

Pacific Salmon Commission



1992/93
Eighth Annual
Report

Pacific Salmon Commission

**Established by Treaty between Canada
and the United States March 18, 1985**

for the

**conservation, management and
optimum production of Pacific salmon**

Eighth Annual Report 1992/93

**Vancouver, B.C.
Canada**



PACIFIC SALMON COMMISSION

ESTABLISHED BY TREATY BETWEEN CANADA
AND THE UNITED STATES OF AMERICA
MARCH 18, 1985

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Letter of Transmittal

In compliance with Article II, Paragraph 14 of the Treaty between the Government of Canada and the Government of the United States of America concerning Pacific salmon, it is my pleasure as Chair of the Pacific Salmon Commission to present my compliments to the Parties and to transmit herewith the Eighth Annual Report of the Commission.

This report summarizes the activities of the Commission for the fiscal year April 1, 1992 to March 31, 1993.

The Commission expected to be able to report to the Parties a successful conclusion to negotiation of the major provisions of Annex IV, most of which expired following the 1992 fishing season. In addition, progress on the outstanding issues of equity, development of long term management approaches for chinook, and development of management approaches for both northern and southern coho stock complexes was desired by both Parties.

In spite of an extended meeting schedule and exhaustive efforts by both national sections, agreement on longer term provisions escaped the Commission. Arrangements for 1993 were ultimately concluded on June 25, 1993, following a government-to-government meeting in Montreal June 3 and 4, 1993, which laid the groundwork for the 1993 escapements.

Reports on the results of the 1992 fishing season, meetings of the Standing Committees on Finance and Administration, and Research and Statistics and the activities of the Northern, Southern and Fraser River Panels are presented in summary. Executive summaries of documents prepared by the Joint Technical Committees during the period covered by this report are also presented.

The Auditors' report on financial activities of the Commission during the fiscal year April 1, 1992 to March 31, 1993, as approved by the Commission, is also included in this report.

Yours truly,

P.S. Chamut
Chair

PACIFIC SALMON COMMISSION

OFFICERS for 1992/93

Chair Mr. J.R. Blum (to June 30, 1992)
 Mr. D.A. Colson (to December 2, 1992)

Vice-Chair Mr. P.S. Chamut (from December 2, 1992)
 Mr. D.A. Colson (from December 2, 1992)

COMMISSIONERS

United States

Mr. J.R. Blum (to June 30, 1992)
Mr. G.R. McMinds (to June 7, 1992)
Mr. D.A. Colson
Mr. B. Wallace
Mr. H.R. Beasley
Mr. G.I. James
Mr. C. Meacham, Jr.
Mr. R. Rousseau
Ms. K. Brigham (from October 20, 1992)
Mr. R.A. Turner (from October 20, 1992)

Canada

Mr. P.S. Chamut
Mr. R. Wright
Mr. J. Gosnell (to January 31, 1993)
Mr. B. Buchanan
Mr. A.F. Lill (to January 5, 1993)
Mr. J. Nichol
Ms. S. Paine (to February 6, 1993)
Mr. N. Keitlah
Ms. W. Grant (from January 31, 1993)
Mr. W. Lefeaux-Valentine (from February 6, 1993)
Mr. Y. Fortier (from January 22, 1993)

SECRETARIAT STAFF

Executive Secretary
Administrative Officer
Chief Biologist

Mr. I. Todd
Mr. K. Medlock
Dr. J.C. Woodey

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INTRODUCTION

Interception of Pacific salmon bound for rivers of one country by fishers of the other has been the subject of discussion between the Governments of Canada and the United States of America since the early part of this century. Intercepting fisheries were identified through research conducted by the two countries on species and stocks originating from Alaska, British Columbia, Washington and Oregon. The results of this research identified that Alaskan fishers were catching salmon bound for British Columbia, Oregon and Washington. Canadian fishers, primarily off the west coast of Vancouver Island, were capturing salmon bound for rivers of Washington and Oregon. Fishers in northern British Columbia were intercepting salmon returning to Alaska, Washington and Oregon, and United States fishers were catching Fraser River salmon as they travelled through the Strait of Juan de Fuca and the San Juan Islands towards the Fraser River.

Management of stocks subject to interception is a matter of common concern to both Canada and the United States. A mechanism to enable the countries to reap the benefits of their respective management and enhancement efforts was required. That mechanism is now provided through the Pacific Salmon Treaty, which entered into force upon the exchange of instruments of ratification by the President of the United States of America and the Prime Minister of Canada on March 18, 1985.

The Pacific Salmon Commission, guided by principles and provisions of the Treaty, establishes general fishery management regimes for international conservation and harvest sharing of intermingling salmon stocks. Each country retains jurisdictional management authority for its fisheries but must take into account and manage its fisheries in a manner consistent with provisions of the Treaty. Implementation of the principles of the Treaty enables the United States and Canada, through better conservation and enhancement, to prevent overfishing, increase production of salmon, and ensure that each country receives benefits equivalent to its own production. The Commission also serves as a forum for consultation between the Parties on their salmonid enhancement operations and research programs.

The organizational structure of the Commission is focused on three geographically oriented panels. The Northern Panel's stocks of concern are those which originate in rivers situated between Cape Suckling in Alaska and Cape Caution in British Columbia, including the transboundary rivers. The Southern Panel's stocks of concern are those which originate in rivers located south of Cape Caution, other than Fraser River sockeye and pink salmon. The Fraser River Panel has special responsibilities for stocks of sockeye and pink salmon originating from the Fraser River.

The functions of panels are to review annual post-season reports, annual and pre-season fishing plans, and ongoing and planned salmonid enhancement programs of each country and to provide recommendations to the Commission for development of annual fishery regimes in accordance with the objectives of the Treaty. These plans, once adopted by the Commission and the governments, are implemented by the management agencies in each country.

The Fraser River Panel, in addition, has been accorded special responsibility for in-season regulation of Fraser River sockeye and pink fisheries of Canada and the United States in southern British Columbia and northern Puget Sound, in an area designated as Fraser River Panel Area Waters. Scientific and technical work is conducted for the Panel by the Fishery Management Division of the Commission's Secretariat staff.

Waters. Scientific and technical work is conducted for the Panel by the Fishery Management Division of the Commission's Secretariat staff.

The Commission meets at least once annually and conducts its business between meetings through its permanent Secretariat located in Vancouver, British Columbia. In the period April 1, 1992 to April 16, 1993, the Commission met on five occasions:

1. Commission Executive Session
October 20-21, 1992 - Juneau, Alaska
2. Post-1992 fishing season meeting of the Commission
November 30-December 4, 1992 - Vancouver, B.C.
3. Panels' negotiating session
January 20-29, 1993 - Vancouver, B.C.
4. Eighth Annual Meeting of the Commission
February 8-17, 1993 - Bellevue, Washington
5. Commission Executive Session (expanded)
April 14-16, 1993 - Vancouver, B.C.

This, the Eighth Annual Report of the Pacific Salmon Commission, provides a synopsis of the activities of the Commission and its subsidiary bodies during its eighth fiscal year of operation, April 1, 1992 to March 31, 1993.

The Commission, as it entered its 1992/93 series of negotiating sessions, was faced with a difficult task. Disruption of sockeye salmon fisheries in Fraser River Panel Area Waters occurred in 1992 as a result of the Parties' inability pre-season to come to agreement on interpretation of the catch-sharing provisions in place for the final year of the Fraser River Chapter in Annex IV; in addition to the expiration of the Fraser River Chapter, agreed provisions coastwide for chinook and coho, for southern chum and for northern boundary chum also expired following the 1992 fishing season. Further, progress on resolving the outstanding issues concerning equity, developing long range management approaches for chinook, and developing management approaches for both northern and southern coho stock complexes, was desired by both Parties.

In recognition of the multitude and complexity of the issues facing it, the Commission scheduled two major negotiating sessions, January 20-29, 1993, and February 8-17, 1993. In spite of the efforts expended by all concerned, the Commission was unable to make progress within the allotted time frame. The Commission ultimately recognized that agreement on long term provisions of the expired chapters of Annex IV was beyond its grasp, and began to focus on reaching agreed arrangements for the major intercepting fisheries for 1993 alone.

A follow-up meeting of the Commission in expanded executive format was held in Vancouver April 14, 15, and 16, 1993. All bilateral sessions during this round were held in camera, and no progress was reported. Subsequently, a series of informal discussions between the Parties were held, culminating in an informal government-to-government meeting in Montreal June 3 and 4, 1993. Agreement was not reached during that session, but the groundwork was laid for further informal discussion by the Commission. On June 25, 1993, the Commission reported to governments that agreement had been reached on fishery regimes for the 1993 season. The letter of transmittal is included in this report as Appendix A. For convenience, the full text of Annex IV, last amended in 1991, is included here as Appendix B.

The challenges facing the Commission in 1993 and beyond remain difficult. Prodigious efforts will have to be advanced by all concerned to ensure that the cornerstone principles of the Treaty are developed and implemented to their full potential to provide security for the future of the combined fisheries resources of the two countries, as well as improved opportunities for the many diverse groups who rely on Pacific salmon for sustenance, pleasure, and profit.

Activities of the Commission

PART I

ACTIVITIES OF THE COMMISSION

A. EXECUTIVE SESSION OF THE PACIFIC SALMON COMMISSION

October 20-21, 1992 -- Juneau, Alaska

The Commission met to review progress on tasks that had been agreed upon during the 1991/92 meeting cycle and to initiate discussion on topics that might be considered during the 1992/93 meeting cycle.

1. Progress on agreed tasks

Report of the Joint Interceptions Committee. The Committee proposes to assemble estimates of interceptions provided by the technical committees for 1990 and 1991 during the 1992/93 meeting cycle; revise estimates for past years; include new methodologies for coho in the south and pinks in the north; and re-do the JIC Report, with a target completion date of January, 1993.

Work on coho methodologies is progressing well for southern stocks, and application may be tried on northern stocks where data are available. Progress is slower on northern boundary pinks. There has been some refinement of Canadian catch data, and mathematical calculations concerning fluctuations in abundance are now available for review. Revised methodology may not be available for this meeting cycle, but estimates can be re-done using existing techniques.

JIC will compile information on the confidence that can be placed on the estimates of interception, and differences that exist on the estimates will be arrayed so that the Commission may resolve differences that cannot be resolved technically.

Report of the Joint Objectives and Goals Committee. The exchange of all chapters has been completed, and the Committee has met twice with representatives of the panels. Agreement was reached on a general outline the panels should follow in their review. The Committee recommends that northern boundary and southern chums be used as test cases for this approach. Cooperative examination of these areas could result in agreed proposals from the panels for changes to the chum components of Annex IV. These two areas were chosen as test cases because the Committee, in consultation with the panel representatives, concluded that there is a high potential for success.

Report of the Valuation Methodology Working Group. This group was established ad hoc to follow up on recommendations which arose from the Valuation Methodology Workshop regarding standardization of definitions and identification of economic data available. The group's preliminary report recommended that the Commission formalize the Working Group to allow it to continue the process. The Commission is asked to endorse the exchange of landed/wholesale value data. Eventually the Working Group would look at ways of measuring recreational values. A draft list of economic definitions was reviewed, but needs refining with a view of achieving common understandings of such terms as singular pricing, reverse pricing, and others.

The Commission concluded that decision on the Working Group's recommendations will not be made until the post-season meeting when the group expects to present its completed report.

Reports of the Coho Workshops:

(a) Northern:

The report of the Northern Coho Workshop was presented. The Northern Panel should be given an opportunity to review the report and its recommendations and seek to resolve differences in views which currently exist between the two sections.

(b) Southern:

The report of the Southern Coho Workshop was presented, and identified that there are potential areas for continued discussion. Another meeting could be productive to explore further a possible blending of the Canadian step approach with the U.S. abundance-driven approach.

Progress on Other Tasks:

Progress on each of the tasks and assignments agreed upon during the 1991/92 meeting cycle was reviewed. Appendix C, contains a list of those tasks which had not been completed as of October, 1992.

2. Preliminary Identification of Issues for Negotiation and Discussion during the 1992/93 Meeting Cycle.

The Commission agreed that there is no need to exchange written lists of issues at this meeting. They agreed it would be useful at this meeting to have open dialogue on each of the six chapters of Annex IV, identify expired elements in each, and exchange preliminary views. Specific negotiating positions will be developed for later meetings. It was agreed that written position papers will be exchanged not later than Thursday, December 3, 1992.

3. Instructions to Panels and Joint Technical Committees.

It was agreed that specific instructions to Panels and Joint Technical Committees were not necessary, other than to confirm that northern and southern boundary areas chum salmon would be used as test cases for the JOGC process, that panels will review post-season fishing reports, and that the Fraser River Panel Joint Technical Committee will review long range sockeye and pink forecasts.

B. POST-1992 FISHING SEASON MEETING OF THE COMMISSION

November 30-December 4, 1992 -- Vancouver, B.C.

The Commission met in executive session on December 2, 1992 where administrative matters were discussed and post-season fishery reports were exchanged (see Section IV B and C for a summary of those reports). The United States presented its annual enhancement update (Section IV D). The office of Commission Chair was transferred to Mr. Chamut, and officers for 1992/93 were appointed (Appendix D).

The Commission met in plenary session on December 3, 1992 for each Party to present the position it intends to advance during the forthcoming round of negotiations. On the outcome of a coin toss, Mr. Chamut presented the Canadian position first, followed by Mr. Colson on behalf of the United States.

1. Statement Regarding the Canadian Position

The intent of this paper is to explain the basic philosophy underlying Canada's approach to the Pacific Salmon Treaty and to summarize Canadian proposals for renegotiation of expiring provisions of Annex IV of the Pacific Salmon Treaty. This past year has been a difficult one, in large part as a consequence of the dispute over the Fraser River, which has diverted us from our main course of creating a dependable and workable system for improving salmon fisheries on a coast-wide basis. I believe we must quickly solve the short-term problems so that we can resume our quest for creation, in the long term, of a positive environment for restoration and expansion of our valuable salmon resources.

The Treaty is based on two principles. The first is aimed at conservation and management of shared stocks. The second provides for each Party to derive benefits from Pacific salmon stocks equivalent to their production.

The commitment of both countries to the first principle, conservation, is well exemplified by our joint efforts in the chinook rebuilding program, which, though not perfect, have provided a vastly improved framework for both of us to restore badly depleted stocks. Canada remains strongly committed to such joint efforts.

Cooperation is a two-way street and our joint efforts must result in a fair distribution of benefits - that is what the "Equity" principle is all about. The Treaty simply won't work if one side or the other considers the results of the Treaty implementation to be unfair.

It is Canada's fundamental belief that both principles of the Treaty are made more achievable if each side works toward depending on their own resources rather than on salmon bound for rivers in the other country. Over the years, this position, which we believe is shared by the United States, has been the centrepiece of Canadian international policy regarding fisheries on both coasts. Moreover, it is an obligation of the Parties under the Treaty to reduce interceptions.

*This position is firmly based in customary international law. The 1982 Law of the Sea Convention makes it clear that the state of origin should be the principal recipient of benefits accruing from use of their own salmon, providing that such States **"...shall have the primary interest and responsibility for [stocks originating in their rivers]"**. The Convention also provided for a de facto ban on development of new fisheries for salmon on the high seas.*

*This "ownership" concept has received its most emphatic and specific expression in the present Pacific Salmon Treaty which provides for **"...each Party to receive benefits equivalent to the production of salmon originating in its waters"**. The Treaty recognized that it was not practical for the two Parties to completely eliminate all interceptions, but that for those unavoidable interceptions, there should be a balance of interceptions to both sides.*

Based on the fundamental principles of the Treaty, supported by emerging international law, the Canadian position favours efforts to reduce the extent of interception by both Parties, provided it is done in a manner that is consistent with the equity principle.

In Canada's view reducing interceptions has many advantages:

- *fishers of the producing country directly receive the benefits of production from their own rivers, encouraging sound management;*
- *attention is focused on the need to protect the aquatic environment. Thus a premium is provided for maintaining habitat in fit condition for salmon production; and,*
- *domestic harvest allocation is facilitated when the needs of the other Party do not have to be taken into account. Reducing interceptions provides flexibility for both sides in developing improved allocation schemes, particularly with respect to new sharing arrangements with native Indian communities which by tradition and practice harvest salmon near the streams of origin.*

Canada believes that the United States, as a signatory to the Pacific Salmon Treaty, fundamentally shares Canada's approach. In this regard, we note that:

- *With Canada, the United States spearheaded the negotiation of the "ownership" Article dealing with anadromous species in the Law of the Sea Convention;*
- *elimination of interception of salmon is the centrepiece of United States and Canadian initiatives within the North Atlantic Salmon Conservation Organization;*
- *the United States has strong reasons to allow greater escapements inshore and up the rivers to meet the needs of native Indian communities; and,*
- *the United States considers the management of chinook and coho salmon bound for United States rivers to be rendered much more difficult because of the impact of intercepting Canadian fisheries. The U.S. sees a reduction in this intercepting fishery as a significant way of improving the well being of U.S. stocks.*

*Accordingly, it should be absolutely clear that Canada's position in the forthcoming negotiations will strongly oppose increases in interceptions and will not accept proposals that do not move towards providing each Party with **"benefits equivalent to [each country's salmon] production"**.*

It is our understanding that the United States wants to harvest significantly increased numbers of Fraser sockeye, will be pressing for alternative arrangements for chinook and coho which would have the effect of reducing harvests by Canadian fishers, and is opposed to making any adjustments to fisheries regimes in S.E. Alaska to address Canadian concerns for northern fisheries. At the same time, in Canada, we are undertaking a difficult transition to address our obligations to Aboriginal people. This imposes new requirements for allocation and harvest of Canadian fish stocks. In this context, Canada intends to advance the following positions:

Northern Boundary

Renegotiation of the northern boundary provisions is not due until 1993/94. However, we believe that the present situation of the northern boundary fisheries is clearly inconsistent with the Treaty, and that the northern boundary chapter should be re-opened in order to permit actions to be taken during the 1993 season.

Canada is extremely concerned by the escalation of interceptions by Alaskan fisheries harvesting salmon bound for Canadian rivers. Specifically, we are concerned about:

- *United States interceptions of sockeye from the Nass and Skeena Rivers are at record levels;*
- *the increased emphasis on the winter troll fishery has resulted in increased interceptions of Canadian origin stocks;*

- the shortened summer troll fishery for chinook has shifted the troll effort on to coho salmon, increased the interceptions of northern British Columbia stocks and has greatly increased incidental mortalities of chinook;
- increased interception of steelhead, early coho and northern chum stocks have contributed to conservation problems in the area; and,
- the full accounting for U.S. interceptions of Fraser River sockeye wherever caught.

Increased interceptions in Alaska have required Canada to place restrictive constraints on important Canadian fisheries, particularly in years of low stock abundance.

Canada believes that Alaska can better control its interceptions of Canadian sockeye salmon while at the same time fully harvesting its own abundant pink stocks. In this regard, Canada is seeking alterations to the early season District 104 annex arrangement to include an additional week (Week 31). Canada also proposes implementation of a "clockwork" management approach which would establish management rules that would restrict the duration of District 104 fisheries based on the ratio of sockeye to total salmon catch.

The United States has expressed concern about the catch of pink salmon in Canada's Area 3 fishery. In this regard, we would point out that there have been very large parallel increases in production on both sides of the boundary with consequent increases in harvest. These have resulted in an escalation of Alaskan interceptions of Canadian pinks. In our judgement, these have exceeded Canadian interceptions of Alaskan pinks in Area 3 and elsewhere. As a part of the overall negotiation, Canada is proposing to discuss the Area 3 annex arrangements in order to address concerns of both the U.S. and Canada. Discussions must include the adjacent Area 101 (Tree Point) fishery, as it is Canada's position that the arrangements in U.S. Area 101 and Canadian Area 3 are lined.

Canada has been disappointed in the past with an apparent unwillingness on the part of the U.S. to consider changes in its fisheries management plans in Alaska to respond to Canadian concerns. At last year's plenary session, we expressed views on the significance of the "undue disruption" qualifying clause in Article III (para. 3b), pointing out that the qualifying clause exhorting the Parties to reduce interceptions (Article III, para. 3a) had every bit as much force as the "undue disruption" clause. We also pointed out that the United States has from time to time made major changes in the structure of its fisheries for domestic purposes. We remain strongly of the view that the implementation of the principles of the Treaty regarding conservation and equitable sharing must not be frustrated by unwillingness to implement changes to fisheries as required. If the U.S. is prepared to make allocative changes in its southeast Alaska fisheries between gears and areas, Canada would be prepared to consider ways of augmenting production to particular Alaskan fisheries in order to help resolve some important management problems, in return for limitation of Alaskan intercepting fisheries.

Canada has increasing conservation concerns about the condition of steelhead stocks in northern British Columbia. In this regard, in cooperation with industry, we have launched a program requiring Canadian fishers to release steelhead caught incidentally in important northern British Columbia commercial fisheries. We are encouraged that this season these measures have contributed to a significant increase in developing a process to initially document and then reduce steelhead interceptions.

Transboundary Rivers

With regards to the Transboundary Rivers, Canada believes that current catch sharing arrangements do not provide Canada with a reasonable share of Canadian production.

Canada attaches particular importance to improved economic opportunities for aboriginal peoples and other fishers on the Taku, Stikine and Alsek Rivers.

To effect such improvements, Canada proposes adjustments to the management regimes on the Stikine and Taku Rivers that would allow higher catches of coho, directed fisheries for chinook when there are demonstrable surpluses, and on the Taku River greater sockeye harvest shares. In addition, Canada wishes to settle the outstanding issue of deeming.

Chinook and Coho Salmon

Improved chinook conservation is a principal goal of the Pacific Salmon Treaty. The rebuilding program that was agreed to in 1984 has been successful for some stocks, but not for others. Our technical experts are concerned that at current rates of recovery some stock groups will not rebuild by 1988. Under these circumstances, Canada can see no basis for considering any increases to the chinook ceilings that are identified in the annex. Indeed, the U.S. needs to take measures in their S.E. Alaska all-gear chinook fishery to reduce its harvest rate on chinook.

The United States is calling on Canada to develop limitations more stringent than are already imposed by the Treaty in the chinook and coho fisheries on the west coast of Vancouver Island. These fisheries are of great importance to the people of the west coast of Vancouver Island and are fundamental to Canada as a counterbalance to U.S. interception fisheries.

Canada understands the United States' desire to implement alternative approaches for chinook coastwide and coho on the west coast of Vancouver Island. We are prepared to consider United States' requests for changes in Canadian fisheries, even though in the case of chinook, Canada has effectively lowered harvest rates to target levels. As we have stated repeatedly in the past, however, we cannot be expected to reduce our catches without offsetting compensation. Any United States' proposals must contain not only a mechanism for the United States to compensate Canadian fishers for further sacrifices but also parallel U.S. actions to expedite stock rebuilding.

I would like to expand on our concerns regarding the issue of compensation. We believe that in the near term there is little likelihood that United States stocks from Washington, Oregon and Idaho, both enhanced and wild, will rebuild. Thus an abundance driven approach for managing west coast fisheries is unlikely to provide tangible benefits to Canada in the foreseeable future. If survivals continue to decline, disruption of Canadian fisheries will worsen, and the balance of benefits accruing to the two countries from intercepting fisheries will tilt overwhelmingly to the United States side. This is the reason why Canada insists that any changes to current arrangements for the west coast of Vancouver Island fisheries must be directly tied to compensatory reductions in interceptions by United States' fisheries.

Although we are sympathetic to United States' concerns about chinook and coho stocks of the northwest States, we must point out that the present conservation problems are not of Canada's making and the implication that Canada is the cause of the declines is without factual basis. Nonetheless, Canada is prepared to assist the United States in addressing their stock conservation problems subject to our stipulation about compensation.

Canada also has great concern for the high interception of northern B.C. coho salmon stocks in South East Alaska, especially in light of conservation problems in recent years by upper Skeena coho. Canada proposes that both countries endorse the recommendations

of the Coho Technical Committee with respect to additional technical work to be done to develop new management approaches.

Chum Salmon

Canada believes that the current arrangements for southern chum stocks are working reasonably well. While we have some specific concerns regarding the current management regime on Fraser River chum salmon stocks, Canada will propose to extend existing arrangements at this session. We are prepared to explore alternative management arrangements within the Joint Objectives and Goals process.

Fraser Sockeye and Pink Salmon

Canada believes that the present arrangements on Fraser sockeye and pink salmon are more than generous for the U.S. In the eight years since the Treaty was signed United States fishers have intercepted over 15 million Fraser sockeye, one of the highest eight-year totals for the United States since 1913. These interceptions reflect the favourable terms of the Treaty with respect to the United States' interest in Fraser stocks. Such terms are less limiting than those that have been applied by the Treaty to west coast of Vancouver Island fisheries. First, Canada agreed that the U.S. would share proportionately in Fraser production from 1985 to 1988 in recognition of past United States involvement in the International Pacific Salmon Fisheries Commission (IPSFC). Second, Canada provided higher escapements in the first four years of the Treaty. As a consequence, the United States had greater assurance of achieving (and in fact exceeding) its 1989-92 cap of 7 million sockeye.

We are not unaware that there are sectors in Washington State who are demanding increases in the level of United States harvest of Fraser sockeye and pink salmon. We would remind those demanding more that the present increases in production are due to Canadian management efforts over the past eight years, to Canadian investment to maintain the environment in fit condition for the production of salmon, to Canadian willingness to forego the use of the watershed for other purposes, and to sacrifices by Canadian fishers who have foregone catch to increase escapement.

To make matters worse, the poor returns of United States chinook stocks have resulted in Canada failing to reap comparable rewards from its intercepting west coast of Vancouver Island fisheries. The calls from certain elements within the United States fishing community for increased shares of Fraser fish are totally unjustified and it is Canada's position that the U.S. catch should be reduced.

Furthermore, Canada intends to obtain compensation in 1993 for the 1992 U.S. overage of 337,000 in excess of the negotiated ceiling. Canada reminds the U.S. that the specified limits for harvest by United States fishers of Fraser sockeye include all sockeye caught by the United States, regardless of area of capture. All United States catches of Fraser bound sockeye must be taken into account.

It is Canada's view that new catch sharing arrangements for Fraser sockeye and pink salmon must have harvest rates that are closely integrated. The U.S. catch objective for Fraser pink salmon stocks should be consistent with the U.S. Fraser sockeye catch objective so that management plans can be developed that are feasible for both species. In light of these concerns, Canada is considering options that would reprofile the U.S. catch of sockeye stocks to meet the U.S. pink catch objective.

This returns us to the "Equity" principle. Canada realizes that the Commission has not yet reached conclusions regarding the extent of benefits being provided under the terms of Article 3 para 1b. On the basis of our technical analyses, we are convinced that, under present Treaty arrangements, the United States is currently receiving benefits exceeding those equivalent to its own production. Accordingly, a further shift in the balance of benefits in the United States' favour is unacceptable to Canada. This is why we are concerned about the escalation of Alaskan interceptions of both Fraser sockeye and of sockeye bound for other Canadian rivers, and why we are only willing to entertain measures for changes in the management of fisheries on United States-bound chinook if there are balancing changes to U.S. interceptions. Reductions in United States sockeye interceptions on both the north and south boundaries will be required.

Conclusion

I have outlined Canada's position in the forthcoming negotiations with some frankness. Canada recognizes that United States difficulties with the protection and management of its southern chinook and coho resources have caused internal problems. We stand ready to do what we can to help you grapple with these problems, problems which, as I said earlier, were not of Canada's making. While expressing willingness to cooperate, it seems to us that solutions will be slow in coming. Under such circumstances, it is obvious that to ask Canadian fishers to make adjustments, we will have to have means for compensating them. The United States should be prepared to make internal adjustments and trades, in order that Canada can be provided with fair compensation through specific and limited reductions in United States interceptions.

Although we realize the present stage of Treaty implementation creates difficulties for both sides we are convinced that, in both the long and short-term, both Parties are far better off with a Treaty than without one. The impact of failure of the Treaty: competitive overfishing such as that occurring in pre-treaty days prior to 1985, would surely be unacceptable to us both.

Keeping the Treaty alive and progressive to ensure our joint aspirations are met will be hard work but with pragmatism, willingness to consider each other's problems and compromise we are sure progress will be possible. We invite you to join us in stepping back from present controversies, to review the problems both of us have and, together to attempt to formulate options for practical solutions.

2. Statement Regarding the United States Position

The United States Section of the Pacific Salmon Commission views the 1992/93 meeting cycle as one of particular importance. Many of the provisions of Annex IV expire at the end of 1992. As we seek agreement on the extension of these provisions, it is incumbent that the Commission demonstrate its ability to focus on the conservation and management of the resources covered by the Treaty, ensure the rebuilding of depressed stocks, and provide for fairness in the fishing regimes to be established.

The United States Section is particularly concerned that significant steps be taken to ensure that we are on track to meet the chinook rebuilding requirements of the Treaty. We also believe it is important that depressed coho stocks are put on a path to recovery. Doing so is in the best interest of both sides; not to do so will demonstrate the inability of this Commission to meet resource conservation challenges, lead to continuing declines in these resources, and have negative consequences in the fisheries in both countries.

It is the responsibility of our bilateral Commission to conserve the West Coast salmon resource. Together, through demonstrated constructive performance in the Commission, the U.S. and Canadian Sections can be strong advocates for the interests of salmon production in our respective countries. Without that demonstrated will to meet resource challenges together, interests other than those concerned with salmon production and conservation will prevail in debates about habitat protection, water flow, and land use.

It is with the overarching theme of resource conservation that the U.S. Section sets forth its views on the extension of various Annex IV provisions.

Chapter 1. Transboundary Rivers

The 1988-92 chapter provisions expire. These provided for a variable allocation of Stikine sockeye based on run size which provided Canada a higher proportion of the catch during years of smaller runs and the U.S. a higher proportion during larger runs. Specific proportional allocations for Taku sockeye, and fixed level coho allocations on the Stikine and Taku, were also established. Further, during the 1988-92 period, cooperative enhancement programs for sockeye were established on the Taku and Stikine Rivers which are expected to begin to show returns in 1993-94.

The United States believes that expired harvest sharing and enhancement provisions of the transboundary river chapter should be extended through 1995. Stability in these provisions will allow the enhancement programs to proceed and provide managers the opportunity to begin to assess management needs and opportunities associated with the enhancement returns. It has already been agreed to review the harvest sharing arrangements for the Stikine in 1996. It is important that both sides dedicate themselves to ensure the necessary funding to keep this cooperative effort going. These kind of cooperative programs truly demonstrate what the Commission can achieve for the fishers of both countries.

The United States notes that the present chapter and three associated understandings are complex and may have some outdated elements. It would be useful for the Northern Panel to review these to update and consolidate where possible. As well, Stikine sockeye escapement goals should be refined and management tools for achieving these goals improved through technical and manager-to-manager consultation.

Chapter 2. Northern Boundary Area

The Portland Canal chum portion of the northern boundary area chapter expired in 1991. Other provisions of this chapter do not expire until the end of 1993. Portland Canal chum stocks have been depressed since the Treaty was signed. The Commission was unable to renew this annex provision last year.

Stringent conservation measures are required for these stocks. Harvest should be limited to incidental harvest in mixed stock fisheries outside Portland Canal. Due to the slow response of these stocks to past conservation efforts, the U.S. Section believes a four-year provision should be developed for 1993-96 during which no net fisheries would be conducted in Pearse and Portland Canals, including U.S. districts 1A and 1B north of Akeku Point and Canadian Areas 3-11, 3-13, 3-15, 3-16, and 3-17. We should continue jointly to assess the productivity of the Portland Canal chum stocks, analyze chum harvest distribution data, and develop a cooperative longer-term management plan. In this connection, the United States Section is willing to explore the recommendation of the JOG Committee that northern boundary area chum is one set of goals and objectives that the Northern Panel should explore consistent with the JOG Committee's recommendations.

The United States Section also believes the Northern Panel should explore the substantial overage in Canada's Area 3 pink fishery. That overage is now near 8 million fish. There needs to be a discussion and resolution of how Canada intends to reduce the overage and manage this fishery in accordance with the provisions of this chapter.

As well, the United States Section believes that the Northern Panel should discuss the need for in-season exchange of information concerning the Area 1 troll fishery. Lack of in-season information raises questions on the U.S. side about compliance with the date/catch limits for the northern part of Area 1. An exchange of in-season information would alleviate these concerns and could assist in-season management.

Chapter 3. Chinook

Rebuilding chinook stocks is a central requirement of the Treaty. It is fundamentally important that the Commission, the bilateral Chinook Work Group, and the Panels devote more attention to the basic question of whether the Commission is on-track in meeting the Treaty's requirements.

For several years, the Commission has discussed the need for an abundance-based approach for the determination of chinook catch ceilings. In 1991, the bilateral Chinook Work Group was charged with a variety of tasks that would have enabled the Commission to develop a critical element of an abundance based approach, a mechanism that would have allowed catch ceilings to be adjusted in response to short-term variations in abundance, thereby increasing our confidence that the rebuilding objectives were being met. Unfortunately, the bilateral Chinook Work Group has not been able to meet, and it would appear impossible to complete development of an agreement in this meeting cycle to an abundance based management approach that would carry us forward into the future consistent with the rebuilding objectives.

Accordingly, as a matter of first importance, the U.S. Section believes it is critical that the Commission re-dedicate itself and the required personnel, to a thorough and complete discussion of chinook so that by the end of the 1993-94 meeting cycle, we can put in place an abundance-based management approach that systematically leads to the establishment of annual catch ceilings which are consistent with the Treaty's rebuilding requirements. We believe that a properly designed abundance-based approach will allow jurisdictions to better meet their respective management goals and objectives, such as mitigating the negative effects of large fluctuations in abundance, including flooding, on ceiled fisheries, consistent with all of the principles of Article III of the Treaty.

For 1993, we believe that catch ceilings should be established which are consistent with our knowledge of the abundance and status of chinook stocks in the various fisheries. In this regard, it should come as no surprise that the United States Section is very concerned about Canada's fishery on the west coast of Vancouver Island and its impact on stocks of concern, and even a stock which is now listed as threatened under the U.S. Endangered Species Act. In addition to the impact of the commercial troll fishery, which is under a PSC ceiling, the recreational fishery in this area has expanded and is generating new impacts that must be addressed under the Pacific Salmon Commission conservation and rebuilding regime. The United States believes strongly that this situation must be turned around now if the rebuilding objectives are to be met. We recognize that reductions in WCVI impacts will come at some short-term expense to specific interests on the west coast of Vancouver Island. But if no action is taken, the future will be dimmer, not brighter, for all. Accordingly, for the west coast of Vancouver Island, the following measures should be implemented:

The U.S. needs to be assured that the total WCVI harvest -- both troll and recreational -- will be managed to comply with Treaty principles and chinook rebuilding objectives. We believe this means that the Commission must ensure that the aggregate (troll and sport) catch of chinook in 1993 is substantially below the present ceiling.

