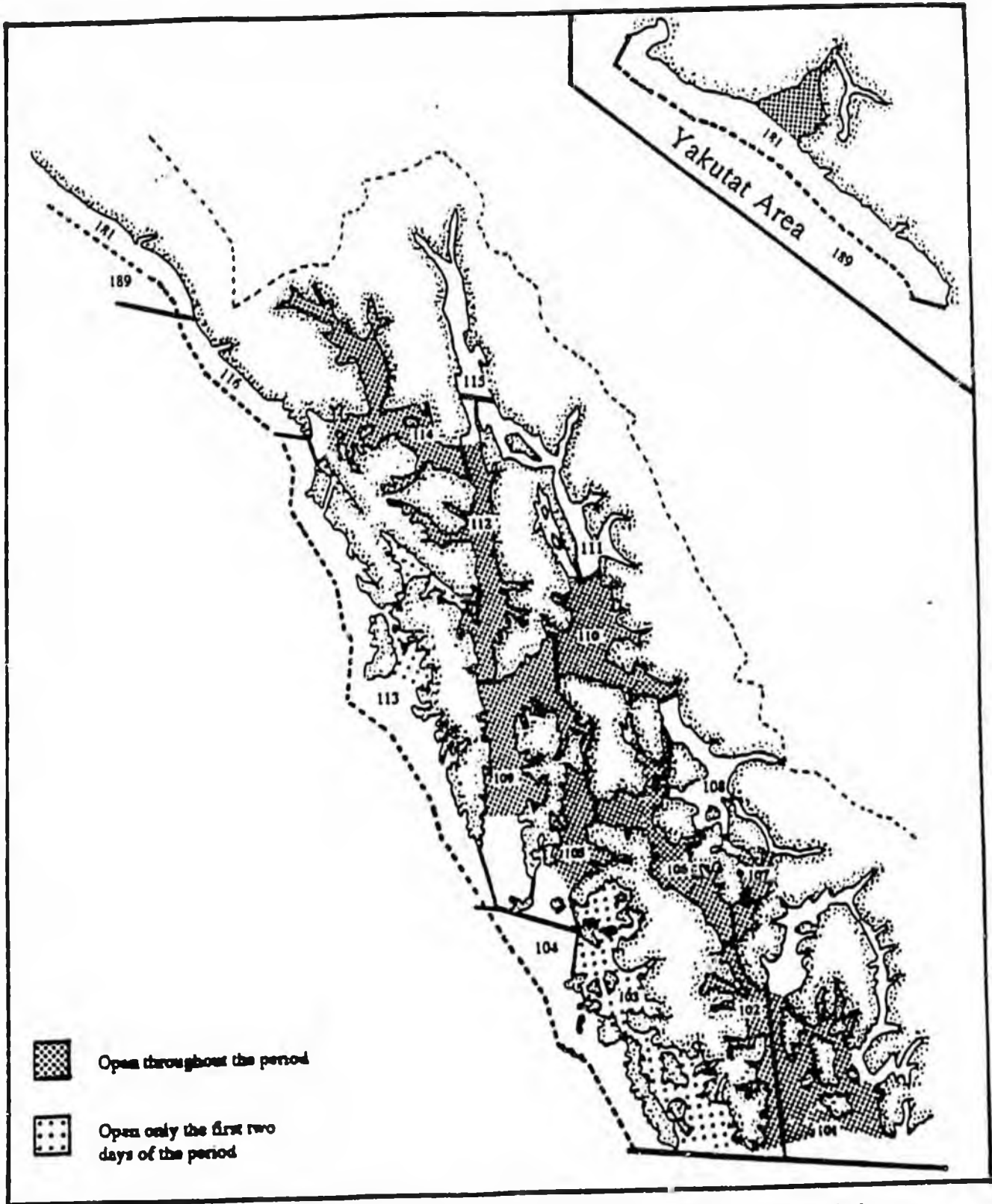


Figure 19. Open areas during the June 1991 Hatchery Access Fishery.

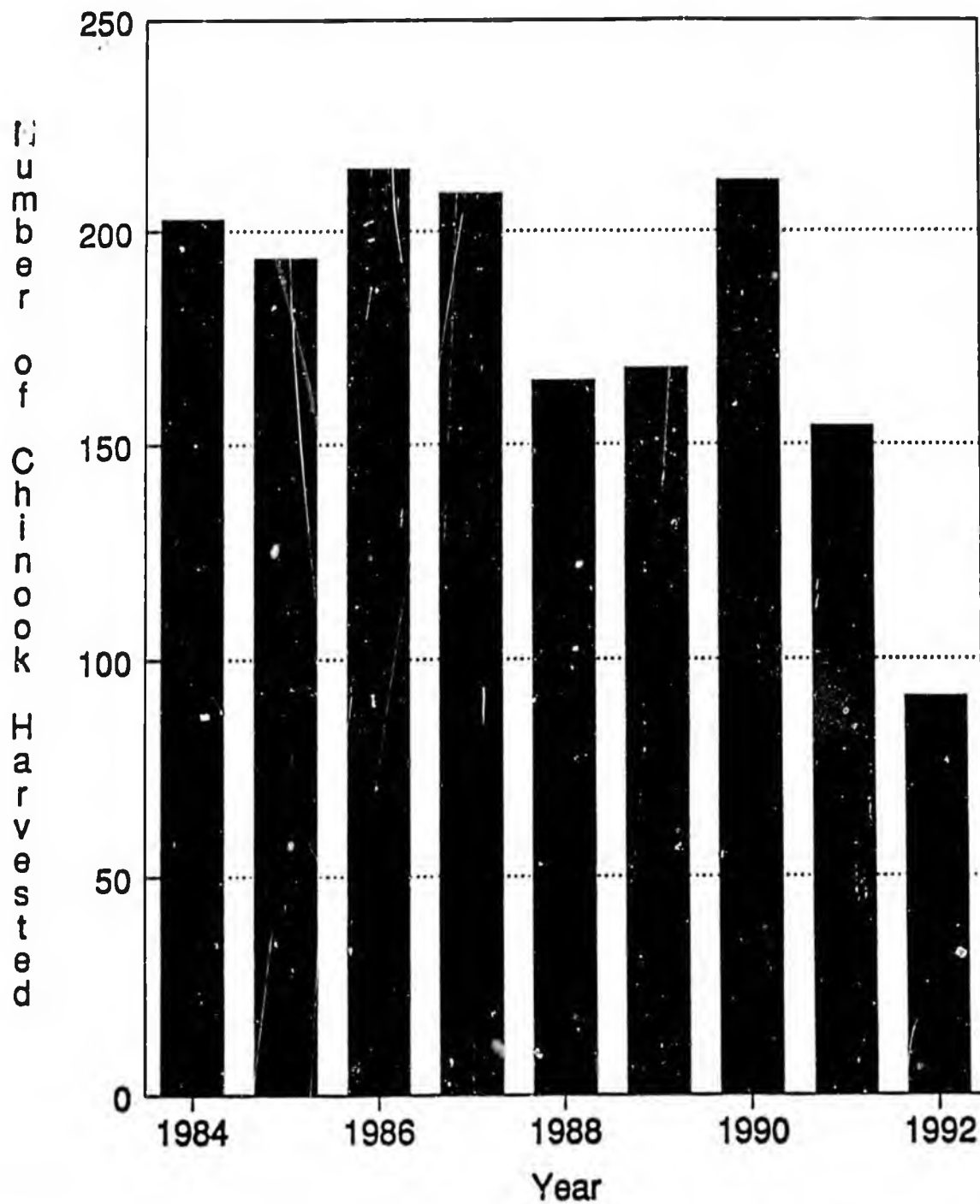


Figure 20. The number of chinook salmon (including Alaska hatchery fish) harvested in the general summer troll fishery, 1984 to 1991 and a projection for 1992.

Including Annette Island

	Net Gear	Troll Gear	Sport	Total
1965	28,207	308,902	13,000	350,109
1966	25,959	282,083	13,000	321,042
1967	26,260	274,678	13,000	313,938
1968	27,056	304,455	14,000	345,511
1969	23,844	290,168	14,000	328,012
5 Yr Avg	26,265	292,057	13,400	331,722
1970	17,713	304,599	14,000	336,312
1971	22,558	311,439	15,000	348,997
1972	44,544	242,282	15,000	301,826
1973	35,980	307,808	16,000	359,786
1974	24,469	322,099	17,000	363,568
5 Yr Avg	29,053	297,645	15,400	342,098
1975	13,365	287,342	17,000	317,707
1976	10,523	231,239	17,000	258,762
1977	13,443	271,735	17,449	302,627
1978	25,492	375,919	16,639	418,050
1979	28,455	339,151	16,581	384,187
5 Yr Avg	18,256	301,077	16,934	336,267
1980	20,114	299,872	20,213	340,199
1981	18,951	248,791	21,300	289,042
1982	48,999	242,315	25,756	317,070
1983	19,655	269,790	22,321	311,766
1984	32,398	235,629	22,050	290,077
5 Yr Avg	28,023	259,279	22,328	309,631
1985	35,469	216,086	24,858	276,413
1986	22,302	237,557	22,551	282,410
1987	15,539	242,025	24,324	281,888
1988	21,450	231,281	26,160	278,891
1989	24,276	235,731	31,071	291,078
5 Yr Avg	23,807	232,536	25,793	282,136
1990	27,698	287,931	51,200	366,827
1991	32,737	263,756	68,400	364,893

Appendix 1. Chinook salmon harvest in Southeast Alaska by year, by gear, 1965 to 1991.

	Troll Total Minus Hatchery	Net Total Minus Hatchery	Sport Total Minus Hatchery	All Total Minus Hatchery
1965	308,902	28,207	13,000	350,109
1966	282,083	25,959	13,000	321,042
1967	274,678	26,260	13,000	313,938
1968	304,455	26,934	14,000	345,389
1969	290,168	23,844	14,000	328,012
5 Yr Avg	292,057	26,241	13,400	331,698
1970	304,599	17,713	14,000	336,312
1971	311,439	22,558	15,000	348,997
1972	242,282	44,395	15,000	301,677
1973	307,806	35,955	16,000	359,761
1974	322,099	24,454	17,000	363,553
5 Yr Avg	297,645	29,015	15,400	342,060
1975	287,342	13,362	17,000	317,704
1976	231,239	10,478	17,000	258,717
1977	271,735	13,369	17,449	302,553
1978	375,433	25,295	16,639	417,367
1979	338,319	28,116	16,581	383,016
5 Yr Avg	300,814	18,124	16,934	335,871
1980	299,872	19,934	20,213	340,019
1981	248,791	18,650	21,300	288,741
1982	242,315	47,859	25,756	315,930
1983	269,790	19,461	21,449	310,700
1984	235,629	32,162	20,146	287,937
5 Yr Avg	259,279	27,613	21,773	308,665
1985	207,986	32,315	21,486	261,787
1986	227,657	19,348	17,541	264,546
1987	225,425	12,707	19,216	257,348
1988	211,508	15,622	20,615	247,745
1989	216,805	14,675	24,720	256,200
5 Yr Avg	217,876	18,933	20,716	257,525
1990	257,052	14,354	34,588	305,994
1991	224,569	17,415	41,700	283,684

Appendix 2.

Chinook salmon harvest in Southeast Alaska minus fish produced by Alaskan hatcheries, by year, by gear, 1965 to 1991.

(updated 10/23/91)
ALASKA HATCHERY ADDON

YEAR	Total Alaska Hatchery	Sport Component	Troll Component	Net Component	Risk Factor	Addon
1965	0	0	0	0	0	0
1966	0	0	0	0	0	0
1967	0	0	0	0	0	0
1968	0	0	0	0	0	0
1969	0	0	0	0	0	0
1970	0	0	0	0	0	0
1971	0	0	0	0	0	0
1972	0	0	0	0	0	0
1973	0	0	0	0	0	0
1974	0	0	0	0	0	0
1975	0	0	0	0	0	0
1976	0	0	0	0	0	0
1977	0	0	0	0	0	0
1978	0	0	0	0	0	0
1979	0	0	0	0	0	0
1980	0	0	0	0	0	0
1981	0	0	0	0	0	0
1982	0	0	0	0	0	0
1983	872	872	0	0	0	0
1984	1,904	1,904	0	0	0	0
1985	13,872	3,372	8,100	2,400	700	8,172
1986	17,610	5,010	9,900	2,700	1,400	11,210
1987	24,008	5,108	16,600	2,300	2,300	16,708
1988	30,415	5,545	19,716	5,154	1,700	23,715
1989	33,986	6,351	18,804	8,831	2,300	26,686
1990	58,993	16,612	30,040	12,341	5,700	48,293
1991	79,546	26,700	38,234	14,612	9,000	65,546

Appendix 3.

Total Southeast Alaska harvest of chinook salmon produced by Alaska hatcheries, by gear, with calculated "addon".

PACIFIC SALMON COMMISSION



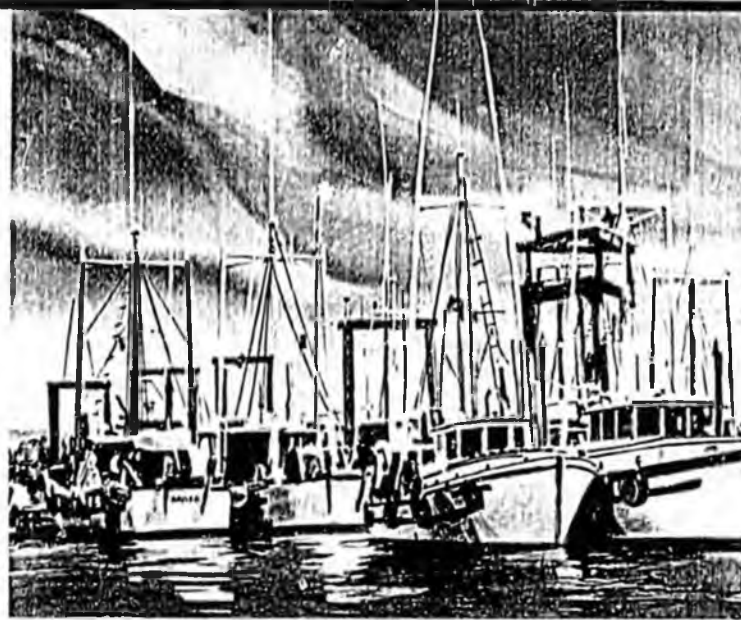
Pacific salmon roam freely in the ocean, with no sense of belonging to any one country. They recognize no international boundaries. Moving fast and far during their long ocean migrations, Pacific salmon meet and intermingle as they travel through the waters of the North Pacific Ocean. It is our shared responsibility to act with wisdom and ensure their migrations continue, by managing for rich harvests, while allowing the salmon to return in abundance to the rivers of their birth.



The Pacific Salmon Commission

Management of Pacific salmon has long been a matter of common concern to the United States and Canada. In 1985, after many years of negotiation, the Pacific Salmon Treaty was signed, setting long-term goals for the benefit of the salmon and the two countries.

The Pacific Salmon Commission is the body formed by the governments of Canada and the United States to implement the Pacific Salmon Treaty. The Commission itself does not regulate the salmon fisheries but provides regulatory advice and recommendations to the two countries. It has responsibility for all salmon originating in the waters of one country which are subject to interception by the other, affect management of the other country's salmon or affect biologically the stocks of the other country. In addition, the Pacific Salmon Commission is charged with taking into account the conservation of steelhead trout while fulfilling its other functions.



The fundamental role of the Pacific Salmon Commission is two-fold: first, to conserve the Pacific salmon in order to achieve optimum production, and second, to divide the harvests so that each country reaps the benefits of its investment in salmon management. In effect, this Commission gives both countries a forum through which to resolve their difficult salmon management problems.

The Pacific Salmon Commission is a sixteen-person body with four

Commissioners and four alternates each from the United States and Canada, representing the interests of commercial and recreational fisheries as well as federal, state and tribal governments.

Each country has one vote in the Commission. The agreement of both is required for any recommendation or decision by the Commission.

Three regional panels — the Southern, Northern and Fraser River—provide technical and regulatory

advice to the Commission. Each panel is made up of no more than six representatives and alternates from each country. Membership reflects a range of governmental and fishing interests.

The panels provide recommendations and comment on the management of the fisheries in their area of responsibility before and after each season's harvest. This is done by reviewing technical data on annual fishing plans and regulations, and the salmon enhancement programs of each country. Panels provide the Commission with specific recommendations for the development of fishery plans. Agreement of both sides is needed for any decision or recommendation. The Fraser River Panel is unique in that it has responsibility for in-season harvest regulation of Fraser River sockeye and pink salmon within a specified area.

Panel recommendations are based on information received by the panels from a variety of bilateral technical committees. Those committees rely

upon information provided by Canadian and United States fishery management agencies.

The Commission receives administrative support from its secretariat staff, headquartered in Vancouver, British Columbia. Secretariat staff members also provide technical information and advice concerning Fraser River sockeye and pink salmon harvest. The staff is actively involved in the day-to-day regulation of sockeye and pink fisheries throughout the Fraser River Panel area of jurisdiction.

