
Pacific Salmon Commission



1986/87

Second Annual Report

Pacific Salmon Commission's New Logo

The cover of this report bears the Pacific Salmon Commission's new logo. The design was inspired by the winning entry from competitions which attracted more than 200 submissions from individuals in Alaska, British Columbia, Washington, Oregon, Idaho, Montana, Alberta, California and Mexico.

The winning entry, selected by a panel of the Commissioners, was created by Ms. Barbara Santora of Fairbanks, Alaska. Ms. Santora, who moved to Fairbanks from Philadelphia, owns and operates her own business, Santora Graphics in Fairbanks. She is an active fiber artist, and is a member of the Fairbanks Weavers and Spinners Guild.

The design clearly identifies the international nature of the Pacific Salmon Commission, and the depiction of a chinook salmon reaching from the Columbia River to Alaska signifies the importance of this species in all areas covered by the Treaty.

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**

Second Annual Report 1986/87

**Vancouver, B.C.
Canada**



PACIFIC SALMON COMMISSION

ESTABLISHED BY TREATY BETWEEN CANADA
AND THE UNITED STATES OF AMERICA
MARCH 17, 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 Second Annual Report of the Commission.

This report summarizes the activities of the Pacific Salmon Commission for the period April 1, 1986 to June 15, 1987. It contains a summary of proceedings of meetings held in Vancouver November 16 to 21, 1986, in Vancouver February 8 to 13, 1987, the Second Annual Meeting first session in Seattle February 21 to March 1, 1987, the second session in Vancouver March 23 to March 25, 1987, and a special meeting in Juneau, Alaska June 9 to 11, 1987. The text of agreements reached by the Commission which form the basis for fishery regimes for the 1987 season is incorporated as an amended Annex IV to the Treaty.

Reports on meetings of the Standing Committees on Finance and Administration, and Research and Statistics, are presented in summary form. Executive summaries of the extensive reports prepared by the Joint Technical Committees are also presented.

The auditors' report for the fiscal year April 1, 1986 to March 31, 1987 is also included.

Yours truly,

C. Wayne Shinnars
Chair

Pacific Salmon Commission

OFFICERS for 1986/87

Chair	Mr. D. Collinsworth (to September 30, 1986) Mr. C.W. Shinnars (from October 1, 1986)
Vice-Chair	Mr. G.E. Jones (to May 21, 1986) Mr. C.W. Shinnars (from May 22, 1986 to September 30, 1986) Mr. S.T. Wapato (from October 1, 1986)

COMMISSIONERS

United States	Canada
Mr. D. Collinsworth	Mr. C.W. Shinnars (from May 22, 1986)
Mr. D. Colson	Mr. G.E. Jones
Mr. S.T. Wapato	Mr. C. Atleo
Mr. W. Wilkerson	Mr. R. Shaw (to Oct. 5, 1986)
Mr. K. Parker	Ms. S. Hewlett (from Oct. 6, 1986)
Mr. G. McMinds	Mr. R. Wright
Dr. J. Donaldson	Mr. P. Greene
Mr. H. Beasley	Mr. J. Nichol
	Mr. J. Gosnell

SECRETARIAT

Executive Secretary	Mr. I. Todd (from April 1, 1986)
Deputy Executive Secretary	Mr. W. Matthaai (from Sept. 8, 1986 to March 31, 1987)
	Mr. T.C. Jensen (from April 1, 1987)
Administrative Officer	Mr. K. Medlock
Chief Biologist	Dr. J.C. Woodey

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INTRODUCTION

On March 18, 1985, a Treaty between the Government of the United States of America and the Government of Canada concerning Pacific salmon, was signed by the President of the United States and the Prime Minister of Canada. This Treaty is the result of nearly two decades of negotiation between the two countries.

The interception of salmon bound for rivers of one country by fishermen of the other has been the subject of discussion between the two countries 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 research identified that Alaskan fishermen were catching salmon bound for British Columbia, Oregon and Washington. Canadian fishermen, primarily off the west coast of Vancouver Island, were capturing salmon bound for rivers of Washington and Oregon. Fishermen in northern British Columbia were intercepting salmon returning to Alaska, and United States fishermen 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 resource managers in 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.

The Commission, guided by principles and provisions of the Treaty, establishes general fishery management objectives for international conservation and harvest sharing of intermingling salmon stocks. However, each country retains jurisdictional management authority for its fisheries which must take into account agreed-to Treaty provisions. Implementation of the principles of the Treaty enables the United States and Canada, through better conservation and enhancement, to prevent overfishing, to increase production of salmon, and ensure that each country receives benefits equivalent to its own production.

Annual management plans are part of the operating mechanisms which enable Canada and the United States to meet these stated objectives of the Treaty. The Commission serves as a forum for negotiation of annual management plans for the major intercepting fisheries of both countries. The Commission serves also as a forum for consultation between the Parties on their salmonid enhancement programs and joint research programs.

The organizational structure of the Commission is focussed 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 area of the Southern Panel lies south of Cape Caution, excluding the Fraser River Panel area which embraces the west coast of Vancouver Island south of the 49th parallel of latitude, the Strait of Juan de Fuca, northern Puget Sound, southern Strait of Georgia, and the Fraser River.