It is our position that the WCVI sport harvest must be more accurately estimated in the future. The first step in this regard is for Canada to begin, in 1993, a program to provide reliable estimates of the catch and stock compositions of this fishery.

With respect to Strait of Georgia fisheries, we note that lower Georgia Strait and Harrison River chinook stocks remain depressed. Georgia Strait fisheries have not been reduced to the extent necessary to rebuild those stocks by 1998. In addition, survival rates for many Puget Sound and Georgia Strait natural stocks are declining. Because it will also benefit other Canadian and U.S. stocks present in the same fisheries, the U.S. continues to support Canada's stated objective of lowering harvest impacts in these fisheries to levels consistent with rebuilding. While we look forward to discussions during this meeting cycle about Canada's internal review of management measures taken to date for this purpose, we believe that additional management measures must be implemented beginning in 1993 to ensure rebuilding of the lower Georgia Strait and Harrison stocks.

The United States is continuing its assessment of appropriate management regimes based on abundance and status of stocks for the two northern fisheries in 1993.

The U.S. Section notes its concern that the Commission has still not developed operational definitions of rebuilt, rebuilding, stocks of concern and pass-through. Agreed definitions of rebuilt and rebuilding are necessary components of a framework to assess progress towards the stated goals and objectives of the Pacific Salmon Treaty chinook rebuilding program. In addition, Commission-agreed definition of key terms would be helpful to the Chinook Working Group in developing a long-term abundance driven approach.

The U.S. Section also notes its continuing concern for the coastwide problem of incidental chinook mortalities. In 1988 and 1989, the U.S. provided Canada with some thoughts on a positive incentive approach to reducing incidental mortalities. We are interested in Canada's view on such an approach. The U.S. Section suggests that the bilateral Chinook Working Group begin discussions on ways in which positive incentives could be developed to encourage reduction of incidental mortalities in PSC fisheries.

Chapter 4. Fraser River Sockeye and Pinks

Record Fraser River runs in the last few years demonstrate what U.S.-Canada cooperation within the Commission can achieve. At the same time, the increased production of the Fraser means that more Fraser River fish are caught incidentally in U.S. fisheries; we can expect such incidental catches to increase if Fraser River runs continue to increase. The United States Section remains prepared to have the principal U.S. fishery on Fraser runs constrained under the Fraser chapter. Constraining this U.S. fishery under the Treaty is of enormous benefit to Canada, allowing Canada to increase production and plan its own fisheries in the full knowledge of U.S. obligations.

The United States Section believes that new Fraser River provisions should be developed covering at least the 1993-96 seasons; it is prepared to consider an even longer period running through the year 2000; it believes that some consideration should be given to ending these arrangements on a high cycle sockeye year to provide for more management flexibility. The new regime should account for variation in annual sockeye and pink run

sizes, recognize the desirability of providing long-term stability, and avoid undue disruption of historical fisheries when conservation problems are not present.

Due to the problems associated with increasing incidental catches as the runs increase, the United States Section believes that the specific catch limitation obligations undertaken with respect to Fraser River runs should be limited to the fisheries in Washington State. Further, the United States Section believes that the specific catch limit obligations to be undertaken by these fisheries should be expressed in terms as a percentage of the TAC, as was the case in 1985-88, rather than in a fixed amount as in 1989-92. This will allow for fair sharing by U.S. fisheries in the case of larger runs, and, reciprocally, fair sharing of burden if the runs decline. As has always been the case throughout the history of joint management of the Fraser fishery, the U.S. is prepared to continue to cooperate in regards to specific conservation and management needs, as evidenced most recently in 1992 when the U.S. withheld its fishery on the Early Stuart run due to conservation concerns and curtailed its fishery early on later runs for management concerns.

The United States Section believes that its interest in Fraser harvests, based on a long history of cooperative, joint management of this resource, is appropriately represented by the approximate percentage of TAC for sockeye and pink runs that applied in the first four years of this Treaty. On that basis, the U.S. proposes that the fishery in Washington State take 28 percent of the sockeye TAC and 32 percent of the pink TAC during the period to be covered by the chapter's provisions. This will allow for predictable harvests in Washington State waters subject to modification only due to variable run sizes and conservation concerns, and will reflect a fair balance between reduced harvest in low run years and gains in higher run years.

As well, the U.S. Section believes that there should be further discussion on questions pertaining to Canada's long-term objectives for Fraser River runs, incidental catch problems in the Fraser Panel area, the calculation of TAC, future management responsibilities and the pros and cons of proportional sharing of each run each year of Fraser River sockeye.

Chapter 5. Coho

The Canadian troll and recreational fisheries off the west coast of Vancouver Island together comprise the single largest harvesters of U.S. natural coho runs from rivers on the Washington coast and Puget Sound. There is no direct Canadian response in the management of these fisheries to the status of these stocks. This is inconsistent with the goals of the Treaty to prevent overfishing and rebuild stocks, and certainly does not take into account the annual variability in the abundance of stocks.

The United States Section strongly believes that the management of the west coast Vancouver Island commercial and sport fishery must become responsive to the abundance and status of its supporting runs. Only by the establishment of an abundance-based management approach to share fairly harvest and conservation responsibilities will there be an incentive to maintain and increase production.

The United States is fully aware that Canada views its west coast Vancouver Island fisheries as "equity" fisheries to balance U.S. harvest of Canadian stocks elsewhere. Whatever the merits of that view, two facts are crystal clear. First, the runs are depressed and seem to be getting worse. Second, the WCVI sport fishery has grown dramatically since the Treaty was signed. Both of these issues must be addressed now.

From our standpoint, we have always tried to be responsive to Canadian conservation considerations concerning Canadian stocks; we see little or no Canadian response to our

concerns about depressed U.S. coho stocks. If Canada wishes to maintain viable coho fisheries in this area, the fish must be present. The U.S. can no longer be expected to shoulder the entire burden of the conservation of these stocks. Vigorous management initiatives are called for, and both sides must share in this effort.

At the Commission-sponsored southern coho workshop, Canada presented a potential management approach that would trigger different target levels in the west coast Vancouver Island troll catch based upon early season catch rates. The U.S. side is prepared to consider the merits of such an approach if specifics can be provided. However, we believe that alternatives based on pre-season predictions of the status of key contributing runs provide a more technically feasible, and immediately available, approach. Whatever approach is chosen, we need to choose one now, and apply it for a period of time on an experimental basis, e.g. four years or more. It seems not only sensible, but fair, that there be a sharing of benefits and burdens.

With respect to the WCVI sport fishery, the U.S. recognizes that the allocation between commercial and recreational interests on the west coast Vancouver Island is Canada's choice. However, we can no longer disregard the large, expanding recreational fishery which, in the absence of data, we can only assume has substantial impacts on U.S. stocks. While we are prepared to look at a range of options concerning the recreational fishery, including bringing it under an all gear ceiling, a separate ceiling coupled with a reduced troll ceiling, or mechanisms for adjusting the troll ceiling for anticipated recreational impacts on U.S. stocks, it is our position that the playing field must first be re-levelled, beginning in 1993.

Considering the foregoing, we propose that a forecast-driven stepped ceiling management regime be applied to the WCVI coho fishery. For 1993, and until a credible and comprehensive sport catch estimation program is in place, we propose that three stepped ceilings of 0.9, 1.2 and 1.5 million apply to the troll fishery. We believe that the proposed center-step of 1.2 million, which would apply in an "average" year, appropriately reflects a fair sharing of conservation measures needed now, and a re-leveling of the playing field which has been upset as a result of a greatly increased (and still expanding) WCVI sport fishery. The Southern Panel should be directed to develop the details of this plan for adoption by the Commission in time for the new chapter. We recognize that the system may not -- and need not -- be perfect in every detail. The Commission has the ability, and the responsibility, to improve upon the system in the future. The main point is that the resource will not wait for us to resolve every conceivable problem before we address this issue.

Further, to ensure better management in the future, our position is that Canada, beginning in 1993, must implement a program to provide reliable estimates of the catch and stock composition of the WCVI recreational fishery.

We also remain concerned about Canadian management actions that would reduce harvest rates on depressed Georgia Strait stocks but shift effort onto U.S. stocks. We fully support the development of a Georgia Strait coho recovery plan, but we wish to see it designed and implemented in a way that avoids increasing impacts on U.S. coho stocks. We believe that safeguards ensuring this protection for U.S. stocks should be developed by the Southern Panel and included in a new coho chapter.

Chapter 6. Southern Chum

The provisions on southern chum now expiring are a negotiated compromise which has worked quite well. Indeed, the "clock work" approach is an abundance-based approach

that is responsive to abundance, conservation needs, and provides for an agreed allocation. Through this mechanism, United States fisheries respond to Canada's management of its chum stocks. This stands in contrast to the way the southern coho situation has been dealt with under the Treaty.

The United States is aware that Canada has made changes to its "clock work" management plan, and we believe the Southern Panel should discuss those changes plus any other fine-tuning that may be required to better assist the Parties in meeting their respective goals and objectives. As well, we look forward to having the Southern Panel discuss long-term southern chum objectives and strategies consistent with the JOG Committee recommendations.

We believe it would be worthwhile extending the chum provisions for a four-year period, together with any fine-tuning which may be required and which the Southern Panel recommends as a result of its JOG discussions.

Article III Principles

The United States Section recognizes that the Canadian Section places a high priority in making progress on the "equity" issue. For our part, we believe that the JOG Committee's work has laid important groundwork in identifying our respective goals and objectives, and we believe that the Committee's recommendations to focus initially on two relatively non-controversial areas -- northern chum and southern chum -- should be pursued.

We are also hopeful that the JIC Committee will soon be able to provide its report with updated interception estimates for 1980-1991. This should provide a basis for further discussion.

As the U.S. side has indicated more than once, we believe that a numerically simplistic ("bean-counting") economic evaluation of production and benefits is not the best way to proceed. Instead, we have advocated making the JOG process the focus for cooperation for both sides' mutual benefit. Canada continues to insist that we begin to discuss economic measures of benefit. We agreed to define relevant terminology, and the bilateral group assigned this task will soon report to the Commission. Nevertheless, a great deal of economic oriented work remains, even to get to the point of having an agreed glossary of terms if we are to explore equity further. The U.S. is prepared to continue this work.

The United States believes that the Commission must be careful to take into account all of the tenets of Article III as it implements the Treaty, including:

- *we need management regimes that prevent overfishing and respond to annual variations in abundance of stocks;*
- *we need programs and incentives to provide for optimum production;*
- *we need to develop a common understanding of benefits equivalent to the production of salmon; and*
- *we need a common understanding of what we mean by "the desirability in most cases of avoiding undue disruption of existing fisheries."*

The U.S. Section looks forward to further discussion with the Canadian section on the implementation of the principles of Article III and is prepared to consider any specific proposals for making progress that Canada may wish to make.

The plenary presentations were completed by 2:10 p.m. December 3, 1992.

The Commission also received a preliminary report on R&S activities, reviewed instruction to the Northern and Southern Panels concerning the JOGC test cases, and discussed the status of the Valuation Methodology Working Group. Discussion on the latter was deferred until the group's report is finalized.

The balance of the meeting time was spent by the delegations in national section sessions.

C. PANELS' NEGOTIATING SESSION AND MEETING OF THE COMMISSION January 21-29, 1993 -- Vancouver, B.C.

The Commission met in executive session beginning the first sitting at 9:15 a.m. Friday, January 26, 1993. During this sitting Mr. Chamut described changes which have taken place in the complement of Canadian commissioners, including the appointment of Mr. Yves Fortier as chief negotiator.

The two sides exchanged detailed elaborations of their respective positions, commenting on views put forward during the December, 1992 plenary statements.

The Commission agreed on a revised work plan for the panels and joint technical committees for the balance of the meeting, concluding the sitting at 12:00 noon.

The Commission conducted a second sitting beginning at 10:20 a.m. January 28, 1993. At this sitting the Commission conducted administrative actions including presentation of the Canadian enhancement update report (see Section IV D).

The Commission adopted the recommendations of the Standing Committee on Finance and Administration which included an approved budget for fiscal year 1993-94 (Appendix E), and an approved future meeting schedule (Appendix F).

The Commission reviewed the status of the Valuation Methodology Working Group's report, which has not been finalized. A review of the Chinook Working Group's task was also conducted at this sitting.

The sitting was adjourned at 10:41 a.m.

The third executive sitting was called to order at 10:05 a.m. January 29, 1993. The agenda for this sitting was comprised of progress reports from the panels, and a discussion of work plans for the Eighth Annual Meeting. The sitting, and the meeting, were adjourned at 10:35 a.m. Friday, January 29, 1993.

D. EIGHTH ANNUAL MEETING OF THE COMMISSION February 8-17, 1993 -- Bellevue, Washington

The first sitting of the Commission was called to order at 3:55 p.m. Friday, February 12, 1993. Minutes of the October 20-21, 1992, and November 30-December 4, 1992 meetings were adopted.

Canada presented a written paper describing its position concerning the "equity" issue. The sitting was adjourned at 4:20 p.m.

The second executive sitting began at 2:45 p.m. Monday, February 15, 1993. The United States presented its preliminary views on the "equity" issue. This sitting was concluded at 4:15 p.m. February 15, 1993.

The Commission did not meet again during the remainder of the Eighth Annual Meeting, which concluded on Wednesday, February 17, 1993.

No further on-the-record sessions of the Commission occurred, although the executive members of both national sections met informally in Vancouver on April 14, 15, and 16, 1993 in an effort to reach agreement on fishing arrangements for 1993 to cover the expired provisions of Annex IV. Success was not achieved.

Activities of the Standing Committees

PART II

ACTIVITIES OF THE STANDING COMMITTEES

A. MEETINGS OF THE STANDING COMMITTEE ON FINANCE AND ADMINISTRATION

The Standing Committee on Finance and Administration met on December 16, 1992 and again on January 27, 1993 to consider a range of financial and administrative issues. The primary focus of the Committee's deliberations was concentrated upon a review of the Commission's current financial status in the light of expected budgetary restrictions which face the two governments in the foreseeable future.

The financial review prepared by staff for the current fiscal year indicates that expenditures by the end of March will be substantially below budgeted costs. In addition, some recovery of monies owing from test fishing operations in 1990 in combination with the expected balance of operating funds will result in an unexpended operating balance of approximately \$469,000. The Committee recommended to the Commission that these funds be carried over into FY 1993/94 for application against program costs.

The Committee in its discussions on program costs for FY 1993/94 was informed that Canadian contributions for 1993/94 will be \$800,000 (Can.), reduced from the 1992/93 level of \$836,500. In accord with usual practice, the United States will match the \$800,000 contribution level. Expenditure requirements for FY 1993/94 forecast by staff in December totalled approximately \$2,183,500, significantly greater than can be covered by direct contributions. This is not a new problem; this current fiscal year will be the first since 1986 where expenditures are expected to be slightly less than current contribution levels.

Application of the forecast positive operating balance from FY 1992/93 by itself will not eliminate the shortfall for FY 1993/94. Accordingly, the Committee instructed staff to present a series of options to reduce expenditures by approximately \$94,500 to achieve a balanced budget for presentation to the Commission.

The Committee reviewed scenarios developed by staff and recommended the following actions;

- freeze staff salaries by eliminating proposed cost-of-living adjustments to parallel those in the Canadian federal system;
- eliminate provision for a May 1993 meeting of the Commission;
- reduce proposed capital expenditures; and
- transfer the costs of non-Fraser Panel Area programs in northern B.C. and Southeast Alaska to the Parties.

Application of all these measures would result in a reduction of expenditures of approximately \$120,000 which will remove the deficit for 1993/94 and will also begin to create a reserve to cushion the effects of potential further reductions to contributions in FY 1994/95.

In this regard, the Committee has conducted a thorough examination of the need for a Deputy Executive Secretary's position. At this point, the Committee has agreed that the position should not be filled during FY 1993/94, but salary and benefit provisions should be protected within the budget. Funds so protected would not be available to the Secretariat for expenditure during FY 1993/94, but would be reserved to provide a further partial offset of the shortfall expected in FY 1994/95. The Committee plans to review the status of the Deputy's position in the fall of 1993 with a view to reaching a final consensus at that time.

On other administrative matters discussed, the Committee recommended adoption of the following items:

- proposed amendments to the Commission's by-laws to reflect agreements to increase the maximum number of observers for each section to eight at Commission executive sessions, and to increase the maximum allowable membership on the F&A Committee to six for each national section;
- discontinuation of the requirement for Secretariat staff to record minutes of the Northern and Southern Panels;
- acceptance of Kamloops as the site of the planned Commission's executive session for October 1994;
- adoption of a policy for use of the Commission's boardroom by outside groups which will limit the amount of service the staff will provide, and identify costs for such items as photocopying;
- adoption of a policy in using U.S. per diem rates as a guideline for the Secretariat in negotiating future contracts with hotels.

The Committee at its meeting January 27, also discussed a request from the Standing Committee on Research and Statistics to devise a process whereby jointly-agreed research contracts could be managed administratively through the office of the Secretariat. The Committee agrees in principle that development of such an approach could be beneficial, and has instructed the Executive Secretary to draft amendments to the Commission's financial regulations in consultation with the financial representatives of the Parties.

The Commission, in closed executive session on January 28, 1993, adopted the Committee's recommendations.

Secretariat Staffing Activities

The staff of the Secretariat remained unchanged over the fiscal year April 1, 1992 to March 31, 1993. The staff organizational structure and list of employees as of March 31, 1993 is presented in Appendix G.

Commission Committees and Panels membership list

An updated membership list for standing committees, panels, joint technical committees, sub-committees, and ad hoc working groups as of March 31, 1993 is presented in Appendix H.

B. MEETINGS OF THE STANDING COMMITTEE ON RESEARCH AND STATISTICS

The Standing Committee on Research and Statistics met on several occasions during the current reporting period.

1. April 13-15, 1992 - Victoria, B.C.

The Committee received a report from the Technical Committee on Data Sharing which, among other items, recommended that a workshop on hatchery methodologies be sponsored by the Commission. The Committee also reviewed progress on updating the Joint Interceptions Committee report and on the status of information exchanges relating to Joint Objectives and Goals Committee.

The Committee focused its major attention to the status of each joint technical committee's reports on prioritized research needs. The technical committees' reports still outstanding are to be completed by September 15, 1992.

The Committee also developed a proposed goals statement and a draft outline of tasks to be performed by R&S. These statements were reviewed in committee, and amended drafts, taking into account comments received, are to be circulated prior to the next meeting.

2. November 4, 1992 - Bellevue, Washington

The Committee reviewed progress of the joint technical committees in completing their reports on prioritized research needs. An outline for an integrated report to the Commission was developed and a draft was targeted for completion by December, with a view to finalization by the January 21-29, 1993 meeting of the Commission.

The Committee discussed ways and means of funding joint research projects. It was agreed that assistance from the Standing Committee on Finance and Administration should be sought to help establish processes to achieve this goal.

The Committee authorized the Data Sharing Committee to proceed with organization of a workshop on hatchery methodologies and to report back to R&S by March, 1993.

A review of a revised list of R&S goals and tasks took place. Further revisions were deemed necessary.

The Committee also prepared a draft report on its activities for presentation to the Commission in December.

3. December 1, 1992 - Vancouver, B.C.

The Committee reviewed progress on development of an integrated prioritized research needs report. Amendments to the draft were proposed, with agreement that a final draft will be distributed to Committee members before the January, 1993 meeting.

The draft statement on improving the effectiveness and utility of R&S was revised, edited and finalized. A request to F&A to develop a funding process for joint research projects was finalized for presentation to the Commission.

4. **January 26, 1993 - Vancouver, B.C.**
5. **January 28, 1993 - Vancouver, B.C.**

Editing of the joint research needs draft report continued during these two brief meetings.

6. February 8, 1993 - Bellevue, Washington

The draft report on research needs was again reviewed. Not all comments could be incorporated, so one final editorial session was agreed to be necessary.

The Committee received endorsement of its proposed joint research project funding proposal from F&A. The proposal will be forwarded to the financial officers of the Parties for approval.

Data Sharing reported that planning for the proposed hatchery methodologies workshop was proceeding and a full report will be ready for the April, 1993 meeting of R&S.



Activities of the Panels

PART III

ACTIVITIES OF THE PANELS

A. FRASER RIVER PANEL

The Panel met during the post-season meeting of the Commission and again during the 1992/93 negotiating sessions. Views on positions taken by the national sections were exchanged for clarification, but no progress of substance toward resolution of the differences was achieved.

The Commission Secretariat's fishery management staff prepared, on behalf of the Panel, an annual report on 1992 Fraser River sockeye fisheries. The executive summary is contained within Part IV, Section A of this report.

B. NORTHERN PANEL

The Northern Panel met in conjunction with the Commission during the 1992/93 meeting cycle. During the November 30-December 4, 1992 post-season meeting, the Panel reviewed and discussed the operation of the 1992 northern and transboundary area commercial and recreational fisheries as well as joint enhancement activities. The Panel initiated discussion on the expired provisions of Annex IV, Chapter 2, relating to chum salmon fisheries in the northern boundary area.

The Panel continued to meet during the January 21-29, 1993 and February 7-17, 1993 negotiating sessions. The Panel prepared a report on joint objectives and goals for chum salmon stocks and fisheries in the northern boundary area dealing with provisions on chum salmon. The Canadian section presented a position on sockeye, coho, and steelhead provisions of Chapter 2, Annex IV, and the United States section presented a position on the transboundary rivers harvest sharing provisions contained in Chapter 1, Annex IV.

C. SOUTHERN PANEL

The Southern Panel met in conjunction with the Commission during the 1992/93 meeting cycle. During the November 30-December 4, 1992 post-season meeting, the Panel reviewed and discussed the operation of 1992 fisheries of concern. The Panel initiated discussions on the expired provisions of Chapter 5, Annex IV, relating to coho, and on the expired provisions of Chapter 6, Annex IV, relating to southern chum fisheries.

During the course of the Eighth Annual Meeting, Canada presented a comprehensive review of the west coast of Vancouver Island sport fishery, and tabled a position paper on compensation for reduction in interceptions of southern U.S. coho. Agreements for presentation to the Commission were not reached.

Review of 1992 Fisheries and Treaty-related Performance

PART IV

REVIEW OF 1992 FISHERIES AND TREATY-RELATED PERFORMANCE

The following review has been drawn from a number of reports prepared by Commission staff, joint technical committees, and domestic agencies for presentation to the Commission. Source documents are referenced for each part of this review. All figures are preliminary and will be updated in future reports as more complete tabulations become available.

A. FRASER RIVER SOCKEYE

Under the Pacific Salmon Treaty, the Fraser River Panel is responsible for in-season management of fisheries that target on Fraser River sockeye and pink salmon within the Panel Area. Prior to the onset of the fishing season, the Panel recommends a fishing regime and a management plan for Panel Area fisheries to the Pacific Salmon Commission (PSC). The plan is based on abundance forecasts and escapement goals for Fraser River sockeye and pink salmon stocks provided by Canada Department of Fisheries and Oceans (DFO), international allocation goals set by the Treaty, domestic allocation goals set by each country and management concerns for other stocks and species also identified by each country.

In-season, to achieve the objectives of the management plan approved by the PSC, the Panel uses commercial and test fishing data and various analyses from PSC staff to modify the fishing times in the management plan.

Achievement of the domestic allocation goals of Canada and the United States has been a major focus of in-season management and, in general, has been met successfully by the Panel. Resource conservation and international allocation goals take precedence over domestic allocation objectives, however, when trade-offs among these three objectives are necessary.

In 1992, the Panel did not perform these tasks due to unresolved differences between the Parties on the interpretation of Annex IV, Chapter 4 of the Pacific Salmon Treaty. This chapter specifies the allocation of Fraser River sockeye salmon to United States fishers. Specifically, the dispute focused on whether Alaska catches of Fraser River sockeye salmon should be included in the United States catch ceiling of 7,000,000 Fraser sockeye for the 1989-92 period.

Pacific Salmon Commission staff, however, conducted its normal field programs designed to assess abundance, timing, and diversion rate by major stock group. The national sections of the Fraser River Panel consulted on a regular basis to obtain the results of PSC staff analyses, which they used to develop domestic regulations for fisheries in the Panel Area.

Following is a summary of significant events which occurred during the 1992 season.

The 1992 fishing season was the final year of the second four-year cycle (1989-92) covered by agreements in Annex IV, Chapter 4 of the Pacific Salmon Treaty. Pre-season forecasts were for a total run of 5,900,000 and a Total Allowable Catch (TAC) of 3,710,000 Fraser River sockeye salmon. A very high proportion (75%) of Fraser River bound sockeye was forecast to migrate

through Johnstone Strait, due to warm ocean temperatures in the north Pacific Ocean caused by an El Nino event.

Canada set a pre-season spawning goal of 1,597,000 sockeye, and a gross escapement of 2,241,000 to provide for this goal and for Fraser River Indian catches. In-season adjustments provided by Canada raised the gross escapement goal to 2,605,000.

Returns of Fraser River sockeye salmon totalled 6,426,000 fish, 526,000 fish more than forecast. This was the largest run on the cycle since record keeping began in 1893.

Returns of Fraser River sockeye salmon totalled 4,169,000 in commercial fisheries, 408,000 in reported Indian fisheries and 31,000 in other fisheries. United States commercial fishers caught 609,000 in Panel Areas and 83,000 in Alaska, for a total of 692,000 Fraser sockeye. Canadian commercial fishers caught 3,477,000 fish.

The Stock Monitoring program provided in-season assessments of abundance, run timing and migration route of Fraser River sockeye stocks throughout the fishing season. Difficulties encountered in making the assessments were due to high diversion rates through Johnstone Strait, unusual fishing patterns in Juan de Fuca Strait and inaccurate catch estimates for Johnstone Strait net fisheries. The diversion rate of Fraser sockeye through Johnstone Strait was about 70%, close to the forecast.

Estimates of sockeye abundance derived from the Mission echo sounding program in 1992 were substantially higher than the combined total of recorded upriver catches and spawning escapement estimates provided by the Department of Fisheries and Oceans. Canada appointed an independent advisor, Dr. Peter H. Pearce, to direct investigations into the reasons for the shortfall. Dr. Pearce concluded that the unaccounted-for fish were split primarily between unreported in-river catches and fishing-induced mortalities.

The Racial Analysis program identified the major stock groups of Fraser River sockeye throughout the season, using scale and other characteristics. Post-season analyses incorporating spawning ground scale samples showed that in-season models slightly underestimated Early Stuart, Early Summer-run and Late-run proportions, and overestimated Summer-run proportions.

Spawning escapements of sockeye salmon in the Fraser watershed totalled 1,068,000 adults and 37,000 jacks. Escapements of most Early Stuart and Early Summer-run stocks were lower in 1992 than in the parent brood year (1988). Escapements to later-timed stocks generally equalled or exceeded parent brood year levels.

(Source document) *Report of the Fraser River Panel to the Pacific Salmon Commission on the 1992 Fraser River Sockeye Fishing Season.* Pacific Salmon Commission staff. May 1993 (Draft).

B. PRELIMINARY 1992 POST-SEASON REPORT FOR UNITED STATES FISHERIES OF RELEVANCE TO THE PACIFIC SALMON TREATY

Northern Boundary Area Fisheries

District 104 Purse Seine Fishery

The U.S./Canada Pacific Salmon Treaty calls for limiting the sockeye salmon harvest in the District 104 purse seine fishery during the period 1990 to 1993 to a maximum four year total catch of 480,000 fish prior to Statistical Week 31. Under the terms of the agreement when the annual catch reaches 160,000 sockeye salmon, no further fishing periods will be allowed prior to Statistical Week 31. All underages not to exceed 20% of the annex ceiling will add to and any overages will subtract from the subsequent four year period.

During the first two years of the annex, 1990 and 1991, 268,526 sockeye were harvested prior to Statistical Week 31 (Table 1). This left a maximum harvest of 211,474 sockeye in 1992 and 1993. In 1992, the Alaska Department of Fish and Game (ADF&G) set an informal harvest limit of 105,000 sockeye salmon prior to Statistical Week 31. There were three weeks of fishing prior to Statistical Week 31 in 1992.

The 1992 season opening date for District 104 was July 6 (Statistical Week 28). The district was open for a 15-hour period. During this opening 30,233 sockeye salmon were harvested by 91 boats (Table 1). In order to limit the sockeye harvest in Statistical Week 29, the district was limited to an eight-hour opening on Sunday, July 12. Fifty-two seine boats participated in the fishery and harvested 38,792 sockeye salmon. This left a harvest of approximately 36,000 sockeye salmon in Statistical Week 30 for 1992's total to be about 105,000. Due to high sockeye abundance throughout the boundary area, the Statistical Week 30 opening was limited to six hours, with the district being opened only south of Cape Augustine. During this opening only 10,618 sockeye were harvested. Therefore, the total sockeye harvest prior to Statistical Week 31 in 1992 was 79,643 fish. This leaves a permissible harvest of 131,831 sockeye salmon in 1993 under the 480,000 limit.

Beginning on July 26 (Statistical Week 31) and continuing through the final day of fishing on August 28, the District 104 fishery was managed accordingly to the strength of the pink salmon return. From Sunday, July 26 through the end of the District 104 fishery on August 28, the southern Southeast Alaska seine fishery was managed on a two day on/two day off fishing schedule. Good early season pink salmon escapements prompted this management approach. In the week immediately following the Treaty period, 1.67 million pink salmon were harvested in the District 104 fishery (Table 2). The harvest of 427,000 sockeye during that week was the single largest catch of sockeye in any week in the District 104 fishery.

Table 1. Management performance relative to treaty requirements for District 104 purse seine fishery, 1990 to 1992.

Year	Stat. Week	Opening Date(s)	Day(s) Open	Hours Open	Open Areas	No. of Boats	Sockeye Harvest	Cum. Sockeye Harvest	Pink Harvest
1990	27	July 1	1	15	All	68	24,485	24,485	43,152
	28	July 8	1	15	All	143	41,117	65,602	98,018
	29	July 15	1	6	All	76	64,795	130,397	226,801
	30	July 22	1	6	N. Portion	87	39,546	169,943	91,672
Sub-totals for 1990:			4	42	-	374	169,943	169,943	459,643
1991	27	-closed-							
	28	July 7	1	15	All	101	23,008	192,951	163,846
	29	July 15	1	10	All	3	2,496	195,447	1,672
		July 17	1	10	All	96	55,115	250,562	370,191
	30	July 22	1	6	S. Portion	35	17,964	268,526	171,208
Sub-totals for 1991:			4	41	-	235	98,583	268,526	706,917
1992	27	-closed-							
	28	July 6	1	15	All	91	30,233	298,759	25,433
	29	July 12	1	8	All	52	38,792	337,551	48,321
	30	July 19	1	6	S. Portion	58	10,618	348,169	28,526
Sub-totals for 1992:			3	29	-	201	79,643	348,169	102,280

Table 2. Weekly catch and effort in the Alaska District 104 commercial purse seine fishery, 1992.

Week	Average Midweek Date	Boats	Hours	Chinook	Sockeye	Coho	Pink	Chum
28	Jul 9	91	15	15	30,233	3,555	25,433	12,867
29	Jul 16	52	8	0	38,792	3,293	48,321	22,168
30	Jul 23	58	6	0	10,618	1,496	28,526	9,796
31	Jul 30	193	78	10	427,085	26,592	1,671,711	148,989
32	Aug 6	193	78	7,085	310,234	45,370	2,751,906	154,389
33	Aug 13	189	57	8,896	162,507	31,752	2,366,581	104,830
34	Aug 20	139	60	1	58,564	24,809	1,322,461	89,968
35	Aug 27	93	78	0	34,006	85,345	662,045	133,263
Total		1,008	380	16,007	1,072,039	222,212	8,876,984	676,270

The total season's pink salmon harvest of 8.88 million fish was below the average of 12.65 million fish since 1985. Catches of sockeye, chum, and coho salmon were above or near historical levels. For the 1992 season, the district was opened for a total of 21 days, three within the Treaty period, and 18 days after the Statistical Week 30. These 21 days constituted a total of 380 hours, 29 within the Treaty period, and 351 after Statistical Week 30. In Statistical Weeks 31, 32, and 33 the number of purse seine boats fishing in the district was slightly above the effort levels experienced since the inception of the Treaty.

Tree Point Drift Gillnet Fishery

The Tree Point drift gillnet fishery opens by regulation on the third Sunday of June. During the early stages of the fishery, management is based on the run strength of Alaskan wild stock chum and sockeye salmon and on the strength of the Nass River sockeye salmon. Beginning in the third week of July when pink salmon stocks begin to enter the fishery in large numbers, management emphasis shifts to that species. By regulation, the District 101 Pink Salmon Management Plan begins on the third Sunday of July. The Plan sets gillnet fishing time at Tree Point in relation to the District 101 purse seine fishing time, when both fleets are concurrently harvesting the same pink salmon stocks. The U.S./Canada Pacific Salmon Treaty calls for an average annual harvest of 130,000 sockeye salmon.

In 1992, the gillnet fishery at Tree Point was initially opened for a four-day fishing week on June 21 (Statistical Week 26). Catches of both sockeye and chum salmon were above average, with the weekly harvest of 42,590 sockeye being the largest catch of sockeye since 1977. Sockeye escapements into Hugh Smith Lake and the Nass River appeared very strong in the early season. Effort levels at Tree Point were below average during that and subsequent weeks. Due to the large sockeye harvest and escapements and the above average chum harvest, four-day fishing weeks were allowed at Tree Point for the next three weeks prior to the start of the District 101 Pink Salmon Management Plan. Portland Canal was closed to fishing north of Akeku Point throughout the season in order to conserve chum salmon stocks returning to the Canal.

On July 19 (Statistical Week 30), the District 101 Pink Salmon Management Plan was initiated and continued through Statistical Week 36. A four-day week was allowed in Statistical Week 30, then for the next five weeks, five-day fishing weeks were mandated under the Plan. On the last week of the Plan (Statistical Week 36), Tree Point had a two-day fishing week.

During the first week of fall management, a two-day fishing period was allowed as the previous week's coho harvest was well below average. However, during the final two weeks, both coho and chum catches improved and the year ended at Tree Point with two three-day weeks.