The Pacific Salmon Commission has a variety of tools at hand to achieve its mandate. The Commission may recommend that the countries implement harvest limitations, time and area closures, gear restrictions, or other measures to control harvests. In addition, the Commission may recommend use of enhancement techniques to strengthen weak runs, mitigate for damage done by logging, mining or dam-building, or for other purposes.

Essentially, the Commission works like this:

Step 1:

Each country provides technical information to the Commission on the conduct of its fisheries, pre-season expectations and enhancement activities, which is:

Step 2:

analyzed by bilateral technical committees, which then report to:

Step 3:

Panels, which use these reports to develop their fishery recommendations. From here the various area plans are:


Step 4:

sent to the Commissioners for consideration. At this stage, the Commissioners meet to review and conclude negotiations on the plans, which are then:

Step 5:

transmitted to the Governments of Canada and the United States for final approval and regulatory implementation.

Each panel is assigned responsibility for salmon stocks originating in a specific geographic area. In cases where fisheries intercept stocks for which more than one panel is responsible, the appropriate panels meet jointly.





Northern Panel:

The Northern Panel has responsibility for salmon originating in rivers with mouths entering the Pacific Ocean between Cape Suckling in Alaska and Cape Caution in British Columbia.



Southern Panel:

The Southern Panel has responsibility for salmon originating in rivers with mouths south of Cape Caution, with the exception of Fraser River sockeye and pink salmon.



Fraser River Panel:

The Fraser River Panel has special responsibility for in-season regulation of Fraser River-origin sockeye and pink salmon fisheries in southern British Columbia and northern Puget Sound.

The Pacific Salmon Treaty

In March, 1985 the United States and Canada agreed to cooperate in the management, research and enhancement of Pacific salmon stocks of mutual concern by ratifying the Pacific Salmon Treaty.

The Treaty embodies the commitment made by Canada and the United States to carry out their salmon fisheries and

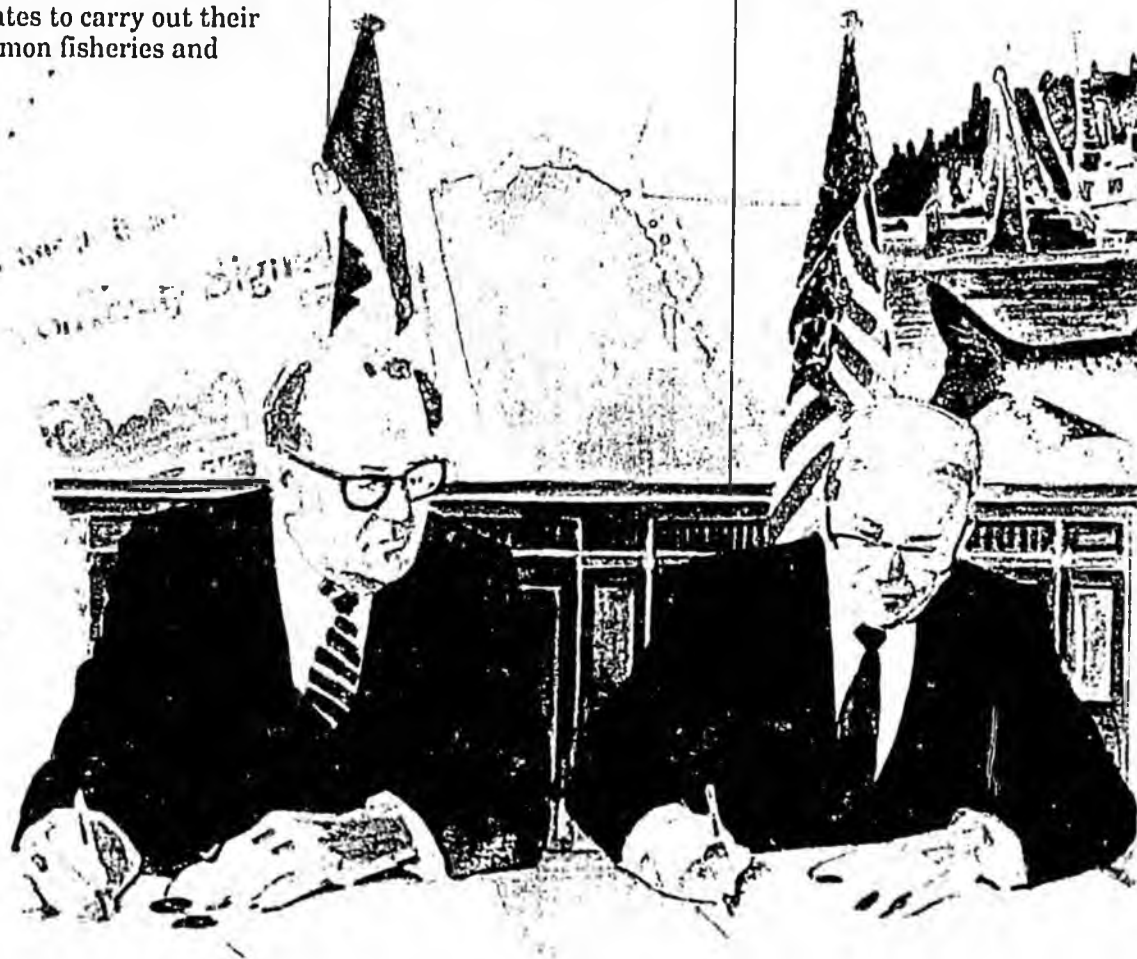
enhancement programs so as to:

- prevent overfishing and provide for optimum production, and
- ensure that both countries receive benefits equal to the production of salmon originating in their waters.

In fulfilling these obligations, both countries

agreed to take into account:

- the desirability in most cases of reducing interceptions
- the desirability in most cases of avoiding undue disruption of existing fisheries, and
- annual variations in abundance of the stocks.



Why we have the Treaty

Salmon fishery managers of Canada and the United States are challenged by the fact that some of the Pacific salmon each country produces are caught by fishermen of the other country. This harvest of one country's salmon by another's fishermen is called interception.

Interception exists because salmon swim across international borders, beyond the jurisdiction of the government in whose water they were spawned. The fish migrate long distances, spending several years at sea. In the course of their migratory cycle, United States-spawned fish enter the fishery zones of Canada and Canadian fish enter United States waters, where they are vulnerable to the other country's fishing fleets.

Salmon interceptions have been the subject of discussion between the two countries since the early part of this century. Over the years, research by both countries revealed that Alaskan fishermen were catching salmon bound for British Columbia, Oregon and

Washington; Canadian fishermen were capturing coho, chinook and other species bound for rivers of Washington and Oregon; fishermen in northern British Columbia were intercepting salmon returning to Alaska, and United States fishermen were catching salmon as they travelled through the Strait of Juan de Fuca and San Juan Islands towards Canada's Fraser River.

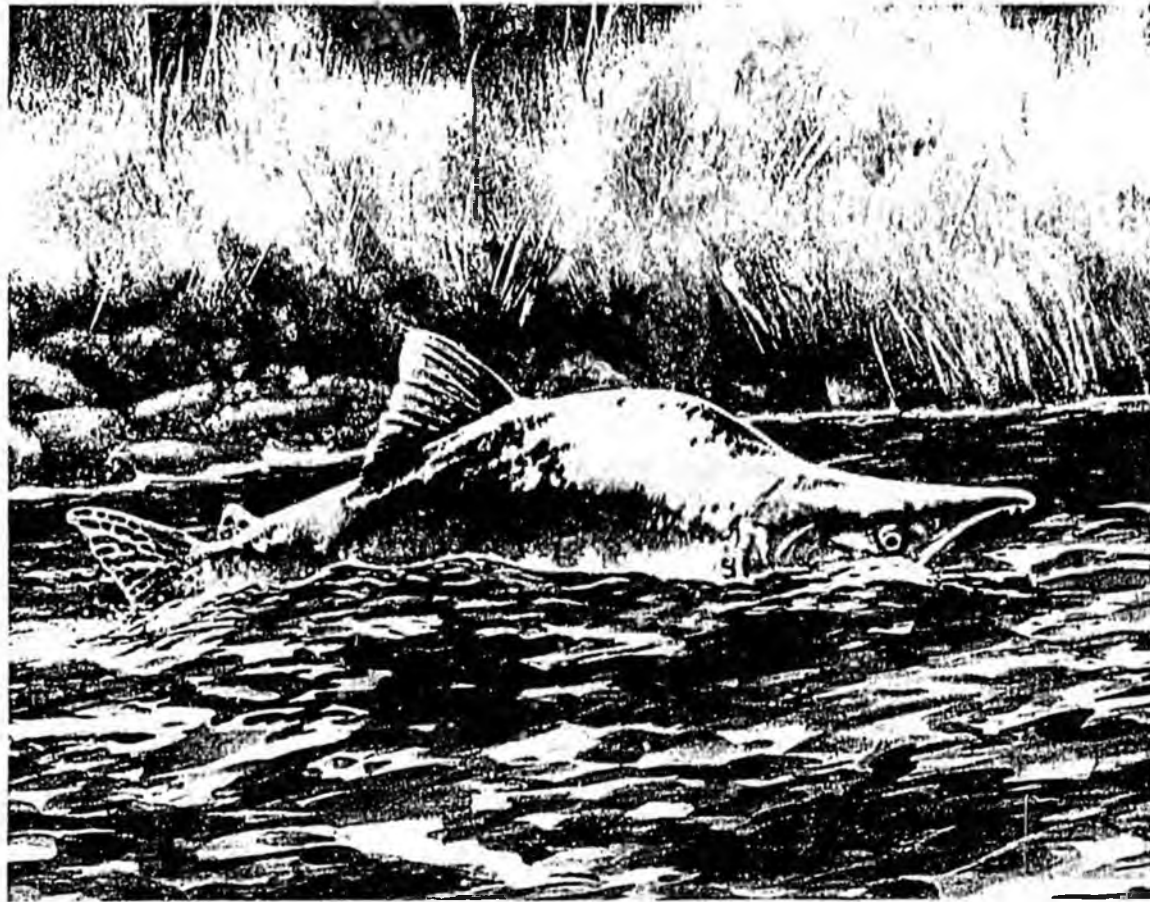
Unless management policies and conservation concerns are jointly agreed, one nation may harvest too many of the other country's stocks and frustrate the home country's management plans. Uncontrolled interceptions may also jeopardize the administrative and financial support needed for salmon enhancement programs: the home country may be reluctant to invest in hatcheries or habitat protection and restoration if the fish produced are caught by fishermen of another nation. Intercepting fisheries encourage overharvest and discourage investment in conservation and enhancement. This was the day-to-day condition of the Pacific salmon

fisheries, particularly in recent decades.

Through the years, the United States and Canada reached agreements over the management of particular salmon stocks in limited regions; for example, Fraser River sockeye and pink salmon. However, the number and diversity of each country's intercepting fisheries defied small-scale solutions. The Pacific Salmon Treaty is broad in scope, enabling it to serve as the means to coordinated management of the coastwide salmon resource.

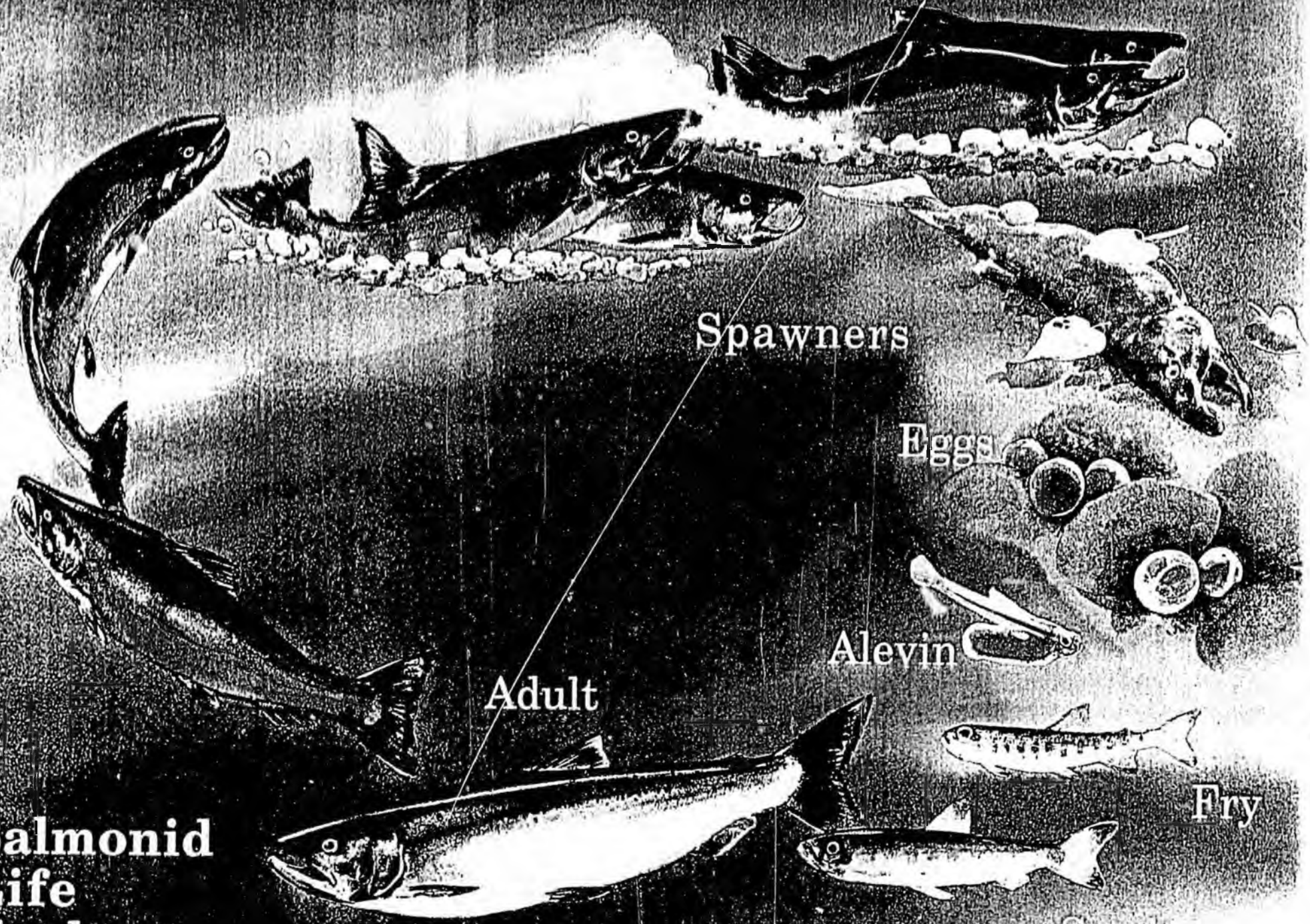


Biology of Pacific Salmon



The five species of Pacific salmon found along the west coast of North America are anadromous — they migrate from the ocean to freshwater to spawn. Spawning completes their life cycle begun in the same freshwater stream two to six years earlier. Homing of Pacific salmon to their stream of origin results in important biological characteristics for groups or stocks of fish. Each stock is genetically adapted to the environment in which it resides, and exhibits unique characteristics such as migration route, migration timing, and productivity. Such biological traits make consideration of individual stocks an important part of salmon management, designed to produce optimum production from the resource.

Salmonid Life Cycle



Spawners

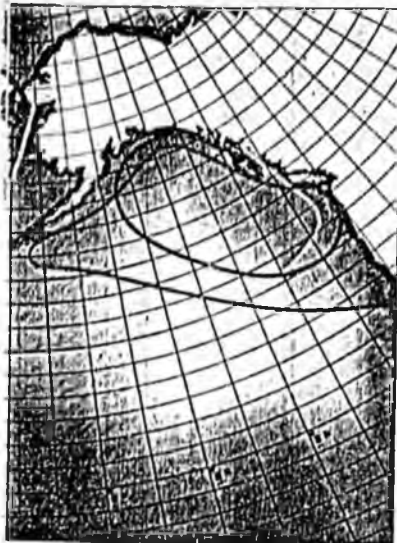
Eggs

Alevin

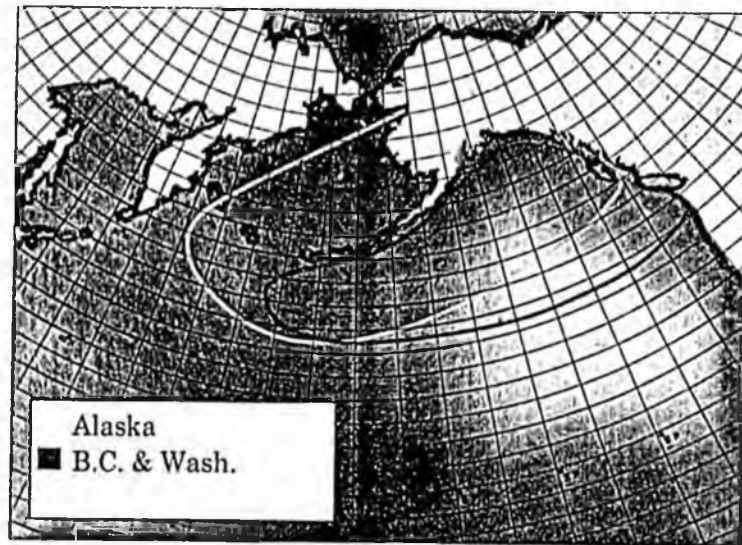
Adult

Fry

Smolt



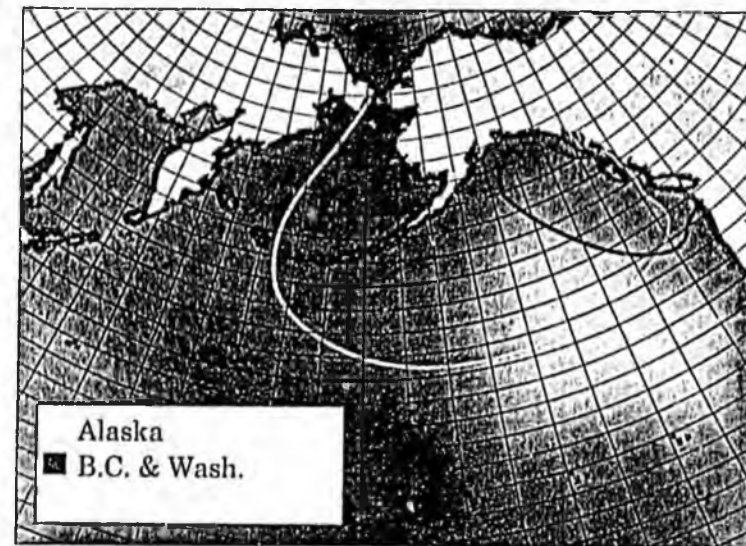
A moderate sized species, coho average eight pounds, but can weigh over 30 pounds. Coho rear from 1 to 2 years in freshwater and mature in the fall of the second year at sea. Usually found in shorter coastal rivers.



Oncorhynchus nerka

**Sockeye,
Red,
Blueback**

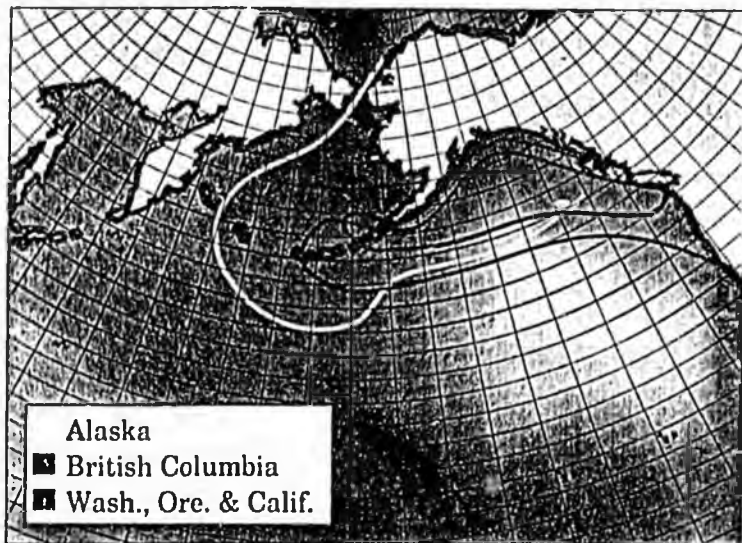
A smaller species, averaging about six pounds, sockeye typically rear for 1 or 2 years in lakes prior to migrating to sea. The fish mature after 2 or 3 years at sea.



Oncorhynchus gorbuscha

**Pink,
Humpback**

The smallest and most abundant species, pink salmon average three to five pounds. This species matures in 2 years. The juveniles migrate directly to estuaries without rearing in freshwater.

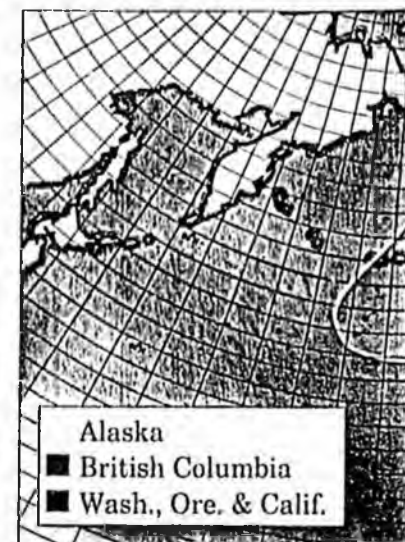


Oncorhynchus tshawytscha

**Chinook,
King,
Spring,
Tyee,
Blackmouth,
Quinnat**

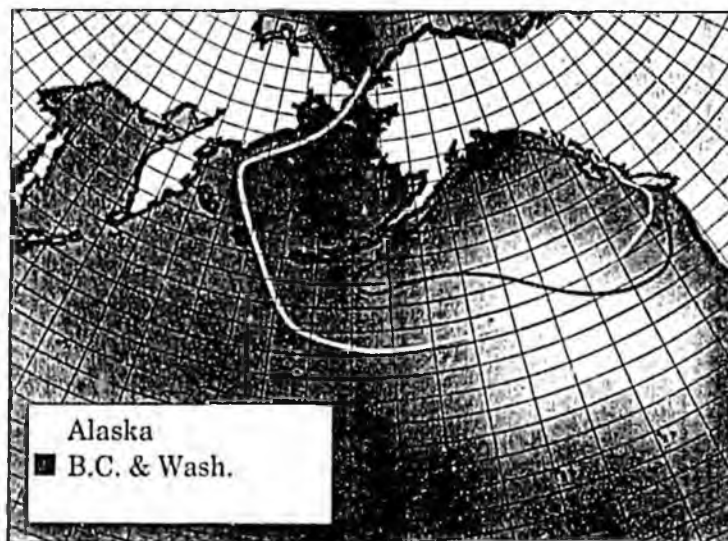
Largest of the five species, chinook average 15-20 pounds, but can weigh over 100 pounds. This species matures in 3 to 6 years. Major stocks originate in large rivers, such as the Columbia. Juveniles may migrate directly to the sea or rear for up to a year in freshwater.

Names and Characteristics of Pacific Salmon



Oncorhynchus kisutch

**Coho,
Silver**



Oncorhynchus keta

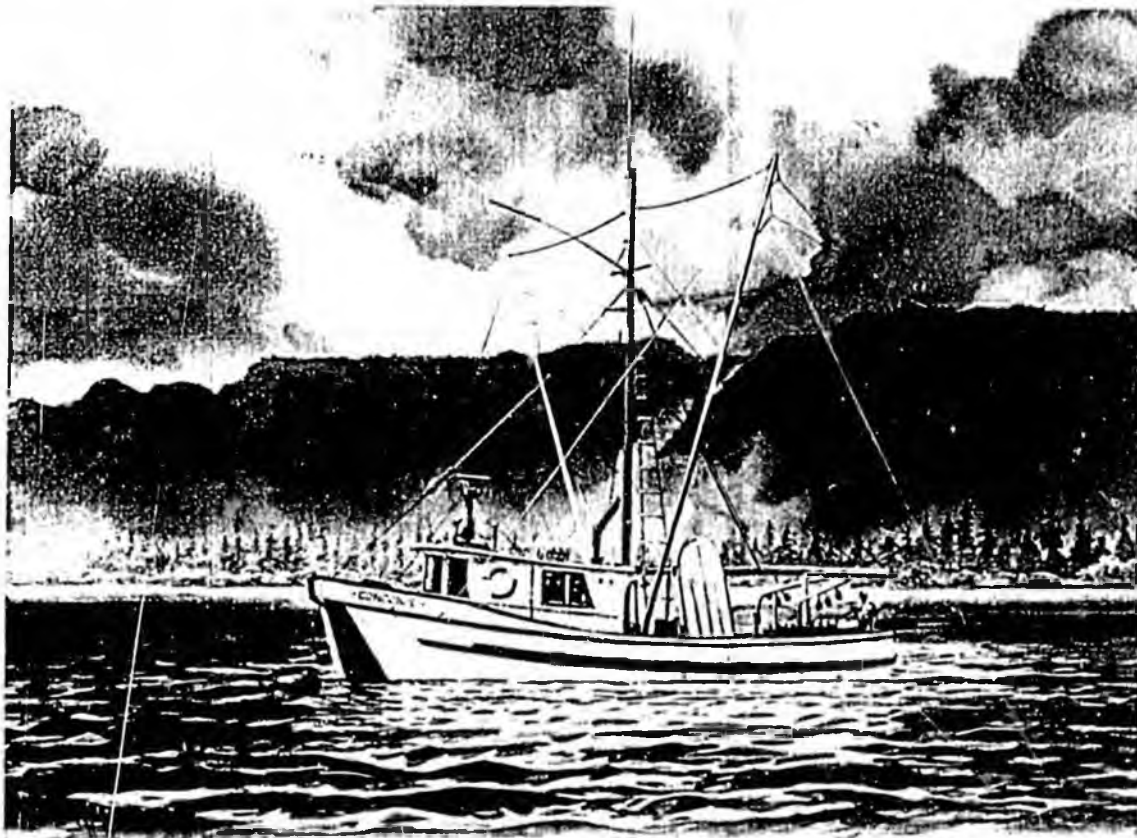
**Chum,
Dog,
Keta**

A large species, averaging eight pounds. Juveniles migrate directly to sea without rearing. Chum salmon mature after 3 or 4 years at sea.

Values of the Salmon fisheries



The salmon play an important role in the social and economic fabric of North America's Pacific coast. Along with a cultural and historical value intricately woven into the society, the economic value of the salmon has a tremendous impact on the quality of life.

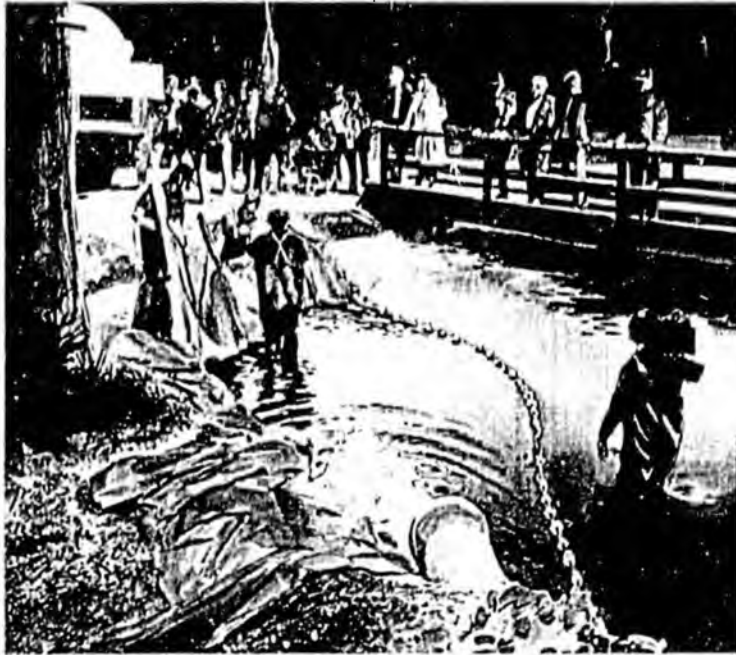


Indians

Indians of this region depend upon the Pacific salmon in almost every facet of their existence. The fish hold a central place in the ceremonial, subsistence and commercial aspects of these people's lives.



Enhancement

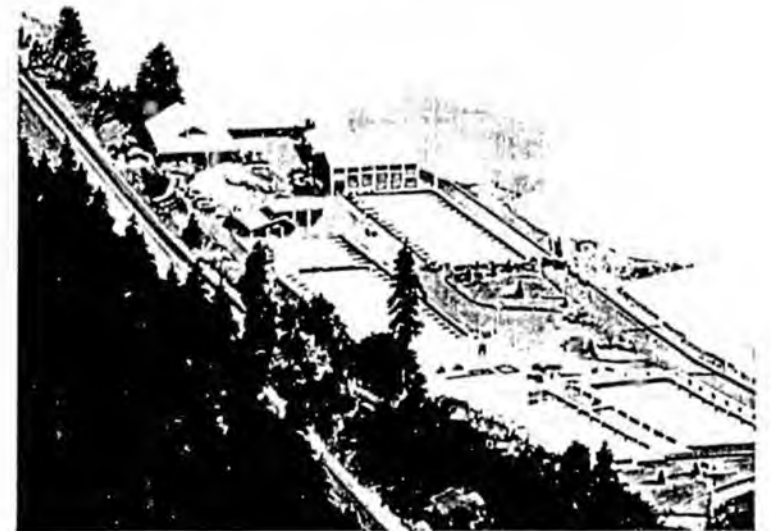


Over the years, tremendous demand for the salmon resource called for commitments by both countries to undertake enhancement activities as part of their overall fisheries management. Without such activities, current salmon catches could not be maintained or increased.

Enhancement covers a wide range of programs, including hatcheries, lake enrichment, fishways, spawning channels, fish rearing, stream surveys, and habitat improvement.

In addition to extensive government programs, Canada and the United States enjoy a large and vital volunteer force in salmon enhancement. Over fifteen thousand volunteers in Washington, Oregon and British Columbia — from school children to senior citizens — actively participate in more than one thousand public involvement projects and are a valued part of salmon enhancement efforts.

The Salmon Treaty offers each country the opportunity to begin new enhancement programs or expand existing operations with confidence that the benefits of those activities will not be lost to uncontrolled intercepting fisheries.



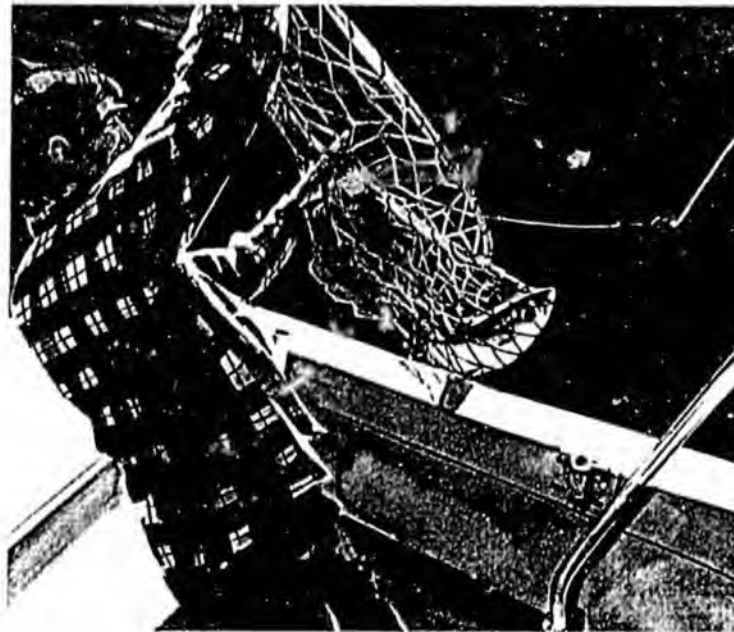
Commercial



In 1986, fishermen landed approximately 177 million Pacific salmon (almost 900 million pounds) in the United States and Canada. This harvest was worth US \$682.5 million / CDN \$921.4 million to the commercial fishermen. These values can be multiplied several times in determining the contribution of Pacific salmon landings to the Canadian and United States economies, leading to an approximate total value of US \$1.37 billion / CDN \$1.84 billion - US \$2.05 billion / CDN \$2.76 billion.



Recreational



Recreational, or sport fishing generates US \$10.5 million in license fees in Washington, Alaska and Oregon, where about 1.5 million sport fishermen enjoy the

estimates of the total value vary, the salmon sport fishery certainly generates many hundreds of millions of dollars for local and national economies of the United States and Canada.

The impact of the Pacific salmon fisheries can be seen in the thousands of jobs and scores of industries they support. A partial list of fishing-dependent businesses would include marina operations, fish processing industries, transportation, fuel sales, boat building and repair, retail fish sales, tackle manufacturers and distributors, hotels, restaurants and resorts. The Pacific Salmon Treaty provides strong assurance of a more stable and prosperous future for many such enterprises.

Pacific salmon resource. In British Columbia, with over 400,000 participating in the sport, salmon fishing contributes significantly to the tourism and recreation industry. In 1986, British Columbia's sport fishermen spent over CDN \$180 million on related goods and services. About CDN \$2.2 million is raised through licenses alone each year. Although

The Pacific Salmon Treaty is an ambitious agreement. Canada and the United States have agreed that salmon are to be more than a fondly remembered but dwindling piece of this region's history. The Treaty means that Pacific salmon will be an abundant, vital part of the countries' present and future. The Pacific Salmon Commission must meet the challenge of the Treaty, guiding the United States and Canada

in prudent fishery management and safeguarding the future of the Pacific salmon and the people who rely upon this magnificent, renewable resource.