The total harvest of sockeye salmon at Tree Point was 244,649 fish (Table 3). This is the largest sockeye harvest of the fishery. This brings the 1985 to 1992 average to 143,591 sockeye (Table 4). The chum harvest of 282,000 is the third largest harvest on record. The harvest of 580,000 pink salmon and 40,000 coho salmon are slightly above the long term averages. Contributions of enhanced salmon has not been determined at this time.

Table 3. Weekly catch and effort in the Alaska District 101 commercial drift gillnet fishery, 1992.

Week	Average Midweek Date	Boats	Hours	Chinook	Sockeye	Coho	Pink	Chum
26	Jun 25	81	96	324	42,590	523	2,473	9,251
27	Jul 2	95	96	235	28,076	1,190	15,025	15,171
28	Jul 9	85	96	159	37,793	617	29,015	25,519
29	Jul 16	93	96	79	20,994	456	50,215	25,160
30	Jul 23	92	96	114	30,605	863	38,146	28,223
31	Jul 30	93	120	64	15,139	1,553	21,345	21,400
32	Aug 6	90	120	27	13,968	2,440	85,506	21,505
33	Aug 13	88	120	22	38,549	3,547	80,405	9,009
34	Aug 20	83	120	15	11,231	3,771	164,259	19,979
35	Aug 27	74	120	14	4,933	6,678	86,550	42,214
36	Sep 3	61	48	4	468	3,866	6,230	26,615
37	Sep 10	44	48	0	111	2,996	1,131	12,928
38	Sep 17	54	72	2	52	7,717	541	20,808
39	Sep 24	46	72	0	140	3,723	71	4,248
Total		1,079	1,320	1,059	244,649	39,940	580,912	282,030

Table 4. Annual harvest, and average annual harvest of sockeye salmon in the Alaska District 101 drift gillnet fishery, 1985 to 1992.

Year	Annual Harvest	Avg. Ann. Harvest
1985	172,736	172,736
1986	145,631	159,184
1987	107,503	141,957
1988	116,092	135,490
1989	144,936	137,380
1990	85,690	128,765
1991	131,487	129,154
1992	244,649	143,591

Programs to estimate sockeye salmon escapements are only in place for two systems in southern Southeast Alaska, Hugh Smith and McDonald Lakes. The weir count of approximately 65,732 at Hugh Smith is the highest on record. McDonald Lake’s escapement is estimated to be 115,123 sockeye, well above goal.

This was the second year that a weir was operated in Fish Creek in Portland Canal to enumerate chum salmon. Approximately 46,771 chum salmon passed through the weir. In 1991, only 9,916 chum salmon were counted through the weir. Aerial survey counts of Tombstone River and Hidden Inlet had counts below recent years but the escapement to the Marx Creek spawning channel was a record.

Transboundary Area Fisheries

Stikine River Area Fisheries

The District 6 and District 8 drift gillnet fisheries open by regulation on the third Sunday of June and normally open again depending upon target species run strengths on each following Sunday throughout the season. The District 8 fishery is usually managed on the basis of the Stikine River sockeye run through the first four to eight weeks of the fishery. Management of the District 6 fishery is based upon the strength of Alaskan sockeye stocks through late July or early August.

Both fisheries switch to pink salmon management after the sockeye runs are passed. By late August the management is usually based upon coho salmon returns. The U.S./Canada Pacific Salmon Treaty confines the District 8 sockeye fishery to those periods when the projected return of Stikine River sockeye was at least 60,000 for escapement and 20,000 for total allowable catch (TAC).

In 1992, the gillnet fisheries in both District 6 and District 8 were opened for a two-day fishery beginning at noon on June 21 (Statistical Week 26). The projected sockeye return to the Stikine River was 127,000 fish, considerably above the 80,000 projected return necessary prior to District 8 being opened. Commercial and test fishing harvests indicated the Stikine sockeye run was stronger than average. Fishing time was increased to three days the following week and a one-day extension was granted because of the good catches. The projected Stikine sockeye return was 152,000 after the first two weeks of fishing and with a U.S. TAC of 62,000 fish, management was altered to draw more fishing effort into the terminal District 8 fishing area. The third week both districts were opened for three days and after a 24-hour period with no fishing, District 8 was reopened for an additional two days from noon Thursday until noon Saturday. This pattern of two-day, midweek openings in District 8 continued through the first week in August. An additional 17,040 sockeye were harvested during these midweek periods and effort was at record levels.

Management in the District 6 gillnet fishery changed from sockeye salmon to pink salmon beginning in Statistical Week 33. However, the expected good returns of pink salmon did not materialize and that, combined with low prices, kept most of the fishing fleet from targeting on pink salmon.

Coho salmon management in the District 6 and District 8 gillnet fisheries usually commences during late August or early September.

Due to the lack of normal coho catch-per-unit-effort (CPUE) District 6 and District 8 management concentrated on coho salmon beginning August 23. The gillnet fisheries terminated for the season on September 29, Statistical Week 40.

During the 1992 season, the gillnet fishery in District 6 was open for 40 days and in District 8 for 51 days. These were above the 1982 to 1991 averages of 31 and 25 days respectively. Fishing effort in numbers of vessels fishing was higher than average in both districts.

The 1992 harvest in the District 106 commercial gillnet fishery included 1,331 chinook, 195,618 sockeye, 279,225 coho, 91,513 pink, and 133,901 chum salmon. District 106 catches of chinook and pink salmon were below the 1982 to 1991 averages while sockeye catches were above average. Chum and coho catches were also above average. An estimated 34.1% of the District 106 coho catch was of Alaskan hatchery origin.

In the District 108 fishery, 952 chinook, 49,717 sockeye, 20,041 coho, 60,730 pink, and 14,086 chum salmon were harvested. Catches of all species were above average. An estimated 28.5% of the District 108 coho catch was of Alaskan hatchery origin. A test fishery was again conducted in District 8 to help managers ascertain the run strength of early run species of salmon in-season.

Harvest sharing of Stikine sockeye stocks is based on in-season abundance forecasts produced by the Stikine Management Model (SMM) (Table 5). Scale pattern analysis is used to estimate stock composition in the U.S. marine catches. The Sumner Strait fishery (Subdistricts 106-41 & 42) harvested 30,036 Stikine sockeye salmon, 21.3% of the total sockeye harvest in that subdistrict; the Clarence Strait fishery (Subdistrict 106-30) took 9,013 Stikine fish, 16.4% of the catch in that subdistrict; and the District 108 fishery, near the mouth of the Stikine River, harvested 46,371 Stikine fish, 93.3% of the District 108 catch. An estimated 85,420 Stikine sockeye salmon were harvested in commercial gillnet fisheries from both districts.

Table 5. Weekly forecasts of run size and total allowable catch for Stikine River sockeye as determined in-season by the Stikine Management Model, 1992.

Week	Start Date	Forecasts		U.S. Fishing Regime		Canada TAC	Cumulative Catch	
		Run Size	TAC	6 8	TAC		U.S.	CANADA
26	21-Jun	127,338	67,338	I D	37,338	30,000	5,917	0
27	28-Jun	127,338	67,338	I D	37,338	30,000	18,294	1,111
28	05-Jul	151,772	91,772	I D	61,772	30,000	37,481	1,811
29	12-Jul	169,019	109,019	I D	79,019	30,000	47,455	10,272
30	19-Jul	194,678	134,678	I D	104,678	30,000	67,201	16,630
31	26-Jul	221,358	161,358	I D	131,358	30,000	76,243	20,758
32	02-Aug	208,343	148,343	I D	118,343	30,000	82,055	25,541
33	09-Aug	213,846	153,846	I D	123,846	30,000	82,055	25,541

I = Indicates indirect fishery allowed; D = Indicates directed fishery allowed.

The estimated Stikine sockeye run was 240,864 fish (Table 6) and the escapement was 125,016 fish which was above the escapement goal.

Table 6. Run reconstruction for Stikine sockeye salmon, 1992.

	Tahltan	non-Tahltan	Total
Escapement	59,907	65,109	125,016
Canadian Harvest	14,859	11,422	26,281
% Harvest	26.1%	20.8%	23.5%
Test Fishery Catch	1,772	1,186	2,958
Inriver Run	76,538	77,717	154,255
U.S. Harvest			
106-41&42	16,142	13,895	30,036
106-30	2,049	6,964	9,013
108	23,843	22,528	46,371
Total	42,034	43,387	85,420
% Harvest	73.9%	79.2%	76.5%
Test Fishery Catch	682	507	1,189
Total Run	119,254	121,611	240,864
Total Allowable Catch			
Minimum	79,254	81,611	160,864
Maximum	99,254	101,611	200,864
Actual Catch	59,347	56,502	115,849

Taku River Area Fisheries

The 1992 District 111 commercial gillnet harvest included 2,456 chinook, 134,752 sockeye, 170,739 coho, 314,331 pink, and 112,324 chum salmon. The record sockeye harvest was 73.2% above the 1982 to 1991 average and was comprised primarily of small immature chinook. The summer chum catch of 97,591 fish (i.e. the District 111 chum harvest prior to August 16, Statistical Week 34), was 69.0% above the 1982 to 1991 average. Hatchery chum salmon returning to the DIPAC Hatchery in Gastineau Channel and the state Snettisham Hatchery remote release in Limestone Inlet, contributed an estimated 28,752 fish. The fall chum salmon harvest, (i.e. chum salmon caught after August 18, Statistical Week 34), was 14,733 fish, and was 60% below the 1982 to 1991 average. Chum salmon that are taken in the fall in District 111 are exclusively wild chum stocks from the Taku River and Port Snettisham. The District 111 pink salmon harvest was the second largest catch on record and almost three times the 1982 to 1990 even year average. Large catches were a result of excellent pink salmon runs to the Taku River, Stephens Passage streams and DIPAC hatchery. The coho catch was above the 1982 to 1991 average. The preliminary estimated DIPAC contribution was approximately 45,048 fish, or 26.4% of the coho catch.

The U.S. personal use fishery in the Taku River harvested an estimated 46 chinook, 2,099 sockeye, 219 coho, 182 pink, and 0 chum salmon. The marine spring sport fishery, near the mouth of the Taku River, harvested an estimated 630 wild mature chinook salmon, the majority of which are believed to be of Taku River origin.

The U.S./Canada Pacific Salmon Treaty stipulates that the U.S. and Canada are entitled to 82% and 18%, respectively of the TAC of the sockeye salmon originating in the Canadian portion of the Taku River. The total Taku sockeye run was estimated at a record high 277,764 fish. Based on the escapement goal range of 71,000 to 80,000 fish, the TAC was 197,764 to 206,764 sockeye salmon. The U.S. harvested an estimated 110,088 Taku sockeye salmon, representing 53.2% to 55.7% of the TAC. The estimated escapement of 138,054 sockeye salmon in 1992 was well over the escapement goal range.

In-season scale pattern analysis was not used in 1992 to determine the stock composition of District 111 sockeye catches and the post-season analysis is in progress. Taku River sockeye salmon comprised an average of 80.1% of the District 111 sockeye catch from 1983 to 1991. This average was used in the preliminary run reconstruction (Table 7).

Table 7. Taku sockeye salmon run reconstruction, 1992. Estimates do not include spawning escapements below the U.S./Canada border.

	Taku Stocks	Snettisham Stocks
Escapement	138,054	31,439
Canadian Harvest	29,590	
% Harvest	21.2%	
Test Fishery Catch	32	
Above Border Run	167,676	
U.S. Harvest		
District 111	107,989	26,763
Personal Use	2,099	
Total	110,088	
% Harvest	78.8%	
Test Fishery Catch		42
Total Run	277,764	58,244
Taku Harvest Plan	Minimum	Maximum
Escapement Goal	71,000	80,000
TAC	206,764	197,764
Canadian Portion	0.143	0.150
U.S. Portion	0.532	0.557

a/ Weir count from Speel Lake and mark-recapture estimate from Crescent Lake

Alsek River Area Fisheries

The U.S. Dry Bay commercial set gillnet fishery harvested 301 chinook, 19,310 sockeye, 3,310 coho, 1 pink, and 136 chum salmon. The harvest of sockeye salmon was 23.4% above the 1982-

1991 average. The catch of chinook salmon was 27.5% above the 1982-91 average; the coho, pink and chum catches were below average.

Pre-season expectations were for an above average run of early run sockeye salmon, an average run of chinook salmon, and a below average run of late run sockeye salmon. As in recent years, the initial opening of the fishery was delayed from the traditional opening on the first Monday in June in order to conserve chinook and early run sockeye salmon. The fishery began this year on a Thursday (June 11), since the standard Monday opening date conflicted with a halibut opening.

ADF&G managers have used a model to assist in managing the Alsek sockeye harvest since 1984. This model has worked well in predicting the total season catch and index run size (catch + Klukshu escapement). In 1990, a second model was developed and the two models have been used since. Both models provided accurate predictions in 1990 and in 1991, and were useful in managing the fishery. The multiple regression model proved more accurate at predicting the total Dry Bay sockeye catch and index run size (Dry Bay catch + Klukshu weir count) than the harvest rate model in 1992. The regression model predicted the total catch fairly well throughout the season; all weekly predictions were within 20% of the total catch and the final in-season estimate was 3.2% below the actual catch. Both models overestimated the index run size, with final in-season estimates exceeding the actual index run size by 13.0% to 19.3% (Table 8).

Table 8. In-season U.S. forecasts of the total 1992 Alsek River catch, Klukshu River weir count, and total index run size (catch + Klukshu weir count) using two predictive models. Data are preliminary.

Stat. Week	Start Date	Harvest Rate Model			Multiple Regression Model		
		Klukshu		Index Run	Klukshu		Index Run
		Total Catch	Weir Count		Total Catch	Weir Count	
27	28-Jun	36,427	42,613	79,040	23,253	34,183	57,436
28	05-Jul	30,271	36,187	66,458	23,235	38,784	62,019
29	12-Jul	25,664	30,930	56,594	21,163	27,955	49,118
30	19-Jul	23,964	28,254	52,218	21,058	26,800	47,858
31	26-Jul	20,826	25,783	46,609	18,686	25,467	44,153
Actual		19,310	19,767	39,077	19,310	19,767	39,077

Transboundary River Joint Enhancement Activities

In 1992, fry were outplanted to Trapper, Tahltan, Tuya, and Tatsamenie Lakes over the periods June 4-6, June 8-9, June 17-21, and June 23-26, respectively (Table 9).

Table 9. Egg survivals and numbers of fry outplanted into Tahltan, Tuya, Tatsamenie, and Trapper Lakes, 1992.

Lake	Green Eggs	Eyed Eggs	Fry Planted	Survival
Tahltan	1,557,000	1,436,000	1,414,000	90.8%
Tuya	2,688,000	2,578,000	1,632,000	60.7%
Tatsamenie	1,360,000	1,260,000	1,232,000	90.6%
Trapper	2,953,000	2,452,000	1,811,000	61.3%

Approximately 881,000 fry destined for Tuya Lake died or were destroyed because of suspected IHN; later tests did not reveal IHN. An estimated 589,000 fry destined for Trapper Lake were destroyed after IHN was detected during pre-release screening.

In 1992, sockeye eggs were collected at Tahltan Lake (Stikine River) for the fourth year and at Little Tatsamenie and Little Trapper Lakes (Taku River) for the third year. They were collected by Canada and flown to the central incubation facility at Port Snettisham. Approximately 5.4 million eggs were collected from Tahltan Lake fish and fertilization rates averaged 93%. At Little Trapper approximately 2.6 million eggs were taken and had an average fertilization rate of 90%. Approximately 1.6 million eggs were collected from Little Tatsamenie Lake fish.

Conceptual designs for the modifications at the Snettisham Hatchery have been formalized and the drawings are being reviewed. The bid opening is scheduled for November 19, 1992. Assuming that the bids come in below the available funds, the selection of the construction firm will be on November 29, 1992. Construction could begin as early as February. If no significant roadblocks occur, remodelling could be finished by July 31, 1993. This would provide enough time for personnel to set up and test the incubation equipment before receiving 1993 brood year eggs. The temporary facility will be used to complete the incubation and holding of the 1992 brood year eggs and alevins.

Although most of the requested 1993 fiscal year funding was not received, the temporary lab facilities are functioning with the acquisition of processing equipment including microscopes, image processing hardware, and grinding wheels. Approximately 16 person months of staff time have been funded for the current year. Lab personnel are doing research to improve the ability to recognize marked otoliths and to determine the minimal time necessary to mark the sockeye embryos.

Chinook Salmon Fisheries

Southeast Alaska Chinook Salmon Fishery

All Gear Harvest

The preliminary estimate of the 1992 chinook salmon catch by all Southeast Alaska fisheries was 260,829 (Table 10). The base catch (total catch minus add-on) was 222,756. The base catch was 40,000 below the quota of 263,000. This brought the cumulative deviation to -10,600 (below zero).

Table 10. Chinook all-gear catches in Southeast Alaska, 1987 to 1992, and deviation from the ceiling each year. Catches in thousands.

Year	Preliminary Catches			Base Ceiling	Deviation from Base	
	Total	Add-on	Base		Number	Percent
1987	281.9	16.7	265.2	263.0	+2.2	+0.8%
1988	278.9	23.7	255.2	263.0	-7.8	-3.0%
1989	291.1	26.7	264.4	263.0	+1.4	+0.5%
1990	366.8	53.7	313.2	302.0	+11.2	+5.5%
1991	357.0	61.3	295.6	273.0	+22.6	+9.6%
1992	260	38.1	222.8	263.0	-40.2	-15.3%
Cumulative	1,836.5	220.2	1,616.4	1,627	-10.6	-4.0%

Troll Fishery

The winter troll fishery harvested 72,000 chinook salmon from October 1, 1991 through April 14, 1992. A total of 7,000 were from Alaskan hatcheries.

Terminal, experimental and hatchery access fisheries were conducted prior to the July 1 general summer opening. The experimental fisheries are designed to increase the harvest of Alaskan hatchery produced chinook salmon by allowing trolling in small areas of the migratory path close to the hatchery. The hatchery access fishery was designed to increase the harvest of Alaskan hatchery stocks while providing some general access to wild Southeast Alaska stocks. Terminal fisheries occurred directly in front of hatcheries or remote release sites.

The terminal, experimental and hatchery access fisheries are managed in-season in order to maximize the number of Alaskan hatchery chinook salmon and to comply with a limit of 35,000 non-Treaty chinook salmon. The total catch in the three fisheries was 39,300 of which 16,000 were from Alaskan hatcheries.

A total of ten experimental areas were open. The number of days open in each area varied according to the proportion of Alaskan hatchery chinook salmon in the fishery. A total of 11,400 chinook salmon were harvested in experimental fisheries, of which 5,600 were Alaskan hatchery origin.

The first hatchery access opening occurred from June 1 through 3. The second opening occurred from June 17 through 19. A total of 23,800 chinook salmon were harvested of which 6,300 were of Alaskan hatchery origin.

A total of 4,100 chinook salmon were harvested in terminal areas.

The summer fishery began on July 1 and continued through noon on July 4. There was a second opening on August 23. A total of 72,600 chinook were harvested during the summer. Following closure of the chinook fishery, areas of high chinook abundance were closed.

The total troll harvest was 183,600 chinook salmon.

Net Fisheries

Net fisheries have 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 (<1.0%) of the total net harvest. In 1992, the net fisheries harvested a total of 31,000 chinook salmon of which 10,300 were from Alaskan hatcheries.

Recreational Fishery

The recreational fishery had a harvest target of 41,310 chinook salmon excluding Alaska hatchery add-on chinook. A bag limit of one fish greater than 28 inches per day, was instituted on May 15 and continued through August 6. The standard two fish per day bag limit was in effect during the rest of the year. The preliminary estimate of total harvest is 45,100 of which 10,800 were from Alaskan hatcheries. Final post-season estimates of recreational catches are based on a statewide mail survey which is available in early summer 1993.

Southern U.S. Chinook Salmon Fisheries

The following is a summary of 1992 and 1991 chinook catches in Washington and Oregon fisheries of interest to the Pacific Salmon Commission (PSC). The data are preliminary and will change as fish ticket data replace in-season projections, errors are discovered and corrected, and landings for the remainder of the year are included in the catch. The 1992 estimates include catches through November 16, 1992; the 1991 estimates include catches for the entire year.

Fishery	1992 Estimate	1991 Estimate
Central Oregon		
Troll	400	0
Recreational	NA	44,500
Columbia River		
Net	56,400	106,800
Recreational	NA	78,000
Ocean (North of Falcon)		
Troll	68,400	50,300
Recreational	19,000	13,300
Net	<50	100

Fishery	1992 Estimate	1991 Estimate
Washington Coastal		
Marine Net	50,700	42,300
River Net	13,100	11,900
Strait of Juan de Fuca		
Net	800	3,200
Troll	26,300	34,700
Recreational	NA	39,700
San Juan Islands		
Net	15,800	13,800
Troll	200	100
Recreational	NA	5,100
Puget Sound		
Recreational	49,500	70,800
Marine Net	10,500	18,400
River Net	NA	46,700

Ocean Fisheries off Central Oregon

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 predominantly harvests the NOC stock aggregate is the late season near-shore fishery off the mouth of the Elk River. In 1991, the Elk River fishery was not conducted due to conservation concerns. In 1992, an estimated 400 chinook were taken in this fishery. Recreational catch estimates for 1992 are not available at this time. Recreational catch for 1991 in estuary and freshwater areas is estimated at 44,500 chinook.

Columbia River

Columbia River 1992 freshwater recreational and commercial net fisheries are incomplete. Preliminary estimates of 1992 spring and fall chinook net catch total 56,400, compared to 106,800 in 1991. Recreational estimates for 1992 are not yet available. Preliminary recreational catch estimates for 1991 total 78,000 chinook. In 1992, no commercial sockeye fishery occurred in Zones 1-6. The Yakima Indian Nation conducted a commercial sockeye fishery during July in the pool behind Priest Rapids dam. Fishing effort was very light. Estimates of the incidental catch of summer chinook are not yet available, but catches are expected to have been very low.

Ocean Fisheries North of Cape Falcon

In 1992, 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. 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. In 1992, coho quotas were substantially reduced due to concerns for the Hood Canal wild coho stock, and fisheries were closed when coho quotas were

reached. The non-tribal trollers traded 21,000 coho to the recreational groups in exchange for an additional 7,000 chinook. In an attempt to improve efficiency in chinook targeting, trollers were required to use 6" or larger plugs and no more than four spreads per line during the all species season. Catches indicate that these regulations were quite successful in targeting chinook, and the chinook quota was almost fully harvested before the coho quota was reached. Preliminary estimates of non-tribal troll chinook catch total 45,900 (2,300 Oregon and 43,600 Washington), about 98% of the 47,000 chinook quota and up from 29,700 in 1991. Approximately 36,900 of these non-tribal troll caught chinook were taken during the early season chinook fishery, May 1 through June 15, 1992.

Preliminary recreational catches are estimated at 19,000 (500 Oregon and 18,500 Washington), about 58% of the 33,000 chinook quota and up from 13,300 in 1991. In 1992, an all salmon except coho fishery was conducted in Area 4B during May. The catch of 100 chinook counted against the ocean chinook quota. This fishery was not conducted in 1991.

Preliminary estimates of 1992 tribal troll chinook catch total 22,500, 68% of the 33,000 chinook quota and up from 20,600 in 1991.

Washington Coast

Ocean escapements of northern Washington coastal stocks were above minimum spawning levels, allowing both commercial and recreational fisheries. Although coastal fisheries are incomplete, preliminary 1992 estimates of Grays Harbor and Willapa Bay net catch total 50,700 chinook, compared to 42,300 in 1991. The 1992 commercial net fisheries in north coastal rivers have harvested an estimated 13,100 chinook, compared to 11,900 in 1991. Catches for the Humptulips and Chehalis rivers are included in the Grays Harbor marine net totals.

Strait of Juan de Fuca

Preliminary estimates of 1992 net catch in the Strait of Juan de Fuca total 800 chinook, compared to 3,200 in 1991. Through November 16, 1992, the Strait of Juan de Fuca tribal troll fishery has harvested an estimated 26,300 chinook, compared to 19,500 chinook caught through November 18, 1991. Tribal troll catch through December 31, 1991 in this area was 34,700. 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 have been included in the North of Cape Falcon troll summary.

In 1992, about 30 chinook were caught in the Area 4B state waters fishery after the PFMC fishery, compared to 400 in 1991. Total 1992 recreational catch estimates in Areas 5 and 6 are not available at this time. Preliminary estimates of 1991 recreational chinook catch for Areas 5 and 6 total 39,300, compared to 50,500 in 1990. In 1992, a creel census was conducted in Area 5 between June 1 and August 23. Chinook catch during this time is estimated at 22,300.

San Juan Islands

Preliminary 1992 estimates of chinook net catch in the San Juan Islands total 15,800, compared to 13,800 in 1991. Recreational catch estimates for 1992 in Area 7 are not available at this time. Preliminary estimates of recreational chinook catch for 1991 in Area 7 total 5,100, compared to 7,400 in 1990.

Puget Sound

Recreational and commercial fisheries in Puget Sound were regulated by time and area closures to protect depressed spring chinook stocks. Preliminary estimates of 1992 net catch in Puget Sound marine areas total 49,500 chinook, compared to 70,800 in 1991. Preliminary estimates of 1992 net catch in Puget Sound freshwater areas total 10,500 chinook, compared to 18,400 in 1991.

Puget Sound recreational catch estimates for 1992 are not available at this time. Recreational fisheries were managed in the same general manner as in recent years. Preliminary estimates of 1991 recreational chinook catch for Areas 8-13 total 46,700, compared to 67,600 in 1990.

Coho Salmon Fisheries

Southeast Alaska Coho Salmon Fisheries

There are no specific provisions of the Annex IV chapter on coho salmon that apply to Southeast Alaska fisheries. These fisheries are managed by the Alaska Department of Fish and Game to achieve gear allocation objectives established by the Alaska Board of Fisheries and general coho salmon conservation objectives. The 1992 fisheries were managed in a manner similar to that since 1980. Catch ceilings are not used, rather they are managed on in-season assessment of run strength. In addition to other fisheries regulations, a 10-day troll closure was implemented during mid-August to meet Board of Fisheries conservation and allocation objectives.

Preliminary all gear harvest was 3,419,200 commercial harvest plus 85,000 recreational harvest (Table 11).

Table 11. Coho salmon harvest in Southeast Alaska in 1992 by gear type.

Gear Type	Harvest
Troll	1,928,200
Drift Gillnet	697,100
Purse Seine	503,900
Set Gillnet	290,000
Recreational	85,000
Total	3,504,200

The 1992 harvest is the largest on record. Returns were strong throughout Southeast Alaska and very strong returns were again seen in the northern inside. Southeast Alaska hatcheries are estimated to have contributed over 700 thousand coho to the 1992 Southeast Alaska fisheries.

Coho escapements were generally strong throughout the region.

Southern U.S. Coho Salmon Fisheries

This review compiles available coho catch data from 1992 and 1991 Washington and Oregon fisheries of interest to the Pacific Salmon Commission (PSC). These data are preliminary and are expected to change as errors are corrected and fisheries are completed.

Fishery	1992 Estimate	1991 Estimate
Columbia River		
Recreational	58,800	413,200
Net	NA	209,800
Ocean (North of Falcon)		
Troll	93,500	160,100
Recreational	134,200	232,000
Net	<50	0
Washington Coastal		
Marine Net	24,400	216,400
River Net	17,300	38,300
Strait of Juan de Fuca		
Net	5,900	35,900
Troll	1,200	5,100
Recreational	NA	207,100
San Juan Islands		
Net	10,700	61,100
Troll	400	500
Recreational	NA	4,000
Puget Sound		
Recreational	316,000	428,700
Marine Net	43,100	43,700
River Net	NA	57,300

Columbia River Net

The preliminary estimate of 1992 net catch in the Columbia River is 58,800 coho. This is substantially less than the 1991 catch of 413,200. The 1992 catch reflects a severely reduced 1992 run size compared to 1991.

Columbia River Sport

Estimates of the 1992 Columbia River recreational catch are not available at this time. The 1991 recreational catch in mainstem and tributary areas is estimated at 228,776, compared to 27,805 in 1990. The large 1991 catch was due to the large 1991 run size and a record catch in the Buoy 10 recreational fishery.

North of Cape Falcon Ocean

The U.S. ocean fisheries operating north of Cape Falcon, OR were constrained by coho ceilings developed through the domestic regulatory process of the Pacific Fisheries Management Council (PFMC). Coho catch ceilings are developed to conserve depressed wild coho stocks originating in Puget Sound and Washington coastal rivers. In 1992, concern for the very depressed Hood Canal wild coho stock led to the adoption of severely restricted ceilings (about half the 1991 levels). In 1992, the recreational groups traded 7,000 chinook to the non-tribal trollers in exchange for an additional 21,000 coho.

North of Cape Falcon Troll

In 1992, the non-tribal troll fisheries operated under a catch ceiling of 19,000 coho. Because of the limited number of coho available to this fishery, regulations intended to improve chinook targeting were adopted during the all species season. Levels of hooking mortality were estimated and included in the calculation of allowable impacts. The total catch in this fishery of 19,200 exceeded the ceiling by 200 coho. This catch was substantially below the 1991 catch of 81,200.

Tribal troll fisheries caught an estimated 74,300 coho, 6,300 over their quota of 68,000. This catch was below the 1991 catch of 78,900. The ocean total for the tribal troll fishery includes the coho caught in Area 4B from May 1 through September 30.

North of Cape Falcon Sport

The 1992 recreational fishery north of Cape Falcon was constrained by a ceiling of 141,000 coho, developed through the PFMC process. For allocation purposes, this fishery was managed on the basis of sub-area coho quotas that corresponded to the ports of Ilwaco/Astoria, Westport, La Push, and Neah Bay. Approximately 134,200 coho (95% of the ceiling) were caught in 1992. This catch was substantially below the 1991 catch of 232,000. The Area 4B catch was considered ocean catch until the PFMC sub-area quota for Neah Bay was met, at which point the fishery was managed as a State waters fishery.

Washington Coastal Marine Net

A total of 11,300 coho have been harvested by the non-tribal 1992 Willapa Bay and Grays Harbor net fisheries compared to a catch of 139,200 in 1991. Tribal fisheries in Grays Harbor landed 13,100 coho in 1992 compared to 77,200 in 1991. There is no tribal catch in Willapa Bay.

Washington Coastal Marine Sport

A small recreational fishery (less than 200 coho) has historically occurred in late summer and fall in the Grays Harbor estuary. In 1991, effort and catch significantly increased in response to the large coho returning to Grays Harbor and the August closure of the Area 2 ocean sport fishery. In 1992, the fishery returned to small historical levels. Catch from this fishery has not been reported in Table 1.

North Washington Coastal River Net

The 1992 tribal net fisheries in Washington's coastal rivers have harvested approximately 17,300 coho compared to 38,300 in 1991. The coastal river net harvest includes catches for the Quillayute, Hoh, Queets, Quinault, Moclips, and Copalis Rivers. Catch for the Humptulips and Chehalis rivers are included in the Grays Harbor tribal coastal marine net totals.

Strait of Juan de Fuca Marine Net

The tribal net fisheries in Areas 4B, 5, and 6C harvested 5,900 coho in 1992 compared to 35,300 in 1991. Non-tribal net fisheries did not land any coho in 1992, compared to 600 in 1991.

Strait of Juan de Fuca Troll

The coho harvested by the tribal troll fishery in Area 4B during the May through September PFMC management period are summarized with the North of Cape Falcon troll data. The tribal troll

fishery outside of the PFMC management period in Areas 4B, 5, and 6C harvested 1,200 coho in 1992 compared to 5,100 in 1991.

Strait of Juan de Fuca Sport

A Washington State managed recreational fishery was conducted in Area 4B in 1992. The harvest of 11,800 coho was slightly below the 11,900 coho quota. This 4B recreational fishery harvested 15,100 coho in 1991. Total 1992 estimates for Areas 5 and 6 are unavailable. The 1991 Area 5 and 6 coho catch of 192,000 is below the 1990 catch of 227,198. In 1992, a creel census was conducted in Area 5 between June 1 and August 23. Coho catch during this time is estimated at 90,000.

San Juan Islands Net

The tribal net fisheries in Areas 6, 6A, 7 and 7A have harvested 8,500 coho (8,300 in 7/7A) in 1992 compared to 43,000 (36,100 in 7/7A) in 1991. The non-tribal net fisheries have harvested 2,200 coho (2,100 in 7/7A) compared to 18,100 (18,000 in 7/7A) in 1991. In 1992, Area 6 accounted for 300 (2.8%), Area 7 accounted for 5,500 (51.4%) and Area 7A accounted for 4,900 (45.8%) of the combined tribal and non-tribal total catch of 10,700. There was not a coho directed fishery in Areas 7/7A in 1992.

San Juan Islands Sport

Catch estimates are not yet available for the 1992 sport fishery in Area 7. The 1991 coho catch of 4,000 was below the 1990 catch of 5,200.

Puget Sound Marine Net

1992 tribal and non-tribal net fisheries in Puget Sound marine areas other than 4B, 5, 6A, 6C, 7, and 7A harvested 218,500 and 97,500 coho respectively. This compares to a tribal harvest of 256,800 and a non-tribal harvest of 171,900 coho in 1991.

Puget Sound River Net

Tribal river net fisheries in Puget Sound harvested approximately 43,100 coho in 1992 compared to 43,700 in 1991.

Puget Sound Sport

Catch estimates are not available at this time for the 1992 Puget Sound sport fishery. The 1991 coho catch of 57,300 in Areas 8-13 was less than the catch of 84,800 in 1990.

Chum Salmon Fisheries

The mixed-stock fisheries in United States (U.S.) waters that are addressed in the chum annex of the Pacific Salmon Treaty are those in the western Strait of Juan de Fuca (Areas 4B, 5 and 6C), the San Juan Islands (Area 7) and Point Roberts (Area 7A). Other chum fisheries in Washington waters are primarily terminal fisheries which harvest stocks of local origin.

Mixed Stock Fisheries

Areas 4B, 5, 6C

As in previous years, the chum fishery in Areas 4B, 5, and 6C was restricted to treaty Indian gillnet gear only. Chum fishing in these areas was delayed until October 18 due to domestic coho conservation concerns. Test fisheries were conducted during the two weeks prior to the commercial fishery opening to collect GSI samples. The commercial fishery was initially opened for seven days from October 18 to October 25. The areas were re-opened on October 27 for four days, closing on October 31. A final one day opening occurred on November 3, and the commercial fishery has remained closed since then. Test fishing for the collection of GSI samples continued for one week following the close of the commercial fishery.