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PACIFIC SALMON COMMISSION

ORGANIZED BY TREATY BETWEEN
UNITED STATES OF AMERICA
AND CANADA
1925

HEAD OFFICE: VANCOUVER, BRITISH COLUMBIA
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Reprint of the
PACIFIC SALMON TREATY
and
ORIGINAL ANNEXES & MEMORANDUM OF UNDERSTANDING

TREATY BETWEEN THE GOVERNMENT OF THE UNITED STATES OF AMERICA AND THE GOVERNMENT OF CANADA CONCERNING PACIFIC SALMON

The Government of the United States of America and the Government of Canada,

Considering the interests of both Parties in the conservation and rational management of Pacific salmon stocks and in the promotion of optimum production of such stocks;

Recognizing that States in whose waters salmon stocks originate have the primary interest in and responsibility for such stocks;

Recognizing that salmon originating in the waters of each Party are intercepted in substantial numbers by the nationals and vessels of the other Party, and that the management of stocks subject to interception is a matter of common concern;

Desiring to cooperate in the management, research and enhancement of Pacific salmon stocks;

Have agreed as follows:

ARTICLE I

DEFINITIONS

As used in this Treaty,

1. "enhancement" means man-made improvements to natural habitats or application of artificial fish culture technology that will lead to the increase of salmon stocks;
2. "fishery" means the activity of harvesting or seeking to harvest salmon;
3. "fishery regimes" means the fishing limitations and arrangements adopted by the Parties pursuant to Article IV, paragraph 6;
4. "interception" means the harvesting of salmon originating in the waters of one Party by a fishery of the other Party;
5. "overfishing" means fishing patterns which result in escapements significantly less than those required to produce maximum sustainable yields;
6. "stocks subject to this Treaty" means Pacific salmon stocks which originate in the waters of one Party and
 - (a) are subject to interception by the other Party;
 - (b) affect the management of stocks of the other Party;or
 - (c) affect biologically the stocks of the other Party; and
7. "transboundary river" means a river that rises in Canada and flows to the sea through the United States.

COMMISSION AND PANELS

1. The Parties shall establish a Pacific Salmon Commission, hereinafter referred to as "the Commission", to be composed of two national sections, a Canadian Section and a United States Section.

2. The Commission shall have legal personality and shall enjoy in its relations with other organizations and in the territories of the Parties such legal capacity as may be necessary to perform its functions and achieve its ends. The immunities and privileges which the Commission and its officers shall enjoy in the territory of a Party shall be subject to agreement between the Commission and the Party concerned.

3. The Commission shall consist of not more than eight Commissioners, of whom not more than four shall be appointed by each Party. Each Party may also appoint not more than four alternate Commissioners, to serve in the absence of any Commissioner appointed by that Party.

4. The Commissioners and alternate Commissioners shall hold office at the pleasure of the Party by which they were appointed.

5. At the first meeting of the Commission one section shall select from its members a Commission Chairman, and the other section shall select from its members a Vice-Chairman, each of whom shall hold office for the calendar year in which the Treaty enters into force and for such portion of the subsequent year as the Commission may determine. Thereafter the Chairman and Vice-Chairman shall hold office for a term of twelve months and shall be selected by their respective sections. The section which selects the first Chairman shall be determined by lot and thereafter the offices of Chairman and Vice-Chairman shall alternate between the sections. If either office becomes vacant before the end of a term, the appropriate section shall select a replacement for the remainder of the term.

6. Each section shall have one vote in the Commission. A decision or recommendation of the Commission shall be made only with the approval of both sections.

7. Subject to the approval of the Parties, the Commission shall make such by-laws and procedural rules, for itself, for the Panels established pursuant to paragraph 18, and for the committees established pursuant to paragraph 17, as may be necessary for the exercise of their functions and the conduct of their meetings.

8. The Commission may make recommendations to or advise the Parties on any matters relating to the Treaty.

9. Unless otherwise agreed by the Parties, the seat of the Commission shall be at New Westminster, British Columbia.

10. The Commission shall hold an annual meeting and may hold other meetings at the request of the Chairman or of either Party. The Chairman shall notify the Commissioners of the time and place of meetings. Meetings may be held at the seat of the Commission or at such other place as may be determined in accordance with the by-laws and procedural rules of the Commission.

11. Each Party shall pay the expenses of its own section.

12. The Commission shall prepare an annual budget of joint expenses and submit it to the Parties for approval. The Parties shall bear the costs of the budget in equal shares unless otherwise agreed, and shall pay their shares as the by-laws may specify after the budget has been approved by both Parties.

13. The Commission shall authorize the disbursement of funds contributed by the Parties pursuant to paragraph 12, and may enter into contracts and acquire property necessary for the performance of its functions.

14. The Commission shall submit to the Parties an annual report on its activities and an annual financial statement.

15. The Commission shall appoint an Executive Secretary, who, subject to the supervision of the Commission, shall be responsible for the general administration of the Commission.

16. The Commission may engage staff or authorize the Executive Secretary to do so. The Executive Secretary shall have full authority over the staff subject to the direction of the Commission. If the office of the Executive Secretary is vacant, the Commission shall determine who shall exercise that authority.

17. The Commission shall establish a Committee on Research and Statistics and a Committee on Finance and Administration. The Commission may eliminate or establish committees as appropriate.

18. The Commission shall establish Panels as specified in Annex I. The Commission may recommend to the Parties the elimination or establishment of Panels as appropriate.

19. The Panels shall provide information and make recommendations to the Commission with respect to the functions of the Commission and carry out such other functions as the Treaty may specify or as the Commission may direct.

20. In cases where fisheries intercept stocks for which more than one Panel is responsible, the appropriate Panels shall meet jointly to carry out the functions specified in paragraph 19. If the Panels cannot agree, each may make an independent report to the Commission.

21. Each Panel shall consist of not more than 6 members from each Party. Each Party may designate alternate Panel members to serve in the absence of any Panel member appointed by that Party.

22. Except as otherwise provided in the Treaty, paragraphs 4, 5, 6, 10 and 11 apply, *mutatis mutandis*, to each Panel.

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 abundances of the stocks.

ARTICLE IV

CONDUCT OF FISHERIES

In order to facilitate the implementation of Articles III, VI and VII:

1. Each Party shall submit an annual report on its fishing activities in the previous year to the other Party and to the Commission. The Commission shall forward the reports to the appropriate Panels.

2. The Panels shall consider the reports submitted pursuant to paragraph 1 and shall provide their views to the Commission. The Commission shall review the reports of the Panels and shall provide its views to the Parties.

3. Each year the State of origin shall submit preliminary information for the ensuing year to the other Party and to the Commission, including:

- (a) the estimated size of the run;
- (b) the interrelationship between stocks;
- (c) the spawning escapement required;
- (d) the estimated total allowable catch;
- (e) its intentions concerning management of fisheries in its own waters; and
- (f) its domestic allocation objectives whenever appropriate.

The Commission shall forward this information to the appropriate Panels.

4. The Panels shall examine the information submitted pursuant to paragraph 3 and report their views to the Commission with respect to fishery regimes for the following year.

5. The Commission shall review the reports of the Panels and shall recommend fishery regimes to the Parties.

6. On adoption by both Parties, the fishery regimes referred to in paragraph 5 shall be attached to this Treaty as Annex IV.

7. Each Party shall establish and enforce regulations to implement the fishery regimes adopted by the Parties. Each Party, in a manner to be determined by the Commission, shall notify the Commission and the other Party of these regulations and shall promptly communicate to the Commission and to the other Party any in-season modifications.

ARTICLE V

SALMON ENHANCEMENT PROGRAMS

1. Salmon enhancement programs that may be established by the Parties shall be conducted subject to the provisions of Article III.

2. Each year each Party shall provide to the other Party and to the Commission information pertaining, *inter alia*, to:

- (a) operations of and plans for existing projects;
- (b) plans for new projects; and
- (c) its views concerning the other Party's salmon enhancement projects.

The Commission shall forward this information to the appropriate Panels.

3. The panels shall examine the information and report their views to the Commission in light of the obligations set forth in Article III.

4. The Commission shall review the reports of the Panels and may make recommendations to the Parties.

ARTICLE VI

FRASER RIVER

1. This Article applies to Fraser River sockeye and pink salmon harvested in the area specified in Annex II.

2. Notwithstanding the provisions of Article IV, paragraph 7, on adoption by the Parties of the fishery regime for the stocks covered by this Article, the Fraser River panel shall propose regulations to the Commission for the harvest of salmon referred to in paragraph 1.

3. The Fraser River Panel shall review with other appropriate Panels the fishery regimes and the information provided pursuant to Article IV, paragraph 3, with respect to salmon other than Fraser River sockeye and pink salmon before proposing regulations pursuant to paragraph 2. The Fraser River Panel and the Commission shall ensure that regulatory proposals and recommendations, to the extent practicable, meet the requirements of the Parties with respect to the management of stocks other than Fraser River sockeye and pink salmon.

4. In implementing this Article, the Fraser River Panel and the Commission shall take into account and seek consistency with existing aboriginal rights, rights established in existing Indian treaties and domestic allocation objectives.

5. On the basis of the proposals made by the Panel, the Commission shall recommend regulations to the Parties for approval. The Parties shall review the recommendations for, *inter alia*, consistency with domestic legal obligations. The regulations shall become effective upon approval by the Party in whose waters such regulations are applicable.

6. During the fishing season, the Fraser River Panel may make orders for the adjustment of fishing times and areas stipulated in the annual regulations in response to variations in anticipated conditions. The Parties shall review the orders for consistency with domestic legal obligations. The Parties shall give effect to such orders in accordance with their respective laws and procedures.

7. The Parties shall not regulate their fisheries in areas outside the area specified in Annex II in a manner that would prevent achievement of the objectives of the fishery regime for the salmon referred to in paragraph 1.

ARTICLE VII

TRANSBOUNDARY RIVERS

1. This Article applies to salmon originating in transboundary rivers.

2. Notwithstanding Article IV, paragraph 3(c), whenever salmon originate in the Canadian portion of a transboundary river, the appropriate Panel shall provide its views to the Commission on the spawning escapement to be provided for all the salmon stocks of the river if either section of the Panel so requests.

3. On the basis of the views provided by the Panel pursuant to paragraph 2, the Commission shall recommend spawning escapements to the Parties.

4. Whenever salmon originate in the Canadian portions of transboundary rivers, or would originate there as a result of enhancement projects, salmon enhancement projects on the transboundary rivers shall be undertaken co-operatively, provided, however, that either Party, with the consent of the Commission, may separately undertake salmon enhancement projects on the transboundary rivers.

ARTICLE VIII

YUKON RIVER

1. Notwithstanding Articles III, paragraph 1(b), and VII, arrangements for consultation, recommendation of escapement targets and approval of enhancement activities on the Yukon River require further development to take into account the unique characteristics of that River.

2. The Parties consider it important to ensure effective conservation of stocks originating in the Yukon River and to explore the development of co-operative research and identification of potential enhancement opportunities.

3. The Parties shall initiate in 1985, and conclude, as soon as possible, negotiations to, *inter alia*,

(a) account for United States harvests of salmon originating in the Canadian section of the River;

(b) develop co-operative management procedures taking into account United States management programs for stocks originating in the United States section of the River;

(c) consider co-operative research programs, enhancement opportunities, and exchanges of biological data; and

(d) develop an organizational structure to deal with Yukon River issues.

4. Prior to the entry into force of this Treaty, the Parties shall agree upon:

(a) the range within which the accounting of United States interceptions referred to in paragraph 3(a) shall be established;

(b) arrangements for exchange of available data on the stocks; and

(c) proposals for research.

ARTICLE IX

STEELHEAD

In fulfilling their functions, the Panels and Commission shall take into account the conservation of steelhead.

ARTICLE X

RESEARCH

1. The Parties shall conduct research to investigate the migratory and exploitation patterns, the productivity and the status of stocks of common concern and the extent of interceptions.

2. The Commission may make recommendations to the Parties regarding the conduct and coordination of research.

3. Subject to normal requirements, each Party shall allow nationals, equipment and vessels of the other Party conducting research approved by the Commission to have access to its waters for the purpose of carrying out such research.

ARTICLE XI

DOMESTIC ALLOCATION

1. This Treaty shall not be interpreted or applied so as to affect or modify existing aboriginal rights or rights established in existing Indian treaties and other existing federal laws.

2. This Article shall not be interpreted or applied so as to affect or modify any rights or obligations of the Parties pursuant to other Articles and Annexes to this Treaty.

ARTICLE XII

TECHNICAL DISPUTE SETTLEMENT

1. Either Party may submit to the Chairman of the Commission, for referral to a Technical Dispute Settlement Board, any dispute concerning estimates of the extent of salmon interceptions and data related to questions of overfishing. The Commission may submit other technical matters to the Chairman for referral to a Board. The Board shall be established and shall function in accordance with the provisions of Annex III. The Board shall make findings of fact on the disputes and the other technical matters referred to it.

2. The findings of the Board shall be final and without appeal, except as provided in paragraph 3, and shall be accepted by the Commission as the best scientific information available.

3. Either Party may, by application in writing to the Chairman of the Commission, request reconsideration of a finding of a Board, provided that such request is based on information not previously considered by the Board and not previously known to or reasonably discoverable by the Party requesting such reconsideration. The Chairman shall, if possible, refer the request to the Board which made the finding. Otherwise, the Chairman shall refer the request to a new Board constituted in accordance with the provisions of Annex III.

ARTICLE XIII

ANNEXES

1. All references to this Treaty shall be understood to include the Annexes.

2. The Commission, whenever appropriate, shall review the Annexes and may make recommendations to the Parties for their amendment.

3. The Annexes may be amended by the Parties through an Exchange of Notes between the Government of Canada and the Government of the United States of America.

4. The Commission shall publish the texts of the Annexes whenever amended.

ARTICLE XIV

IMPLEMENTATION

Each Party shall:

(a) enact and enforce such legislation as may be necessary to implement this Treaty;

(b) require reports from its nationals and vessels of catch, effort and related data for all stocks subject to this Treaty and make such data available to the Commission; and

(c) exchange fisheries statistics and any other relevant information on a current and regular basis in order to facilitate the implementation of this Treaty.

ARTICLE XV

ENTRY INTO FORCE AND TERMINATION OF TREATY

1. This Treaty is subject to ratification. It shall enter into force upon the exchange of instruments of ratification at [at a place to be determined].

2. At the end of the third year after entry into force and at any time thereafter, either Party may give notice of its intention to terminate this Treaty. The Treaty shall terminate one year after notification.

3. Upon the entry into force of this Treaty, the Convention between Canada and the United States of America for the Protection, Preservation and Extension of the Sockeye Salmon Fishery in the Fraser River System, as amended, signed May 26, 1930, shall be terminated. However, the International Pacific Salmon Fisheries Commission shall continue to function insofar as is necessary to implement Annex IV Chapter 4, paragraph (1)(c). Following the termination of the Convention, the transfer of responsibilities from the International Pacific Salmon Fisheries Commission to the Commission, the Fraser River Panel and the Government of Canada shall be as agreed by the Parties.

PANELS

The following panels shall be established pursuant to Article II, paragraph 18:

(a) a Southern Panel for salmon originating in rivers with mouths situate south of Cape Caution, except as specified in sub-paragraph (b);

(b) a Fraser River Panel for Fraser River sockeye and pink salmon harvested in the area specified in Annex II; and

(c) a Northern Panel for salmon originating in rivers with mouths situate between Cape Caution and Cape Suckling.

ANNEX II

FRASER PANEL AREA

The area comprises the waters described in Article I of the Convention between Canada and the United States of America for Protection, Preservation and Extension of the Sockeye Salmon Fishery in the Fraser River System, as amended, signed May 26, 1930, as follows:

1. The territorial waters and the high seas westward from the western coast of Canada and the United States of America and from a direct line drawn from Bonilla Point, Vancouver Island, to the lighthouse on Tatoosh Island, Washington—which line marks the entrance to Juan de Fuca Strait—and embraced between 48 and 49 degrees north latitude, excepting therefrom, however, all the waters of Barkley Sound, eastward of a straight line drawn from Amphitrite Point to Cape Beale and all the waters of Nitinat Lake and the entrance thereto.

2. The waters included within the following boundaries:

Beginning at Bonilla Point, Vancouver Island, thence along the aforesaid direct line drawn from Bonilla Point to Tatoosh Lighthouse, Washington, described in paragraph numbered 1 of this Article thence to the nearest point of Cape Flattery, thence following the southerly shore of Juan de Fuca Strait to Point Wilson, on Quimper Peninsula, thence in a straight line to Point Partridge on Whidbey Island thence following the western shore of the said Whidbey Island, to the entrance to Deception Pass, thence across said entrance to the southern side of Reservation Bay, on Fidalgo Island, thence following the western and northern shore line of the said Fidalgo Island to Swinomish Slough, crossing the said Swinomish Slough, in line with the track of the Great Northern Railway, thence northerly following the shore line of the mainland to Atkinson Point at the northerly entrance to Burrard Inlet, British Columbia, thence in a straight line to the southern end of Bowen Island, thence westerly following the southern shore of Bowen Island to Cape Roger Curtis, thence in a straight line to Gower Point, thence westerly following the shore line to Welcome Point on Sechart Peninsula, thence in a straight line to Point Young on Lasqueti Island, thence in a straight line to Dorcas Point on Vancouver Island, thence following the eastern and southern shores of the said Vancouver Island, to the starting point at Bonilla Point, as

shown on the British Admiralty Chart Number 579, and on the United States Coast and Geodetic Survey Chart Number 6300, as corrected to March 14, 1930, copies of which are annexed to the 1930 Convention and made a part thereof.