Incidental chum catches in fisheries prior to the chum management period totalled only 81 fish. Catches in the Strait of Juan de Fuca commercial chum fishery were about as expected given the forecast abundance of Puget Sound chum runs. The total commercial harvest during the chum management period was 60,911. There were an additional 2,148 chum harvested in test fisheries for GSI collection and in ceremonial and subsistence fisheries, bringing the total chum catch in Areas 4B, 5, and 6C, reported through November 16, to 63,140. Little, if any, additional catch is expected to be reported.

Areas 7 and 7A

Prior to the chum management period, relatively few chum were harvested incidental to fisheries targeting on other species (sockeye). Total catches of chum salmon in Areas 7 and 7A prior to chum management were only 69 fish.

The start of chum fishing in Areas 7/7A was delayed until November 18 due to domestic coho conservation concerns. Throughout the chum season, U.S. and Canadian technical staffs kept in close communication on the status of the chum run size entering Johnstone Strait. Indications from the initial evaluation fishery and subsequent test fisheries in late September and early October were that the run was slightly lower than expected, with an estimated total run size of 3.7 million. However, prior to commencing fisheries in Areas 7/7A, the U.S. was notified by DFO staff on October 9 that the total catch in Johnstone Strait had exceeded 640,000 chum. We were also informed on October 15 that the run size had been upgraded to 4.0 million. Under the provisions of the chum annex of the PST, this catch level and run size in Johnstone Strait allows 140,000 chum to be harvested in U.S. fishing Areas 7 and 7A. Because there was an overage in 1991 by the U.S. of approximately 19,000 chum, it was the U.S. intent to restrict fishing in these areas to 121,000 chum.

A treaty Indian chum fishery was scheduled in Areas 7 and 7A for 3.5 days, from October 18 to October 21, and was expected to harvest approximately 45,000 chum. The actual catch was much larger than expected with a total harvest of 118,264 chum salmon. The daily catch rates were three times greater than expected and nearly double the highest daily catch previously observed for the treaty fleet. Catches increased over successive days of the opening, with the highest catches occurring on the last day.

Because the treaty Indian fishery harvested virtually all of the U.S. quota, and because of high fish availability, the managers determined that it would not be possible to conduct an Areas 7/7A non-treaty fishery in 1992 if the U.S. chum catch was to remain within the total harvest objective. Test fisheries for collection of GSI samples were conducted both prior to and following the commercial fishery, harvesting an additional 870 chum.

The preliminary total season catch in Areas 7 and 7A is 119,203 chum; approximately 1,800 fish less than the 121,000 harvest objective, leaving a cumulative U.S. shortfall of about 1,800 chum.

Puget Sound Terminal Area Fisheries and Run Strength

Pre-season forecasts for chum returns to Puget Sound were for a fall chum run of about 1.5 million, which is an above average return. Most Puget Sound chum runs have been updated in-season with the North Puget Sound runs returning at less than predicted and the Hood canal and South Puget Sound runs greater than predicted. Overall, the in-season estimates of abundance, as of November 13, indicate a total Puget Sound fall chum return of about 1.6 million. Many Puget Sound chum fisheries are still underway or just beginning, and additional in-season estimates of abundance will be made in the coming weeks. It is far too early to assess spawning escapement.

1992 Fraser Sockeye Fishery Management

Preliminary Post-Season Overview

Having failed to reach an agreement on the 1992 U.S. allocation objective, the two countries proceeded to manage their respective 1992 fisheries for Fraser sockeye unilaterally. The bilateral Fraser Panel did not assume regulatory control of the fisheries in Panel waters as would normally be the case. It was agreed that the PSC staff would function as normal except that they would not provide in-season fishery recommendations. All information was communicated by the PSC staff during manager-to-manager telephone conference calls held on Fridays and other days of the week as needed. In addition, there were regularly scheduled technical reviews with the PSC staff and management staffs from both countries. It was agreed that information on fishery openings and closings would be communicated to each country and the PSC staff by telephone and FAX.

After several unsuccessful attempts, it became obvious that it would be politically impossible to develop an agreed pre-season fishing plan without agreed allocation objectives. Therefore, each country proceeded to develop their own fishing plans. In this regard, the U.S. re-stated their intent to manage for a total Washington fishery harvest of 870,000 Fraser sockeye. The U.S. also stated their intent to not conduct a directed Early Stuart fishery, thereby providing Canada with greater flexibility to meet its domestic allocation and spawning escapement objectives.

The U.S. developed a pre-season fishing plan with catch objectives of 390,000 sockeye (85,000 Strait and 305,000 Inside) for the treaty fishery and 480,000 for the non-treaty fishery (purse seines - 230,000, gillnets - 250,000, reef nets - 0). The fisheries were proposed to begin after the passage of the Early Stuart and Lake Washington runs and near the anticipated peak of the Early Summer run. As is normally the case, the Strait of Juan de Fuca fishery was scheduled to begin earlier than the inside fisheries. Based on Canada's run size forecasts and escapement goals, it was anticipated that most of the U.S. harvest would be of Summer run fish which were expected to be available during early to mid August. Forecasts of run timing and diversion indicated that the runs might be significantly later than normal, and that a large proportion of the runs may migrate by way of Johnstone Strait rather than the normal Strait of Juan de Fuca route.

In-season management began on July 7 with the first telephone conference call between the PSC staff and the two countries. Between July 7 and September 4, telephone conferences were normally held twice weekly (usually Tuesday and Friday), with technical consultation each Thursday. The U.S. fisheries began on July 20 for five days in the Strait of Juan de Fuca (Areas 4B, 5 and 6C), with very slow catches. This fishery was re-opened on July 26 for another five day fishery and again catch rates were very low. The inside (Areas 6, 7 and 7A) fisheries remained closed during this two week period.

By the end of July it was becoming obvious that the runs were late and that the northern diversion rate was increasing rapidly. On July 31, after delaying the start of the primary fisheries (in Areas 6, 7, and 7A) for one to two weeks in response to the late timing of the runs, the U.S. announced to Canada that we intended to open our first significant fishery during the week of August 2. This limited opening was originally scheduled for approximately one day each for the treaty and non-treaty fisheries. Canada chose to consider this first U.S. fishery as the occasion to begin preempting U.S. fishing opportunity, and so announced their intent to conduct their Area 20 fishery accordingly.

In response to seven days per week fishing in Area 20 by Canada, the U.S. began fishing seven days per week also. Treaty and non-Treaty fisheries were rotated in Areas 6, 7 and 7A while the tribes fished continuously in Areas 4B, 5, and 6C. Shortly after the beginning of U.S. fisheries the northern diversion rate increased rapidly up to about 75% and remained at this high level throughout the season. This extraordinarily high diversion rate allowed Canada the ability to fish continuously in Area 20 and manage the Johnstone Strait and Area 29 fisheries to provide for their escapement goals up-river. This resulted in relatively low daily catches in the U.S. fisheries, particularly in Areas 4B, 5, and 6C.

Largely because of domestic allocation concerns, Canada announced that Area 20 would close on August 22 and that other fisheries would not open the week of August 23. Canada was also concerned about possible short-falls in spawning escapement levels. For several weeks, evidence was mounting that fewer fish than expected were reaching the spawning grounds. The numbers were significantly less than the estimated escapement past Mission, in the Fraser River, minus the reported native fisheries catch in the river upstream of Mission. On August 28, Pat Chamut, DFO, contacted Robert Turner, WDF, and requested that the U.S. close its sockeye fisheries in light of the projected uncertainty in the achievement of spawning escapement goals because of these fish that were "missing" between Mission and the spawning grounds. The U.S. complied with this request. Canada has initiated a federal inquiry to investigate this "missing" fish question.

The preliminary post-season estimated run size is 6.4 million Fraser sockeye compared to the forecast of 5.9 million. The post-season estimated gross escapement past Mission is 1.892 million. The U.S. caught 609,000 Fraser sockeye in Washington fisheries compared to the goal of 870,000. The catch was equally split between treaty and non-treaty fisheries. An additional 88,000 Fraser sockeye are estimated to have been caught in Alaska District 104. The incidental catch of coho was significantly less than anticipated in both the U.S. fisheries and in the Canadian Area 20 fishery.

(Source document) *Preliminary 1992 Post-Season Report for United States Fisheries of Relevance to the Pacific Salmon Treaty. December, 1992.* United States Section of the Pacific Salmon Commission.

C. 1992 POST-SEASON REPORT FOR CANADIAN TREATY LIMIT FISHERIES

Preliminary 1992 catches reported below are based on in-season estimates (hailed statistics), on-the-grounds counts by DFO Management Staff, sales slip data (commercial troll and net), and creel surveys (sport). Annex fisheries are reported in the order of the Chapters of Annex IV. The expectations, management objectives, catches and escapements are only for those stocks and fisheries covered by the Pacific Salmon Treaty (PST); domestic catch allocations have been excluded. The attached table summarizes 1985-1992 catches in Canadian fisheries under limits imposed by the Pacific Salmon Treaty.

Transboundary Rivers

Stikine River

As required by the Transboundary Chapter of Annex IV, a pre-season forecast of 127,338 Stikine sockeye was made to guide initial fishing patterns of both countries. The total run forecast included an estimated Tahltan Lake sockeye run of 55, 912 fish which was above the previous ten-year average of 44,730 sockeye, and an estimated run of 71,426 non-Tahltan sockeye, again above the previous ten-year average (51,707) for this stock component.

The annual harvest sharing arrangements for Stikine sockeye (excluding test fishery catches) from 1988 until 1992, tied to commitments by the Parties to undertake cooperative enhancement, were as follows:

Range in TAC		Canadian Catch	
from	to	Minimum	Maximum
0	0	4,000	4,000
1	20,000	10,000	15,000
20,001	60,000	15,000	20,000
60,001	60,001+	20,000	30,000

A total of 26,281 sockeye was caught in the combined Canadian commercial and Indian food (IF) fisheries. This was the second largest sockeye catch on record and was well above the previous ten-year average catch of 17,561 sockeye.

For most of the season, forecasts of the total run based on the Stikine Management Model were in excess of 200,000 sockeye, which translated into a target catch of 30,000 sockeye for Canadian fisheries. The final in-season estimates of the total run and TAC were approximately 214,100 and 154,100, respectively, indicating the total in-river catch (excluding the Stikine test fishery) was 3,719 sockeye below the allowable harvest of 30,000.

Sockeye escapement past the Tahltan Lake weir was 59,907 fish which was approximately 2.4 times the previous ten-year average of 25,277 sockeye, and was well above the escapement goal range of 20,000 to 40,000 sockeye for Tahltan Lake. The preliminary post-season estimate of run size for the total Tahltan stock was 119,254 sockeye, compared to the pre-season expectation of 55,912 fish. The preliminary post-season estimates of the non-Tahltan run size and escapement were 121,611 and 65,109 sockeye, respectively. Thus, the total Stikine escapement was approximately 125,016 sockeye, which is more than two times both the interim escapement goal of 60,000 fish and the previous ten-year average of 61,801.

Mid-way through the season, when it was apparent that a near record run to Tahltan Lake was imminent, Canada made arrangements to terminally harvest sockeye salmon at Tahltan Lake to prevent over-escapement and harvest fish that were deemed surplus to spawning requirements. The U.S. agreed with the plan providing the following conditions were met: (a target of 40,000 spawners would be in effect, U.S. biologists would be allowed to observe the operation at Tahltan Lake if harvesting went ahead, and profits from the sale of fish would go back into restoration and enhancement of Stikine River fish). Unfortunately, the lack of lead time, logistical problems and

a strike in Prince Rupert which would have affected the marketing of fish, precluded going ahead with the harvest.

The target in-river coho catch for 1992 was 4,000 fish; however, the actual catch was only 1,855 coho. Unfavourable economic factors were the primary reason the quota was not taken. Coho run strength appeared to be well above average in terminal marine areas adjacent to the Stikine River, and aerial surveys of coho index areas indicated above average escapement.

The total 1992 gillnet catch of chinook was 1,829 adults and 237 jacks. Catches of large and jack chinook were below previous five-year averages of 2,300 large chinook and 559 jacks. The adult chinook count of 6,627 fish at the Little Tahltan weir was 46% above the 1985-91 average of 4,528 adult chinook. The escapement goal for this system is 5,300 large chinook. The count of 131 jacks was 63% below the 1985-91 average of 358 jacks. Except for one area, aerial surveys of Stikine chinook index spawning areas were above average.

Enhancement activities continued in 1992 with approximately 5.4 million sockeye eggs taken at Tahltan Lake and flown to the Port Snettisham hatchery for incubation. In June of 1992, from 1991 egg-takes, approximately 1.414 million fry were out-planted into Tahltan Lake and 1.632 million fry were outplanted into Tuya Lake. The fry were mass-marked with a thermally-induced otolith mark.

A record 1.555 million sockeye smolts was enumerated emigrating from Tahltan Lake in 1992.

Taku River

The annual 1988 to 1992 harvest sharing arrangements for Taku salmon stocks of Canadian origin allowed for a Canadian harvest of 18% of the sockeye TAC and a coho catch of 3,000 pieces. Other species could be taken incidentally to the directed sockeye and coho harvest. Like the Stikine River, the harvest arrangements were tied to a commitment by both Parties to undertake a cooperative enhancement program.

The Canadian pre-season forecast was for a below average return of approximately 169,000 sockeye, and a Canadian harvest of 16,000 to 17,600 sockeye.

In-season projections of the total run size and TAC were made frequently throughout the season based on the joint Canada/U.S. mark-recapture program, the estimated catch of Taku sockeye in the U.S. District 111 gillnet fishery, the catch in the Canadian in-river fishery, and historical run timing information. The in-season forecasts generally indicated a run size greater than expected ranging from 168,488 sockeye in mid July to 261,800 sockeye in late July. The final in-season forecast was for a total run of 251,385 sockeye, a TAC of 171,385 to 180,385 sockeye, and a Canadian allowable harvest of 30,849 to 32,469 sockeye.

The preliminary post-season estimate of the total run was a record 277,764 sockeye based on tagging and preliminary harvest data. This translates into a TAC of 197,764 to 206,764 sockeye and a Canadian allowable catch of 35,597 to 37,217 sockeye. The estimated run size in 1992 was 52% above the 1984-91 average.

The 1992 Canadian sockeye catch was a record 29,340 in the commercial fishery and 250 in the Indian food fishery (IF). For comparison, the previous ten-year average catches in the commercial and IF fisheries were 16,671 and 134 sockeye, respectively. Preliminary analysis suggested that the total catch of 29,590 sockeye in 1992 represented 14.3% to 15.0% of the TAC and was 6,007 to 7,627 short of the allowable Canadian catch. One of the reasons for the shortfall was the high

incidental catch of coho salmon during the sockeye season which led to the eventual closure for the fishery while sockeye were still abundant.

Based on the Canada/U.S. mark-recapture program, the estimated total escapement of 138,054 sockeye was well above the interim escapement goal of 71,000 to 80,000 fish and was the highest on record. Weir counts at Little Trapper and Little Tatsamenie lakes were 14,372 and 6,576, respectively. Both counts were above average and above the respective principle brood year escapement.

The coho catch was 4,027 fish in the commercial fishery and 187 coho in the IFF; the combined catch was 40% above the 3,000 coho quota. The coho quota was exceeded due to above average incidental coho catches during the sockeye season, resulting in no targeted coho fishery in 1992. Preliminary mark-recapture and test fishery data suggest the interim escapement goal of 27,500 to 35,000 was greatly exceeded.

The Canadian chinook catch consisted of 1,445 large fish and 147 jacks. The catch of large chinook was roughly 1.9 times the previous five-year average of 802 large chinook, whereas the catch of chinook jacks was below the 1987-91 average of 198 jacks. Chinook index escapement counts from aerial surveys were above average in all of the Taku index streams. The combined index count was 11,058 chinook which was the second highest on record, and was 54% above the previous ten-year average.

Enhancement activities continued in 1992 with approximately 2.6 million sockeye eggs taken at Little Trapper Lake and 1.6 million sockeye eggs taken from Little Tatsamenie Lake. The eggs were flown to the Port Snettisham hatchery for incubation. In June of 1992, from 1991 eggs-takes, approximately 1.811 million sockeye fry were out-planted into Little Trapper Lake in 1.232 million fry to into Tatsamenie Lake. The fry were mass-marked with a thermally-induced otolith mark.

Alsek River

Although catch sharing between Canada and the U.S. has not been specified for Alsek River salmon stocks, both countries have agreed to attempt to rebuild depressed chinook and early sockeye stocks.

Canada does not currently commercially fish salmon in the Alsek drainage, but does conduct important IF and sport fisheries. In keeping with Annex provisions, Canadian catches of Alsek chinook and early sockeye continued to be restricted. The 1992 IF fishery catch included 84 chinook and 2,256 sockeye, compared to previous ten-year averages of 219 chinook and 2,246 sockeye. A below average chinook catch was also recorded in the sport fishery (102), whereas above average sport catches of sockeye (557) and coho (162) were recorded. Previous ten-year average sport catches resulted primarily from very poor fishing conditions due to high water throughout most of the season.

At the Klukshu River, and Alsek River tributary, the total weir counts were: 1,366 chinook (below average); a record 11,791 early sockeye count; 8,424 late run sockeye (below average); and 1,221 coho (above average). An above average escapement of 11,485 sockeye was estimated in Village Creek from electronic counter data.

Northern British Columbia and Southeast Alaska

Areas 3-1 to 3-4 and 5-11 Pink Catch by Nets

A below average pink return was anticipated to Area 3 providing a catch of 200,000 Area 3 pinks, in addition to a catch of one million Skeena pinks. The Area 4 catch was expected to be 950,000 pinks for a total Area 3-4 catch of 2.15 million.

The Canadian management objective, in keeping with the Treaty annex, is to limit the above net fisheries in a manner that would result in an average annual harvest of 900,000 pink salmon.

Canadian catch in 1992, based on in-season hailed data, was 927,000 in Areas 3 (1-4) and 5 (11-12) and the 1985-92 average catch is 2,064,000. The percentage of the 1992 catch taken in sub-areas (1-4) during the 1992 season, 68%, was between the 1985-92 average of 63% and the pre-Treaty average of 74%

Pink escapements to rivers and streams in Area 3 were near target levels, but below escapements of recent years, the preliminary Area 4 escapement of 930,000 is close to the minimum escapement target of one million pinks.

Area 1 Pink Catch by Troll

Canadian management objectives, in keeping with Annex IV of the Treaty, were to close the A-B line strip (Areas 101-4, 101-8, and northern portions of Areas 101-3 and 103) to trolling for pinks on July 22, or earlier if a 300,000 pink troll catch was taken in the strip before July 22. The annual Area 1 troll catch of pinks must not exceed 1.95 million and there is a four-year cap (1990-93) of 5.125 million.

Based on in-season estimates, the Canadian troll catch in the A-B line strip was 71,000 when it closed to trolling at midnight on July 22.

The Area 1 troll fishery for pink salmon was closed on September 15. Based on preliminary sales slip data to November 3, the catch was 760,000 in 1992. The preliminary estimate of the 1990-92 cumulative catch is 3.571 million, leaving an uncaught balance of 1.554 million for 1993.

Chinook Salmon Fisheries

North and Central Coasts (Areas 1 to 10, 101 to 111, 130-2, 130-3, and 142 for Net and Sport; Troll includes above Areas plus 11 and 111)

In 1992, Annex IV, Chapter 3 of the PST allowed for a base chinook catch of 263,000.

In 1992 the troll catch was 179,600 based on sales slips to November 3, 1992. This troll catch plus the net catch estimate of 44,500 from sales slip data and the preliminary sport catch estimate of 40,100 gives a total North/Central catch of 264,200. Terminal sport and net catches of 6,000 chinook have been excluded from this total, subject to technical review.

The troll fishery opened on July 1 and major chinook areas closed to all trolling on August 1. All areas closed to chinook trolling on August 14. Coho trolling closed on September 15.

Based on preliminary information, chinook escapements in 1992 were similar to those in recent years.

West Coast Vancouver Island Troll (Areas 21 to 27, 121 to 127 and 130-1)

The troll ceiling for the west coast of Vancouver Island (WCVI) was 360,000 chinook with a 7.5 percent management range.

A spring fishery was conducted from April 1 to 5 with a preliminary catch estimate of 4,594 chinook.

Trolling re-opened on July 1 and continued until midnight September 30 with no chinook non-retention fisheries.

Except for two days in August to provide access to sockeye, Areas F1, G and H were closed until late in the season. Beginning in early September these areas were opened (September 6, Area H; September 11, Area F1; September 16, Area G) to the end of the season to provide opportunities to fish coho. Area S was closed all season.

The preliminary estimate of the annual WCVI troll catch is 355,300 based on sales slips to November 3.

Strait of Georgia Troll and Sport (Areas 13 to 19, 20-5 to 20-7, 28 and 29)

The Treaty catch ceiling for the Strait of Georgia is 275,000 chinook, of which 225,000 are allocated to sport and 50,000 are allocated to troll. In response to conservation concerns for the Lower Georgia Strait (LGS) chinook stocks, Canada continued a series of area and gear specific management actions to reduce LGS harvest rate by 20 percent. Therefore, the Canadian management objectives in the Strait of Georgia for 1992 were to manage sport and troll fisheries for catches below the Treaty ceiling.

The Canadian objective for the troll fishery was to manage for a 31,000 chinook harvest (62 cm minimum size limit). The troll season for chinook started June 30 and continued until midnight August 6 when chinook non-retention was implemented until the end of the season on September 30. The Strait of Georgia troll catch based on sales slips as of November 3 was 37,000.

For the sport fishery, a management plan to reduce chinook harvest rates, implemented in Georgia and Johnstone Straits in 1989, was continued in 1992. In these areas, the annual bag limit was 15, the daily bag limit was 2 and the size limit was 62 cm for Georgia Strait north of Cadboro Point (and for Johnstone Strait). In 1988, by comparison, there was a 45 cm size limit in Georgia and Johnstone Straits, an 8 per year bag limit in Georgia Strait, a 30 per year limit in Johnstone Strait, and a daily limit of 4 per day in Johnstone Strait. For the Canadian portion of Juan de Fuca Strait (Victoria area) in 1992, the size limit was 45 cm and the annual bag was 20.

To the end of October 1992 the Georgia Strait sport catch of chinook, including the Victoria area, was 111,600 based on creel survey results.

Fraser River Sockeye and Pink Salmon Fisheries

For the four-year period of 1989 through 1992, the United States interception of Fraser River sockeye is capped by the Treaty at 7 million fish in aggregate. In addition, a payback of 88,000 Fraser sockeye is added to the total.

The 1992 return of Fraser River sockeye is currently estimated at approximately 6.1 million fish, about 3 percent larger than forecast. This is the largest return on this sockeye cycle. The previous record was 5.9 million in 1984.

The commercial catch was approximately 4.1 million fish, of which 3.4 million were caught by Canada and 700,000 by the United States.

The two countries disagreed on a balance of the U.S. allocation remaining for 1992. Canada's position was that the U.S. allocation included sockeye wherever caught, including southeast Alaska, thus leaving a balance of 360,000 for 1992. The U.S. contended that the previous Alaskan catch of 510,000 should not be included, therefore leaving the 1992 TAC balance of 870,000 for southern U.S. fisheries.

Since there was no agreement on the U.S. allocation, each country managed its fisheries in a manner designed to achieve its respective objectives. The PSC staff provided in-season technical information to both countries, as in past years, but did not recommend fishery management actions.

In 1992, a pilot fishery agreement with the Sto:lo and Musqueam/Tsawwassen Indians resulted in these groups having a greater role in management of their fisheries and provided them an opportunity to legally sell salmon for the first time. Catch allocations by species were part of the agreement and included an allocation of 395,000 sockeye. The policy governing management of native fisheries throughout the remainder of the watershed was similar to that of past years.

The current reported catch of sockeye in all Fraser River Indian fisheries is 358,000 fish and is under review. An estimated additional catch of 51,000 Fraser sockeye was taken by Indian fisheries outside of the Fraser River area.

The Fraser River sockeye spawning escapement estimates are incomplete and under review. The current estimate is approximately 1.1 million fish, which is well below the escapement goal of 1.9 million and the 1988 escapement of 1.4 million. Some of the major stocks include Early Stuart (65,000 escapement), Stellako (98,000), Chilko River and Lake (514,000), and Birkenhead (210,000).

During the fishing season, discrepancies were noted between the number of early timed sockeye estimated to have migrated past Mission on the lower Fraser River and the number arriving on the spawning grounds. As a result of these discrepancies, fisheries were closed in mid-August and an investigation was launched to determine the most likely cause for the shortfall in sockeye on the spawning grounds.

Coho Salmon Fisheries

Area 20 Net Catch

There were no targeted coho fisheries in Area 20 in 1992.

Based on sales slip information to November 3, incidental net catches during three weeks of Fraser River sockeye fishing in August totalled 94,000 coho, 8,900 chinook and 2,400 chum. An additional 670 coho were taken in PSC test fisheries.

West Coast Vancouver Island Troll (Areas 21 to 27, 121 to 127 and 130-1)

The Canadian objective was to manage a catch ceiling of 1.8 million coho.

There were time/area closures near the Canada/U.S. boundary during 1992 (see WCVI section above). These actions were taken in order to avoid small coho early in the season.

The preliminary estimate of the WCVI troll catch is 1.629 million, based on sales slips as of November 3, 1992.

Southern British Columbia Chum Fisheries

Inside Net (Areas 11 to 19, 28 and 29)

Pre-season expectations indicated a total inside run size of 4,008,000 chum salmon which included 100,000 U.S. chum.

There were three directed commercial chum fisheries in Johnstone Strait in 1992. The first occurred on September 21-23 (seines 24 hours, gillnets 38 hours). The catch for this assessment fishery was 251,000 and indicated a run size of 3.7 million, which allowed a 20% harvest rate (740,000 catch) under the clockwork plan. Consequently, a second fishery was conducted on October 5-8 (seines 11 hours, gillnets 74 hours) which harvested a further 655,000. Run size assessment indicated a total clockwork chum run of 4.1 million and this was announced on October 16. Under clockwork rules, the harvest rate increased from 20% to 30%. This meant the TAC was now set at 1.23 million. As of October 16, the Johnstone Strait commercial clockwork catch totalled 922,000 (including an incidental troll catch of 16,000). In addition, it was anticipated that a further 143,000 would be taken by directed chum fisheries in U.S. Areas 7 and 7A, IF fisheries in Areas 11-13, Johnstone Strait test fisheries and as incidental catch in non-terminal fisheries in Area 14. It was decided to hold a short duration fishery of six hours for seines and 14 hours for gillnets to catch the 165,000 balance of the TAC. This third and final clockwork fishery occurred October 21-22 and actually caught 410,000 chum. Subsequent analysis of test and commercial fishing catches suggested a revised run size of 4.5 million. The TAC at this run size was 1.35 million. As the total catch in all clockwork areas totalled 1.475 million, no further fisheries were conducted. Post-season run assessment will be completed once escapement enumeration is finished.

Terminal fisheries occurred in Area 12 (Nimpkish River) on November 23 and 25. Estimated total catch was 20,000.

Georgia Strait

Terminal fisheries were conducted in a number of areas within the Strait of Georgia. There were a total of four openings in Area 14. Catches from these fisheries totalled 440,000. Terminal fisheries in Jervis Inlet, Area 16, were conducted three times this season for a total catch of 20,000. In Area 17, two fisheries were conducted producing a catch of 17,800. No further fisheries were planned for Areas 14, 16 and 17. Area 18 has had three commercial openings to date (November 24) for a total catch of 68,000. Additional fishing opportunities are anticipated for Area 18.

Fraser River

One commercial fishery occurred in the Fraser River on October 27. The total catch is estimated at 38,000 fish.

The Indian catch of chum salmon in the Fraser River is estimated at 17,000 fish.

Outside Net (Areas 21 and 22)

The stock of concern, relative to the Treaty, is the chum stock returning to Area 22 (Nitinat Lake) which is caught in Area 21 and parts of Areas 121 and 20-1. Pre-season expectations were for a

harvestable surplus of approximately 600,000 chum, based on average Nitinat survivals. The escapement objective is 250,000 for the Area including 175,000 into the Nitinat Lake tributaries, 15,000 for the test fishery payment, and 60,000 for hatchery requirements.

In total, there were 21 days fishing for gillnets and 19 days fishing for seines. The combined gear fishery lasted 17 days. The hailed catch was 1,033,940 chum, 1,527,000 coho, 161 chinook and 68 steelhead.

During the single gear fisheries, the fishing area was limited to waters inside a line from two miles south of Pachena Point to two miles south of Bonilla Point. During the combined gear fisheries, a gillnet only area was instituted in part of Area 20-1 inside a line two miles south of Bonilla Point to a point two miles south of Logan Creek. This gillnet only area is less than half the size of the extension used in 1991.

Preliminary observations suggest that escapement objectives will be met in Area 22, with about 150,000 counted in the Nitinat River. The hatchery egg take took about 30 million eggs, about 4 million less than the target due to difficulties in obtaining broodstock.

West Coast Vancouver Island Troll (Areas 21 to 27, 121 to 127 and 130-1)

The 1992 troll catch of chum was 42,600 taken predominantly in northwest WCVI.

G.S.I. Sample Collection

In Johnstone Strait, ten weeks of both test and commercial fishery catches were sampled for a total of 4,724 fish. In the mid-Vancouver Island area, 750 fish were sampled from commercial fisheries over a four week period. At Nitinat, approximately 1,200 chum were sampled from the commercial fisheries over a five week period. There was no GSI sampling in the WCVI troll fishery due to low chum catches.

Preliminary 1992 Catches in Canadian Treaty Limit Fisheries and 1985-91 Catches for Comparison. Prepared for the November 30 - December 4, 1992 meeting of the Pacific Salmon Commission.

Fisheries/Stocks	Species	1992+	1991**	1990	1989	1988	1987	1986	1985
Stikine River (all gears)	Sockeye	26,281	22,763	18,024	20,032	15,291	9,615	17,434	25,464
	Coho	1,855	2,648	4,037	6,098	2,117	5,731	2,280	2,175
	Chinook	1,829	1,511	2,250	2,669	2,370	2,201	1,938	1,111
	Adults	237	660	959	289	444	444	975	185
	Chinook	122	394	496	825	418	646	107	2,356
	Jacks	231	208	499	674	733	459	307	536
	Pink	129	82	199	127	261	219	194	240
	Chum								
	Steelhead								
Taku River (commercial gillnet)	Sockeye	29,340	25,067	21,100	18,545	12,014	13,554	14,739	14,244
	Coho	4,027	3,415	3,207	2,876	3,123	5,599	1,783	1,770
	Chinook	1,445	1,177	1,258	895	555	127	275	326
	Adults	147	432	128	139	186	106	77	24
	Chinook	0	296	378	695	1,030	6,250	58	3,373
	Jacks	7	2	12	42	733	2,270	110	136
	Pink	15	5	22	24	86	223	48	32
	Chum								
	Steelhead								
Areas 3 (1-4) and 5-11 (commercial net)	Pink	927,000	6,960,000	831,000	2,259,000	425,000	1,851,000	1,983,000	1,277,000
Area 1 (commercial troll)	Pink	760,000	1,646,000	1,165,000	1,377,000	1,630,000	495,000	416,000	687,000
North/Central Coast* (commercial/sport)	Chinook	264,000	303,200	253,000	301,200	245,600	282,800	261,000	275,000
West Coast Vanc. Is. Area 12 (com. troll)	Chinook	335,300	202,900	298,000	203,700	408,700	379,000	342,000	358,000
	Chinook	2,600	1,000	2,000	2,000	2,000	2,000	4,000	4,000
Georgia Strait (sport)	Chinook	111,600	112,700	112,000	133,000	119,000	121,000	182,000	235,000
(troll)	Chinook	37,000	32,000	34,000	29,000	20,000	39,000	44,000	56,000
	Total	148,600	144,700	146,000	162,000	139,000	160,000	226,000	291,000
Fraser River stocks (total Canadian Catch)	Sockeye	3,802,000	6,945,000	13,412,000	12,784,000	1,615,000	3,783,000	9,363,000	8,754,000
	Pink		6,273,000		6,333,000		2,546,000		8,725,000
Fraser River stocks (total U.S. Catch)	Sockeye	697,000	1,869,000	2,408,000	2,382,000	679,000	1,932,000	2,748,000	2,925,000
	Pink		2,819,000		2,007,000		1,339,000		3,834,000
West Coast Vancouver Island (commercial troll)	Coho	1,629,000	1,890,000	1,864,000	1,953,000	1,596,000	1,821,000	2,157,000	1,389,000
Johnstone Strait clockwork catch#	Chum	1,367,000	262,000	1,184,000	482,000	1,112,000	127,000	1,177,000	587,000

+ 1992 catches for North Coast are based on in-season hails, sport catch to November 15 and troll sales slips to November 3, 1992, preliminary sport catch estimates and creel survey sport catch estimates to October 31, 1992.

** 1991 catches are preliminary.

* North Coast catch less terminal exclusion catches of 6,000 in 1992, 6,000 in 1991, 5,500 in 1990 and 4,800 in 1989.

Canadian clockwork catch includes commercial, IFF and test fish catches in Areas 11-13 and 29 for 1985-87 and in Areas 11-13 for 1988-92.

D. 1992 UPDATE REPORTS FOR SALMONID ENHANCEMENT PROGRAMS IN CANADA AND THE UNITED STATES

The Pacific Salmon Treaty between Canada and the United States requires that information be exchanged annually regarding operations of and plans for existing enhancement projects, plans for new projects, and views concerning the other country's enhancement projects. In 1988, a committee was formed to develop recommendations for the pre- and post-season and enhancement report formats. In summary, the committee proposed that:

- detailed reports on existing enhancement facilities of the type produced in 1987 be prepared every four years;
- the Parties will annually update information on eggs taken, fry or smolt released and adults back to the facility; significant changes in facility mission or production will be highlighted in narratives; and
- the Parties will provide periodic reports through the appropriate panels on new enhancement plans.

1. 1992 Annual Report on the Salmonid Enhancement Activities of the United States

The United States provided a report dated January 31, 1990 to Canada that combined under one cover all pertinent biological data for United States enhancement projects with a detailed account of plans for new projects. The 1992 Annual Report, the third in the series, incorporates updated information, including projections for releases from the 1991 brood year, as well as preliminary data on numbers of adults returning to hatcheries, and the number of eggs taken during 1991. **Please note that whenever updated, or preliminary, new data were not available, the 1992 report is the same as the 1991 report.** Final information and projections current through the end of the 1991 calendar year are contained in this report.