3. The Fraser River and the streams and lakes tributary thereto.

ANNEX III

TECHNICAL DISPUTE SETTLEMENT BOARD

1. Each Technical Dispute Settlement Board shall be composed of three members. Within 10 days of receiving a request under Article XII to refer a matter to a Board, the Chairman of the Commission shall notify the Parties. Within 20 days of this notification, each Party shall designate one member and the Parties shall jointly designate a third member, who shall be Chairman of the Board.

2. The Board shall determine its rules of procedure, but the Commission or the Parties may specify the date by which the Board shall report its findings. The Board shall provide an opportunity for each Party to present evidence and arguments, both in writing and, if requested by either Party, in oral hearing. The Board shall report its findings to the Commission, along with a statement of its reasons.

3. Decisions of a Board, including procedural rulings and findings of fact, shall be made by majority vote and shall be final and without appeal except as provided in Article XII, paragraph 3.

4. Remuneration of the members and their expense allowances shall be determined on such basis as the Parties may agree at the time the Board is constituted. The Commission shall provide facilities for the proceedings.

ANNEX IV

Chapter I

TRANSBOUNDARY RIVERS

1. Recognizing the desirability of accurately determining exploitation rates and spawning escapement requirements of salmon originating in the Transboundary Rivers, the Parties shall establish a Joint Transboundary Technical Committee (Committee) reporting, unless otherwise agreed, to the Northern Panel and to the Commission. The Committee, *inter alia*, shall

(a) assemble and refine available information on migratory patterns, extent of exploitation and spawning escapement requirements of the stocks;

(b) examine past and current management regimes and recommend how they may be better suited to achieving preliminary escapement goals;

(c) identify enhancement opportunities that:

(i) assist the devising of harvest management strategies to increase benefits to fishermen with a view to permitting additional salmon to return to Canadian waters;

(ii) have an impact on natural Transboundary River salmon production.

2. The Parties shall improve procedures of coordinated or cooperative management of the fisheries on Transboundary River stocks.

3. Recognizing the objectives of each Party to have viable fisheries, the Parties agree that the following arrangements shall apply to the United States and Canadian fisheries harvesting salmon stocks originating in the Canadian portion of

(a) the Stikine River:

(i) in 1985 and in 1986 Canada shall annually harvest 35% of the total allowable catch of sockeye originating in the Canadian portions of the Stikine River or 10,000 such sockeye, whichever is greater;

(ii) in 1985 and in 1986 Canada shall annually harvest 2,000 Stikine River coho;

(iii) in the years 1985 through 1995, the Parties shall take appropriate management action to ensure that the escapement goal of 19,800 to 25,000 chinook salmon in the Canadian portion of the Stikine River is achieved by 1995;

(iv) in 1985, since the run of sockeye is anticipated to be below average, in-season run-size determination and subsequent management actions will be necessary to ensure that harvest objectives and escapements are met;

(v) in 1985 and in 1986, Canadian commercial catches of chinook, pink and chum salmon in the Canadian portions of the Stikine River may be taken as an incidental harvest in the directed fishery for sockeye and coho;

(b) the Taku River:

(i) in 1985 and in 1986 Canada shall annually harvest 15% of the total allowable catch of sockeye originating in the Canadian portion of the Taku River;

(ii) in 1985 and in 1986 Canadian harvests of chinook, pink, chum, and coho salmon may be taken as an incidental harvest in the directed fishery for sockeye;

(iii) in the years 1985 through 1995, the Parties shall take appropriate management action to ensure that the escapement goal of 25,600 to 30,000 chinook salmon in the Canadian portion of the Taku River is achieved by 1995.

4. The Parties agree that if the catch allocations set out in paragraph 3 are not attained due to management actions by either Party in any one year, compensatory adjustments shall be made in subsequent years. If a shortfall in the actual catch of a Party is caused by management actions of that Party, no compensation shall be made.

5. The Parties agree that the following arrangements shall apply to United States and Canadian fisheries harvesting salmon stocks originating in Canadian portions of the Alsek River:

(a) recognizing that chinook and early run sockeye stocks originating in the Alsek River are depressed and require special protection, and in the interest of conserving and rebuilding these stocks, the necessary management actions shall continue until escapement targets are achieved;

in the event that in 1985 and in 1986 the run of sockeye is below average, additional restrictions will be required to meet escapement goals.

6. The Parties agree to consider cooperative enhancement possibilities and to undertake studies as soon as possible on the feasibility of new enhancement projects on the Transboundary Rivers and adjacent areas for the purpose of increasing productivity of stocks and providing greater harvests to the fishermen of both countries.

7. Recognizing that stocks of salmon originating in Canadian sections of the Columbia River constitute a small portion of the total populations of Columbia River salmon, and that the arrangements for consultation and recommendation of escapement targets and approval of enhancement activities set out in Article VII are not appropriate to the Columbia River system as a whole, the Parties consider it important to ensure effective conservation of up-river stocks which extend into Canada and to explore the development of mutually beneficial enhancement activities. Therefore, notwithstanding Article VII, paragraphs 2, 3, and 4, during 1985, the Parties shall consult with a view to developing, for the transboundary sections of the Columbia River, a more practicable arrangement for consultation and setting escapement targets than those specified in Article VII, paragraphs 2 and 3. Such arrangements will seek to, *inter alia*,

- (a) ensure effective conservation of the stocks;
- (b) facilitate future enhancement of the stocks on an agreed basis;
- (c) avoid interference with United States management programs on the salmon stocks existing in the non-transboundary tributaries and the main stem of the Columbia River.

Chapter 2

NORTHERN BRITISH COLUMBIA

SOUTHEASTERN ALASKA

1. Considering that the chum salmon stocks originating in streams in the Portland Canal require rebuilding, the Parties agree in 1985 to jointly reduce interception of these stocks to the extent practicable and to undertake assessments to identify possible measures to restore and enhance these stocks. On the basis of such assessments, the Parties shall instruct the Commission to identify long-term plans to rebuild stocks.

2. With respect to sockeye salmon, the United States shall

(a) during the period 1985 through 1988, limit its purse seine fishery in District 4 in a manner that will result in a maximum four-year total catch of 480,000 sockeye salmon prior to United States statistical week 31;

(b) limit its drift gillnet fishery in Districts 1A and 1B in a manner that will result in an average annual harvest of 130,000 sockeye salmon.

3. With respect to pink salmon, Canada shall

(a) limit its net fishery in Areas 3-1, 3-2, 3-3, 3-4, and 5-11 in a manner that will result in an average annual harvest of 900,000 pink salmon;

(b) in 1985 and 1986, limit its troll fishery in Area 1 in a manner that will result in a maximum two year total catch of 1 million troll pink salmon;

(c) in 1985 and 1986, if 300,000 troll pink salmon are caught in Area 1 in either year, then close to pink salmon trolling sub-areas 101-3 north of 54° 35' north, 101-4, 101-8, and 103 north of 54° 35' north.

4. In 1985 and thereafter, in order to ensure that catch limits specified in paragraphs 2 and 3 are not exceeded, the Parties shall implement appropriate management measures which take into account the expected run-sizes and permit each country to harvest its own stocks.

5. In setting pink salmon fisheries regimes for 1987 and thereafter, the Parties agree to take into account information from the 1984 and 1985 northern pink tagging program.

6. The Parties shall at the earliest possible date exchange management plans for the fisheries described herein.

7. In order to accomplish the objectives of this Chapter, neither Party shall initiate new intercepting fisheries, nor conduct or redirect fisheries in a manner that intentionally increases interceptions.

8. The Parties shall establish a Joint Northern Boundary Technical Committee (Committee) reporting, unless otherwise agreed, to the Northern Panel and the Commission. The Committee, *inter alia*, shall

(a) evaluate the effectiveness of management actions;

(b) identify and review the status of stocks;

(c) present the most current information on harvest rates and pattern on these stocks, and develop a joint data base for assessments;

(d) collate available information on the productivity of stocks in order to identify escapements which produce maximum sustainable harvests and allowable harvest rates;

(e) present historical catch data, associated fishing regimes, and information on stock composition in fisheries harvesting these stocks;

(f) devise analytical methods for the development of alternative regulatory and production strategies;

(g) identify information and research needs, including future monitoring programs for stock assessments;

(h) for each season, make stock and fishery assessments and recommend to the Northern Panel conservation measures consistent with the principles of the Treaty.

Chapter 3

CHINOOK SALMON

1. Considering that escapements of many naturally spawning chinook stocks originating from the Columbia River northward to southeastern Alaska have declined in recent years and are now substantially below goals set to achieve maximum sustainable yields, and recognizing the desirability of stabilizing trends in escapements and rebuilding stocks of naturally spawning chinook salmon, the Parties shall

(a) instruct their respective management agencies to establish a chinook salmon management program designed to meet the following objectives:

(i) halt the decline in spawning escapements in depressed chinook salmon stocks;

(ii) attain by 1998 escapement goals established in order to restore production of naturally spawning chinook stocks, as represented by indicator stocks identified by the Parties, based on a rebuilding program begun in 1984.

(b) jointly initiate and develop a coordinated chinook management program.

(c) establish a Joint Chinook Technical Committee (Committee) reporting, unless otherwise agreed, to the Northern and Southern Panels and to the Commission, which, *inter alia*, shall

(i) evaluate management actions for their consistency with measures set out in this Chapter and for their potential effectiveness in attaining these specified objectives;

(ii) evaluate annually the status of chinook stocks in relation to objectives set out in this Chapter and, consistent with paragraph (d)(iv) beginning in 1986, make recommendations for adjustments to the management measures set out in this Chapter;

(iii) develop procedures to evaluate progress in the rebuilding of naturally spawning chinook stocks;

(iv) recommend strategies for the effective utilization of enhanced stocks;

(v) recommend research required to implement this rebuilding program effectively;

(vi) exchange information necessary to analyze the effectiveness of alternative fishery regulatory measures to satisfy conservation objectives.

(d) ensure that

(i) in 1985 and 1986, the annual all-gear catch in northern and central British Columbia and southeast Alaska shall not exceed 526,000 chinook salmon to be divided equally between the Parties;

(ii) in 1985 and 1986, the annual troll catch off the west coast of Vancouver Island shall not exceed 360,000 chinook;

(iii) in 1985 and 1986, the total annual catch by the sport and troll fisheries in the Strait of Georgia shall not exceed 275,000 chinook;

(iv) if recommended by the Committee, in 1986 and subsequent years adjustments to the ceilings may be made in response to reductions in chinook abundance so that the indicator stocks are rebuilt by 1998; provided that reductions in ceilings for 1986 will not be made unless the Committee recommends a reduction greater than 15 percent, based on reductions in stock abundance for that year;

(v) fishing regimes are reviewed by the Committee and structured so as not to affect unduly or to concentrate disproportionately on stocks in need of conservation;

(vi) if catch ceilings are exceeded in any year, the differences shall be addressed by the responsible Party in a manner that will ensure rebuilding of the affected stocks by 1998.

(e) evaluate all sources of induced fishing mortality, estimate unreported catches of chinook salmon, assess the impact and minimize the effects of these factors in 1985 and 1986. The Commission shall take into account such estimates of total chinook mortality in implementing the chinook rebuilding program.

(f) manage all salmon fisheries in Alaska, British Columbia, Washington and Oregon, so that the bulk of depressed stocks preserved by the conservation program set out herein principally accrue to the spawning escapement.

(g) establish at the conclusion of the chinook rebuilding program fishery regimes to maintain the stocks at optimum productivity and provide fair internal allocation determinations. It is recognized that the Parties are to share the benefits of coastwide rebuilding and enhancement, consistent with such internal allocation determinations and this Treaty.

(h) exchange annual management plans prior to each season.

2. The Parties agree that enhancement efforts designed to increase production of chinook salmon would benefit the rebuilding program. They agree to consider utilizing and redirecting enhancement programs to assist, if needed, in the chinook rebuilding program. They agree that each region's catches will be allowed to increase above established ceilings based on demonstrations to the Commission and assessments by it of the specific contributions of each region's new enhancement activities, provided that the rebuilding schedule is not extended beyond 1998.

Chapter 4

FRASER RIVER SOCKEYE AND PINK SALMON

1. In order to increase the effectiveness of the management of fisheries in the Fraser River Area (hereinafter the Area) and in fisheries outside the Area which harvest Fraser River sockeye and pink salmon, the Parties agree

(a) that the preliminary expectations of the total allowable catches of Fraser River sockeye and pink are:

[in millions]

	Sockeye	Pink
1985	6.6	11.0
1986	12.5	
1987	3.1	12.0
1988	3.6	
1989	7.1	14.0
1990	13.0	
1991	3.1	14.0
1992	3.6	

(b) that (i) based on these preliminary expectations, the United States shall harvest as follows:

	Sockeye	Pink
1985	1.78	3.6
1986	3.0	
1987	1.06	3.6
1988	1.16	

(ii) the United States catches referred to in paragraph 1(b)(i) herein shall be adjusted in proportion to any adjustments in the total allowable catches set out in paragraph 1(a) herein that are due to any agreed adjustments in pre-season or in-season expectations of run-size. When considering such adjustment, the Parties shall take into account all fisheries that harvest Fraser River sockeye and pink salmon including annual Fraser River Indian food fish harvests in excess of 400,000 sockeye. The United States catches shall not be adjusted due to any adjustments in the total allowable catch that may be caused by changes in escapement goals that form the basis for the agreed total allowable catches set out in paragraph 1(a) herein;

(iii) notwithstanding the agreed United States and Canadian catch levels for Fraser River sockeye and for coho off the west coast of Vancouver Island, as provided in paragraph 1(b)(i) herein and in Chapter 5, respectively, and subject to paragraph 1(b)(ii), in 1985 the United States catch of Fraser River sockeye shall be 1.73 million and the Canadian catch of coho off the west coast of Vancouver Island shall not exceed 1.75 million; and in 1986, the United States catch of Fraser River sockeye shall be 2.95 million and the Canadian catch of coho off the west coast of Vancouver Island shall not exceed 1.75 million;

(c) in 1985, to instruct the International Pacific Salmon Fisheries Commission to develop regulatory programs in the Area to give effect to the provisions of paragraph 1(b);

(d) to instruct the Fraser River Panel for 1986 through 1992 to develop regulations to give effect to the provisions of paragraphs 1(b) and 1(f);

(e) to instruct the Fraser River Panel that if management measures fail to achieve such sockeye and pink catches, any difference shall be compensated by adjustments to the Fraser fishery in subsequent years;

(f) in the period 1989 to 1992, the Fraser River Panel shall determine the annual United States catch level so that the total United States catch in this period shall not exceed 7 million sockeye, in the aggregate. In the years 1989 and 1991, the United States harvest shall not exceed 7.2 million pink salmon, in the aggregate. Notwithstanding the foregoing, these levels shall be reduced in proportion to any decreases in the total allowable catches set out in paragraph 1(a) herein that are due to any agreed decreases in pre-season or in-season expectations of run size. When considering such reductions, the Parties shall take into account all fisheries that harvest Fraser River sockeye and pink salmon including annual Fraser River Indian

food fish harvests in excess of 400,000 sockeye. The United States catches shall not be reduced due to any decreases in the total allowable catch that may be caused by changes in escapement goals that form the basis for the agreed total allowable catches set out in paragraph 1(a) herein;

(g) to consider no sooner than 1989 adjusting the regime in accordance with the principles of Article III;

(h) to instruct the Fraser River Panel that in managing Fraser River sockeye and pink salmon, it shall take into account the management requirements of other stocks in the Area;

2. Notwithstanding the provisions of Paragraphs 1(b) and 1(f), and to ensure that Canada receives the benefits of any Canadian-funded enhancement activities undertaken following entry into force of this Treaty, any changes in the total allowable catch due to such activities shall not result in adjustment of the United States catch.

3. The Parties shall establish data-sharing principles and processes which ensure that the Parties, the International Pacific Salmon Fisheries Commission, the Commission and the Fraser River Panel are able to manage their fisheries in a timely manner consistent with this Chapter.

4. The Parties may agree to adjust the definition of the Area as necessary to simplify domestic fishery management and ensure adequate consideration of the effect on other stocks and species harvested in the Area.

5. In managing the fisheries in the Area, the Parties, the Commission, and the Fraser River Panel shall take into account fisheries inside and outside the Area that harvest Fraser River sockeye and pink salmon. The Parties, the Commission, and the Fraser River Panel shall consider the need to exercise flexibility in management of fisheries outside the Area which harvest Fraser River sockeye and pink salmon.