Southern Southeast Alaska

New Production

The most dramatic success story for sockeye salmon enhancement continues to be McDonald Lake. The production from lake fertilization (additional to what would have been produced without fertilization) contributed 69,500 sockeye to southern southeast commercial fisheries, or 6% of the entire seine and gillnet commercial sockeye catch for the SSE region.

The first adult coho salmon from the Bold Island remote release stocking program returned in 1991. A 6% survival to the marine fisheries was documented; escapement to the lake is unknown. Approximately 40,000 coho presmolts will be planted in Bold Island Lakes by the end of 1991, in a cooperative project with the Alaska Sports and Wildlife Club. Two years of fry releases in Reflection Lake are yielding very low adult returns. Less than 1% survival is anticipated when all the coded-wire-tag (CWT) data are complete. Based on returns to other sites, the first release of presmolts (1991), should provide much better survival to adult, with returns beginning in 1992.

Approximately 40,000 presmolts are scheduled to be planted in Reflection Lake by the end of 1991.

A production group of 40,000 triploid chinook salmon at Deer Mountain Hatchery (DMH) is planned from the 1991 brood. Detailed culture data are being collected, with six families tracked separately through incubation and rearing. Triploids and their sibling diploids will be reared separately for three of the families and reared together for three of the families. Use of passive induced transponder (PIT) tags will allow tracking of growth rates in some individual fish. This will be the second release from DMH; 15,000 with their own tag code were released from the 1987 brood.

Yearling steelhead smolts were produced at DMH for the second year in a row. The final month of rearing in saltwater (Thomas Basin net pens) gave a needed growth surge and 5,000 fish were released at 45.7 g on June 11th.

DMH personnel delivered 25,000 summer coho smolts to Margaret Lake in May 1991. Margaret Lake is located on Revillagigedo Island and flows into west Behm Canal. The USFS, Ketchikan Ranger District, built and opened the Margaret Creek fishpass in 1990. They planted sockeye fry in the lake in 1988, 1990, and 1991. The Forest Service has been conducting an extensive study of the resident cutthroat trout population since 1989 and will be able to document the effect of introducing anadromous fish. They cancelled the planting of 20,000 DMH summer coho presmolts in late 1991 because natural escapement/colonization by coho salmon is occurring, and the Forest Service would like to study this phenomenon.

Limited brood stock is the most critical problem facing the Klawock Hatchery sockeye salmon program. This year, for the first time, a group of 20,000 sockeye salmon is being reared to presmolt stage and will be released into Klawock Lake by the end of 1991.

The USFS, Craig Ranger District, is planning the construction of two new fishpasses at Old Franks Creek for 1992. The fishpasses will open 730 acres of lake habitat and 3.8 miles of stream habitat to anadromous fish production.

Return of most chum salmon stocks in SSE continues to be depressed. Incubation survival and fry production from the only chum salmon project in the area, Marx Creek Chum Spawning Channel, was excellent for the parent years of the 1991 escapement. We expected a harvest of about 34,000 adults in the commercial fisheries in 1991; only 163 have been documented by coded-wire-tag recoveries in U.S. fisheries. Escapement to Marx Creek was also extremely low (325).

USFS extended the Marx Creek spawning channel in 1989, and total channel length is now 1.8 km. Severely depressed adult escapement has precluded brood stock transfer to the new section and has also not allowed natural colonization. A total of 515,000 chum salmon fry, 21,000 yearling and emergent coho fry, and 81,500 pink salmon fry (biomass estimates) emigrated from the spawning channel.

Bryce Creek is an isolated slough located between Fish Creek and the Salmon River. A field trial was conducted in 1991 to decide if Bryce Creek is a suitable rearing habitat. In May a combined ADF&G and USFS crew trapped and moved 312 yearling coho salmon from Fish Creek to Bryce Creek. They freeze-branded each fish with one of five distinct marks to show the planting location. Follow-up trapping in August and September indicated excellent growth and survival. The Forest Service plans to excavate a connecting channel from Fish Creek to Bryce Creek in 1992 to allow access for coho and Dolly Varden.

Program direction at DMH is shifting away from remote releases and putting more emphasis on research. Approximately 25,000 smolts were transported to Thorne Bay on the east coast of Prince of Wales Island (POW) for imprinting and release. Another 25,000 smolts were transported to Big Salt (west coast, POW) where they also were imprinted and released. Observed returns from all remote chinook releases from DMH have been dismal - less than 0.1% for most releases, with the best return at only 0.3%. Therefore, this was the final year of remote chinook salmon releases from these sites.

Loss of Production

Deer Mountain Hatchery was vandalized this summer and nearly 12,000 steelhead and 25,000 triploid rainbow trout were destroyed. Staff also destroyed 3,100 steelhead eggs that were from a female that tested positive for BKD.

Northern Southeast Area

New Production

NSE staff chose the Pavlof River stock to increase Juneau-area sport fish catches in July. In 1990, we produced 27,280 age-2.0 Pavlof stock coho salmon smolts. We released these fish in Fish Creek, which is the site of a substantial roadside sport fishery for other fish produced with D-J(W-B) funds. In both 1990 and 1991, the Pavlof stock coho salmon made a strong contribution to the Juneau sport fishery. In 1991 sport fishers caught 1,300 fish (primarily in the roadside fishery). This represents an 8% return to the sport fish creel, which is probably a record for a coho salmon released in southeast Alaska.

Suntaheen River is located on the east side of Chichagof Island. The river originates in a broad valley with many ponds and channels characteristic of prime coho salmon habitat. However, two barriers prevent fish from gaining access to this habitat. In 1989 the USFS began construction of two fish ladders over the barriers. To ensure colonization above the fish ladder the USFS and NSE office have cooperated to place coho salmon fry in the new habitat. In 1991 this effort continued. In June we assisted with the transport of 58,000 fry produced from eggs collected on an adjacent stream in 1990. This year the NSE office again assisted with adult salmon and egg collections at nearby Game Creek. Fry produced from these eggs will be planted above the Suntaheen River fish ladders in 1992.

Indian Lake was stocked in 1990 and 1991 with 200,000 and 220,000 coho salmon fry respectively. Indian Lake is a barriered system 5 km from Snettisham Hatchery. It has potential as a sockeye enhancement site and has functioned as nursery system for coho salmon fry planted from Snettisham Hatchery. Coho salmon have done very well in the system with survival-to-adult from fry plants of over 1%. Significant adult returns will be expected for the next three years.

Loss of Production

Over one million Little Trapper Lake sockeye eggs were destroyed at the Snettisham CIF due to a suspected IHN outbreak. Snettisham Hatchery staff destroyed 195,000 chinook eggs because the salmon tested positive for BKD. The eggtake crew at Tahltan Lake had to dump 600,000 sockeye eggs back into the lake after holding them for two days. Bad weather delayed the transport of the eggs. Experience has shown that holding eggs at the site for over 48 hours will significantly affect fertilization.

Central Southeast Area

New Production

Success of initial fry plants in the Farragut River led to the expansion of this project in 1991, jointly funded by the State and U.S./Canada Treaty monies. Egg collection goals have been increased to 250,000 eggs annually with an expected annual adult production from 2,000 to 4,000 adults. Severe weather conditions in 1991 hampered egg collection, limiting the crew to only 109,300 green eggs. We will release the resultant fry in Farragut Lake during the spring of 1992 after we CWT 50,000 fish for harvest evaluation.

A five-year effort to bioenhance chinook salmon on the Harding River began in 1991. The project is funded by U.S./Canada Treaty monies. FRED personnel collected only 57,700 eggs of the 100,000 goal because of severe weather conditions. All fry resulting from the 1991 egg collection will be CWTed and released above the Harding River canyon for bioenhancement. The USFS will improve access through the canyon if staff decides that rock work will help the migration of adults resulting from the 1986 and 1989 broods when they return.

The USFS built the St. John's fishway in 1986, with a projected annual production of 9,240 coho salmon. Coho salmon bioenhancement efforts on St. John's Creek was initiated in 1985, and through 1987 less than 24,000 fry had been planted above the barrier. A committee of local ADF&G, NSRAA, SSRAA, and USFS personnel recommended use of hatchery stocks in 1988. Permission was granted to use CLH coho salmon eggs fertilized with milt obtained from St. John's Creek coho salmon stocks. This resulted in 113,400 fed fry being planted above the fish pass in 1989 and 1990.

Mitchell Creek is located on Kupreanof Island and drains into Duncan Canal about 10 miles west, southwest of Petersburg. There are a series of falls located 3.1 miles above tidewater, two of which will be modified for coho passage. USFS crews worked on the first barrier this year and will shift their attention to the second barrier in 1992. Coho bioenhancement is scheduled to begin in 1992 using indigenous adult salmon below the barriers. Eggs will be collected and incubated in the new isolation facility being constructed at CLH with USFS funds. Habitat above the barriers is expected to produce an additional 3,200 adult coho salmon annual as well as an undetermined number of steelhead trout, which should invade the upper watershed on their own.

The USFS built a fishway on a partial barrier in Kwatahein Creek, Kuiu Island, in 1989 to pass pink and chum salmon. Coho salmon and steelhead trout could ascend the falls before construction. No bioenhancement of pink and chum salmon was performed, but in 1991 aerial surveys Commercial Fisheries staff saw 22,000 salmon of a peak of 27,000 escapement above the barrier.

The USFS completed phase two of a two-phase plan to provide pink salmon access over several barriers on Meter Bight Creek located 18 miles southeast of Wrangell on Zarembo Island. These fishways will also assist passage of coho and chum salmon and steelhead trout that, under certain flows, could ascend the barriers. USFS documented that several hundred pink salmon reached the upper watershed, but this estimate is low since the surveys were conducted several weeks after peak escapement.

Loss of Production

Approximately 1,000 adult chinook died when a pump failed at Crystal Lake Hatchery and the alarm system failed to awake the crew.

Washington State Department of Fisheries

New Facilities or Production Increases

Eastbank-Chelan Co. PUD

A major facility located near Rocky Reach Dam on the Columbia River with several release/acclimation sites located on tributaries. Emphasis on the use of native stocks for rebuilding.

Species	Stock	Stage	Number	Release Year
Summer Chinook	Methow	Yrlng	400,000	1991
Summer Chinook	Okanagan	Yrlng	576,000	1991
Spring Chinook	Chiwawa	Yrlng	672,000	1991
Summer Chinook	Wenatchee	Yrlng	864,000	1991
Sockeye	Wenatchee	Yrlng	200,000	1991

Winthrop-Douglas Co. PUD

A major facility located near Winthrop on the Methow River with several release/acclimation sites located on tributaries. Emphasis on the use of native stocks for rebuilding.

Species	Stock	Stage	Number	Release Year
Spring Chinook	Trisp	Yrlng	225,000	1993
Spring Chinook	Methow	Yrlng	225,000	1993
Spring Chinook	Chewak	Yrlng	225,000	1993
Sockeye		Yrlng	500,000	1993

Yakima/Klickitat Project

Potentially several facilities located on the Yakima or Klickitat Rivers with several release/acclimation sites located on tributaries. Emphasis on the use of native stocks for rebuilding.

Species	Stock	Stage	Number	Release Year
Spring Chinook	Yakima	Yrlng	823,000	1995?
Spring Chinook	Naches	Yrlng	823,000	1995
Spring Chinook	Klickitat	Yrlng	3,000,000	1995
Summer Chinook	Naches	Yrlng	200,000	1995
URB Fall Chin.	Yakima	Fingerling	3,003,000	1995
Coho		Yrlng	1,850,000	1995
Sockeye		Yrlng	1,106,000	1995

Trends in Production

Trends in production are depicted in the following table.

Thousands of pounds of salmon released by the Washington Department of Fisheries, 1983-1989.

Release Year	Fall Chinook	Spring Chinook	Coho	Chum	Pink	Annual Total
1983	1,532	466	2,121	119	0	4,238
1984	1,514	697	2,414	92	1	4,718
1985	1,609	605	2,373	131	0	4,718
1986	2,014	583	2,576	119	3	5,295
1987	1,856	495	2,695	115	0	5,161
1988	1,843	707	2,605	99	7	5,261
1989	1,958	613	2,619	102	0	5,292
1990	1,910	874	2,439	93	3	5,319
1991	1,686	1,179	2,234	71	0	5,170

Treaty Tribes of Western Washington

Reported by the Northwest Indian Fisheries Commission

New Production

A major new facility, the Nisqually Tribe’s Clear Creek Hatchery, began operations in the spring of 1991. The hatchery has a production goal of 3,400,000 fall chinook, 630,000 yearling coho, and 3,400,000 chum. Releases for 1992 were 1,094,000 fall chinook and 498,000 yearling coho.

The Muckleshoot and Suquamish Tribes are planning a cooperative marine net pen facility for central Puget Sound. The facility is planned to be in operation by 1994 or 1995 and will produce approximately 950,000 yearling coho.

Loss of Production

Viral Hemorrhagic Septicemia virus (VHSV) was isolated from BY 1989 adult coho at the Lummi Bay Sea Pond Hatchery. The Lummi Skookum Creek Hatchery was also potentially exposed to the virus through egg transfers. As part of the emergency eradication measures associated with this detection, 6,000,000 BY 89 coho eggs, 500,000 BY 89 pink eggs, and 150,000 BY 89 fall chinook eggs and fry were destroyed at the two hatcheries. The affected facilities were sanitized and resumed operations in the spring of 1990.

Major Trends in Production

Tribal fish releases are listed in the attached table. Tribal releases have substantially increased in recent years. From 1982 to 1984, total annual releases averaged approximately 33 million fish. From 1985 to 1991, total annual releases increased production is predicted to continue. Beginning in 1989, releases from the Quinault National Fish Hatchery are being reported by the USFWS. Although this involves no net loss in production for the region, an annual increase of approximately 2 million fish is reflected in the tribal release numbers.

A synopsis of release trends, by species, is as follows:

1) Fall chinook production (age 0+ smolt release) has gradually increased to a high of 15 million in 1991. This increasing trend is expected to continue in the future. 2) Only three stocks of spring chinook (N.F. Nooksack, S.F. Nooksack and White River) are currently being reared. All of these programs are directed at wild stock restoration of highly depressed stocks. 3) Two stocks of summer chinook (Quillayute and Stillaguamish) are now being enhanced at tribal facilities. 4) Coho production has fluctuated from 8 to 15 million with some increases planned for future years. 5) Chum fry releases have undergone the most significant increase. Beginning in 1985, annual chum releases almost doubled to an average of approximately 20 million. Modest increases are also planned for future years. 6) Pink salmon are currently being reared at only two tribal facilities (Port Gamble Hatchery and Lummi's Skookum Creek Hatchery). Because of the life history pattern of the species in Puget Sound, fry releases occur only on even numbered years. 7) Only the Lake Ozette stock of sockeye is now being reared in a tribal facility (Makah's Umbrella Creek hatchery). Enhancement options for this stock are currently being studied. 8) Steelhead releases are predicted to remain at the 1 to 2 million level.

Hatchery Releases for Western Washington Tribes (1,000's of fish). Release numbers include tribal cooperative projects with state, federal and private entities.

Species	1982-1984 (average)	Release Year						
		1985	1986	1987	1988	1989	1990	1991
Fall Chinook	9,801	9,686	11,632	11,080	13,094	12,102	14,212	15,466
Spring Chinook	30	67	114	142	4	231	471	178
Summer Chinook	250	355	123	91	472	451	188	268
Coho sub-yearling	2,870	9,512	2,893	2,584	1,699	2,364	1,269	2,692
Coho yearling	5,733	6,598	7,536	6,957	8,150	8,033	7,693	6,994
Chum	12,426	25,190	22,380	23,470	21,092	20,221	14,981	14,887
Pink	281	0	0	0	882	0	110	0
Sockeye	318	200	240	12	133	200	0	12
Steelhead sub-yearling	590	1,402	1,159	932	577	398	353	769
Steelhead yearling	750	1,252	1,242	978	905	872	821	903
Totals	33,049	54,262	47,319	46,246	47,008	44,872	40,098	42,169

Oregon Department of Fish and Wildlife

New Production

Construction on the Umatilla Hatchery that began in mid-1990 was completed and the hatchery is now operating on an experimental basis. The production for 1991 brood year is expected to be:

Summer Steelhead Smolts	210,000
Spring Chinook Smolts 1+	210,000
Spring Chinook (0 Age)	813,000 ¹
Upriver Fall Chinook Sub-Yearling	2,934,000 ²

¹Well water shortages at Umatilla Hatchery necessitated the rearing of an additional 516,000 fish at Irrigon and 1,264,000 fish at Bonneville Hatchery.
²Well water shortages at Umatilla Hatchery necessitated the rearing of an additional 267,000 fish at Irrigon Hatchery.

Loss of Production

There are no anticipated losses of production expected for the 1991 brood year.

Major Trends

Mitchell Act funding continues to be insufficient to run existing fish hatchery programs. If funding shortfalls continue, hatchery closure and reduction in programs can be expected in the near future.

General Fund reductions as a result of Measure Five, a property tax reduction measure, may also result in hatchery closures and program reductions.

The implementation of Oregon's Wild Fish Policy will change programs in some areas emphasizing natural production, habitat improvement and acclimation over increased production.

United States Fish and Wildlife Service

New Production

There is no increased production planned at any Fish and Wildlife facilities at this time.

Losses in Production

Deteriorating water quality has resulted in decreased production at Leavenworth NFH and Entiat NFH. The spring chinook salmon program at Leavenworth was reduced from 2.2 million to 1.6 million smolts and the spring chinook program at Entiat was reduced from 800,000 to 400,000 smolts.

Trends in Production

Production levels are stable and no changes are scheduled for the near future.

Idaho Department of Fish and Game

New Production

A sockeye salmon captive broodstock program, for endangered (U.S. Endangered Species Act) Snake River sockeye salmon, was initiated in 1991 using Redfish Lake returning adults. Only one female and three males were trapped in 1991 for the captive brood program. A portion of the sockeye smolts emigrating from the lake in 1991 was also incorporated into the captive brood program.

Losses in Production

The 1989, 1990, and 1991 spring and summer chinook salmon brood escapements and egg takes were well below potential hatchery capacities. Smolt releases below hatchery capacity in 1991 will be followed by below capacity releases in the springs of 1992 and 1993.

Trends in Production

Hatchery production, as well as natural production, is predicted to diminish with the low adult fish numbers returning to Idaho. The continuing trend of drought conditions, low flows in the

mainstem drainages, and exacerbated mortality of smolts through the federal hydroelectric system, continue to take their toll on smolts as well as returning adult fish.

Adult brood shortages for hatchery production occurred in both 1990 and 1991 for spring and summer chinook. Approximately 47% and 48% of the spring and summer chinook egg requirements, respectively, were available in 1991.

The observed decreasing trend in numbers of wild redds counted in trend areas indicates declining abundance of wild chinook. The 1991 count was less than 15% of the average 1960-65 counts, a period of peak counts. Counts have declined since the indicator stock program was initiated.

(Source Document) *1992 Annual Report on the Salmonid Enhancement Activities of the United States*. United States Section of the Pacific Salmon Commission. December, 1992.

2. 1992 Update Report for the Salmonid Enhancement Program in British Columbia

In Canada, the Salmonid Enhancement Program (SEP) is a jointly funded program of the federal and provincial governments designed to enhance British Columbia and the Yukon Territory's five salmon and two sea-run trout species. SEP was initiated in 1977 to assist the Department of Fisheries and Oceans in reaching the objective of doubling salmonid stocks. Funding was provided to construct, operate, maintain, and assess salmonid culture facilities as well as to operate existing facilities.

Summary of Eggs Taken and Juvenile Releases

A summary of total releases of juveniles in 1992 by the SEP unit and program component is presented in Table 1.

Data by Species and Stock/River for individual facilities in the Enhancement Operations component are presented by production unit in Table 2 of the report, which is not reproduced here. These data include: egg target, eggs taken (or transferred to or from another facility), fry or yearlings rearing as of December 31, 1992, and number released by release stage. In cases where Stock or River is not specified, assume that the stock is native to the facility. Estimates for some of the spawning channels and for the Community Programs facilities are not available at this time but will be forwarded in the spring.

Significant Changes in Program

Enhancement Operations

Coastal Division

East Coast Vancouver Island/Mainland Inlets - Over half a million enhanced chum salmon from Big Qualicum channel, Little Qualicum channel and Puntledge hatchery were harvested. Enhancement includes both fed and unfed chum fry releases to the river systems.

Over one million pink salmon were captured in the fisheries. These fish are primarily a result of pink fry enhancement at Quinsam and Puntledge hatcheries and Glendale and Kakweiken channels. Chinook and coho returns are similar to past years.

Campbell River side channel for chinook salmon was constructed and put into its first year of operation.

West Coast Vancouver Island - Both chinook and chum returns have exceeded expectations to Robertson Creek, Conuma and Nitinat hatcheries. Enhancement at Conuma and Nitinat hatcheries includes fresh and salt water rearing of both species. At Robertson Creek chinook are released from both fresh and salt water sites. Chum returns have been very encouraging at Conuma River hatchery with river escapements meeting conservation requirements and supporting a terminal fishery for the first time in four years. Conuma hatchery had strong chinook salmon returns with escapements exceeding expectations.

North Coast - Anadromous steelhead and cutthroat trout returned in strong numbers to the Kitimat river system. This enhancement effort of Kitimat hatchery's smolt release program has resulted in a sustainable sport fishery.

Chum enhancement efforts at Pallant Creek hatchery have resulted in a significant increase in Cumsheewa Inlet terminal fishery. Pallant hatchery chum were a major hatchery contributor to north coast net fisheries.

Fraser River and Northern B.C. Division

Chilliwack Hatchery - Fall returns of white chinook have been unexpectedly strong.

Clearwater Hatchery - 1991 brood chinook production has ended under Native Co-Management funding. The facility is being used to enhance the 1992 brood Upper Adams sockeye. Broodstock was available for only 0.75 million of the 3.0 million egg target. Soft shell has caused high (60%) incubation mortality.

Eagle River Hatchery - Very low escapements of Salmon River chinook provided broodstock for only 58,000 eggs.

Fulton and Pinkut Channels - Sockeye escapements were adequate for normal loading of the channels.

Horsefly Channel - This was a very low off cycle-year, with 1,752 adults loaded into this channel.

Quesnel Hatchery - Due to budget cuts, only the Quesnel River chinook stock is being enhanced. Good numbers of marked adults in the Quesnel River chinook escapement are encouraging for the yearling smolt production strategy.

Tenderfood Hatchery - Chinook returns from Porteau Cove netpens continue to exceed expectations.

Transboundary Sockeye Enhancement - Egg-takes are on or near target. Total egg target is approximately 10 million. Data from smolt and adult enumeration at Tahltan suggest smolt-to-adult survival of up-river stocks may be less than predicted, which will affect the expected enhanced adult production. However, survival from egg-to-smolt may exceed predictions.

Whitehorse Hatchery - The facility continues to be operated by the Yukon Territory. The full egg target was met. SEP provided CWT's for the 1991 brood juvenile release.

Development Division

Chilko Channel - Approximately 20,000 sockeye successfully spawned in the channel this year, all of which swam into the channel rather than being air-lifted in by helicopter.

Fraser River Fish Passage - Maintenance work continued. Permanent lighting was installed at Hell's Gate, China Bar and Little Hell's Gate.

Nekite Channel - Approximately 4,000 summer chums spawned in the channel this year.

Phillips Channel - Approximately 4,000 pink salmon, 1,500 chum and 80 chinook spawned in the channel this year.

Community Programs Division

Nanaimo and Cowichan Hatcheries - Modifications to the Nanaimo and Cowichan hatcheries are complete. Production targets of 3.5 million chinook at Cowichan have been met with the addition of the captive brood program, though high incubation mortalities of these eggs resulted in a lower fry release than anticipated (2.6 million of 1991 brood). Operating costs of the Cowichan hatchery have increased by \$280 thousand since expansion and the contractor continues to do fry salvage work and sampling for Science Branch. Nanaimo Hatchery chinook survivals are disappointing and brood stock holding continues to be a problem due to warm water and the "ich" infestation.

Nimpkish Hatchery - The hatchery is being expanded to increase production of Nimpkish stocks and mainland chinook stocks. The \$4 million expansion is about half complete and funding completion may be an issue. When completed, the new facility will be capable of producing 2.0 million chinook, 2.0 million chum, 3.0 million sockeye and 500,000 coho annually.

Others - There have been minor modifications at many of the CEDP facilities. For a more detailed review, a copy of the SEP Community Involvement Directory is appended.

Lake Enrichment Program

Summary - Great Central, Henderson, Hobiton and Long Lakes on the coast, and Chilko Lake on the Fraser River system all received fertilization for five months this year.

Chilko Lake - An exceptionally warm spring caused higher than normal surface temperatures. A resultant more stable lake environment caused fertilization effects to be more pronounced than usual with higher than normal primary and secondary production. Overall, greater than normal benefits should accrue to juvenile sockeye this year.

Table 1. 1992 Releases from the Salmonid Enhancement Program (thousands)

	Sockeye	Chum	Chinook	Coho	Pink	Cutthroat	Steelhead
Enhancement Operations							
Coastal Division		143,901	35,388	6,363	17,088	26	238
Fraser/NBC Division	240,543	24,037	10,320	5,217	33,738	60	545
	240,543	167,938	45,708	11,580	50,826	86	784
Community Programs							
Community Programs Division	1	7,420	8,936	6,356	6,761	51	186
Resource Restoration Division	1,902	24,860	227	1,913	5,109		
	1,902	32,279	9,163	8,269	11,870	51	186
Lake Enrichment Program							
	42,700						
TOTAL SEP	285,146	200,217	54,870	19,849	62,696	137	969

Reports of the Joint Technical Committees

PART V

REPORTS OF THE JOINT TECHNICAL COMMITTEES

Executive summaries of reports submitted to the Commission by the joint technical committees during the period April 1, 1992 to March 31, 1993 are presented in this section. Copies of the complete reports are available on request from the library of the Pacific Salmon Commission.

A. JOINT CHINOOK TECHNICAL COMMITTEE

Joint Chinook Technical Committee. Long-Term Research Plans for Coastwide Pacific Chinook Stocks. TCCHINOOK (92)-3. October 23, 1992.

The purpose of this report is to: 1) summarize current monitoring and research activities dealing with coastwide chinook stocks of interest to the Pacific Salmon Commission (PSC); 2) identify missing or incomplete information needed for assessment of chinook stocks; and 3) recommend data collection and research programs that the Chinook Technical Committee (CTC) believes are most important in improving our ability to assess chinook stocks and harvest management. In some cases, entirely new programs will be required, while in others, further analysis of existing information may be sufficient. This report will provide the Commission with direction for data gathering and research on chinook stocks. The report should also provide information to assist the various government agencies in allocating research funds. The report is written at the request of the Standing Committee on Research and Statistics and will be used with similar reports from other technical committees to review the status of salmon knowledge and to recommend areas where new or additional information is needed.

Long-term goals established by the U.S./Canada Pacific Salmon Treaty (PST) include achieving optimum salmon production and providing each Party (Canada and the U.S.) benefits equivalent to the salmon production originating in its own waters while at the same time providing for security and long-term stability of the Parties' fisheries. In fulfilling these obligations, the Parties are requested to cooperate in management, research, and enhancement. In the first several years under the PST, the parties have cooperated in management efforts through exchange of management plans and through negotiating harvest sharing regimes. In order to manage stocks more effectively and to allow maximum harvest of surplus stocks while ensuring adequate spawning escapements, more knowledge is needed about the abundance, productivity, and distribution of individual stocks and their relationships with each other. This will require the Parties to expend more time, effort, and money on research into both natural and enhanced productivity. Without additional research, the Parties will be limited in how they can allocate and manage the resource.

One goal of the PST is to "attain by 1998 escapement goals established in order to restore production of naturally spawning chinook stocks." Chinook stocks and spawning escapements from the Oregon coast to Southeast Alaska declined from the 1950's through the years immediately prior to the PST and concern was expressed in the PST that chinook stocks were "substantially below goals set to achieve maximum sustainable yields". A rebuilding program on harvest restrictions was initiated in 1984. During the first six years after the start of this rebuilding program, 40% of the naturally spawning indicator stocks that were originally depressed have either reached goal or are increasing at a rate to allow reaching goal by 1998, 18% showed initial increases but later decreases in escapements, and 42% have either shown no response to the rebuilding program or such varied escapements that no assessment can be made. In order to understand what is

happening to the 60% of the indicator stocks not responding to the rebuilding program, more information is needed on their stock-specific productivity and their distribution and exploitation in the different fisheries. Additionally, the interim escapement goals developed for most stocks at the beginning of the rebuilding program need to be evaluated and improved. For both short-term goals of achieving target escapements and long-term goals of maximum sustainable production and harvest, careful planning of programs designed to address them must be undertaken.

The PST recognizes the importance of collecting and sharing data on salmon stocks. With regard to all salmon stocks, the PST states (Article IV, paragraph 3) that "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"

To provide this information, it is necessary to have forecasting abilities, knowledge of migration patterns and productivity of individual stocks, accurate measures of spawning escapement, and appropriate escapement goals. Currently, forecasts of chinook salmon returns are imprecise and such categories as above average, average, and below average are often used in predicting returns for the following year. Catch distributions are known for many hatchery stocks since many of these stocks are tagged; but, only limited knowledge exists about the distribution of wild stocks. Catch distributions for most wild stocks are inferred from associated hatchery stocks. Escapement goals have been established for most, but not all, of the regularly monitored stocks; however, in many cases the goals have been set based on past observations of escapement levels rather than on spawner-recruit analyses that would provide a maximum or sustainable harvest escapement goal. In Chapter 2, the data that are routinely collected by the various management agencies and research pertinent to PST management or stock assessment are summarized for chinook stocks.

The PST (1990 Annex IV, chapter 3, Paragraph 1.d) charges the CTC with:

- 1) evaluating management actions for their potential effectiveness in attaining objectives of rebuilding and maintaining stocks,
- 2) evaluating annually the status of chinook stocks,
- 3) developing procedures to evaluate the progress being made in rebuilding these stocks,
- 4) recommending strategies for effective utilization of enhanced stocks,
- 5) recommending research required to implement the rebuilding program effectively, and
- 6) exchanging information necessary to analyze the effectiveness of management measures in satisfying conservation objectives.

This charge has been met by the CTC in part by development of

- 1) an escapement analysis based on escapement trends of natural stocks,

- 2) exploitation rate analyses based on coded-wire-tag recoveries of indicator hatchery stocks in the various fisheries, and
- 3) a simulation model, referred to as the chinook model, designed to evaluate the effect of alternative management actions on rebuilding of chinook stocks.

Results from the analyses and the model are given in an annual report from the CTC each fall and in briefing papers as requested by the Commission during the annual negotiating meetings. The Commission also requires that the Parties provide interception estimates of all salmon species. As there is currently no stock identification program available for chinook salmon that could identify all stocks in a mixed stock fishery, these estimates are derived from the chinook model. Data that are needed to run these analyses and the chinook model are described in Chapter 3. In addition, data quality and the assumptions used are reviewed and areas where improvements could best be made are identified.

In Chapter 4, a summary is provided of the information and research needs based on PST requirements and on current analyses conducted by the CTC. Improvements to existing programs and new programs are identified that would improve current analyses and address important aspects of chinook production that are not now being addressed.

While each CTC annual report has made reference to poor quality data and has given recommendations for improvement, little attention has been paid to these comments by the PSC community. It is hoped that this report and the follow-up review to be conducted by the Standing Committee on Research and Statistics will receive more attention. The lack of reliable data in some areas and the complete lack of data in other areas, forcing the CTC to make simplifying assumptions for current analyses and modelling efforts, restricts the quality of CTC stock and fishery assessment.

Recommendations

To seriously address Treaty objectives and to provide annual assessments of chinook salmon, greater effort will be needed in the identification of necessary data and its collection, and greater commitment will be needed to long-term research projects. The biological data involved is complex and is collected against a background of natural variability and man-induced changes in the environment. Unfortunately, a legacy of past inadequacies results in a long list of information requirements for now and the future.

The CTC has attempted to develop a comprehensive list of information improvements and needs for existing and new programs. The list developed is presented in Table 10. Each member of the CTC was requested to rank these projects. Rankings were highly variable between respondents, but an overall ranking by project was determined based on the average of individual rankings. Then the CTC, at its October 1992 joint meeting, reviewed the top ranked projects, combined projects that were similar in nature, identified missing project areas, and constructed a list of 14 top priority projects (Table 11). Given that these projects agreed upon by the CTC would encompass a significant monitoring and research commitment, the CTC chose to limit their recommended list of information needs to these 14 projects but does not mean to imply that information from any of the remaining projects listed in Table 10 is not needed.

It is worth noting that ten of the top 14 projects identified by the CTC involve improvements to existing programs or data collection. In other words, before new programs are initiated, a stronger core program of accurate and comparable data is essential for coastwide management of chinook salmon. Many of these projects require dedicated time from CTC members, to examine existing programs and to recommend change, rather than large sums of additional moneys or continued

analyses of the existing information. However, some new programs are clearly required, such as studies to improve our knowledge of chinook population dynamics and to directly examine equity issues. New programs will also strengthen existing information systems by examining basic assumptions of present analyses and by improving the coverage of catch/sampling data to all chinook fisheries and of exploitation rate indicator stocks to include other chinook production areas and stock types. From the large list of possible new projects, the CTC focused on: applying genetic stock identification (GSI) information to estimate the stock composition in fisheries; initiating a few well designed programs to examine the productivity of natural and enhanced populations; and establishing programs to study fishery dynamics. In the case of GSI, extensive resources have already been invested in collecting a coastwide baseline database and it should now provide a useful tool for examining PST chinook issues. To understand the biological productivity of chinook is inherently a long-term study, but achieving the objectives of the PST requires that the Parties recognize this and invest in developing this basic understanding. A major issue for funding agencies will be the need to maintain a long-term commitment to these new biological programs. Studies of fishery dynamics are essential for evaluations of alternative management strategies and expected impacts on chinook rebuilding. The types of studies envisioned include examining effort responses to changes in quotas or seasons, standardizing effort or estimating directed effort, evaluating size limits, relating harvest rates to days fishing, etc.