Chapter 5

COHO SALMON

1. Recognizing that for the past several years some coho stocks have been below levels necessary to sustain maximum harvest and that recent fishing patterns have contributed to a decline in United States catch of coho stocks of United States origin, and in order to prevent further decline in spawning escapements, adjust fishing patterns, and initiate, develop or improve management programs for coho stocks, the Parties shall

(a) establish a Joint Coho Technical Committee (Committee), reporting unless otherwise agreed to the Panels and the Commission. The membership of the Committee shall include representation from the Northern and Southern Panel Areas. The Committee, *inter alia*, shall

(i) evaluate the effectiveness of management actions;

(ii) identify and review the status of stocks;

(iii) present the most current information on harvest rates and patterns on these stocks, and develop a joint data base for assessments;

(iv) collate available information on the productivity of coho stocks in order to identify escapements which produce maximum sustainable harvests and allowable harvest rates;

(v) present historical catch data, associated fishing regimes, and information on stock composition in fisheries harvesting these stocks;

(vi) devise analytical methods for the development of alternative regulatory and production strategies;

(vii) identify information and research needs, including future monitoring programs for stock assessments;

(viii) for each season, make stock and fishery assessments and recommend to the Commission conservation measures consistent with the principles of the Treaty;

(b) unless otherwise agreed, in any area where fisheries of one Party may intercept coho stocks originating in the rivers of the other, endeavour to limit incidental coho catches by fisheries targeting on other species.

2. For coho stocks shared by Washington and southern British Columbia fisheries, each Party shall establish regimes for its ocean troll, ocean sport, and inside troll, net and sport fisheries consistent with management objectives approved by the Commission.

3. In 1985, the Parties shall adhere to presently agreed management objectives for Canadian Area 20, U.S. Areas 7 and 7A, and Juan de Fuca Strait.

4. The Parties agree

(a) that in 1985 and 1986 the total annual troll catch of coho in Canadian Management Areas 21, 23, 24, 25, 26, 27, 121, 123, 124, 125, 126, 127, and 130-1 shall not exceed 1.75 million;

(b) to avoid any alterations in coho fisheries along the west coast of Vancouver Island that would increase the proportional interception of U.S. coho stocks;

(c) to develop, in 1986 and thereafter fishery regimes for the west coast of Vancouver Island that

(i) implement conservation measures approved by the Commission and take into account any increased contributions by Canada to the fishery, and

(ii) provide for the sharing of benefits of coho production of each Party consistent with the principles of Article III.

5. If management measures result in a significant deviation from catch levels set out in paragraph 4 in any year, differences shall be compensated by adjustments to the fishery in subsequent years, provided that conservation objectives for natural coho stocks and other principles of Article III are not adversely affected.

6. Notwithstanding any other provisions of this Chapter, the Commission, for 1987 and thereafter, shall set specific harvest levels for coho salmon in the intercepting fisheries in areas described in paragraph 4.

Chapter 6

SOUTHERN BRITISH COLUMBIA—WASHINGTON CHUM FISHERIES

Considering that anticipated returns of some natural salmon stocks originating in Johnstone Strait, the Strait of Georgia, the Fraser River, Puget Sound, Juan de Fuca Strait and Nitinat Lake are expected to be weak and therefore not likely to provide a harvestable surplus in 1985, although some enhanced stocks originating in these areas may provide harvestable surpluses and anticipating locally directed fisheries on such enhanced stocks, the Parties shall

1. no later than March 31, 1985, establish a Joint Chum Technical Committee (Committee) reporting, unless otherwise agreed, to the Southern Panel and the Commission, to, *inter alia*,

(a) identify and review the status of stocks of primary concern;

(b) present the most current information on harvest rates and patterns on these stocks, and develop a joint data base for assessments;

(c) collate available information on the productivity of Chum stocks in order to identify escapements which produce maximum sustainable harvests and allowable harvest rates;

(d) present historical catch data, associated fishing regimes, and information on stock composition in fisheries harvesting those stocks;

(e) develop analytical methods to permit the exploration of alternative regulatory and production strategies;

(f) identify information and research needs, to include future monitoring programs for stock assessments;

(g) develop fishery regimes for the 1985 season and thereafter.

2. no later than August 15, 1985, instruct the Committee to present a report to the Parties on the activities set out in paragraph 1 herein.

Chapter 7

GENERAL OBLIGATION

With respect to intercepting fisheries not dealt with elsewhere in this Annex, unless otherwise agreed, neither Party shall initiate new intercepting fisheries, nor conduct or redirect fisheries in a manner that intentionally increases interceptions.

IN WITNESS WHEREOF, the undersigned representatives, duly authorized by their respective Governments, have signed this Agreement.

DONE in duplicate at Ottawa, in the English and French languages, both versions being equally authentic, this 28th day of January 1985.


FOR THE GOVERNMENT OF THE
UNITED STATES OF AMERICA

POUR LE GOUVERNEMENT DES
ÉTATS-UNIS D'AMÉRIQUE




FOR THE GOVERNMENT OF CANADA

POUR LE GOUVERNEMENT DU CANADA

MEMORANDUM OF UNDERSTANDING

The Governments of the United States of America and Canada have agreed to record the following in connection with the Treaty Concerning Pacific Salmon, in order to set out the intention of the Parties with respect to implementation of Article III, paragraph 1(b) of the said Treaty, Data Sharing and the Yukon River, Transboundary Rivers and the Northern Boundary—Southeastern Alaska fisheries:

A. Implementation of Article III, paragraph 1(b)

The principal goals of the Treaty are to enable both countries, through better conservation and enhancement, to increase production of salmon and to ensure that the benefits resulting from each country's efforts accrue to that country. In this regard, research on the migratory movements of stocks subject to interception must be continued for several years. Such research is required not only to determine with more precision the extent of interceptions by both sides, but also to provide an improved basis for conservation and enhancement. The resultant long-term increases in production of salmon should fully justify the short-term expenditures on research.

With respect to the obligation to provide each Party with benefits equivalent to the production of salmon originating in its rivers (contained in Article III, paragraph 1(b) of the Treaty), it is recognized that data on the extent of interceptions in some areas are imprecise and that it is therefore not possible to determine with certainty the total production of salmon from each country's rivers. It is also recognized that methods of evaluating benefits accruing within each country may differ. For these reasons, it is anticipated that it will be some time before the Commission can develop programs to implement the provisions of Article III, paragraph 1(b) in a complete and comprehensive manner. Nevertheless, in the short term, the Commission shall ensure that the annual fishery regimes and understandings regarding enhancement are developed in an equitable manner taking into account the principle outlined in Article III 1(b). In particular, the Commission's decisions should 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.

In the longer 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. Since correction of imbalances is a national responsibility and may involve differential fishery adjustments or enhancement projects on a regional basis within either country, the Party with the advantage shall submit appropriate proposals to the Commission for consideration. Such proposals shall be discussed within the Commission and be reflected in the agreed fishery regimes and coordinated enhancement planning in ensuing years.

B. Data Sharing

Considering that development of comprehensive evaluations of management is required in order to assess the impact of such regimes on interception fisheries and on the stocks which contribute to those fisheries, for the effective implementation of the Treaty, the Parties consider it necessary to develop a coast-wide stock assessment and management data system, including catch, effort, escapement, and coded-wire tag data that will yield reliable management information in a timely manner and to develop analytical models along with standardized methods for monitoring fishing effort. The Parties agree to maintain a coded-wire tagging and recapture program designed to provide statistically reliable data for stock assessments and fishery evaluations. The Parties agree to establish a working group prior to April 1, 1985 to review the program and to make recommendations to the Commission before April 1, 1987.

Therefore, the Parties agree to

(a) develop the capability to use current season coded-wire tag data, fishing data, spawning escapement data, and age composition data for the pre-season management process for the next season;

(b) continue in 1985 and 1986 the research program begun in 1982 in northern British Columbia and Southeast Alaska, designed to develop agreed estimates of rates of interception of salmon in the area;

(c) continue efforts to develop analytical models that forecast abundance and analyze recovery and escapement data to refine stock productivity estimates and monitor and forecast management needs;

(d) improve evaluation of escapements through improved monitoring (key index area streams, standardization of methods, etc.) and coded-wire tag recovery in escapements;

(e) develop and maintain coded-wire tagging programs for key stocks or index groups to measure exploitation rates and better define time-area distribution for development of management options;

(f) obtain coastwide estimates for non-reported incidental catches of juvenile salmon;

(g) evaluate and develop alternative techniques such as electrophoresis, scale analysis, etc., for stock identification in order to identify stocks not represented by coded-wire tag groups;

(h) explore the feasibility of in-season management;

(i) review annually methodologies and procedures for the purpose of determining performance of applied measures and maintaining "state-of-the-art" fishery management techniques.

C. Yukon River

Considering that salmon stocks originating from the Canadian section of the Yukon River and the Canadian section of the Porcupine River are harvested by fishermen of both Canada and the United States and that effective conservation and management of these resources is of mutual interest, the Parties, in order to facilitate implementation of Article VIII, shall

1. During March 1985, meet in order, *inter alia*, to

(a) determine current stock status;

(b) develop preliminary escapement goals;

(c) examine enhancement opportunities;

(d) examine conservation concerns, including habitat degradation, and recommend management strategies and goals;

(e) develop and recommend cooperative research proposals for 1985 and thereafter; and

(f) notwithstanding the Transboundary River Annex and other provisions of this Memorandum, establish the range within which the percentage of the U.S. harvest of each species of salmon originating in Canadian sections of the rivers that shall be deemed to be of U.S. origin shall be set, as required by Article VIII, paragraph (4).

2. During March 1985, establish a technical committee to compile available data and itemize research requirements for effective future management and conservation.

3. Notwithstanding the Transboundary River Annex and other provisions of this Memorandum, during October 1985, initiate negotiations as required by Article VIII, paragraph (3), to determine, *inter alia*, the percentage of the U.S. harvest of each species of salmon originating in Canadian sections of the rivers that shall be deemed to be of U.S. origin.

D. Transboundary Rivers

Whereas salmon originating in Canadian sections of Transboundary Rivers are subject to harvesting by U.S. fishermen in the U.S. waters;

And whereas the Parties have encountered difficulties in determining the percentage of the total allowable catch of salmon that shall be deemed to be of United States origin for the purpose of implementing Article III, paragraph 1(b) of the Treaty,

The Parties therefore agree that the Commission shall determine this percentage during the first year following the entry into force of the Treaty.

E. Northern Boundary—Southeastern Alaska

In recognition of the Northern Boundary Technical Committee Report which indicates that the Area 3 net fisheries in Canada har-

vest both Canadian and U.S. pink stocks along the boundary areas Canada shall provide to the United States a plan that ensures that fisheries in this Area are not increased during the period of mid July through mid August.

DONE in duplicate at Ottawa, in the English and French languages, both versions being equally authentic, this 28th day of January 1985.

Edward R. Roy
 FOR THE GOVERNMENT OF THE
 UNITED STATES OF AMERICA

POUR LE GOUVERNEMENT DES
 ETATS-UNIS D'AMERIQUE

Timothy J. Ryan

John Allen Lewis
 FOR THE GOVERNMENT OF CANADA

POUR LE GOUVERNEMENT DU CANADA



PACIFIC SALMON COMMISSION

ESTABLISHED BY TREATY IN 1949 IN CANADA
AND THE UNITED STATES OF AMERICA
MAY 12 1974

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Reprint of the

1991 REVISION OF

ANNEX IV, PACIFIC SALMON TREATY

including the

1991 AGREED FISHERY REGIMES

Revised Annex IV
to the Pacific Salmon Treaty
in effect for 1991

Annex IV

Chapter 1

TRANSBOUNDARY RIVERS

1. Recognizing the desirability of accurately determining exploitation rates and spawning escapement requirements of salmon originating in the Transboundary Rivers, the Parties shall maintain a Joint Transboundary Technical Committee (Committee) reporting, unless otherwise agreed, to the Northern Panel and to the Commission. The Committee, inter alia, shall

- (a) assemble and refine available information on migratory patterns, extent of exploitation and spawning escapement requirements of the stocks;
- (b) examine past and current management regimes and recommend how they may be better suited to achieving preliminary escapement goals;
- (c) identify enhancement opportunities that:
 - (i) assist the devising of harvest management strategies to increase benefits to fishermen with a view to permitting additional salmon to return to Canadian waters;
 - (ii) have an impact on natural Transboundary river salmon production.

PA 11B

2. The Parties shall improve procedures of coordinated or cooperative management of the fisheries on Transboundary River stocks.

3. Recognizing the objectives of each Party to have viable fisheries, the Parties agree that the following arrangements shall apply to the United States and Canadian fisheries harvesting salmon stocks originating in the Canadian portion of

(a) the Stikine River:

(1) Assessment of the annual run of Stikine River sockeye salmon shall be made as follows:

- a. A pre-season forecast of the Stikine River sockeye run will be made by the Transboundary Technical Committee prior to March 1 of each year. This forecast may be modified by the Transboundary Technical Committee prior to the opening of the fishing season.
- b. In-season estimates of the Stikine River sockeye run and the Total Allowable Catch (TAC) shall be made under the guidelines of an agreed Stikine Management Plan and using a mathematical forecast model developed by the Transboundary Technical Committee. Both U.S. and Canadian fishing patterns shall be based on current weekly estimates of the TAC. At the beginning of the season and up to an agreed date, the weekly estimates of the TAC shall be determined from the pre-season forecast of the run strength. After that date, the TAC shall be determined from the in-season forecast model.
- c. Modifications to the Stikine Management Plan and forecast model may be made prior to June 1 of each year by agreement of both Parties. Failure to reach agreement in modifications shall result in use of the model and parameters used in the previous year.

RL HB

- d. Estimates of the TAC may be adjusted in-season only by concurrence of both Parties' respective managers. Reasons for such adjustments must be provided to the Transboundary Technical Committee.

(11) Harvest sharing of naturally occurring Stikine River sockeye salmon for the period 1988 to 1992, contingent upon activities specified in the February 1988 Understanding between the United States and the Canadian Section of the Pacific Salmon Commission concerning Joint Enhancement of Transboundary River Salmon Stocks (Understanding) shall be as follows:

- a. When the estimated TAC of Stikine River sockeye salmon is zero or less:

1. Canada may conduct its native food fishery but the catch shall not exceed 4,000 fish, there will be no commercial fishing;
2. The United States shall not direct commercial fisheries at St'ikine River sockeye salmon in District 108;
3. The United States may fish in the commercial gill net fisheries in the Sumner Strait portion of District 106 so long as the in-season estimate of the contribution of Stikine River sockeye salmon is less than 20 percent of the total catch to date of sockeye salmon in Sumner Strait.