The CTC recognizes that new biological programs could involve large amounts of new funds but believes that a careful examination of opportunities for study site selection and an integration of project objectives and funding sources can significantly reduce the new funds required. The CTC stresses, however, that new programs can not simply replace the core information systems since our established assessment procedures and the new programs are premised on these programs continuing and being strengthened. Extensive amounts of information on chinook salmon have been collected, but we continue to have a great deal to learn, particularly against a background of climate change and man-induced changes in the environment. Management agencies should recognize and acknowledge the limitations of existing information and find ways to maximize what we learn from these new programs and future management actions.

Table 10. Chinook long-term research survey and project listings.

Part I. Information needs for Existing Program activities	
1. Maintain a consistent set of Escapement Indicator streams which meet CTC quality standards.	6. Establish guidelines for identification of stock groupings for exploitation rate indicator stocks.
2. Establish guidelines for identification of stock groupings for escapement indicator stocks.	7. Establish guidelines for the types and quality of exploitation rate data to be collected.
3. Establish guidelines for the types and quality of escapement data to be collected.	Institute catch estimation and sampling programs in fisheries lacking these programs:
4. Estimate return of enhanced chinook to escapement indicator stocks.	8. sport fisheries (e.g., WCVI sport),
5. Maintain a consistent set of Exploitation Rate Indicator stocks which meet CTC quality standards.	9. personal use or take-home fisheries,
	10. native fisheries.
	Estimation of incidental mortalities:
	11. encounters in fisheries,
	12. stock composition of encounters,
	13. applicable mortality rates.
	Coded-wire-tag (CWT) information base:

14. meet minimum sampling standards for commercial fisheries,
15. examine feasibility of random sampling for sport fisheries,
16. examination of sampling design for escapements,
17. investigate reliability of recovery programs (missed marks, mark incidence,...),
18. exchange catch/sample expansion factors for Alaskan sport fishery recoveries.

Assessment of CWT data:

19. verify accuracy through alternative marks,
20. accuracy of total releases associated with tags,
21. accuracy and reporting of escapement sampling,
22. statistical properties (e.g., variance estimates).

Review of CWT expansion methods:

23. effect of pooling across strata and tag groups,
24. standardization of expansion factors for commercial fisheries,
25. standardization of expansion factors for sport fisheries,
26. reporting of data necessary for expansion of escapement recoveries.

Analytical tests to examine validity of assumptions:

27. constant annual spatial distribution of stocks,
28. similarity of distributions among CWT groups.

Recommended additional indicator stocks:

29. Upper Fraser R. spring and summers,
30. Central & Northern B.C. spring and summers,
31. Transboundary river stocks,
32. Upper Columbia R. summers,
33. Upper Columbia R. springs,
34. Washington coastal springs,
35. South Puget Sound yearlings,
36. St. of Georgia summer/falls,
37. West coast Vancouver Island,
38. Fraser R. fall - Harrison stock,
39. Central Oregon coastal falls.
40. Improving estimates of catch for commercial fisheries.
41. Improving estimates of catch for sport fisheries.
42. Improving estimates of catch for native fisheries.
43. Improving estimates of catch for ceremonial and subsistence use.
44. Improving estimates of catch for personal use.

Part II. Information needs from New Program activities:

Quantitative estimates of production:

45. spawning escapement by sex and age,
46. juvenile production monitoring,
47. tagging of migrants for exploitation rates,
48. stock identification programs for catch by stock,
49. estimates of pre-spawn mortality.

Interactive effects on total chinook production:

50. inter-specific competition,
51. intra-specific competition,
52. hatchery x wild stock interactions,
53. supplementation programs (outplanting, etc.).

Habitat determinants of production:

54. identification and quantification of habitat factors limiting chinook production,
55. quantification of habitat impacts/stresses hindering rebuilding of natural stocks,
56. monitoring of environmental factors.

Coastwide production limitations:

57. marine carrying capacity,
58. climate change/trends,
59. between stock correlation analyses (e.g., survival variation, etc.).

Validation of interception estimates:

60. genetic stock identification programs,
61. mass marking programs in hatchery stocks,
62. stock specific marker studies (e.g., DNA probes),
63. stock identification for Transboundary R. stocks.

Development of analytical methods:

64. stock concentrations (fishery shaping analysis),
65. effort standardization, response, and determination of directed effort in multiple species fisheries,
66. estimation of abundance by area,
67. abundance forecasting.

Table 11. The top priority information needs identified by the Chinook Technical Committee and required to meet the objectives of the Pacific Salmon Treaty including current annual assessments. The projects are not ordered in any way related to priority. Reference numbers refer to the project numbers in Table 10.

Ref. #	Project	Project Description
1-4	Escapement Data	Establish guidelines for types & quality of escapement data collected for PST escapement indicator stocks; develop & maintain a consistently monitored set of stocks to evaluate spawning escapement trends among years and stocks.
5-7,26	Exploitation Rate Data	Establish guidelines for types & quality of data collected for PST exploitation rate indicator stocks; develop & maintain a consistently monitored set of stocks to estimate exploitation rates by stock and brood year for evaluation of optimal production, equity, and fishery assessments.
8 & 10	Encounter Rates	Institute catch estimation, biological sampling, and tag recovery programs in fisheries lacking these programs, in particular; Native fisheries in Canada and sport fisheries (e.g., WCVI, freshwater fisheries, etc.)
11	Commercial CWT Sampling	Monitor chinook encounter rate in fisheries for the estimation of total fishing impacts (both incidental mortalities and reported catch); particularly in fisheries harvesting indicator stocks representing a depressed naturally spawning chinook population.
14	Other CWT Sampling	Maintain the essential CWT information base by establishing and maintaining minimum sampling standards for coded-wire tag recovery in commercial fisheries.
15	CWT Accuracy	Improve the CWT information basis by examining the feasibility of random sampling for CWT in sport fisheries to examine comparability of sport, native, and commercial recovery programs, and potential biases in voluntary recovery programs (implement if feasible).
19	CWT Distribution	Assess the accuracy of CWT data through the application of mass marking (otolith, elemental marks, etc.) of tagged stocks and recovery programs in terminal runs for examination of tag loss, differential mortalities of tagged and untagged fish, straying between stocks, etc.
27,28, 67	New CWT Stocks	Develop and apply analytical methods to compare spatial and temporal distributions of CWT groups for among year or stock comparisons and to predict abundance in fishery areas.
29-31, 38	Habitat	Establish additional exploitation indicator stocks to improve the geographic and stock type coverage of these indicators; the most important new indicators would be: the Harrison River falls, upper Fraser River springs & summers, North/Central B.C., springs & summers, and a transboundary river indicator.
55	Stock Composition	Investigate habitat factors influencing chinook production in escapement indicator stocks that are not rebuilding.

Ref. #	Project	Project Description
60	Stock Comparison	Monitor stock composition in fisheries using Genetic Stock Identification techniques to examine stock composition predicted by the Chinook Model, and therefore, to evaluate current interception estimates.
various	Sampling Errors	Examine sampling errors associated with catch and escapement estimation procedures to investigate the accuracy of CWT data, to evaluate how to improve these estimates, and for statistical evaluations of stock-recruitment relations in productivity studies.
various	Population Dynamics	Establish a core group of rigorously designed experiments to study the population dynamics of chinook salmon; particularly addressing biological productivity of chinook life history types and evaluating escapement goals, effects of the environment on survival, long-term production of hatchery stocks, and the interaction of enhanced & wild chinook populations.
new	Fishery Dynamics	Identify information needs and design monitoring programs to examine the dynamics of salmon fisheries for consideration of alternative management strategies.

Joint Chinook Technical Committee. 1991 Annual Report. TCCHINOOK (92)-4. November 17, 1992.

The Pacific Salmon Treaty established a system of fishery-specific catch and harvest rate restrictions intended to:

"halt the decline in spawning escapements of depressed stocks; and 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".

The goal of the program is to rebuild depressed naturally-spawning stocks and restore production through progressive increases in spawning escapements achieved through a combination of catch ceilings in selected mixed-stock fisheries and harvest rate restrictions in non-ceiling, pass-through fisheries. The Pacific Salmon Commission instructed the Chinook Technical Committee to "develop procedures to evaluate progress in the rebuilding of naturally spawning chinook stocks". The February 1987 Chinook Technical Committee Report, "Assessing Progress Toward Rebuilding Depressed Chinook Stocks", established an evaluation framework that documented an indicator stock program, identified information requirements, and recommended analytical procedures for the assessment of rebuilding. The Committee also identified a number of policy issues that had to be resolved before final conclusions could be reached regarding the status of rebuilding on a regional or coastwide basis. Agreement on those issues has not yet been reached.

In assessing the status of individual stocks under the rebuilding program, the Committee identified three main elements that must be examined: (1) spawning escapement levels; (2) fishery harvest and stock-specific exploitation rates; and (3) production responses to increases in spawning escapements. The Committee recommended that rebuilding assessment be stratified into three phases corresponding with three 5-year chinook life-cycles in the rebuilding period: 1984-1988; 1989-1993; and 1994-1998. The Committee felt that a three-phase approach to assessment would address the problems of changing data availability and quality over time.

This report provides an evaluation through the midpoint of the second phase of the rebuilding program using data through 1991. This report includes recent catch in fisheries of concern to the Pacific Salmon Commission (Chapter 1), assessment of spawning escapements for 42 escapement indicator stocks (Chapter 2), fishery harvest and stock-specific exploitation rates based on 40 exploitation rate indicator stocks (Chapter 3), an integration of Chapters 2 and 3, and results from the chinook model (Chapter 4).

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.

Area/Fisheries a/	Ceiling	Catch	Difference	
			Numbers	Percent
S.E. Alaska (T,N,S) b/	273	295.6	+22.6	+8.6%
North/Central B.C. (T,N,S) c/	273	303.2	+30.2	+11.1%
West Coast Vancouver Island (T)	360	202.9	-157.1	-43.6%
Strait of Georgia (T,S)	275	147.8	-127.2	-46.3%

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

b/ The actual total catch was 357,100 chinook, including a hatchery add-on of 61,400.

c/ Excludes 6,066 chinook caught in terminal areas in 1991, which Canada proposes to exclude from the ceiling.

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 (in thousands of fish) are as follows:

Area/Fisheries	Ceiling	Catch					Cumulative Deviation		
		1987	1988	1989	1990	1991	Total Deviation	Numbers	Percent
S.E. Alaska (T,N,S) a/	263 b/	265.2	255.2	264.4	313.2	295.6	+29.6	+29.6	+11.3% c/
North Central B.C. (T,N,S) d/	263 b/	282.8	245.6	301.2	253.0	303.2	+21.8	+21.8	+8.3% c/
West Coast Vancouver Island (T)	360	379.0	408.7	203.7	298.0	202.9	-307.7	-27.0	-7.5% e/
St. of Georgia (T,S)	275	159.7	138.6	161.3	146.3	147.8	-621.3	-20.6	-7.5% e/

a/ S.E. Alaska catches exclude hatchery add-ons of 16,700, 23,700, 26,700, 48,300, and 61,400 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 6,066 chinook caught in terminal areas in 1989, 1990, and 1991, respectively, for a total of 16,434.

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

ESCAPEMENT ASSESSMENT

Our objective is to assess the rebuilding status of each escapement indicator stock through an evaluation of 1) the mean escapement in the base period and the rebuilding period, 2) consistency with a linear approximation of the expected rebuilding pattern, and 3) a positive trend in escapements. As in 1990, 42 naturally spawning escapement indicator stocks were included in the assessment. These stocks represent distinct naturally spawning populations or management groups that originate from individual rivers or watersheds. Some stocks represent several populations aggregated by region and life history type.

The rebuilding response of the escapement indicator stocks is inconsistent with expectations. There has been a general decline in the proportion of stocks that are classified as rebuilding, while the proportion of stocks that are not rebuilding has increased. Furthermore, 29 of the 42 indicator stocks had lower escapements in 1991 than in 1990 and less than half (16 of 36) of the escapement indicator stocks with goals are currently classified as Above Goal, Rebuilding, or Probably Rebuilding. This is especially significant since most stocks are now more than halfway and the

remainder are more than two-thirds through their rebuilding programs. Of particular concern are the 15 stocks classified as Not Rebuilding or Probably Not Rebuilding. In 1991, the escapements of all of these stocks were less than 60% of their rebuilding goals and, for seven of these 15 stocks, the average escapement during the rebuilding period has actually declined from the base period level.

STOCKS WITH ESCAPEMENT GOALS				
CATEGORY	Assessment for 1990 with 1991 methods ¹		Actual 1991 Assessment	
	#	%	#	%
Above Goal	12	34%	12	33%
Rebuilding	0	0%	1	3%
Probably Rebuilding	4	12%	3	8%
Indeterminate	9	26%	5	14%
Probably Not Rebuilding	10	29%	12	33%
Not Rebuilding	0	0%	3	8%
TOTAL	35	100%	36	100%

¹ Explanation of the difference between the 1990 and 1991 assessments may be found in Chapter 2, Section 2.3.

The poor response seen in half of the Southeast Alaska (SEAK) and Transboundary (TBR) stocks, primarily the Behm Canal stocks, in 1991 is of particular concern to the CTC since this group has only four years remaining in its rebuilding program. In 1991, five of the ten stocks were classified as either Probably Not Rebuilding (4) or Not Rebuilding (1). These five stocks all declined in status from 1990 and their 1991 escapements ranged from only 30% to 54% of goal.

While the 26 stocks with goals and a target rebuilding date of 1998 still have seven years remaining to rebuild, the CTC is concerned by the large number of these stocks that are classified as Probably Not Rebuilding or Not Rebuilding. Although all six stocks without goals were classified in 1991 as showing a long-term escapement increase, all but the Oregon Coastal stock had declines in escapements from 1990. One of these stocks, Queets spring/summer, had an escapement below its management floor. For those stocks with goals, 58% (15 of 26) were assessed as either Indeterminate (5), Probably Not Rebuilding (8), or Not Rebuilding (2). Five stocks declined in status from 1990 while only one stock improved.

EXPLOITATION RATE ASSESSMENT

The primary purpose of the Exploitation Rate Assessment is to evaluate the effectiveness of management measures in PSC fisheries. The assessment relies upon coded wire tag (CWT) release and recovery data to estimate indices of fishery harvest rates, a CTC suggested passthrough index for depressed natural stocks, brood exploitation rates, and the survival of CWT groups. The utility of the indices is dependent on how representative the indicator stocks are of the actual populations harvested in the fisheries.

A basic premise of the rebuilding program is that fixed ceilings will act in concert with increases in the abundance of chinook to continually reduce harvest rates. In addition, the CTC recommended when the rebuilding program was developed that restrictions in the length of the season, or other restrictions designed to reduce harvest rates, should be implemented in years in which abundance precluded harvesting the full ceiling without an increase in the harvest rate (PSC 1991). Since 1985, the SEAK and North/Central B.C. (NCBC) all gear fisheries and Georgia Strait (GS) troll fishery have been managed primarily through the use of ceilings, while the West Coast Vancouver Island (WCVI) troll and GS sport fisheries have implemented restrictions related to effort or bag limits to control harvest rates.

For all ceiling fisheries, the initial objective was to achieve the 1985 target reduction in harvest rates. Further reductions in harvest rates were expected to occur in subsequent years as abundance increased. The fishery indices indicate that only the NCBC fishery has consistently achieved these objectives. WCVI has shown mixed results with respect to fishery index changes. Since 1985 there have been three years with fishery index changes greater than or equal to the 1985 target reduction, one year near the target, and three years with fishery indices less or much less than the 1985 target reduction. Management measures in the SEAK and GS fisheries have been insufficient to consistently achieve the target harvest rate reductions.

While the 1985 target harvest rate reduction in the SEAK fishery has been achieved for the reported catch, the total harvest rate reduction has not been met due to the high chinook availability and/or abundance and management regime for the SEAK fisheries, including prolonged chinook non-retention (CNR) periods for the troll fishery. In 1991, the length of the general troll summer season was the shortest (7.5 days) since the inception of the PST primarily due to a high abundance and large catch per fleet day. The 1991 CNR period was 64.5 days (1988 to 1990 average was 51.1).

Since 1989, catch in the WCVI fishery has been controlled primarily through restrictions in fishing areas and by limiting the total effort. The 1990 Letter of Transmittal stated that "it is Canada's intention in 1990 to manage this fishery in a manner so as not to exceed the 1985-87 average troll fishery harvest rate". To this end fishing effort, both in terms of days open and total boat days, was restricted to the average 1985-1987 level in each year. Revised estimates of harvest rates included in this report indicate that the commitment to harvest rate reductions was achieved. The 1985-1991 average reduction in the harvest rate of 22% is near the 1985 target reduction of 24%.

Harvest rates in the combined GS sport and troll fishery remain above even the 1985 target level (1985-91 average reduction being 72% of the 1985 target reduction) primarily due to the sport fishery. Management actions which have been taken in the sport fishery are summarized in Chapter 1. Despite these actions, the harvest rate in the sport fishery was estimated to be only 2% less than the base period level. This indicates that management actions taken in this fishery have been insufficient to achieve the 1985 target reduction.

CHANGE IN TOTAL FISHERY HARVEST RATES FROM BASE PERIOD

FISHERY	AGE	1985	1986	1987	1988	1989	1990	1991	85-91 AVERAGE	85 TARGET REDUCTION
SEAK Troll	3,4,5	16%	5%	1%	-22%	-30%	-12%	-4%	-7%	-22%
NCBC Troll	3,4,5	-8%	-20%	-21%	-38%	-31%	-30%	-27%	-25%	-16%
WCVI Troll	3,4	-11%	-4%	-24%	2%	-57%	-19%	-43%	-22%	-24%
St. of Georgia Sport & Troll	3,4,5	-53%	-27%	-34%	-41%	-18%	-40%	-23%	-34%	-47%

Passthrough indices provided in this report were computed using methods suggested by the CTC in 1992. Although these methods are consistent with assumptions used by the CTC in previous analyses of fishery management regimes, it should be noted that the PSC has not formally provided the CTC with a definition of passthrough which can be used to analytically assess if the passthrough provision of the PST has been satisfied. In addition, the reported indices do not include the WCVI sport fishery and some terminal sport and net fisheries. These fisheries were excluded in instances in which the exploitation rate indicator stock was of hatchery origin and subject to terminal fisheries designed to harvest surplus hatchery production. The analysis indicated that the passthrough commitment has generally been achieved for depressed natural stocks. Exceptions occurred in 1990 for U.S. fisheries (Stillaguamish, Snohomish, and Columbia River Summer stocks), and 1986 and 1989 for Canadian fisheries (Lower GS and Upper GS stocks, respectively).

Implementation of the PST ceilings was expected to reduce brood exploitation rates by 16 percentage points for the Georgia Strait stock and 9 percentage points for the WCVI stock. For reported catch, these targets have now been achieved. Unfortunately, reductions in exploitation associated with reported catch have been offset to a large extent by increases related to incidental mortality. For example, while the average Robertson Creek (exploitation indicator stock for the WCVI) brood exploitation rate for reported catch in ocean fisheries has declined by 11 percentage points, the brood exploitation rate for total mortality in ocean fisheries has declined by seven percentage points. Similarly, the average Big Qualicum (exploitation indicator stock for Lower GS) brood exploitation rate for reported catch in all fisheries has declined by 20 percentage points, but the brood exploitation rate for total mortality in all fisheries has declined by only seven percentage points.

The 1982-1987 average brood year ocean exploitation rates for total mortality have declined from base period levels for 13 of the 16 stocks for which adequate data are available. For these stocks, the median decline was eight percentage points from the base period. The average 1982-1987 brood year ocean exploitation rates increased from base period levels for three stocks. The median decline in total ocean exploitation rates for all stocks was 6.5 percentage points.

INTEGRATED ANALYSIS

The technical basis for development of the PST chinook rebuilding program in 1984 relied upon a chinook model that included four stock types: Columbia Upriver Bright, Columbia River Tule, WCVI fall, and GS fall. The Columbia Upriver Bright stock was used as an indicator for far-north migrating fall-type stocks originating in Washington and Oregon, the Columbia River Tule (Spring Creek Hatchery) stock was an indicator for early-maturing chinook stocks harvested off the coast of the WCVI and Washington, the WCVI was represented by Robertson Creek Hatchery to indicate impacts on far-north, fall-type stocks originating in Canada, and the GS stock was represented by the Big Qualicum stock as an indicator for fall-type stocks that contribute primarily to GS fisheries.

The model was used to evaluate a number of potential management actions, with the objective of identifying a regime that would rebuild depressed natural stocks by 1998 and was acceptable to the Parties. The task of rebuilding WCVI and GS stocks was most critical in the development of the PST's management regime since the Columbia Upriver Bright stock was close to its escapement goal and the Spring Creek stock primarily represented hatchery production. The response of stocks other than WCVI and GS to the PST management regime was expected to vary depending upon stock specific attributes, including distribution and productivity. Realizing the limitations of the data available at the time, and the general objective to "attain by 1998, escapement goals...of naturally spawning chinook stocks, as represented by indicator stocks

identified by the Parties", the original chinook chapter recognized that modification of the PST chinook management regime might be required to achieve the rebuilding objective.

As expected, the analysis presented in this chapter indicates that the response of stocks to the PST management regime has been highly variable. Among the stock groups which include more than one escapement indicator stock, there is no instance in which the rebuilding status of all stocks is equivalent, and in some instances, the status ranges from Above Goal to Not Rebuilding.

The CTC provided an integrated assessment of the status of chinook stocks two years ago in the 1989 Annual Report. During the two years since the last assessment, if the rebuilding program were proceeding as expected, we would expect fishery and stock indices to have declined further below the 1985 target levels, further reductions in brood year exploitation rates, chinook abundance in fisheries to have increased, and most of the escapement indicator stocks to be in the upper status categories. When the results of this assessment are compared with the 1989 Annual Report, it is apparent that these expectations have not been fulfilled.

- 1) In 1989, the 1985 target reductions were achieved in 3 of the 4 ceiling fisheries, and the average reduction was 34%. In 1991, the 1985 target reductions were achieved in 2 of the fisheries, and the average reduction was 24%.
- 2) In 1989, average brood exploitation rates for stock groups during the rebuilding period had declined by an average of 12% (8 percentage points). In 1991, brood exploitation rates had declined by an average of 10% (7 percentage points).
- 3) Comparing the rebuilding status of the 35 escapement indicator stocks with goals used in both the 1989 and 1991 assessments, 29% of the stocks were classified as Probably Not Rebuilding or Not Rebuilding in 1989 and 42% were in these categories in 1991.
- 4) The estimated model abundance of chinook available to the ceiling fisheries in 1991 was less than in 1989 with the exception of the GS sport and troll fishery.

ATTRIBUTE	1989	1991
Average Reduction in Ceiling Fishery Harvest Rates	34%	24%
Ocean Brood Exploitation Rates (Average Change From Base)	-12%	-10%
Percent of Escapement Indicator Stocks in Probably Not Rebuilding or Not Rebuilding Categories	23%	42%
Abundance Indices		
SEAK Troll	1.35	1.20
NCBC Troll	1.04	0.98
WCVI Troll	0.72	0.61
GS Sport and Troll	0.45	0.57

Bearing in mind the variability observed within the stock groups, several conclusions regarding the rebuilding program may be drawn:

- 1) **Above Average Survival Benefitted Far North Migrating Stocks.** Progress toward rebuilding was accelerated in the initial years of the PST by survival rates greater than the long term average for stocks for which a majority of the fishing mortality occurs in the NCBC and SEAK ceiling fisheries. In particular, escapements for many components of the Washington Coastal/Columbia River/Oregon summer/fall (WACO) (1983-1984 broods) and SEAK (1980-1982) stock groups showed substantial increases in escapement in the period from 1985 to 1989 which were likely related to good survival. Good survival, and the resultant increases in abundance, acted in conjunction with the ceilings to further increase escapements by reducing harvest rates. These stock groups may also have benefitted from delayed openings in summer seasons and reductions in the exploitation rates in passthrough fisheries. Although the evidence is less conclusive, similar processes may have affected the NCBC and Upper Fraser stock groups. As survival rates declined, model estimates of abundance in the fisheries stabilized or declined, fishery indices increased, and escapement for many of the stocks also stabilized or declined. The 1989 report noted that "the survival of stocks contributing to the northern fisheries is expected to be poor...Consequently, the harvest rate reductions expected under the rebuilding program are not likely to be achieved." This statement continues to be applicable in 1992 and 1993, as survivals are projected to be substantially below the long-term average.
- 2) **Rebuilding Progress is Poor For Stocks Harvested in GS.** Escapement indicator stocks in stock groups in which more than 40% of the fishing mortality occurs in GS are classified as Probably Not Rebuilding (Lower GS, Lower Fraser Fall, and Skagit Spring). This is consistent with results from the chinook model, which predicts that the Lower GS stock and the Lower Fraser stock will not rebuild by 1998. The limited response of these stocks is likely due to poor recent survivals and the failure to meet target harvest rate reductions in some ceiling fisheries (the stock index for the Lower GS stock indicates that only 25% of the 1985 target reduction has been achieved). However, brood year total exploitation on the Big Qualicum exploitation indicator stock in Lower GS has been successfully reduced since the base period. Survivals of recent Lower GS broods are expected to remain poor but survival of the Lower Fraser stock is expected to improve relative to recent years. The 1989 CTC report stated that because "an additional [abundance] reduction of 9% is projected for 1990-1991... the 1985 target reductions are not likely to be achieved in 1990 and 1991 unless additional management actions are implemented." Although some additional management actions have been taken in GS (See Discussion, Chapter 3), these actions appear to have been insufficient.
- 3) **Mixed Progress For Stocks Primarily Harvested in U.S. Passthrough Fisheries.** The two stock groups with more than 40% of the fishing mortality in U.S. non-ceiling fisheries have displayed a mixed response to the PSC management regime. The North Puget Sound (PS) Summer/Fall stock group has responded poorly; all three of the stocks are in the Indeterminate or Not Rebuilding categories and the chinook model predicts that two of the three stocks in the group will not rebuild by 1998. Exploitation rates on these stocks remain high, despite harvest rate reductions in ceiling fisheries and satisfactory achievement of the CTC definition of passthrough. Brood exploitation rates in ocean fisheries alone remain near the maximum sustainable yield (MSY ER). In contrast, the South Puget Sound Summer/Fall stock group has shown a marked increase in escapement, perhaps in response to enhancement.

- 4) **In view of poor recent survivals and failures to at least achieve 1985 target harvest rate reductions in some ceiling fisheries, the CTC concludes that stock groups with all escapement indicator stocks presently categorized in the lower two rebuilding categories (WCVI, Lower GS, Lower Fraser Fall, North PS Spring, and Columbia Upriver Spring) will not rebuild by 1998.** Rebuilding will require sustained increases in productivity (e.g., through habitat improvements or other enhancement activities) or a sustained decrease in fishing mortality of those stocks. Further, projections for continued poor survivals indicate that the required reductions in exploitation will be greater than originally estimated when average survivals were assumed.
- 5) **Total brood exploitation rates have been reduced for exploitation indicator stocks in most stock groups (no change in SEAK) and are nearing the estimated exploitation rate at the MSY ER of associated model stocks (with the exception of the Lower GS and Columbia Upriver Summer stocks).** The lack of a positive response in escapements coupled with reduced brood exploitations indicate that poor survivals are limiting our ability to achieve the escapement goals. Exploitation rates are being reduced but have generally not been adequate for the degree of reduction in survivals. This seems particularly true for the Lower GS and Columbia Upriver Summer stocks. Managers of the summer stock noted problems with freshwater survival and the Lower GS stock has the poorest survival index of the 13 stock groups.
- 6) **Harvest management of ocean fisheries is not benefitting all stocks equally. Rebuilding some specific stocks should be expected to require more detailed stock-specific investigations (e.g., examination of the biological basis of the escapement goal) and actions (e.g., habitat improvements, supplementation, etc.).** Management of ocean fisheries using catch ceilings must be responsive to changes in abundance and stock productivities in order to achieve target harvest rate reductions but detailed stock-specific actions will likely also be required to rebuild all the indicator stocks.

RECOMMENDATIONS

Stock Status and Fishery Regimes

1. *Undertake management actions to increase the probability that stocks achieve spawning escapement goals by the end of the rebuilding program.* The failure to consistently achieve even the 1985 target reductions in harvest rates in all ceiling fisheries except NCBC, the lack of progress toward rebuilding by many stocks, and the expectations for reduced survival indicate that additional management actions will be required if stocks are to meet escapement goals by the target rebuilding dates. The CTC recommends:
 - a) Evaluate target fishery harvest rate reductions with respect to projected survival, projected abundance, current estimates of stock productivity, and stock status.
 - b) Evaluate alternative management approaches that account for annual variations in abundance and impacts on stock status.
 - c) SEAK: Reduce incidental mortality so as to achieve total mortality harvest rate reductions at least equal to the 1985 target levels.
 - d) NCBC: Maintain current ceilings and management regime.

- e) **WCVI:** Manage fishery so as to achieve, at a minimum, the 1985 target reductions. If a catch ceiling is not used to control harvest, develop and utilize a measure of effort which will achieve the target harvest rate for chinook salmon.
 - f) **GS:** Institute additional management actions to at least achieve the 1985 target reductions, account for depressed current survivals, and attain the conservation objectives for the Lower GS stock.
2. ***Resolve policy issues and information needs for interpretation of the passthrough provision.*** The PST should determine if the CTC recommended definition of passthrough is acceptable or provide a definition which can be used to analytically evaluate the impact of non-ceiling fisheries on the rebuilding program.
 3. ***Continue controls on passthrough fisheries.*** Proposed preseason and inseason management actions in non-ceiling fisheries should continue to be evaluated with respect to the passthrough provision.
 4. ***Evaluate causes and develop solutions to rebuild stocks classified as Not Rebuilding or Probably Not Rebuilding.*** If the PSC intends to rebuild these stocks, potential causes for the continued poor response must be evaluated and a remedial management plan developed. Stock specific management actions should be considered for stocks which will not rebuild with PST management actions following from 1) above.
 5. ***Resolve policy issues of what constitutes rebuilding and rebuilt.*** Southeast Alaska and Transboundary stocks are in the final phase of the 15 year rebuilding program, and the remaining stocks are past the midpoint of the program. Given the limited time prior to the target dates of rebuilding, and the poor progress of some stocks, it is imperative that rebuilding/rebuilt be defined immediately. The definition should include provisions for stocks without escapement goals, or escapement goals should be established for all escapement indicator stocks.

Monitoring and Evaluation

1. ***Eliminate data limitations which are compromising the ability of the CTC to complete the escapement and exploitation rate analyses.*** General research needs of the CTC will be addressed in detail in a separate report currently in preparation. Data needs for the annual report that have not been completely satisfied include the following:
 - a) ***Report estimated CWT recoveries to the PSMFC by July of the year following the fishery.*** As requested by the PSC, the CTC is currently conducting the Exploitation Rate Analysis on a year-out basis to allow agencies sufficient time to collect and report recovery data. However, the following data were still not available from the PSMFC: i) Estimated recoveries for the 1990 and 1991 Puget Sound sport fisheries; ii) 1991 tributary sport recoveries in the Columbia River; iii) escapement recoveries for most southern U.S stocks; and iv) expansion factors for CWT recoveries by Alaskan sport fisheries for all years.
 - b) ***Collect and provide information on the age and sex composition of escapement.*** Age and sex specific escapement data are essential to evaluate brood production, stock productivity, and escapement goals. Age specific data also improve the quality of the calibration of the CTC Chinook Model.

- c) ***Tag representative Exploitation Rate indicator stocks at sufficient levels.*** The CTC is especially concerned about the adequate representation of spring and summer stocks and the lack of an indicator stock (with escapement data) for the Harrison River stock.
- d) ***Establish consistent and standardized recovery programs for CWT fish at hatcheries and on spawning grounds.*** Accurate estimates of escapement are essential for the Exploitation Rate Analysis. The CTC is concerned that: i) Pilot studies have indicated that many tagged fish may not be successfully identified at hatcheries; ii) CWT fish which do not return to the hatchery may not be accounted for on a consistent basis; and iii) standard procedures to estimate escapement are not used by some hatcheries in SEAK. In addition, standardized procedures should be instituted for enumeration of marked and unmarked releases and tag retention rates.
- e) ***Provide estimates of sublegal encounter rates in troll fisheries and legal and sublegal encounter rates in chinook non-retention and net fisheries.*** The CTC has estimated that non-landed catch mortality is approximately 30-50% of the reported catch (TCCHINOOK (87)-5). However, sampling programs to determine the magnitude and stock composition of the non-landed catch mortality are virtually nonexistent.
- f) ***Provide estimates of nonreported chinook catches by Canadian Native fisheries and the WCVI sport fishery.*** The CTC is unable to fully evaluate impacts of these fisheries on chinook stocks and the rebuilding program until these data are provided.

Joint Chinook Technical Committee. Chinook Technical Report on Preliminary 1992 Catch and Escapement. TCCHINOOK (93)-1. February 11, 1993.

1992 CHINOOK SALMON CATCHES IN FISHERIES WITH CEILINGS

Estimates of 1992 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 for the years 1989-1992 are documented in Table 1.

Area/Fisheries a/	Ceiling	Catch	Difference	
			Numbers	Percent
S.E. Alaska (T,N,S) b/	263	221.9	-41.1	-15.6%
North/Central B.C. (T,N,S) c/	263	262.0	-1.0	-0.3%
West Coast Vancouver Island (T)	360	339.8	-20.2	-5.6%
Strait of Georgia (T,S)	275	153.8	-121.2	-44.1%

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

b/ The actual total catch was 260,500 chinook, including a hatchery add-on of 38,600.

c/ Excludes 6,070 chinook caught in terminal areas in 1992, which Canada proposes to exclude from the ceiling.

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 January 29, 1993.

Area/Fisheries	Ceiling	Catch					Cumulative Deviation	
		1987	1988	1989	1990	1991	1992	Percent
S.E. Alaska (T,N,S) a/	263 b/	265.2	255.2	264.4	313.1	295.6	221.9	-11.6 -4.4%
North/Central B.C. (T,N,S) c/	263 b/	282.8	245.6	301.2	253.0	303.2	262.0	+21.0 +8.0% d/
West Coast Vancouver Island (T)	360	379.0	408.7	203.7	298.0	202.9	339.8	-27.0 -7.5% e/
St. of Georgia (T,S)	275	159.8	138.7	161.3	146.3	147.7	153.8	-20.6 -7.5% e/

a/ S.E. Alaska catches exclude hatchery add-ons of 16,700, 23,700, 26,700, 53,700, 61,400 and 38,600 for 1987 through 1992.