- b. When the estimated TAC of Stikine River sockeye salmon is between 1 and 20,000 fish:

1. Canada shall conduct its commercial and native food fisheries so that the all gear catch is at least 10,000 fish and may increase its catch to include any surplus available in-river total allowable catch but not to exceed 15,000 fish;

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2. The United States shall not direct commercial fisheries at Stikine sockeye salmon in District 108;
 3. The United States may fish in the commercial gill net fisheries in the Sumner Strait portion of District 106 so long as the in-season estimate of the contribution of Stikine River sockeye salmon is less than 25 percent of the total catch to date of sockeye salmon in Sumner Strait. If the contribution of Stikine River sockeye salmon is greater than 20 percent but less than 25 percent only one day of fishing per week will be permitted, if greater than 25 percent, no fishing will be permitted in Sumner Strait.
- c. When the estimated TAC of Stikine River sockeye salmon is between 20,001 and 60,000 fish:
1. Canada shall conduct its commercial and native food fisheries so that the all gear catch is at least 15,000 fish and may increase its catch to include any surplus total allowable catch but not to exceed 20,000 fish;
 2. The United States may direct commercial fisheries at Stikine River sockeye salmon in District 108 if the total TAC of Stikine River sockeye salmon is greater than the actual catch of Stikine River sockeye salmon in District 106 plus 20,000
- d. When the estimated TAC of Stikine River sockeye salmon is greater than 60,000 fish:
1. Canada shall conduct its commercial and native food fisheries so that the all gear catch is at least 20,000 fish and may increase its catch to include any surplus total allowable catch but not to exceed 30,000 fish;

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2. The United States may direct commercial fisheries at Stikine River sockeye salmon in District 108 if the total TAC of Stikine River sockeye salmon is greater than the actual catch of Stikine River sockeye salmon in District 106 plus 30,000.
- e. United States incidental catches of Stikine River sockeye salmon in District 108 shall not be counted when computing TAC available for the Canadian fishery. For the purpose of calculation, the Canadian inriver allowable catch of sockeye salmon will be based on a 10 percent harvest rate of Stikine River sockeye salmon in the District 106 drift gill net fishery.
- (iii) Canada shall harvest no more than 4,000 coho salmon annually in the Stikine River from 1988 through 1992.
- (iv) Canadian harvests of chinook, pink, and chum salmon may be taken as an incidental harvest in the directed fishery for sockeye and coho salmon.
- (v) Both Parties shall take the appropriate management action to ensure that the necessary escapement goals for the chinook salmon bound for the Canadian portions of the Stikine River are achieved by 1995.
- (vi) If the United States unilaterally withdraws from mutually agreed enhancement goals and activities as specified in the Understanding, then the harvest sharing of naturally occurring Stikine River salmon as stated in sections (ii) through (iv) above shall remain in effect.
- (vii) If Canada unilaterally withdraws from mutually agreed enhancement goals and activities as specified in the Understanding, then the harvest sharing of naturally occurring Stikine River sockeye salmon shall be as follows:
- a. When the estimated TAC of Stikine River sockeye salmon is zero or less:

1. Canada may conduct its native food fishery but the catch shall not exceed 4,000 fish, there will be no commercial fishing;
 2. The United States shall not direct commercial fisheries at Stikine River sockeye salmon in District 108;
 3. The United States may fish in the commercial gill net fisheries in the Sumner Strait portion of District 106 so long as the in-season estimate of the contribution of Stikine River sockeye salmon is less than 20 percent of the total catch to date of sockeye salmon in Sumner Strait.
- b. When the estimated TAC of Stikine River sockeye salmon is between 1 and 20,000 fish:
1. Canada shall conduct its commercial and native food fisheries so that the all gear catch is at least 4,000 fish and may increase its catch to include any surplus available in-river total allowable catch but not to exceed 7,000 fish;
 2. The United States may direct commercial fisheries at Stikine sockeye salmon in District 108 if the total TAC of Stikine River sockeye salmon is greater than the actual catch of Stikine River sockeye salmon in District 106 plus 7,000;
 3. The United States may fish in the commercial gill net fisheries in the Sumner Strait portion of District 106 so long as the in-season estimate of the contribution of Stikine River sockeye salmon is less than 25 percent of the total catch to date of sockeye salmon in Sumner Strait.
- c. When the estimated TAC of Stikine River sockeye salmon is between 20,001 and 60,000 fish:

1. Canada shall conduct its commercial and native food fisheries so that the all gear catch is at least 7,000 fish and may increase its catch to include any surplus total allowable catch but not to exceed 15,000 fish;
 2. The United States may direct commercial fisheries at Stikine River sockeye salmon in District 108 if the total TAC of Stikine River sockeye salmon is greater than the actual catch of Stikine River sockeye salmon in District 106 plus 15,000.
- d. When the estimated TAC of Stikine River sockeye salmon is greater than 60,000 fish:
1. Canada shall conduct its commercial and native food fisheries so that the all gear catch is at least 15,000 fish and may increase its catch to include any surplus total allowable catch but not to exceed 25,000 fish;
 2. The United States may direct commercial fisheries at Stikine River sockeye salmon in District 108 if the total TAC of Stikine River sockeye salmon is greater than the actual catch of Stikine River sockeye salmon in District 106 plus 25,000.
- e. United States incidental catches of Stikine River sockeye salmon in District 108 shall not be counted when computing TAC available for the Canadian fishery. For the purpose of calculation, the Canadian inriver allowable catch of sockeye salmon will be based on a 10 percent harvest rate of Stikine River sockeye salmon in the District 106 drift gill net fishery.
- f. Canada shall harvest no more than 2,000 coho salmon annually.

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g. Canadian harvest of chinook, pink, and chum salmon may be taken as an incidental harvest in the directed fishery for sockeye and coho salmon.

(b) the Taku River:

- (1) Harvest sharing of naturally occurring Taku River sockeye salmon for the period 1988 to 1992, contingent upon activities specified in the February 1988 Understanding concerning Joint Enhancement of Transboundary River Salmon Stocks (Understanding), shall be as follows:
 - a. Canada shall harvest no more than 18 percent of the TAC of the sockeye salmon originating in the Canadian portion of the Taku River each year.
 - b. Canada shall harvest no more than 3,000 coho salmon each year.
- (ii) Canadian harvests of chinook, pink and chum salmon may be taken as an incidental harvest in the directed fishery for sockeye and coho salmon.
- (iii) Both Parties shall take the appropriate management action to ensure that the necessary escapement goals for chinook salmon bound for the Canadian portions of the Taku River are achieved by 1995.
- (iv) If the United States unilaterally withdraws from mutually agreed enhancement goals and activities as specified in the Understanding, then the harvest sharing of naturally occurring Taku River salmon as stated in sections (i) and (ii) above shall remain in effect.
- (v) If Canada unilaterally withdraws from mutually agreed enhancement goals and activities as specified in the Understanding, then Canada's share of naturally occurring Taku River sockeye salmon shall be 15 percent of the TAC. Furthermore, Canada shall commercially harvest coho, chinook, pink, and chum salmon only incidentally during a directed sockeye salmon fishery.

4. The Parties agree that if the catch allocations set out in paragraph 3 are not attained due to management actions by either Party in any one year, compensatory adjustments shall be made in subsequent years. If a shortfall in the actual catch of a Party is caused by management action of that Party, no compensation shall be made.

5. The Parties agree that the following arrangements shall apply to United States and Canadian fisheries harvesting salmon stocks originating in Canadian portions of the Alsek River: recognizing that chinook and early run sockeye stocks originating in the Alsek River are depressed and require special protection, and in the interest of conserving and rebuilding these stocks, the necessary management actions shall continue until escapement targets are achieved.

6. The Parties agree to consider cooperative enhancement possibilities and to undertake as soon as possible studies on the feasibility of new enhancement projects on the Transboundary Rivers and adjacent areas for the purpose of increasing productivity of stocks and providing greater harvests to the fishermen of both countries.

7. Recognizing that stocks of salmon originating in Canadian sections of the Columbia River constitute a small portion of the total populations of Columbia River salmon, and that the arrangements for consultation and recommendation of escapement targets and approval of enhancement activities set out in Article VII are not appropriate to the Columbia River system as a whole, the Parties consider it important to ensure effective conservation of up-river stocks which extend into Canada and to explore the development of mutually beneficial enhancement activities. Therefore, notwithstanding Article VII, paragraphs 2, 3, and 4, during 1985, the Parties shall consult with a view to developing, for the transboundary sections of the Columbia River, a more practicable arrangement for consultation and setting escapement targets than those specified in Article VII, paragraphs 2 and 3. Such arrangements will seek to, inter alia,

- (a) ensure effective conservation of the stocks;
- (b) facilitate future enhancement of the stocks on an agreed basis;
- (c) avoid interference with United States management programs on the salmon stocks existing in the non-transboundary tributaries and the main stem of the Columbia River.

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Chapter 2

NORTHERN BRITISH COLUMBIA
SOUTHEASTERN ALASKA

1. Considering that the chum salmon stocks originating in streams in the Portland Canal require rebuilding, the Parties agree in 1990 and 1991 to jointly reduce interceptions of these stocks to the extent practicable and to undertake assessments to identify possible measures to restore and enhance these stocks. On the basis of such assessments, the Parties shall instruct the Commission to identify long-term plans to rebuild these stocks.

2. With respect to sockeye salmon, the United States shall

(a) with respect to District 4 purse seine fishery:

(i) for the four year period, 1990 through 1993, limit its fishery in a manner that will result in a maximum four-year total catch of 480,000 sockeye salmon prior to United States Statistical Week 31;

(ii) when the annual catch reaches 160,000 sockeye salmon, no further daily fishing periods in District 4 will be allowed prior to Statistical Week 31;

(iii) all underages not to exceed 20% of the Annex ceiling will add to, and overages will subtract from, the subsequent four-year period.

(b) limit its drift gillnet fishery in Districts 1A and 1B in a manner that will result in an average annual harvest of 130,000 sockeye salmon.

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3. With respect to pink salmon, Canada shall

- (a) limit its net fishery in Areas 3-1, 3-2, 3-3, 3-4, and 5-11 in a manner that will result in an average annual harvest of 900,000 pink salmon;
- (b) with respect to the Area 1 troll fishery:
 - (i) for the four year period, 1990-1993, limit its Area 1 pink salmon troll catch to a total of 5.125 million;
 - (ii) during the period 1990 through 1993, close the pink salmon troll fishery in the most northerly portion of Area 1 in management units 101-4, 101-8, 101-3 north of 54 degrees 37 minutes N. and 103 north of 54 degrees 37 minutes N to pink salmon trolling when the pink salmon fishery has lasted 22 days starting with the beginning of the troll season in Area 1, but no earlier than July 22, except that the most northerly portion of the area shall close to pink salmon trolling whenever the catch in that area reaches 300,000 pinks.
 - (iii) limit the maximum harvest in the entire Area 1 in any one year to 1.95 million pink salmon; and,
 - (iv) all underages, not to exceed 20% of the Annex ceiling, will add to, and overages will subtract from, the subsequent four-year period.

4. In 1987 and thereafter, in order to ensure that catch limits specified in paragraphs 2 and 3 are not exceeded, the Parties shall implement appropriate management measures which take into account the expected run sizes and permit each country to harvest its own stocks.

5. In setting pink salmon fisheries regimes for 1987 and thereafter, the Parties agree to take into account information from the northern pink tagging program.

6. The Parties shall at the earliest possible date exchange management plans for the fisheries described herein.

7. In order to accomplish the objectives of this Chapter, neither Party shall initiate new intercepting fisheries, nor conduct or redirect fisheries in a manner that intentionally increases interceptions.

8. The Parties shall maintain a Joint Northern Boundary Technical Committee (Committee) reporting, unless otherwise agreed, to the Northern Panel and the Commission. The Committee, inter alia, shall

- (a) evaluate the effectiveness of management actions;
- (b) identify and review the status of stocks;
- (c) present the most current information on harvest rates and pattern on these stocks, and develop a joint data base for assessments;
- (d) collate available information on the productivity of stocks in order to identify escapements which produce maximum sustainable harvests and allowable harvest rates;
- (e) present historical catch data, associated fishing regimes, and information on stock composition in fisheries harvesting these stocks;
- (f) devise analytical methods for the development of alternative regulatory and production strategies;
- (g) identify information and research needs, including future monitoring programs for stock assessments; and,
- (h) for each season, make stock and fishery assessments and recommend to the Northern Panel conservation measures consistent with the principles of the Treaty.

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Chapter 3

CHINOOK SALMON

1. Considering the escapements of many naturally spawning chinook stocks originating from the Columbia River northward to southeastern Alaska have declined in recent years and are now substantially below goals set to achieve maximum sustainable yields, and recognizing the desirability of stabilizing trends in escapements and rebuilding stocks of naturally spawning chinook salmon, the Parties shall

- (a) instruct their respective management agencies to establish a chinook salmon management program designed to meet the following objectives:
 - (i) halt the decline in spawning escapements in depressed chinook salmon stocks; and,
 - (ii) attain by 1998, escapement goals established in order to restore production of naturally spawning chinook stocks, as represented by indicator stocks identified by the Parties, based on a rebuilding program begun in 1984;
- (b) continue the chinook working group to clarify policy issues relating to the execution of this Chapter; for example, the definition of pass-through, and the development of common procedures for adjusting catch ceilings in response to changes in abundance, positive incentives and enhancement add-ons; the chinook working group will develop options for consideration by the Commission and Panels as appropriate;
- (c) jointly initiate and develop a coordinated chinook management program;
- (d) maintain a Joint Chinook Technical Committee (Committee) reporting, unless otherwise agreed, to the Northern and Southern Panels and to the Commission, which inter alia, shall

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- (i) evaluate management actions for their consistency with measures set out in this Chapter and for their potential effectiveness in attaining those specified objectives;
 - (ii) evaluate annually the status of chinook stocks in relation to objectives set out in this Chapter and, consistent with paragraph (d) (v) beginning in 1986, make recommendations for adjustments to the management measures set out in this Chapter;
 - (iii) develop procedures to evaluate progress in the rebuilding of naturally spawning chinook stocks;
 - (iv) recommend strategies for the effective utilization of enhanced stocks;
 - (v) recommend research required to implement this rebuilding program effectively; and,
 - (vi) exchange information necessary to analyze the effectiveness of alternative fishery regulatory measures to satisfy conservation objectives;
- (e) ensure that
- (i) in 1991, the all-gear catch in Southeast Alaska shall not exceed the base ceiling of 263,000 chinook salmon plus 10,000; in 1992, the all-gear catch in Southeast Alaska shall not exceed 263,000 chinook salmon; these catches exclude the Alaska hatchery add-on as described in the letter of transmittal; in 1991 and 1992 Alaska shall open its general summer troll fishery on July 1; the June fishery shall not exceed 40,000 chinook salmon (excluding the Alaska hatchery add-on) taken in a manner similar to 1989 and 1990; and areas of high chinook abundance shall be closed during chinook non-retention periods to reduce incidental mortalities;
 - (ii) in 1991, the all-gear catch in Northern and Central B.C. shall not exceed the base ceiling of 263,000 chinook salmon plus 10,000; in 1992, the all-gear catch in Northern and Central B.C. shall not exceed 263,000 chinook salmon; these catches

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exclude a portion of the catch in extreme terminal areas as described in the letter of transmittal;

- (iii) In 1991 and 1992, the annual troll catch off the west coast of Vancouver Island shall not exceed 360,000 chinook salmon;
- (iv) In 1991 and 1992, the total annual catch by the sport and troll fisheries in the Strait of Georgia shall not exceed 275,000 chinook salmon; Canada will undertake management measures to achieve the target of rebuilding Lower Georgia Strait and Fraser River chinook stocks by 1998;
- (v) adjustments to the ceilings may be made in response to reductions in chinook abundance so that the indicator stocks are rebuilt by 1998;
- (vi) fishing regimes are reviewed by the Committee and structured so as not to affect unduly or to concentrate disproportionately on stocks in need of conservation;
- (vii) starting with the 1987 season, a 7.5 percent management range is established above and below a catch ceiling. On a continuing basis, the cumulative deviation (in numbers of fish) shall not exceed the management range. In the event that the cumulative deviation exceeds the range, the responsible Party shall be required in the succeeding year, to take appropriate management actions to return the cumulative deviation, plus any penalty assessed, to a level within the established management range. Negative cumulative deviations shall not accumulate below the management range. It is the intent of this section to insure that, on average, the annual catch in ceilinged fisheries is equal to the agreed target ceiling; and,
- (viii) in 1987 and thereafter, the United States will continue to monitor fisheries in Juan de Fuca Strait (Areas 4B, 5, 6A, 6C) and the outer portions of Puget Sound (6B, 7, 7A, 9) so as to assess the levels and trends in the interceptions of Canadian chinook salmon;

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- (f) maintain the following program, recognizing that associated fishing mortalities can affect the rebuilding schedule. The Parties shall
- (i) minimize the effects of such mortalities;
 - (ii) monitor, assess, and report associated fishing mortalities;
 - (iii) provide the information required by the Chinook Technical Committee to estimate the magnitude and assess the impacts of associated mortalities on an on-going basis;
 - (iv) beginning in 1989, the Chinook Technical Committee shall
 - a. review reports provided by the Parties on an annual basis, unless directed by the Commission, and estimate the magnitude of all quantifiable sources of associated fishing mortalities;
 - b. evaluate their impact on the rebuilding schedule and recommend management actions that will achieve the objectives of the chinook rebuilding program, taking into account the effects of all fishing mortalities; and
 - c. develop technical procedures and standardize methodologies to quantify the magnitude of associated fishing mortalities, including savings of fish, and assess their impacts upon the rebuilding program, including pass-through commitments;
 - (v) the Commission shall annually take into account, starting in 1988, the impacts of fishing mortalities, as determined by the Chinook Technical Committee, in establishing regional fishing regimes and may adjust allowable catches accordingly, to assure rebuilding by 1998;
- (g) manage all salmon fisheries in Alaska, British Columbia, Washington and Oregon, so that the bulk of depressed stocks preserved by the conservation program set out herein principally accrue to the spawning escapement;

(h) establish, at the conclusion of the chinook rebuilding program, fishery regimes to maintain the stocks at optimum productivity and provide fair internal allocation determinations. It is recognized that the Parties are to share the benefits of coastwide rebuilding and enhancement, consistent with such internal allocation determinations and this Treaty; and,

(i) exchange annual management plans prior to each season.

2. The Parties agree that enhancement efforts designed to increase production of chinook salmon would benefit the rebuilding program. They agree to consider utilizing and redirecting enhancement programs to assist, if needed, in the chinook rebuilding program. They agree that each region's catches will be allowed to increase above established ceilings based on demonstrations to the Commission and assessment by it of the specific contributions of each region's new enhancement activities, provided that the rebuilding schedule is not extended beyond 1998, and provisions of Subsection 1(e)(vi) of this Chapter are adhered to.

3. The Parties shall submit a report to the Commission by December 1991 which presents

- (a) joint recommendations for chinook salmon escapement goals in the transboundary rivers;
- (b) given the goals recommended in 3(a), a jointly accepted assessment of progress toward rebuilding chinook stocks in these transboundary rivers based on escapement data available through 1991, and the likelihood of achievement of these goals by 1995; and,
- (c) cooperatively developed management options to be identified by December 1991 and initiated in 1992 and following seasons to ensure rebuilding of chinook stocks in the transboundary rivers which are identified in 3(b) as requiring further management actions.