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

c/ Catches exclude 4,819, 5,549, 6,066, and 6,070 chinook caught in terminal areas in 1989, 1990, 1991, and 1992 respectively, for a total of 22,504.

d/ This deviation exceeds the 7.5% management range.

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

TABLE 1. Summary of the 1989-1992 Chinook catches in fisheries relevant to the U.S./Canada Pacific Salmon Treaty (numbers in thousands of fish). Note: Catches for 1992 are preliminary (estimates as of 29-Jan-93).

Area	Troll				Net				Sport				Total			
	1992	1991	1990	1989	1992	1991	1990	1989	1992	1991	1990	1989	1992	1991	1990	1989
S.E. ALASKA a/	184	264	288	236	32	33	28	24	44	60	51	31	260	357	367	291
BRITISH COLUMBIA b/c/																
North/Cent. Coast	180	221	179	225	45	50	42	41	38	32	31	35	263	303	252	301
W. Vanc. Island d/	340	203	298	204	7	60	30	40	47	80	61	48	394	343	389	292
Georgia St./Fraser e/	37	32	34	28	9	15	15	24	117	116	112	133	163	163	161	185
Johnstone St.	3	1	2	2	9	13	18	29	NA	10	10	10	NA	24	30	41
Juan de Fuca Strait	0	0	0	0	9	8	7	21					9	8	7	21
sub-total	560	457	513	459	79	146	112	155	NA	238	214	226	NA	841	839	840
WASHINGTON INSIDE f/																
Strait (mar) g/	31	35	46	65	1	3	5	10	NA	39	51	53	NA	77	102	128
San Juans (mar) h/	0	0	1	1	16	14	9	16	NA	5	7	10	NA	19	17	27
Other PS (mar+fw) i/	0	0	0	0	62	89	179	156	NA	47	68	75	NA	136	247	231
Coastal (mar+fw) i/	0	0	0	0	64	54	58	85	NA	NA	5	6	NA	NA	63	91
sub-total	31	35	47	66	143	160	251	267	NA	NA	131	144	NA	NA	429	477
COLUMBIA RIVER j/k/	-	-	-	-	54	107	147	275	65	83	95	97	119	190	242	372
WA/OR N OF FALCON l/	68	51	65	75	0	0	0	1	19	14	33	21	87	65	98	96
OREGON																
Inside Waters m/	0	0	0	5	-	-	-	-	NA	45	38	45	NA	45	38	50
GRAND TOTAL	843	807	913	841	308	446	538	722	NA	NA	562	564	NA	NA	2013	2126

- a/ Southeast Alaska troll chinook catches shown for Oct. 1 - Sept. 30 catch counting year.
- b/ British Columbia net catches include only fish over 5 lbs. round weight. Native food fishery catches are not included. 1989, 1990, 1991, and 1992 exclude catch from terminal gillnet fisheries (4 year total of 22,504) 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 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.

TABLE 2. Summary of the 1988-1992 escapement of Pacific Salmon Commission Chinook Escapement Indicator Stocks. Escapements for 1992 are very preliminary (estimates as of 29-Jan-93).

Production Unit	Stock Type	Ave Esc. Base a/	Esc. Goal	1988 Esc.	1989 Esc.	1990 Esc.	1991 Esc.	1992 Esc.	1992 % Base	1992 % Goal
S.E. Alaska										
Situk	Spring	1,299	600	885	652	700	875	1,400	108%	233%
King Salmon	Spring	92	250	206	238	168	134	117	127%	47%
Andrew Creek	Spring	379	750	760	848	1,062	640	1,245	328%	166%
Blossom	Spring	163	1,280	614	550	411	382	240	147%	19%
Keta	Spring	325	800	920	1,848	970	435	347	107%	43%
Transboundary Rivers Not Addressed in Treaty Annexes										
Unuk (U.S.)	Spring	1,469	2,880	2,794	1,838	946	1,221	1,413	96%	49%
Chickamin (U.S.)	Spring	338	1,440	1,258	1,494	902	779	554	164%	38%
Transboundary Rivers Addressed in Treaty Annexes										
Klukshu R. (Alsek)	Spring	2,673	4,700	1,994	2,289	1,742	2,153	1,367	51%	29%
Taku Index	Spring	4,582	13,200	8,626	9,480	12,249	10,153	11,058	241%	84%
Little Tahltan (Stikine)	Spring	1,945	5,300	7,292	4,715	4,392	4,500	6,627	341%	125%
B.C. North Coast										
Yakoun River	Summer	788	1,580	2,000	2,800	2,000	1,900	2,000	254%	127%
Nass area	Spr/Sum	7,944	15,890	10,000	12,525	12,123	4,017	7,312	92%	46%
Skeena area	Spr/Sum	20,883	41,770	68,705	57,202	55,976	52,753	67,076	321%	161%
B.C. Central Coast										
Area 6 Index	Summer	2,760	5,520	3,165	998	281	709	373	14%	7%
Area 8 Index	Spring	2,725	5,450	1,650	2,535	2,385	2,470	3,247	119%	60%
Rivers Inlet	Spr/Sum	2,475	4,950	4,429	3,265	4,039	6,635	10,000	404%	202%
Smith Inlet	Summer	1,055	2,110	1,050	225	510	500	500	47%	24%
West Coast Vancouver Island										
Indicator Stocks	Fall	5,520	11,040	5,500	8,480	5,760	5,756	7,820	142%	71%
Fraser River										
Upper River	Spring	12,229	24,460	34,400	25,310	35,552	27,317	24,330	199%	99%
Middle River	Spr/Sum	9,216	21,130	24,164	15,095	25,510	21,170	24,474	266%	116%
Thompson River	Summer	22,059	55,710	47,103	37,975	41,704	36,460	39,406	179%	71%
Harrison River	Fall	120,837	241,700	35,116	74,685	177,375	90,638	140,000	116%	58%
Georgia Strait										
Upper	Sum/Fall	2,546	5,100	3,300	6,607	2,200	3,276	5,268	207%	103%
Lower	Fall	10,968	21,935	7,040	6,830	7,635	12,895	10,893	99%	50%
Puget Sound										
Skagit	Spring	1,217	3,000	1,988	1,853	1,902	1,411	1,001	82%	33%
Skagit	Sum/Fall	13,265	14,900	11,954	6,776	17,206	6,014	7,671	58%	51%
Stillaguamish	Sum/Fall	817	2,000	717	811	842	1,632	780	95%	39%
Snohomish	Sum/Fall	5,028	5,250	4,513	3,138	4,209	2,783	2,650	53%	50%
Green	Fall	5,723	5,800	7,994	11,512	7,035	10,548	5,267	92%	91%
Washington Coast										
Hoh	Spr/Sum	1,325	NA b/	2,600	4,700	3,900	1,100	1,100	83%	
Queets	Spr/Sum	925	NA b/	1,800	2,500	1,800	600	500	54%	
Grays Harbor	Spring	425	1,400	3,500	2,100	1,500	1,200	1,700	400%	121%
Grays Harbor	Fall	8,575	14,600	28,200	26,100	17,500	15,000	NA		
Quillayute	Summer	1,275	1,200	1,300	2,400	1,500	1,200	800	63%	67%
Quillayute	Fall	5,850	NA b/	15,200	10,000	13,700	6,300	5,400	92%	
Hoh	Fall	2,875	NA b/	4,100	5,100	4,200	1,400	2,000	70%	
Queets	Fall	3,875	NA b/	7,600	8,700	10,100	4,500	5,100	132%	
Columbia River										
Upper River	Spring	28,050	84,000	35,100	27,000	28,800	15,500	30,400 c/	108%	36%
Upper River	Summer	23,100	85,000	29,000	28,700	25,000	18,800	15,000	65%	18%
Lewis River	Fall	13,021	5,700	12,100	21,200	17,500	9,100	8,000	61%	140%
Upriver Bright	Fall	28,325	45,000	110,400	92,900	55,200	46,600	51,200	181%	128%
Oregon Coast										
Aggregate Index d/	Fall	91	NA	221	151	125	169	141	155%	

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. Escapement floors are as follows: Queets spring/summer, 700; Queets fall, 2,500; Hoh spring/summer, 900; Hoh fall 1,200; Quillayute fall, 3,000.

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.

B. JOINT CHUM TECHNICAL COMMITTEE

Joint Chum Technical Committee. Final 1991 Post Season Summary Report. TCCHUM (93)-1. March, 1993.

Introduction

This Joint Chum Salmon Technical Committee report presents the appropriate information for 1991 chum salmon stocks and fisheries in southern British Columbia and Washington, as required in Chapter 6 of Annex IV of the Pacific Salmon Treaty (PST). In addition, the Pacific Salmon Treaty Letters of Transmittal dated May 17, 1991 paragraph 6, provided for an amendment to Chapter 6 of Annex IV of the PST. Detailed information may be found in the Canadian and United States agency reports appended to this report.

Status of Treaty Requirements

Chum stocks and fisheries in southern B.C. and in U.S. Areas 4B, 5, 6C, 7, and 7A are managed under the terms set out in the Pacific Salmon Treaty. The following provides a brief synopsis of the PST chum annex provisions (*italics*) and of Canadian and United States Management actions in 1991.

1. *The Parties shall maintain a Joint Chum Technical Committee to review stock status, develop new methods for stock management and report on management and research findings.*

The Joint Chum Technical Committee convened on three separate occasions during the year to address various assignments. The following report was published: The 1989 Post-Season Summary Report.

2. *Canada was to manage its inside fisheries to provide rebuilding of depressed naturally spawning stocks and minimize increased interceptions of U.S. chum.*

In 1991, the gross escapement of inside chum totalled 1,686,000. Escapement to natural spawning areas totalled 1,475,000 which was 74% of the clockwork goal of 2,000,000. The Fraser River escapement was 621,000, or 89% of the 700,000 goal.

Terminal area fisheries scheduled by Canada to harvest specific stocks with identified surpluses included; mid Vancouver Island (Area 14), Cowichan (Area 18), Nanaimo (Area 17) and Fraser River (Area 29). These fisheries were managed to limit interceptions of U.S. origin or other non-targeted stocks. Stock composition samples were taken, but the technical committee has not addressed the issue of "minimizing increased interceptions".

3. *In 1991, Canada was to manage its Johnstone Strait clockwork harvest to set levels dependent on the run size entering Johnstone Strait, as determined inseason. The catch level of chum salmon in U.S. fishing Areas 7 and 7A was determined by the catch of chum salmon in Johnstone Strait. In addition, the traditional proportion of effort and catch between Areas 7 and 7A was to be maintained.*

The Clockwork Harvest Plan was reviewed and revised after the end of the 1988 fishing season; no further changes were incorporated in 1991. The inseason estimate of Johnstone Strait run size was 2,700,000, providing for a harvest rate of 10% or 270,000 chum. Post-

season, the run size was estimated at 2,733,000 chum. The overall harvest rate for clockwork management purposes was 16.3%.

The total allowable catch for U.S. Areas 7 and 7A was 120,000, based on a total chum harvest in Johnstone Strait which exceeded 225,000 fish. The total commercial catch for this fishery in 1991 was 137,000 chum. This fishery was managed to maintain a traditional fishing pattern with both areas opened simultaneously. However, the U.S. catch in Areas 7 and 7A was disproportionately harvested with 70% of the total taken in Area 7A. The traditional proportion is an even distribution of catch between the two areas.

- In 1991, the U.S. was to maintain the limited effort nature of its chum fishery in U.S. Areas 4B, 5, and 6C to minimize increased interceptions of Canadian chum. In addition, the U.S. was to monitor this fishery for increasing interceptions of Canadian chum.*

The U.S. chum fishery in the Strait of Juan de Fuca (Areas 4B, 5, and 6C) was limited, as it has been in past years, to participation by gillnet fishers from the four tribes that fish in the Strait of Juan de Fuca. The commercial catch of 49,500 chum was within 5% of the Strait harvests of the last two years. Genetic Stock Identification (GSI) samples were taken. However, the technical committee has not addressed the issue of whether increased interceptions were minimized.

- When the catch of chum salmon in U.S. Areas 7 and 7A fails to achieve the specified ceiling, the ceiling in subsequent years will be adjusted accordingly.*

The U.S. Area 7 and 7A fishery exceeded the 1991 ceiling by 18,000 fish. Thus, a future adjustment will be required (Table 1).

Table 1. Summary of U.S. Treaty chum allocations and catches for Areas 7 & 7A, 1986-1991.

YEAR	PST SPECIFIED CATCH LEVEL	ADJUSTED U.S. 7 & 7A CATCH ¹	ACTUAL CATCH	CURRENT DUE U.S.
1986	80,000	80,000	92,984	N/A
1987	20,000	20,000	26,323	-6,323
1988	140,000	133,677	131,356	2,321
1989	120,000	122,321	81,021	41,300
1990	140,000	181,300	180,544	756 ²
1991	120,000	120,000	138,361	-18,361

- Takes into account underages or overages from previous years.
 - 1990 accumulated U.S. shortfall foregone through P.S.C. agreement.
- Catch compositions in fisheries covered by this chapter were to be estimated post-season using methods agreed upon by the Joint Chum Technical Committee.*

Fisheries covered by this chapter were sampled, and estimates were provided to the Joint Interception Committee. However, methods for estimating stock composition are under continuing review by the Committee.

7. *In 1991, Canada was to manage the Nitinat net chum fishery to minimize the harvest of non-targeted stocks.*

The boundaries of the Nitinat fishery were expanded in 1991 to include a portion of Area 20-1. Canada conducted GSI sampling to quantify the incidence of interceptions of passing stocks in Area 121. Additional GSI samples were not collected from Area 20-1. The technical committee has not determined whether the harvest of non-target stocks has been minimized.

8. *In 1991, Canada was to conduct GSI sampling of West Coast Vancouver Island troll fishery (Areas 121-124) if catch levels were predicted to reach levels similar to those in 1985 and 1986.*

Early season catch information from the West Coast Vancouver Island troll fishery did not indicate that the season's total chum catches would reach 1985 and 1986 levels. As a result, Canada did not conduct GSI sampling of this fishery.

9. *As per the Pacific Salmon Treaty Letters of Transmittal dated May 17, 1991, paragraph 3.c.iii, the Pacific Salmon Commission agreed that the U.S. would not harvest the cumulative chum salmon shortfall through 1990 in Areas 7 and 7A.*

A cumulative catch shortfall of 756 fish in the U.S. Area 7 and 7A fishery was foregone when setting the 1991 ceiling.

C. JOINT COHO TECHNICAL COMMITTEE

No reports were finalized for publication by this Committee during this reporting period.

D. JOINT NORTHERN BOUNDARY TECHNICAL COMMITTEE

Joint Northern Boundary Technical Committee. U.S./Canada Northern Boundary Area 1992 Salmon Fisheries Management Report and 1993 Preliminary Expectations. TCNB (92)-1. November, 1992.

This report reviews: 1) catch, effort, and management actions in the 1992 Boundary Area pink, chum, and sockeye salmon fisheries of southern Southeast Alaska Districts 101-106 and northern British Columbia Areas 1, 3, 4, and 5; 2) management performance relative to Treaty requirements; 3) historical catches and escapements; and 4) preliminary 1993 expectations and fishing plans.

Returns of sockeye salmon were exceptionally strong in the Northern Boundary Area in 1992. Fisheries in southern Southeast Alaska harvested a record 1,797,000 sockeye; well above the 1985 to 1991 average of 1,028,000 fish. In northern British Columbia, the 723,000 sockeye harvested in Area 3 was the second only to 1991's record harvest and harvests in Areas 1, 4, and 5 were all above the 1985 to 1991 averages. Sockeye escapements appeared strong in southern Southeast Alaska although programs to directly estimate escapements are in place only at Hugh Smith and McDonald Lakes. The weir count of 65,732 sockeye at Hugh Smith is the highest on record; well

above ADF&G's informal 27,000 escapement target. The escapement of 115,123 sockeye into McDonald Lake was over the 70,000-85,000 escapement goal for the third year in a row. The record sockeye escapement of over 600,000 to Canadian Area 3 is three times the 200,000 escapement target. Almost 575,000 were counted past the Meziadin fishway in the Nass system. The preliminary sockeye escapement estimate in Area 4 of 1.3 million is above the management target of 1.0 million. The contribution of enhanced sockeye to fisheries in the Northern Boundary Area has not been estimated.

Returns of pink salmon were moderate in the Northern Boundary Area in 1992. The harvest of 19.0 million pink salmon in southern southeast Alaska was 10.0 million below the 1985-1991 average but 5.0 million above the 1960-1991 average. The Canadian Area 3 pink salmon harvest of 1.4 million was 60% of the 1985-1991 average while the Area 4 harvest of 1.2 million was just below the 1985-1991 average. Pink salmon catches and escapements in Area 1 were below recent even-year averages. The escapement index for southern Southeast Alaska pink salmon exceeded the 6.0 million target by 1.0 million. Index escapements were above goal in Districts 101, 102, and 103, but below goals in Districts 105, 106, and 107. Pink salmon escapements were close to targets in Canadian Areas 3 and 4.

Returns of summer and fall run chum salmon were good in southern Southeast Alaska but poor in northern British Columbia. Alaskan fisheries harvested a record 2,180,000 chum salmon while Canadian harvests were below 1985-1991 averages in all areas. Escapements of summer and fall run chum salmon were generally good in southern Southeast Alaska although ADF&G does not have a directed program to index chum escapements. Escapements to Fish and Marx Creeks at the head of Portland Canal were well above 1990 and 1991 levels. Chum salmon escapements to northern British Columbia systems were poor again in 1992.

The Pacific Salmon Treaty limits the Alaska District 104 (Noyes Island) purse seine fishery to a four-year total catch (1990-1993) of 480,000 sockeye salmon prior to Statistical Week 31. Under terms of the agreement, when the annual catch reaches 160,000 sockeye salmon, no further daily fishing periods are allowed prior to week 31. The 1992 sockeye salmon harvest in District 104 prior to week 31 was 79,643 fish. Combined with the 1990 and 1991 pre-week 31 catches, a total of 348,169 sockeye have been caught, leaving a permissible harvest of 131,831 in 1993 under the 480,000 limit.

In the Alaska District 101-11 (Tree Point) drift gillnet fishery, the catch of sockeye salmon since 1985 has been limited to an annual average of 130,000 by the Pacific Salmon Treaty. Catch of sockeye salmon in 1992 was 244,649, bringing the 1985 to 1992 average to 143,591.

Under the Pacific Salmon Treaty the outside portions of Statistical Areas 3 and 5 are to be managed such that an average annual pink harvest of 900,000 is achieved. In 1992, 927,052 pinks were harvested in Management Units 3(1-4) and 5-11 combined. The current average annual pink harvest from 1985-1992 in the treaty area is 2,064,223.

The Area 1 pink troll fishery is managed to an annual ceiling of 1.95 million pinks with a cumulative ceiling of 5.125 million pink salmon for the period 1990-1993. In addition, the area adjacent to the Canada-U.S. boundary in the northern portion of Area 1 closes to pink retention if the pink catch reaches 300,000 in this area, or by July 22, should this sub-ceiling not be met. In 1992, the pink catch in the A-B line area reached only 71,000 and closed to pink retention July 22. Preliminary saleslips indicate an Area 1 troll catch of 760,269, providing a cumulative catch from 1990-1992 of 3,571,640.

Good returns are forecast for Northern Boundary Area pink salmon in 1992. The Alaska Department of Fish and Game's preliminary forecast for pink salmon returning to all of Southeast Alaska in 1993 is approximately 80-85 million pink salmon. Individual forecasts of returns for northern and southern sections are not being made officially this year but it is anticipated that 30-40 million pink salmon will be harvested in southern Southeast Alaska in 1993. The 1983-1992 average harvest in southern southeast Alaska is 27.5 million pink salmon.

The odd-year pink run to the Queen Charlotte Islands is not expected to provide a surplus in 1993. Average sockeye fisheries are anticipated in Area 3 in 1993, while higher than average pink catches, surpluses from both Areas 3 and 4 are forecast. Skeena returns are predicted to provide an Area 4 commercial net catch of 1,000,000 pinks and 1,000,000 sockeye.

E. JOINT TRANSBOUNDARY TECHNICAL COMMITTEE

Joint Transboundary Technical Committee. Salmon Management and Enhancement plans for the Stikine, Taku and Alsek Rivers, 1992. TCTR (92)-2. June, 1992.

Management of the transboundary Stikine, Taku, and Alsek Rivers to achieve conservation and allocation objectives stipulated by the Pacific Salmon Treaty requires close cooperation between Canada and the United States. This plan has been developed to assure that each Party has a clear understanding of objectives and procedures used in managing relevant fisheries.

This report is organized by river system and salmon species. For each species within each drainage, the pre-season forecast, spawning escapement goals, harvest sharing objectives, and management procedures are presented. For salmon stocks of the Stikine River, details of the stock assessment program are also presented.

The pre-season forecast for the Stikine River sockeye salmon run in 1992 is approximately 127,000 fish. This is an above average run from which a total allowable catch of 67,000 fish could be shared by the two Parties. The escapement goal of 60,000 sockeye salmon has not been changed. The in-season predictions of run size during the 1992 season, as determined by the Stikine Management Model, are based on historical data from 1982 to 1991. The stock assessment program for the river is similar to last year. The 1992 runs of chinook and coho salmon to the Stikine River are expected to be about average. There are no major changes to the management plans for the other species of salmon originating in the Stikine River.

It is expected that the run sizes of Taku River sockeye, pink, and chum salmon will be below average; the coho run is expected to be below average to average; and the chinook run is expected to be average to above average. Management of Taku River salmon stocks will be similar to that of previous years.

Alsek River chinook and coho salmon runs are expected to be above average in 1992. The overall sockeye run is expected to be below average consisting of an above average early run and a larger, but below average late run. No major changes to the management plan for Alsek salmon are anticipated.

Sockeye salmon enhancement will continue in 1992 in the Stikine and Taku drainages. The following fry out-plants from the 1991 egg-takes are scheduled to occur in June: 1.4 million to Tahltan Lake; 2.6 million to Tuya Lake; 1.3 million to Tatsamenie Lake; and 1.9 million to Trapper Lake. To date, egg-to-fry mortality rates have been low with the exception of Little

Trapper Lake stock which encountered an outbreak of IHNV resulting in the mortality of approximately 600,000 fry. Egg-take targets for the fall of 1992 are as follows: 5.4 million at Tahltan Lake; 1.75 million at Little Tatsamenie Lake; and 2.75 million at Little Trapper Lake.

Most of the stock assessment and research programs conducted in 1991 will be continued in 1992. Notable exceptions include the cancellation of aerial surveys for coho salmon on the Taku River, and the termination of the Little Tatsamenie coho CWT project. New programs include matched parasite and scale sampling in the District 111 sockeye fishery to improve stock identification accuracy, and a major radio-tagging program for studying Taku River coho salmon.

Joint Transboundary Technical Committee. Transboundary River Salmon Production, Harvest and Escapement Estimates, 1991. TCTR (93)-1. January, 1993.

Estimates of catches and escapements of Pacific salmon returning to the transboundary Stikine, Taku, and Alsek Rivers for 1991 are presented and compared with historical patterns. Relevant information pertaining to the management of appropriate U.S. and Canadian fisheries is presented and the use of in-season management models is discussed.

Beginning with this report, chinook salmon escapement data are presented using index counts only. In previous reports, through 1990, various expansion factors were applied to index counts to estimate escapements. The Transboundary Technical Committee (TTC) concluded that index counts were a more appropriate measure of escapement since there is little or no scientific basis for the expansion factors.

The 1991 Stikine sockeye run was estimated at 154,500 fish, of which 59,500 fish were harvested and 95,000 escaped to spawn. The estimated U.S. commercial and test fishery catches of Stikine stocks were 33,700 and 700 fish, respectively; the Canadian commercial, Indian food, and test fishery catches were 18,300, 4,400, and 2,400 fish. The Stikine Management Model correctly predicted a larger than average portion of the run being from the Tahltan stock. Weekly in-season model forecasts ranged from 72,400 to 192,200 sockeye salmon; the final in-season prediction was 112,600 fish. The model prediction exceeded the total run size during the first two weeks of July, was close to the post-season run estimate during the third week in July, and decreased thereafter to a final estimate approximately 27% under the post-season estimate of 91,000 Tahltan and 63,500 non-Tahltan fish. Total allowable catch (TAC) estimates are derived from predictions of the Stikine sockeye run. During the directed sockeye fishery in-season, harvest estimates for both Canada and the U.S. were less than the in-season TAC allowed under the Pacific Salmon Treaty. Catches were well below the allowable harvest range estimated from the post-season analysis. The escapement of 50,100 fish to Tahltan Lake was 36% above the 1986 to 1990 average, and above the 20,000 to 40,000 goal established by the TTC. The estimated escapement of 44,900 non-Tahltan Stikine sockeye salmon was also above the 20,000 to 40,000 fish goal.

The chinook catch in Canadian fisheries in the Stikine River was 2,200 fish, 4% less than the 1981 to 1990 average, with 51% harvested in commercial fisheries and 49% harvested in the Indian food fishery. The U.S. marine catch of chinook salmon in the District 106 and 108 mixed stock gillnet fisheries was 3,600 fish, approximately 2.4 times the 1981 to 1990 average catch. The chinook spawning escapement through the Little Tahltan weir in 1991 was 4,500 large adults, close to the 1985 to 1990 average but below the interim escapement goal of 5,300 fish.

The U.S. marine harvest of Stikine River coho salmon is not known since there is no stock identification program in place; however, total mixed stock coho catches in District 106 and 108 were more than three and two times the 1981 to 1990 averages, respectively. An estimated 32.5%

of District 106 and 21.8% of District 108 coho harvests were of Alaska hatchery origin. The Canadian in-river coho catch was 2,600, less than the Treaty entitlement of 4,000 fish. Coho aerial survey escapement counts were above average.

The Stikine River runs of pink and chum salmon are typically very small. In 1991, Canadian catches of these two species were approximately 400 and 200 fish, respectively. These were 34% and 39% of the 1981 to 1990 averages for pink and chum salmon, respectively. The steelhead catch was estimated to be 72 fish.

The 1991 total Taku sockeye run was estimated at 256,100 fish and included an estimated catch of 131,000 fish and an escapement of 125,100 fish. The U.S. harvest of Taku sockeye stocks, estimated by analysis of scale patterns, was 103,400 fish in the commercial fishery and 700 in the test fishery. An additional 1,500 Taku sockeye salmon were caught in the U.S. in-river personal use fishery. Canadian commercial, Indian food, and test fishery catches were 25,100, 100, and 200 fish, respectively. The Treaty defines harvest sharing of Canadian origin Taku River sockeye salmon as 18% of the TAC to Canada and 82% to the U.S. Since the escapement goal set by the TTC is expressed as a range, 71,000 to 80,000 fish, the resulting TAC is also expressed as a range. In 1991, Canada took 13% to 14% and the U.S. took 57% to 60% of the TAC. The estimated spawning escapement for Taku sockeye salmon exceeded the upper level of the escapement goal range.

The chinook catch in the Canadian commercial fishery in the Taku River was 1,600 fish, three times the 1981 to 1990 average. The chinook catch in the U.S. District 111 mixed stock fishery was 3,200 fish, 47% above the 1981 to 1990 average. Above average escapements were observed in most of the Taku River chinook index tributaries in 1991. The combined aerial survey count of six index tributaries was 10,200 fish, which is 20% above the 1985 to 1990 average of 8,500 fish, but below the revised index escapement goal of 13,200 chinook salmon.

The Taku coho run was strong in 1991. The U.S. harvest of 126,400 coho salmon in the District 111 mixed stock fishery was a record, over three times the 1981 to 1990 average, and almost double the previous record catch of 67,300 coho taken in 1990. An estimated 23% (28,700 fish) of the District 111 coho catch was of local hatchery origin. The Canadian commercial coho catch was 3,400 coho, close to the Treaty limit of 3,000 fish. An additional 2,000 coho were taken in the Canadian in-river test fishery. The mark-recapture estimate of the above border escapement was approximately 130,000 fish which was above the interim escapement goal range of 27,500 to 35,000 fish.

The catch of pink salmon in District 111 was 74,200 fish, approximately 68% below the 1981 to 1990 odd-year average catch. Low catches were assumed to be caused by depressed pink salmon prices and the extremely small size of the fish which reduced their catchability in gillnets. The Canadian commercial in-river catch of pink salmon was also below average at 300 fish. The escapement of pink salmon to the Taku River was an estimated 576,000 fish, above the interim escapement goal of 150,000 to 200,000 fish.

The catch of chum salmon in the District 111 fishery was 161,200 fish, composed of 147,400 summer run fish (prior to mid-August) and 13,800 fall run fish. The catch of summer chum salmon was composed of coastal Alaskan wild and hatchery stocks and was a record. The catch of fall chum salmon was composed of wild Taku River and Port Snettisham stocks and was 64% below the 1981 to 1990 average. The Canadian catch of chum salmon was below average at just two fish reported.

The sockeye run to the Alsek River was average. The U.S. Dry Bay catch was 17,500 sockeye salmon, 8% above the 1981 to 1990 average catch. The Canadian sport fishery catch of 300 sockeye salmon was approximately 31% below the 1981 to 1990 average while the Indian food fishery catch of 2,100 fish was 3% below average. The count of 19,000 sockeye salmon through the Klukshu weir was about equal to the 1986 to 1990 average, as were both the early (1,900 fish) and late (17,100) components of the run. The escapement past the Indian food fishery was estimated at 17,100 fish.

The chinook run to the Alsek River was about average. The U.S. Dry Bay catch of 100 fish was approximately one-third the 1981 to 1990 average. The combined Canadian sport and Indian food fishery catch of 900 fish was nearly twice the 1981 to 1990 average. The chinook count through the Klukshu River weir, 2,500 fish, was above the 1985 to 1990 average of 2,200 fish, but below the interim escapement goal of 4,700 chinook salmon.

The coho run to the Alsek River was above average. The U.S. Dry Bay catch of 6,000 fish was 15% above the 1981 to 1990 average and the combined Canadian Indian food and sport fishery catch of 500 fish was five times the 1981 to 1990 average. The Klukshu weir count of 8,500 coho salmon was three times the previous record count.

The U.S. Dry Bay pink and chum salmon catches of 0 and 100 fish, respectively, were near average for pink salmon but only 12% of the 1981 to 1990 average for chum salmon. There are no recorded Canadian catches of pink or chum salmon in the Alsek River.

F. JOINT TECHNICAL COMMITTEE ON DATA SHARING

No reports were finalized for publication by this Committee during this reporting period.



Publications of the Pacific Salmon Commission

PART VI

PUBLICATIONS OF THE PACIFIC SALMON COMMISSION

Documents listed herein are available to domestic fishery agencies of Canada and the United States, research organizations, libraries, scientists and others interested in the activities of the Commission, through the offices of the Secretariat, 600 - 1155 Robson Street, Vancouver, B.C., V6E 1B5. Photocopying charges may be levied for documents which are out of print.

Documents listed here are those which were published during the period covered by this report. For previous publications, please refer to the Pacific Salmon Commission 1989/90 Fifth, 1990/91 Sixth and 1991/92 Seventh Annual Reports, or contact the Pacific Salmon Commission Library.

A. ANNUAL REPORTS

7. Pacific Salmon Commission 1991/92 Seventh Annual Report. November 1992.

This report contains a summary account of the Commission's seventh year of operation.

B. REPORTS OF JOINT TECHNICAL COMMITTEES

i. Joint Chinook Technical Committee

23. TCCHINOOK (92)-3 - *Long-Term Research Plans for Coastwide Pacific Chinook Stocks.* October 23, 1992.

24. TCCHINOOK (92)-4 - *1991 Annual Report.* November 17, 1992.

25. TCCHINOOK (93)-1 - *Chinook Technical Report on Preliminary 1992 Catch and Escapement.* February 11, 1993.

ii. Joint Chum Technical Committee

16. TCCHUM (93)-1 - *Final 1991 Post Season Summary Report.* March, 1993.

iii. Joint Coho Technical Committee

No reports were finalized for publication during this reporting period.

iv. Joint Northern Boundary Technical Committee

13. TCNB (92)-1 - *U.S./Canada Northern Boundary Area 1992 Salmon Fisheries Management Report and 1993 Preliminary Expectations.* November, 1992.

v. Joint Transboundary Technical Committee

20. TCTR (92)-2 - *Salmon Management and Enhancement plans for the Stikine, Taku and Alsek Rivers, 1992.* June, 1992.
21. TCTR (93)-1 - *Transboundary River Salmon Production, Harvest and Escapement Estimates, 1991.* January, 1993.

vi. Joint Technical Committee on Data Sharing

No reports were finalized for publication during this reporting period.

C. REPORTS OF THE FRASER RIVER PANEL

6. *Report of the Fraser River Panel to the Pacific Salmon Commission on the 1991 Fraser River Sockeye and Pink Salmon Fishing Season.* PSC Staff. In preparation.
7. *Report of the Fraser River Panel to the Pacific Salmon Commission on the 1992 Fraser River Sockeye Salmon Fishing Season.* PSC Staff. In preparation.

**D. TECHNICAL REPORT SERIES OF THE
PACIFIC SALMON COMMISSION**

No reports in this series were finalized for publication during this reporting period.

**E. PUBLICATIONS BY PACIFIC SALMON COMMISSION
SECRETARIAT STAFF**

No reports in this series were finalized for publication during this reporting period.

**F. REPORTS OF THE INTERNATIONAL
PACIFIC SALMON FISHERIES COMMISSION**

Responsibility for maintenance of the library of the International Pacific Salmon Fisheries Commission, on its termination December 31, 1985, was transferred to the Pacific Salmon Commission. Documents in the library include historical archival papers which are available to researchers and other interested parties through contact with the Pacific Salmon Commission's librarian.

Publication of John F. Roos' History of the International Pacific Salmon Fisheries Commission, and P. Gilhousen's Estimation of Fraser River Sockeye Escapements ended all publication series of the International Pacific Salmon Fisheries Commission. Copies of all in-print Progress Reports and Bulletins of the International Pacific Salmon Fisheries Commission are available free of charge through the Library of the Pacific Salmon Commission. Copies of the History of the International Pacific Salmon Fisheries Commission may also be ordered through the Library of the Pacific Salmon Commission.