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Chapter 4

FRASER RIVER SOCKEYE AND PINK SALMON

1. In order to increase the effectiveness of the management of fisheries in the Fraser River Area (hereinafter the Area) and in fisheries outside the Area which harvest Fraser River sockeye and pink salmon, the Parties agree

- (a) that the preliminary expectations of the total allowable catches of Fraser River sockeye and pink are:

	<u>Sockeye</u>	<u>Pink</u>
1985	6.6 million	11.0 million
1986	12.5 million	
1987	3.1 million	12.0 million
1988	3.6 million	
1989	7.1 million	14.0 million
1990	13.0 million	
1991	3.1 million	14.0 million
1992	3.6 million	

- (b) that

- (1) based on these preliminary expectations, the United States shall harvest as follows:

	<u>Sockeye</u>	<u>Pink</u>
1985	1.78 million	3.6 million
1986	3.0 million	
1987	1.06 million	3.6 million
1988	1.16 million	

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- (ii) the United States catches referred to in paragraph 1(b)(i) herein shall be adjusted in proportion to any adjustments in the total allowable catches set out in paragraph 1(a) herein that are due to any agreed adjustments in pre-season or in-season expectations of run-size. When considering such adjustment, the Parties shall take into account all fisheries that harvest Fraser River sockeye and pink salmon including annual Fraser River Indian food fish harvests in excess of 400,000 sockeye. The United States catches shall not be adjusted to any adjustments in the total allowable catch that may be caused by changes in escapement goals that form the basis for the agreed total allowable catches set out in paragraph 1(a) herein;
- (iii) notwithstanding the agreed United States and Canadian catch levels for Fraser River sockeye and for coho off the west coast of Vancouver Island, as provided in paragraph 1(b)(i) herein and in Chapter 5, respectively, and subject to paragraph 1(b)(ii), in 1985 the United States catch of Fraser River sockeye shall be 1.73 million and the Canadian catch of coho off the west coast of Vancouver Island shall not exceed 1.75 million; and in 1986, the United States catch of Fraser River sockeye shall be 2.95 million and the Canadian catch of coho off the west coast of Vancouver Island shall not exceed 1.75 million;
- (c) in 1985, to instruct the International Pacific Salmon Fisheries Commission to develop regulatory programs in the Area to give effect to the provisions of paragraph 1(b);
- (d) to instruct the Fraser River Panel for 1986 through 1992 to develop regulations to give effect to the provisions of paragraphs 1(b) and 1(f);
- (e) to instruct the Fraser River Panel that if management measures fail to achieve such sockeye and pink catches, any difference shall be compensated by adjustments to the Fraser fishery in subsequent years;

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- (f) In the period 1989 to 1992, the Fraser River Panel shall determine the annual United States catch level so that the total United States catch in this period shall not exceed 7 million sockeye in the aggregate. In the years 1989 and 1991, the United States harvest shall not exceed 7.2 million pink salmon, in the aggregate. Notwithstanding the foregoing, these levels shall be reduced in proportion to any decreases in the total allowable catches set out in paragraph 1(a) herein that are due to any agreed decreases in pre-season or in-season expectations of run size. When considering such reductions, the Parties shall take into account all fisheries that harvest Fraser River sockeye and pink salmon including annual Fraser River Indian food fish harvests in excess of 400,000 sockeye. The United States catches shall not be reduced due to any decreases in the total allowable catch that may be caused by changes in escapement goals that form the basis for the agreed total allowable catches set out in paragraph 1(a) herein;
- (g) to consider no sooner than 1989 adjusting the regime in accordance with the principles of Article III;
- (h) to instruct the Fraser River Panel that in managing Fraser River sockeye and pink salmon, it shall take into account the management requirements of other stocks in the Area.

2. Notwithstanding the provisions of Paragraphs 1(b) and 1(f), and to ensure that Canada receives the benefits of any Canadian-funded enhancement activities undertaken following entry into force of this Treaty, any changes in the total allowable catch due to such activities shall not result in adjustment of the United States catch.

3. The Parties shall establish data-sharing principles and processes which ensure that the Parties, the International Pacific Salmon Fisheries Commission, the Commission and the Fraser River Panel are able to manage their fisheries in a timely manner consistent with this Chapter.

4. The Parties may agree to adjust the definition of the Area as necessary to simplify domestic fishery management and ensure adequate consideration of the effect on other stocks and species harvested in the Area.

5. In managing the fisheries in the Area, the Parties, the Commission, and the Fraser River Panel shall take into account fisheries inside and outside the Area that harvest Fraser River sockeye and pink salmon. The Parties, the Commission, and the Fraser River Panel shall consider the need to exercise flexibility in management of fisheries outside the Area which harvest Fraser River sockeye and pink salmon.

6. The Parties shall establish a technical committee for the Fraser River Panel:

- (a) the members shall coordinate the technical aspects of Fraser River Panel activities with and between the Commission staff and the national sections of the Fraser River Panel, and shall report to their respective national sections of the Panel. The committee may receive assignments of a technical nature from the Fraser River Panel and will report results directly to the Panel.
- (b) membership of the committee shall consist of up to 3 such technical representatives as may be designated by each national section of the Commission.
- (c) members of the technical committee shall analyze proposed management regimes, provide technical assistance in the development of proposals for management plans, explain technical reports and provide information and technical advice to the respective national sections of the Panel.
- (d) the technical committee shall work with the Commission staff during pre-season development of the fishery regime and management plan and during in-season consideration of regulatory options for the sockeye and pink salmon fisheries of Fraser Panel Area waters to ensure that:
 - (i) domestic allocation objectives of both Parties are given full consideration;
 - (ii) conservation requirements and management objectives of the Parties for species and stocks other than Fraser River sockeye and pink salmon in the Fraser River Panel Area during periods of Panel regulatory control are given full consideration; and,

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- (111) the Commission staff is timely informed of management actions being taken by the Parties in fisheries outside of the Fraser River Panel Area that may harvest sockeye and pink salmon of Fraser River origin.
- (e) the staff of the Commission shall consult regularly in-season with the technical committee to ensure that its members are fully and timely informed on the status of Fraser River sockeye and pink salmon stocks, and the expectations of abundance, migration routes and proposed regulatory options, so the members of the technical committee can brief their respective national sections prior to each in-season Panel meeting.

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Chapter 5

COHO SALMON

1. Recognizing that for the past several years some coho stocks have been below levels necessary to sustain maximum harvest and that recent fishing patterns have contributed to a decline in some Canadian and United States coho stocks, and in order to prevent further decline in spawning escapements, adjust fishing patterns, and initiate, develop, or improve management programs for coho stocks, the Parties shall

- (a) instruct their respective management agencies to continue to develop coho salmon management programs designed to meet the following objectives
 - (i) prevent overfishing; and,
 - (ii) provide for optimum production;
- (b) maintain a Joint Coho Technical Committee (Committee), reporting, unless otherwise agreed, to the Panels and the Commission. The membership of the Committee shall include representation from the Northern and Southern Panel Areas. The Committee, inter alia, shall, at the direction of the Commission and relevant Panels
 - (i) evaluate management actions for their consistency with measures set out in this Chapter and for their potential effectiveness in attaining the objectives established by the Commission;
 - (ii) annually identify, review, and evaluate the status of coho stocks in relation to the objectives set out in this Chapter and make recommendations for adjustments to the management measures consistent with those objectives;
 - (iii) present the most current information on exploitation rates and patterns on these stocks, and develop a joint data base for assessments;

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- (iv) collate available information on the productivity of coho stocks in order to identify the management objectives necessary to prevent overfishing;
 - (v) present historical catch data and associated fishing regimes;
 - (vi) estimate stock composition in fisheries of concern to the Commission and Panels;
 - (vii) devise analytical methods for the development of alternative regulatory and production strategies;
 - (viii) identify information and research needs, including future monitoring programs for stock assessments;
 - (ix) investigate the feasibility of alternative methodologies for implementing indicator stock programs in all areas;
 - (x) for each season, make stock and fishery assessments and recommend to the Commission conservation measures consistent with the principles of the Treaty;
 - (xi) develop programs to assure the attainment of spawning escapement goals and prevent overfishing;
 - (xii) exchange information necessary to analyze the effectiveness of alternative fishery regulatory measures in achieving conservation objectives; and,
 - (xiii) work to develop, under the direction of the Joint Northern and Southern Panels, standard methodologies for coho stock and fishery assessment; and,
- (c) unless otherwise agreed, in any area where fisheries of one Party may intercept coho stocks originating in the rivers of the other which require conservation action or such other action as the Commission may determine, that Party will endeavor to limit incidental coho catches in fisheries targeting on other species.

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2. For coho stocks shared by fisheries of the United States and Canada, recommendations for fishery regimes shall be made by the Northern Panel for coho salmon originating in rivers with mouths situated between Cape Caution and Cape Suckling and by the Southern Panel for coho salmon originating in rivers with mouths situated south of Cape Caution, as provided in Annex 1. At the direction of the Commission, each Party shall establish regimes for its troll, sport, and net fisheries consistent with management objectives approved by the Commission.

3. The Parties agree

- (a) for 1991 and 1992, the west coast of Vancouver Island (Canadian Management Areas 21, 23, 24, 25, 26, 27, 121, 123, 124, 125, 126, 127, and 130-1) annual troll harvest shall not exceed 1.8 million Coho;
- (b) for 1991 and 1992, the Swiftsure Bank area will be closed to chinook and coho salmon trolling in order to address conservation concerns expressed by both Parties. Troll fishing for sockeye and pink salmon shall, upon appropriate prior notice, be permitted only in order to attain Canadian domestic troll allocation objectives on sockeye and pink;
- (c) to avoid any alterations in coho fisheries along the west coast of Vancouver Island that would increase the proportional interception of U.S. coho stocks;
- (d) that in 1991 and 1992, for Canadian Area 20, and U.S. Areas 7 and 7A, fisheries directed at coho salmon will be permitted. Notwithstanding this agreement, if the Commission determines that conservation concerns expressed by either Party warrant further restrictions, then the Parties shall limit their catch of coho salmon to that taken incidentally during fisheries under the control of the Fraser Panel and those permitted under the provisions of Annex IV, Chapter 6. Both Parties agree that in 1987, due to conservation concerns expressed by both Parties and agreed to by the Commission, coho fisheries in Canadian Area 20 and U.S. Areas 7 and 7A shall be limited by the levels of incidental coho catch anticipated during fisheries conducted under the control of the Fraser Panel and provisions of Annex IV, Chapter 6;

- (e) for 1991 and 1992, the United States shall adhere to presently agreed management objectives in Strait of Juan de Fuca Areas 4B, 5, and 6C; and,
- (f) to develop in 1993 and thereafter, troll fishery regimes for the west coast of Vancouver Island that
 - (i) implement conservation measures approved by the Commission and take into account any increased contributions by the Parties to the fishery; and,
 - (ii) provide for the sharing of benefits of coho production of each Party consistent with the principles of Article III.

4. Notwithstanding any other provisions of this Chapter, the Commission, for 1993 and thereafter, may set specific fishery regimes as appropriate, which may include troll harvest ceilings, for coho salmon in the intercepting fisheries restricted under this Chapter that

- (a) implement conservation measures approved by the Commission;
- (b) take into account increased production;
- (c) provide for the recognition of benefits of coho production of each Party consistent with the principles of Article III;
- (d) take into account actions taken by each Party to address its conservation concerns; and,
- (e) take into account time and area management measures which will assist either Party in meeting its conservation objectives while avoiding undue disruption of fisheries.

5. Starting with the 1987 season, a 7.5 percent management range is established above and below a catch ceiling. On a continuing basis, the cumulative deviation (in numbers of fish) shall not exceed that management range. In the event that the cumulative deviation exceeds the range, the responsible Party shall be required, in the succeeding year, to take appropriate management actions to return the cumulative deviation, plus any penalty assessed, to a level within the established management range. Negative cumulative deviations shall not

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accumulate below the management range. It is the intent of this section to insure that, on average, the annual catch in ceilinged fisheries is equal to the agreed target ceiling.

6. The Parties agree that enhancement efforts designed to increase production of coho salmon would, when combined with catch ceilings and/or time/area management measures, aid in rebuilding depressed natural stocks by reducing the exploitation rates on these stocks. They agree that utilizing this opportunity in the future to rebuild natural stocks is, in most cases preferable to reductions in fishing levels. A major objective of enhancement is to lay the foundation for improved fisheries in Annex areas in the future.

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Chapter 6

SOUTHERN BRITISH COLUMBIA AND WASHINGTON STATE CHUM SALMON

1. The Parties shall maintain a Joint Chum Technical Committee (Committee) reporting, unless otherwise agreed, to the Southern Panel and the Commission. The Committee, inter alia, will undertake to

- (a) identify and review the status of stocks of primary concern;
- (b) present the most current information on harvest rates and patterns on these stocks, and develop a joint data base for assessments;
- (c) collate available information on the productivity of chum stocks to identify escapements which produce maximum sustainable harvests and allowable harvest rates;
- (d) present historical catch data, associated fishing regimes, and information on stock composition in fisheries harvesting those stocks;
- (e) devise analytical methods for the development of alternative regulatory and production strategies;
- (f) identify information and research needs, to include future monitoring programs for stock assessment; and,
- (g) for each season, make stock and fishery assessments and evaluate the effectiveness of management.

2. In 1991 and 1992, Canada will manage its Johnstone Strait, Strait of Georgia, and Fraser River chum fisheries to provide continued rebuilding of depressed naturally spawning chum stocks, and, to the extent practicable, minimize increased interceptions of United States origin chum. Terminal fisheries conducted on specific stocks with identified surpluses will be managed to minimize interception of non-targeted stocks.

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3. In each of 1991 and 1992,

(a) for Johnstone Strait run sizes less than 3.0 million

- (i) Canada, taking into account the catch of Canadian chum in United States Areas 7 and 7A, will limit its harvest rate in Johnstone Strait to less than 10 percent, resulting in a Johnstone Strait catch level of up to 225,000 chum; and,
- (ii) when the catch in Johnstone Strait is 225,000 chum or less, the United States catch of chum in Areas 7 and 7A shall be limited to chum taken incidentally to other species and in other minor fisheries, but shall not exceed 20,000, provided, however, that catches for the purposes of electrophoretic sampling shall not be included in the aforementioned limit;

(b) for Johnstone Strait run sizes from 3.0 million to 3.7 million

- (i) Canada, taking into account the catch of Canadian chum in United States Areas 7 and 7A, will limit its harvest rate in Johnstone Strait to 20 percent, resulting in a Johnstone Strait catch level of 225,000 to 640,000 chum; and,
- (ii) when the catch in Johnstone Strait is from 225,000 to 640,000 chum, the United States catch of chum in Areas 7 and 7A shall not exceed 120,000;

(c) for Johnstone Strait run sizes of 3.7 million and greater

- (i) Canada, taking into account the catch of Canadian chum in United States Areas 7 and 7A, will harvest at a rate in Johnstone Strait of 30 percent or greater, resulting in a Johnstone Strait catch level of 640,000 chum or greater; and,
- (ii) when the catch in Johnstone Strait is 640,000 chum or greater, the United States catch of chum in Areas 7 and 7A shall not exceed 140,000;

- (d) It is understood that the Johnstone Strait run sizes, harvest rates, and catch levels referred to in 3(a), 3(b), and 3(c) are those determined in season, in Johnstone Strait, by Canada; and,
 - (e) the United States shall manage in a manner that, as far as practicable, maintains a traditional proportion of effort and catch between United States Areas 7 and 7A, and avoids concentrations of effort along the boundary in Area 7A.
4. In 1991 and 1992, the United States shall conduct its chum fishery in the Strait of Juan de Fuca (United States Areas 4B, 5 and 6C) so as to maintain the limited effort nature of this fishery, and, to the extent practicable, minimize increased interceptions of Canadian origin chum. The United States shall continue to monitor this fishery to determine if recent catch levels indicate an increasing level of interception.
5. If the United States chum fishery in Areas 7 and 7A fails to achieve the 1991 and 1992 catch levels specified in paragraphs 3(a)(ii), 3(b)(ii), and 3(c)(ii), any differences shall be compensated by adjustments to the Areas 7 and 7A fishery in subsequent years, except that chum catches below the level specified in paragraph 3(a)(ii) shall not be compensated.
6. Catch compositions in fisheries covered by this chapter will be estimated by post-season analysis using methods agreed upon by the Joint Chum Technical Committee.
7. Canada will manage the Nitinat net chum fishery to minimize the harvest of non-targeted stocks.
8. In 1991 and 1992, Canada shall conduct electrophoretic sampling of chum taken in the West Coast Vancouver Island troll fishery if early-season catch information indicates that catch totals for the season may reach levels similar to 1985 and 1986. Sampling, should it occur, will include catches taken from the southern areas (Canadian Areas 121-124).

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Chapter 7

GENERAL OBLIGATION

With respect to intercepting fisheries not dealt with elsewhere in this Annex, unless otherwise agreed, neither Party shall initiate new intercepting fisheries, nor conduct or redirect fisheries in a manner that intentionally increases interceptions.

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