G. DOCUMENTS SUBMITTED BY THE PARTIES

In compliance with provisions of the Treaty, the Parties provide annual post-season fishery reports and updates on their respective salmonid enhancement programs to the Commission. Documents received during 1992/93 were:

1. *Preliminary 1992 Post-Season Report for United States Salmon Fisheries of Relevance to the Pacific Salmon Treaty.* United States Section, Pacific Salmon Commission. December, 1992.
2. *1992 Post-Season Report for Canadian Treaty Limit Fisheries.* Canada Department of Fisheries and Oceans. December, 1992.
3. *Preliminary Annual Report on the Salmonid Enhancement Activities of the United States in the Areas of the Pacific Salmon Treaty.* United States Section, Pacific Salmon Commission. December, 1992.
4. *Operations and Plans for the Salmonid Enhancement Program in British Columbia and the Yukon Territory.* Canada Department of Fisheries and Oceans. January, 1993.

Report of the Auditors for 1990/91

PART VII
AUDITORS' REPORT AND FINANCIAL STATEMENTS
FOR THE PERIOD APRIL 1, 1992 TO MARCH 31, 1993

AUDITORS' REPORT TO THE COMMISSIONERS

We have audited the balance sheet of Pacific Salmon Commission as at March 31, 1993 and the statements of revenue and expenditures, fund balances and changes in financial position for the year then ended. These financial statements are the responsibility of the Commission's Management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by the Commission, as well as evaluating the overall financial statement presentation.

In our opinion, these financial statements present fairly, in all material respects, the financial position of the Commission as at March 31, 1993 and the results of its operations and the changes in its financial position for the year then ended in accordance with the Financial Regulations of the Commission applied on a basis consistent with that of the preceding year.

Leat Marwick Thorne
Chartered Accountants

New Westminster, Canada
May 27, 1993

PACIFIC SALMON COMMISSION

Balance Sheet

March 31, 1993, with comparative figures for 1992

	1993	1992
Assets		
General fund:		
Current assets:		
Cash and term deposits	\$ 1,056,757	\$ 460,638
Accounts receivable	6,930	19,454
Interest receivable	10,219	6,457
Prepaid expenses	30,506	22,227
	1,104,412	508,776
Note receivable	85,982	96,415
	\$ 1,190,394	\$ 605,191
Working capital fund:		
Cash and term deposit	\$ 88,911	\$ 94,756
Fixed asset fund:		
Fixed assets (note 2)	\$ 227,735	\$ 226,588
International Pacific Salmon Fisheries Commission Trust Fund:		
Term deposits	\$ 73,583	\$ 74,454
Liabilities and Fund Balances		
General fund:		
Current liabilities:		
Accounts payable and accrued liabilities	\$ 132,239	\$ 118,996
Deferred revenue (note 3)	400,000	-
Fund balance (note 4):		
Reserves	658,155	486,195
	\$ 1,190,394	\$ 605,191
Working capital fund:		
Fund balance	\$ 88,911	\$ 94,756
Fixed asset fund:		
Fund balance	\$ 227,735	\$ 226,588
International Pacific Salmon Fisheries Commission Trust Fund:		
Fund balance	\$ 73,583	\$ 74,454

On behalf of the Commission:

Chair, Standing Committee on Finance and Administration

Vice-Chair, Standing Committee on Finance and Administration

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION

General Fund

Statement of Revenue and Expenditures

Year ended March 31, 1993, with comparative figures for 1992

	1993	1992
Revenue:		
Contributions from contracting parties	\$ 1,673,000	\$ 1,650,000
Interest	61,328	81,728
Test fishing	263,195	969,624
	<u>1,997,523</u>	<u>2,701,352</u>
Expenditures:		
Salaries and employee benefits	1,259,269	1,342,997
Travel and transportation	60,729	57,004
Rents and communication	76,125	89,538
Printing and reproductions	9,604	16,801
Contract services	98,176	227,565
Materials and supplies	19,866	47,406
Test fishing	223,690	807,000
Loss (gain) on disposal of fixed assets	(22,831)	3,109
	<u>1,724,628</u>	<u>2,591,420</u>
Excess of revenue over expenditures	<u>272,895</u>	<u>109,932</u>
	<u>\$ 1,997,523</u>	<u>\$ 2,701,352</u>

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION

Working Capital Fund

Statement of Revenue and Expenditures

Year ended March 31, 1993, with comparative figures for 1992

	1993	1992
Revenue:		
Interest	\$ 3,879	\$ 6,330
Expenditures:		
Meeting expenses	—	6,012
Pearse inquiry	9,724	—
	9,724	6,012
Excess (deficiency) of revenue over expenditures	\$ (5,845)	\$ 318

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION

International Pacific Salmon Fisheries Commission Trust Fund

Statement of Revenue and Expenditures

Year ended March 31, 1993, with comparative figures for 1992

	1993	1992
Revenue:		
Interest earned on term deposit	\$ 2,609	\$ 7,879
Book sales	4,209	17,456
	6,818	25,335
Expenditures:		
Publications	2,801	96,235
Past service costs	4,888	—
	7,689	96,235
Excess of expenditures over revenue	\$ (871)	\$ (70,900)

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION

Statement of Fund Balances

Year ended March 31, 1993, with comparative figures for 1992

	1993	1992
General fund:		
Fund balance, beginning of year	\$ 486,195	\$ 429,707
Transfer to funds:		
Fixed asset fund	(100,935)	(53,444)
Excess of revenue over expenditures	272,895	109,932
Fund balance, end of year	\$ 658,155	\$ 486,195
Working capital fund:		
Fund balance, beginning of year	\$ 94,756	\$ 94,438
Excess (deficiency) of revenue over expenditures	(5,845)	318
Fund balance, end of year	\$ 88,911	\$ 94,756
Fixed asset fund:		
Fund balance, beginning of year	\$ 226,588	\$ 273,972
Transfer from General Fund	100,935	53,444
Depreciation	(99,788)	(100,828)
Fund balance, end of year	\$ 227,735	\$ 226,588
International Pacific Salmon Fisheries Commission Trust Fund:		
Fund balance, beginning of year	\$ 74,454	\$ 145,354
Excess of expenditures over revenue	(871)	(70,900)
Fund balance, end of year	\$ 73,583	\$ 74,454

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION

Statement of Changes in Financial Position

Year ended March 31, 1993, with comparative figures for 1992

	1993	1992
Working capital fund:		
Financing activity:		
Excess (deficiency) of revenue over expenditures	\$ (5,845)	\$ 318
Cash and term deposits, beginning of year	94,756	94,438
Cash and term deposits, end of year	\$ 88,911	\$ 94,756
Fixed asset fund:		
Operating activity:		
Item not affecting working capital:		
Loss (gain) on sale of fixed asset	\$ (22,831)	\$ 3,109
Investing activities:		
Additions to fixed assets	(110,292)	(73,335)
Proceeds on sale of fixed assets	32,188	16,782
Cash used for investing activities	(78,104)	(56,553)
Financing activity:		
Transfer from general fund	100,935	53,444
	(22,831)	3,109
Increase in cash position during the year	-	-
Cash position, beginning of year	-	-
Cash position, end of year	\$ -	\$ -
General fund:		
Operating activities:		
Excess of revenue over expenditures	\$ 272,895	\$ 109,932
Add (deduct):		
Net changes in non-cash working capital balances relating to operations	413,726	(6,574)
Cash provided by operations	686,621	103,358
Financing activity:		
Transfer to fixed asset fund	(100,935)	(53,444)
Investing activities:		
Decrease in note receivable	10,433	34,092
Increase in cash during the year	596,119	84,006
Cash and term deposits, beginning of year	460,638	376,632
Cash and term deposits, end of year	\$ 1,056,757	\$ 460,638

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION

Statement of Changes in Financial Position

Year ended March 31, 1993, with comparative figures for 1992

	1993	1992
International Pacific Salmon Fisheries Commission Trust Fund:		
Operating activities:		
Excess of expenditures over revenue	\$ (871)	\$ (70,900)
Decrease in cash during the year	(871)	(70,900)
Cash and term deposits, beginning of year	74,454	145,354
Cash and term deposits, end of year	\$ 73,583	\$ 74,454

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION

Notes to Financial Statements

Year ended March 31, 1993, with comparative figures for 1992

Nature of organization:

The Pacific Salmon Commission was established by Treaty between the Governments of Canada and the United States of America to promote cooperation in the management, research and enhancement of Pacific salmon stocks. The Treaty was ratified on March 18, 1985 and the Commission commenced operations on September 26, 1985.

Effective January 1, 1987 and pursuant to a decision of the International Pacific Salmon Fisheries Commission, balances of funds belonging to that Commission and commitments against those funds were transferred to the Pacific Salmon Commission for administrative purposes.

1. Significant accounting policies:

(a) Fund accounting:

The General Fund represents funds provided annually through contributions from the Contracting Parties. Any unappropriated balance remaining at the end of one fiscal year is used to offset the contributions by the Parties in the following year.

The Fixed Assets Fund represents the cumulative results of fixed asset transactions. Depreciation is charged to the Fixed Assets Fund.

The Working Capital Fund represents monies contributed by the Parties to be used temporarily pending receipt of new contributions from the Parties at the beginning of a fiscal year, or for special programs not contained in the regular budget but approved during the fiscal year. Any surplus above the fixed limit in the account at the end of the fiscal year is transferred to the General fund and is treated as income.

(b) Basis of accounting:

The operations of the Commission are generally accounted for on an accrual basis except that purchase order expenditures are recognized at the time that the commitment for goods and services are made, rather than at the time that the goods or services are delivered.

(c) Fixed assets:

Fixed assets are stated at cost. Costs of repairs and replacements of a routine nature are charged as a current expenditure while those expenditures which improve or extend the useful life of the assets are capitalized. Depreciation is provided using the straight-line method of rates sufficient to amortize the costs over the estimated useful lives of the assets. The rates of depreciation used on a annual basis are:

Automobiles	20%
Boats	20%
Computer equipment and software	30%
Equipment	20%
Films	33%
Furniture and fixtures	10%
Leasehold improvements	10%

PACIFIC SALMON COMMISSION

Notes to Financial Statements (continued)

Year ended March 31, 1993, with comparative figures for 1992

1. Significant accounting policies: (continued)

(d) Income taxes:

The Commission is a non-taxable organization under the Privileges and Immunities (International Organizations) Act (Canada).

(e) Foreign exchange translation:

Transactions originating in foreign currencies are translated at the exchange rate prevailing at the transaction dates. Assets and liabilities denominated in foreign currency at the balance sheet date are translated to equivalent Canadian amounts at the current rate of exchange.

2. Fixed assets:

			1993	1992
	Cost	Accumulated depreciation and amortization	Net book value	Net book value
Automobiles	\$ 83,157	\$ 72,716	\$ 10,441	\$ 3,442
Boats	77,446	72,697	4,749	5,321
Computer equipment	353,164	292,747	60,417	53,788
Equipment	315,182	271,273	43,909	30,787
Films	1,800	-1,800	-	-
Furniture and fixtures	229,656	135,226	94,430	118,347
Computer software	69,567	63,591	5,976	5,137
Leasehold improvements	19,532	11,719	7,813	9,766
	\$ 1,149,504	\$ 921,769	\$ 227,735	\$ 226,588

3. Deferred revenue:

Deferred revenue consists of cash contributions received from a contracting party in the current year that represent revenues for the year ended March 31, 1994.

4. Fund balance:

The Commission has approved a carryover of the unexpended funds to be utilized as follows:

	1993	1992
(a) Continuing operations	\$ 541,667	\$ 367,553
(b) Reserve for note receivable	85,982	96,415
(c) Reserve for prepaid expenses	30,506	22,227
	\$ 658,155	\$ 486,195

PACIFIC SALMON COMMISSION

Notes to Financial Statements (continued)

Year ended March 31, 1993, with comparative figures for 1992

5. Pension plan:

The Commission maintains a defined benefit pension plan for its employees. Actuarial valuations of this pension plan are carried out triennially and provide estimates of present value of accrued pension benefits at a point in time, calculated on the basis of various assumptions with respect to pension plan costs and rates of return on investments.

At the date of the most recent actuarial valuation, January 1, 1993, the present value of accrued benefits is \$2,647,930 and the market value of related assets available to provide these benefits is \$2,548,273 leaving an unfunded liability of \$99,657.

The International Fisheries Commissions Pension Society ("the Society") after review of the above noted valuation recalculated the potential unfunded liability based on different and more conservative assumptions. Had the valuation been conducted using the assumptions of the Society the unfunded liability would be \$483,006. This additional unfunded liability is attributable to current pensioners and not to active employees.

Appendices

Appendix A
Letter of Transmittal
to Governments regarding fishery
regimes for 1993

The Honourable Perrin Beatty, P.C., M.P.
Secretary of State for External Affairs
Ottawa, Ontario
K1A 0G2

The Honourable Ross Reid, P.C., M.P.
Minister of Fisheries and Oceans
Ottawa, Ontario
K1A 0E6

The Honorable Warren M. Christopher
Secretary of State
U.S. Department of State
2201 C Street N.W.
Washington, D.C.
20520

The Honorable Ronald H. Brown
Secretary of Commerce
U.S. Department of Commerce
14th and Constitution Avenue N.W.
Washington, D.C.
20230

Dear Sir:

I have the honour to report to you on understandings reached by the Pacific Salmon Commission regarding certain of the fishery regimes specified in Annex IV of the Pacific Salmon Treaty.

In accordance with Article XIII, Paragraph 2 of the Treaty, the Commission recommends implementation of the following arrangements for 1993:

1. Transboundary Rivers - Annex IV, Chapter 1.

With respect to the Transboundary rivers, Canada and the U.S. agree to continue the expired annex provision through 1993. Discussions directed towards adjusting agreed fishing regimes to improve access to enhanced sockeye returns will continue prior to the 1994 season.

2. Northern B.C. and S.E. Alaska - Annex IV, Chapter 2.

With respect to Portland Canal chum salmon, Canada and the U.S. agree to prohibit net fisheries in relevant areas as recommended by the bilateral Northern Panel on February 15, 1993. In addition, they agree to continue discussion of restoration and enhancement programs for northern boundary chum salmon.

3. Fraser River Sockeye and Pink Salmon - Annex IV, Chapter 4.

Canada and the U.S. agree that the management regime for the Fraser sockeye and pink salmon fishery in 1993 is as follows:

a) For sockeye salmon:

- i) When the estimated TAC is less than 12.062 million fish, the U.S. catch in the Panel area shall not exceed 20 percent of the TAC;
- ii) When the estimated TAC is between 12.062 and 15 million fish, the U.S. catch in the Panel area shall not exceed 2.412 million fish plus 10 percent of the TAC between 12.062 and 15 million fish;
- iii) When the estimated TAC is greater than 15 million fish, the U.S. catch in the Panel area shall not exceed 2.706 million fish plus 5 percent of the TAC above 15 million fish, but the catch shall not exceed 2.806 million fish;
- iv) Differences concerning catches of Fraser sockeye caught outside of the Panel area remain unresolved and will be addressed in connection with negotiations on 1994 arrangements.
- v) The U.S. will not fish in 1993 on the early Stuart run in order to provide adequate escapement and viable fisheries in the upper portion of the Fraser River drainage.

b) For pink salmon the total U.S. catch shall be 25.7% of the TAC, but shall not exceed 3.6 million fish.

- c) Calculation of 1993 TACs for Fraser River sockeye and pink salmon, and any catch overages or underages in 1993, shall be as specified in Annex IV, Chapter 4 of the Treaty and as specified in previous agreements by the Fraser Panel.
- d) The dispute referred to in Canada's Note 189 of November 24, 1992 and the Department of State's Note of December 8, 1992 remains unresolved and will be addressed in connection with negotiations on 1994 arrangements.
- e) Based on these arrangements, the Fraser Panel shall develop fishery management plans for the Fraser Panel area as soon as possible.

4. Coho Salmon - Annex IV, Chapter 5.

For 1993, Canada will limit its WCVI coho troll fishery to 1.7 million. Other coho chapter provisions remain unchanged.

5. Southern B.C. and Washington State Chum Salmon - Annex IV, Chapter 6.

With respect to southern chum, Canada and the U.S. agree to continue the expired Annex provisions through 1993.

The Commission expects that the relevant management agencies will manage fisheries under their responsibility consistent with these agreements.

The Commission respectfully requests your early approval of these recommendations.

Yours truly,

Yves Fortier, Chair
Pacific Salmon Commission

Appendix B

Revised Annex IV to the Pacific Salmon Treaty effective May 17, 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 fishers 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) 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.
 - 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.
- (ii) 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 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 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;
 - 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;
 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.
- 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:

- (i) 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 fishers 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.

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.
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.

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 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.

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

(i) 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	

(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;
 - (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,
 - (iii) 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.

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;
 - (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 endeavour to limit incidental coho catches in fisheries targeting on other species.
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 I. 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 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.

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.

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).

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.

Appendix C

Status of Agreed 1991-1992 Work Assignments, as at October

Due Date	Group	Task	Status
(a) November 1991	Northern Boundary Tech Comm	Interim progress report-northern boundary area sockeye, pink & chum status review distribution prior to the December meeting.	The Northern Boundary stock status report is in final editing stage and will be sent to the Secretariat for printing and
(b) December 1991	Parties	Develop 7/7A 1990 interception estimates; criteria for enhancement re compensation 7/7A	Discussion is continuing in the Southern Panel regarding Area 7/7A 1990 interception estimates and criteria for compensation through enhancement. Data have been exchanged and work is in progress on methodology. With respect to task (i) concerning assessment of new U.S. production to Area 7/7A, a base period has not been agreed, but work is continuing.
(c) December 1991	Northern Panel	Begin a planning process Panel re: opportunities/ options for improved management, conservation & enhancements in the N. Boundary Area preparatory for the Dec. 1991 PSC meetings	Work on a Northern Panel planning process can begin as soon as the stock status report is completed.
(d) December 1991	Chinook Working Group	Chinook workshop follow-up; progress report & work Group plan to complete tasks leading to long range management approach	The Chinook working group has not been authorized to meet by the Canadian Section. Direction on the assignment is now being sought from the Commission.
(e) December 1991	United States	Alaska hatchery add-ons: comp. procedures re risk adj. factor; impacts on rebuilding, etc. TCCHINOOK (92)-1.	Analysis of Alaska's proposed risk adjustment factor has been reported in the Chinook Technical Committee's report
(f) Undated - following PSARC review	Canada	Report on the effectiveness PSARC review of 1988, 1989, & 1990 management measures to reduce harvest rates on depressed chinook stocks & provide data on harvests, harvest rates, chinook stock composition & management measures for Georgia Strait & Area 20 fisheries	Georgia Strait management regime analysis expected to be completed internally by the end of the year. PSARC review will be followed by consultations with Canadian industry, and then the report will be forwarded to the Commission in the spring of 1993.
(g) January 1992	Canada	Provide tech data on term-area exclusion fisheries in 1991	Canadian report on terminal area exclusions will be available for the post-season meeting.

Appendix D

Appointment of Officers for 1992/93

Effective December 2, 1992, the new slate of officers for the Pacific Salmon Commission was identified as follows:

(a)	Commission Chair	Can.	P.S. Chamut
(b)	Commission Vice-Chair	U.S.	D.A. Colson
(c)	Fraser River Panel Chair	Can.	F. Fraser
(d)	Fraser River Panel Vice-Chair	U.S.	D. Austin
(e)	Northern Panel Chair	Can.	N. Lemmen
(f)	Northern Panel Vice-Chair	U.S.	K.C. Duffy
(g)	Southern Panel Chair	U.S.	R.W. Whitener
(h)	Southern Panel Vice-Chair	Can.	P. Sprout
(i)	Meetings of the Northern and Southern Panels		
	- Chair	U.S.	R.W. Whitener
(j)	Meetings of the Fraser and Southern Panels		
	- Vice-Chair	Can.	N. Lemmen
(k)	Stan. Comm. on F&A		
	- Chair	Can.	F. Fraser
(l)	Stan. Comm. on F&A		
	- Vice-Chair	U.S.	R.W. Whitener
(m)	Stan. Comm. on R&S		
	- Chair	Can.	P.S. Chamut
(n)	Stan. Comm. on R&S		
	- Vice-Chair	U.S.	R. Rousseau
		U.S.	N.K. Brigham
		Can.	S. Paine

Appendix E

Approved Budget FY 1993/94

1. Income

A. Contribution from Canada	\$ 800,000
B. Contribution from U.S.	<u>800,000</u>
Sub-total	\$1,600,000
C. Carry-over from 1992/93	469,276
D. Interest	<u>20,000</u>
E. Total Income	<u>2,089,276</u>

2. Expenditures

A. 1. Permanent Salaries & Benefits	\$1,245,288
2. Temporary Salaries & Benefits	<u>240,660</u>
3. Total Salaries & Benefits	1,485,948
B. Travel	77,875
C. Rents, Communications, Utilities	124,039
D. Printing and Publication	18,700
E. Contractual Services	266,773
F. Supplies and Materials	46,620
G. Equipment	<u>43,280</u>
H. Total Expenditures	<u>\$2,063,235</u>

3. Balance (Deficit) \$ 26,041

4. Test-Fishing Program

A. Forecast Revenues	\$ 861,207
B. Forecast Expenditures	<u>734,886</u>
C. Forecast Balance	<u>\$ 126,321</u>

5. Total Balance (Deficit) \$ 152,362

Appendix F

Pacific Salmon Commission Approved Meeting Schedule 1993/94 and 1994/95

1. 1993/94

- (a) Fall Executive Session
October 19-21, 1993
Olympia, Washington
- (b) Post-Season Meeting
November 29-December 3, 1993
Four Seasons Hotel
Vancouver, B.C.
- (c) Panel/Commission Meeting
January 24-28, 1994
Portland Hilton Hotel
Portland, Oregon
- (d) Ninth Annual Meeting
February 7-11, 1994
Four Seasons Hotel
Vancouver, B.C.

2. 1994/95

- (a) Fall Executive Session
October 18-20, 1994
Kamloops, B.C.
- (b) Post-Season Meeting
November 28-December 2, 1994
Four Seasons Hotel
Vancouver, B.C.
- (c) Panel/Commission Meeting
January 23-27, 1994
Four Seasons Hotel
Vancouver, B.C.
- (d) Tenth Annual Meeting
February 6-10, 1995
Portland Hilton
Portland, Oregon

Appendix G

Pacific Salmon Commission Secretariat Staff as of March 31, 1993

EXECUTIVE OFFICE

Ian Todd
Executive Secretary

Janice Abramson
Secretary

Vicki Ryall
Meeting Planner

Teri Tarita
Librarian/Records Administrator

FINANCE & ADMINISTRATION

Kenneth N. Medlock
Finance and Administration

Bonnie Dalziel
Accountant

FISHERY MANAGEMENT

James C. Woodey
Chief Biologist

Jim Gable
Head, Racial Identification Group

Jim Cave
Head, Stock Monitoring Group

Mike Lapointe
Project Biologist, Sockeye

Valerie Craig
Project Biologist, Test-Fishing

Bruce White
Project Biologist, Pinks

Peter Cheng
Project Biologist, Acoustics

Keith Forrest
Project Biologist, Racial Database

Ian Guthrie
Head, Biometrics

Carol Lidstone
Scale Analyst

Doug Stelter
Statistician

Jullie Parkin
Assistant Scale Analyst

Kathy Mulholland
Computer Services

Holly Derham
Assistant Scale Analyst

Appendix H

Membership Lists for Standing Committees, Panels, Joint Technical Committees and other Appointments as of March 31, 1993

CANADA

UNITED STATES

1. STANDING COMMITTEE ON FINANCE AND ADMINISTRATION

Mr. Patrick S. Chamut (Chair)
Ms. Joyce Quintal-McGrath
Mr. C.C. (Bud) Graham
Ms. Heather James

Mr. Rollie Rousseau (Vice-Chair)
Mr. Charles Meacham Jr.
Mr. Charles K. Walters
Mr. James Heffernan
Mr. W. Ron Allen
Mr. John L. McGruder

Staff: I. Todd (ex. officio)

Editorial Board

Mr. C.C. (Bud) Graham

Dr. Norma Jean Sands

Staff: I. Todd

2. STANDING COMMITTEE ON RESEARCH AND STATISTICS

Ms. Stephani Paine (Vice-Chair)
Dr. Brian Riddell
Mr. David Peacock
Mr. Robin Harrison
Mr. Ron Kadowaki
Mr. Don Anderson
Mr. Wayne Saito
Mr. Louis Lapi
Dr. Jake Rice
Dr. Dick Beamish (alternate to J. Rice)
Dr. Don Noakes (alternate to J. Rice)

Ms. N. Kathryn Brigham (Chair)
Dr. Norma Jean Sands
Mr. Ben Van Alen
Dr. Don Bevan
Dr. James C. Olsen
Dr. Gary S. Morishima
Mr. Gary R. Graves
Mr. Michael Grayum
Mr. James B. Scott
Dr. John E. Clark

Research and Statistics Working Group

Mr. A.W. (Sandy) Argue
Ms. Susan Steele

Dr. Norma Jean Sands
Mr. Larry Rutter
Dr. Phil Mundy
Mr. Thomas D. Cooney
Mr. Rich Lincoln (alternate to Cooney)
Mr. Charles K. Walters

Staff: I. Todd (ex. officio)
Ian Guthrie (ex. officio)

Ad Hoc Joint Interceptions Committee

Mr. A.W. (Sandy) Argue (Co-Chair)
Mr. Ken Wilson
Ms. Barb Snyder
Ms. Stephani Paine

Dr. Gary S. Morishima (Co-Chair)
Dr. Richard Moore
Mr. Ben Van Alen

Ad Hoc Joint Objectives and Goals Committee

Mr. C.C. (Bud) Graham (Co-Chair)
Mr. Colin N. MacKinnon
Ms. Stephani Paine

Mr. Thomas D. Cooney (Co-Chair)
Ms. N. Kathryn Brigham
Mr. Larry Rutter
Mr. Kevin C. Duffy

3. FRASER RIVER PANEL

Mr. Al F. Lill (Chair)
Mr. Ernie Crey
Mr. Mike Forrest
Mr. Jim Hill
Ms. Ruth Kendall
Mr. Larry Wick

Mr. A. Dennis Austin (Vice-Chair)
Ms. Lorraine Loomis
Mr. Robert P. Zuanich
Mr. Rollie A. Schmitten

Fraser River Panel Alternates

Mr. Vince Fiamengo
Mr. Mike Griswold
Ms. Kaarina McGivney
Mr. Mike Medenwaldt
Mr. Russell Nugent

Mr. W. Ron Allen
Mr. William L. Robinson
Mr. Robert Suggs

4. SOUTHERN PANEL

Mr. Paul Sprout (Vice-Chair)
Mr. Tom Davis
Mr. Ron Fowler
Mr. William Green
Mr. John Legate

Mr. Thomas D. Cooney (Chair)
Mr. Burnell Bohn
Mr. J. Gary Smith
Mr. Robert Haindel

Southern Panel Alternates

Mr. Roy Alexander
Mr. Bob Duncan
Mr. Warren Peterson
Ms. Jane Reid
Ms. Susan Steele
Ms. Geraldine (Danni) Tribe

Dr. Donald O. McIsaac
Mr. Mark Cedergreen
Mr. Terry R. Williams
Mr. Jerry R. Van Meter
Mr. David B. Sones

5. NORTHERN PANEL

Mr. Norm Lemmen (Chair)
Mr. Mark Forand
Ms. Nancy James
Mr. William Kristmanson
Mr. Alan Ronneseth
Ms. Mandy Wade

Mr. Kevin C. Duffy (Vice-Chair)
Mr. Daniel V. Hickman
Mr. Arnold Enge
Mr. Steven Pennoyer
Mr. John Winther
Mr. John P. Peckham

Northern Panel Alternates

Mr. Elmer Derrick
Mr. Rick Haugan
Mr. Ray Kendel
Ms. Joan Lemmers
Mr. Gary Miltenberger
Mr. Chris Dragseth

Mr. Scott Marshall
Mr. Jev Shelton
Mr. Don W. Collinsworth
Mr. William Foster
Mr. James E. Bacon

6. JOINT CHINOOK TECHNICAL COMMITTEE

Dr. Brian Riddell (Co-Chair)
Ms. Barb Snyder
Mr. Louis Lapi
Mr. Ken Pitre
Mr. Neil Schubert
Mr. Paul Ryall
Mr. Wilf Luedke
Mr. Tom Shardlow
Mr. Rob Kronlund
Dr. Steve Macdonald

Mr. James B. Scott (Co-Chair)
Dr. Don Bevan
Mr. Gary R. Freitag
Mr. Dexter Pitman
Dr. Kenneth A. Henry
Mr. Alex C. Wertheimer
Dr. Richard Moore
Dr. Gary Winans
Dr. Norma Jean Sands
Mr. Ronald H. Williams
Dr. Gary S. Morishima
Mr. Timothy W. Roth

6. JOINT CHINOOK TECHNICAL COMMITTEE CONT.

Dr. Sandra Moore
Mr. Dave Gaudet
Mr. Jim M. Berkson
Mr. John Carlile
Mr. Paul Suchanek
Ms. Marianne Johnson
Mr. Steve Elliot

Joint Chinook Working Group

Mr. C.C. (Bud) Graham (Co-Chair)
Mr. A.W. (Sandy) Argue
Dr. Brian Riddell
Mr. Ron Fowler
Mr. Tom Davis
Mr. William Green
Mr. Alan Ronneseth

Mr. Thomas D. Cooney (Co-Chair)
Mr. Melvin C. Seibel
Ms. N. Kathryn Brigham
Mr. Dave Gaudet
Mr. Daniel V. Hickman
Mr. Gerald P. Merrigan
Mr. Burnell Bohn
Mr. David B. Sones

Joint Chinook Working Group - Alternates

Mr. Robert W. Whitener, Jr.
Mr. Robert Haindel
Mr. James B. Scott
Dr. Sandra Moore
Mr. Kevin C. Duffy
Mr. James E. Bacon
Mr. William Foster
Dr. Norma Jean Sands

7. JOINT COHO TECHNICAL COMMITTEE

Mr. Ron Kadowaki (Co-Chair)
Mr. Ken Pitre
Mr. Neil Schubert
Mr. Tom Pendray
Mr. Louis Lapi
Mr. Ken Wilson
Mr. Paul Ryall
Dr. Blair Holtby

Dr. Gary S. Morishima (Co-Chair)
Ms. Jane Banyard
Mr. James B. Scott
Mr. Robert A. Hayman
Dr. Kenneth A. Henry
Mr. Ronald H. Williams
Dr. Richard Moore
Mr. Robert Wunderlich
Mr. George Milner

Northern Coho

Dr. Aven M. Anderson
Mr. Steve Elliot
Dr. H. Richard Carlson
Mr. Leon D. Shaul
Mr. Dave Gaudet

8. JOINT CHUM TECHNICAL COMMITTEE

Mr. Don Anderson (Co-Chair)
Mr. Al Gould
Dr. Terry Beacham
Ms. Marilyn Joyce
Mr. Wilf Luedke
Mr. Leroy Hop Wo

Mr. Gary R. Graves (Co-Chair)
Dr. Kenneth A. Henry
Mr. Nick Lampsakis
Mr. Ralph Boomer
Mr. Tim Tynan
Mr. Randy Hatch
Dr. Gary Winans

9. JOINT NORTHERN BOUNDARY TECHNICAL COMMITTEE

Mr. David Peacock (Co-Chair)
Mr. Les Jantz
Ms. Barb Snyder
Mr. R.S. Hooton
Dr. Chris Wood
Mr. Dennis Rutherford
Mr. Skip McKinnel

Mr. Ben Van Alen (Co-Chair)
Dr. Jack H. Helle
Mr. Phillip S. Doherty
Mr. Glen T. Oliver
Dr. Jim Blick
Dr. Jerome J. Pella
Mr. Fred Gaffney
Mr. Steve Elliot

10. JOINT TRANSBOUNDARY TECHNICAL COMMITTEE

Mr. Robin Harrison (Co-Chair)
Mr. Sandy Johnston
Mr. P. Milligan
Mr. P. Etherton
Dr. Mike Henderson
Dr. Brent Hargreaves

Mr. Andrew J. McGregor (Co-Chair)
Dr. Norma Jean Sands
Mr. John H. Eiler
Mr. William R. Bergmann
Ms. Kathleen A. Jensen
Mr. Keith Pahlke
Dr. James C. Olsen
Mr. Brian Lynch
Mr. Joe J. Muir
Mr. Keith A. Weiland

Enhancement Sub-Committee

Mr. Bruce Morley (Co-Chair)
Mr. P. Milligan
Mr. Cam J. West

Dr. John Burke (Co-Chair)
Dr. Jeff Koenings
Dr. Robert Burkett
Mr. Pete Hagen
Mr. Michael Scott Kelley

11. JOINT TECHNICAL COMMITTEE ON DATA SHARING

Mr. Marc Hamer (Co-Chair)
Mr. James H. Bjerring
Ms. Margaret Birch
Ms. Susan Bates
Mr. Rob Kronlund

Dr. John E. Clark (Co-Chair)
Dr. Kenneth A. Henry
Dr. Ken Johnson
Dr. Gary S. Morishima
Mr. Mike Matylewich
Mr. Joseph Pavel
Dr. Don Bevan

Staff: K. Mulholland (ex. officio)

Working Group on Mark-Recovery Statistics

Dr. John Schnute (Co-Chair)
Ms. Carol Cross
Dr. Tim Mulligan
Mr. Rob Kronlund

Dr. Ray Hilborn (Co-Chair)
Dr. John E. Clark
Dr. Kenneth A. Henry
Dr. John Skalski
Mr. Rich Comstock
Mr. Robert Conrad
Dr. Peter W. Lawson

Working Group on Data Standards

Mr. Louis Lapi
Mr. Marc Hamer

Dr. Ken Johnson
Mr. Ron Olson
Mr. Charles Corrarino
Mr. Dick O'Connor
Ms. Barbara Haar

Catch Data Exchange Working Group

Mr. James H. Bjerring (Co-Chair)
Ms. Lia Bijsterveld
Mr. Vic Palermo
Ms. Susan Bates

Mr. Joseph Pavel (Co-Chair)
Mr. Scott Johnson
Mr. Will Daspit
Ms. Susan Markey
Mr. Gerald Lukas

12. FRASER RIVER PANEL TECHNICAL COMMITTEE

Mr. Wayne Saito (Co-Chair)
Mr. Al Gould
Mr. Al MacDonald

Mr. Michael Grayum (Co-Chair)
Mr. Bill Tweit
Mr. Bob Vreeland

13. NATIONAL CORRESPONDENTS

Mr. C.C. (Bud) Graham
Ms. Heather James
Mr. Mal Farquhar

Mr. Charles K. Walters