The functions of the Northern and Southern Panels are to review annual post-season reports, annual pre-season fishing plans and ongoing and planned salmonid enhancement programs of each country to provide recommendations to the Commission for development of annual fishery regimes in accordance with the objectives of the Treaty. These plans, once adopted, are implemented by the management agencies in each country. The Fraser River Panel, in addition to the general functions described earlier, 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. 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, 1986 to June 15, 1987 the Commission met on six occasions:

1. Telephone Conference — June 23, 1986
2. Fall Meeting — November 16-21, 1986 at Vancouver, B.C.
3. First Negotiating Meeting — February 8-13, 1987 at Vancouver, B.C.
4. Second Annual Meeting (First Session) — February 21 — March 1, 1987 at Seattle, WA
5. Second Annual Meeting (Second Session) — March 23-25, 1987 at Vancouver, B.C.
6. Special Meeting — June 9-11, 1987 at Juneau, Alaska

This, the second annual report of the Pacific Salmon Commission, provides a synopsis of the activities of the Commission and its subsidiary bodies during the second fiscal year of operation (April 1, 1986 to March 31, 1987) and includes a report on the special meeting held in Juneau, June 9-11, 1987.

Activities of the Commission

PART I

ACTIVITIES OF THE COMMISSION

1. MEETING OF THE COMMISSION: June 23, 1986 — Telephone Conference

The Commission met by telephone conference to receive a special report from the Standing Committee on Finance and Administration concerning budgetary matters. The Commission approved recommendations put forward by the Committee concerning the commitment of funds to enable the Commission to move toward achieving the objectives of the Treaty, to assist the Secretariat staff in carrying out its major functions, and to meet the costs associated with relocation of Commission offices. The Commission also decided that the fall post-season meeting would be held in Vancouver, B.C. during the period November 16 through 21.

2. MEETING OF THE COMMISSION: November 16 - 21, 1986 — Vancouver, B.C.

First Plenary Session

The first plenary session of this meeting was chaired by Mr. D. Collinsworth of the United States. At this session, open to the public, Mr. Collinsworth as the outgoing chair expressed appreciation for the progress made by the Commission during its first full year of operation and the promise it holds for the future of Pacific salmon.

Mr. C. W. Shinnars of Canada was designated Chair of the Commission by Canada, in accordance with rules of procedure which establish an annual transfer of Commission chair responsibilities between the two national sections. On behalf of Canada, and pursuant to Article IV, paragraphs 1 and 3 of the Pacific Salmon Treaty, he tabled a report from the Government of Canada, Department of Fisheries and Oceans, regarding Canadian catches in 1986 and pre-season expectations for 1987 (Appendix 1). Pursuant to Article V paragraph 2, he also tabled a report from the Government of Canada regarding enhancement operations in Canada (Appendix 2).

The United States section appointed Mr. S. T. Wapato Vice-Chair of the Commission. On behalf of the United States, he tabled a report from the Government of the United States regarding United States catches in 1986 and pre-season expectations for 1987 (Appendix 3). The United States report on enhancement (Appendix 4) was distributed through the Secretariat office later during the meeting.

The Chair issued instructions to the Panels and Joint Technical Committees to meet to review the results of the 1986 fishery regimes and to identify issues for consideration by the Commission.

Second Plenary Session

The second plenary session of this meeting, chaired by Mr. C. W. Shinnars, was held on November 19. The Chair stated that the purpose of this meeting was to exchange information, ideas and points of view between the two national sections and to identify the issues that would be negotiated beginning in February. Progress reports from the Panels and Joint Technical Committees were requested.

(i) Northern Panel

Chair Sprout (Canada) reported that the Panel had held two meetings but required further time before reporting on progress. A report on identification of issues for negotiation was expected to be prepared by Friday, November 21.

(ii) Southern Panel

Chair DiDonato (United States) reported that the Panel had held three meetings and had completed discussions on topics contained in the agenda, but required an additional meeting to finalize its report to the Commission for presentation Friday, November 21.

(iii) Fraser River Panel

This report was deferred as the Panel was in concurrent session.

(iv) Joint Northern/Southern Panel

Chair Morley (Canada) reported that meetings of the Joint Northern/Southern Panel would not be held until the Northern and Southern Panels had made further progress.

(v) Joint Technical Committee on Chinook

Co-Chair Fraidenburg (United States) reported that the Joint Technical Committee on Chinook had issued several reports since the last Commission meeting. The Committee had also established sub-committees to deal with specific issues including:

- definition of "rebuilding", and assessment of progress toward rebuilding
- induced mortality
- reporting requirements
- analytical methods
- "pass through".

The Committee planned to prepare reports on each of these issues at future meetings.

One of the Committee's primary concerns was that the next Commission meeting would take place before the analysis of the 1986 chinook data could be completed. Commission Chair C. W. Shinnars recognized this as an ongoing concern and suggested that perhaps the Commission could develop procedures whereby availability of current season data would be of lesser import in the negotiating process.

(vi) Joint Technical Committee on Coho

Co-Chair Kadowaki (Canada) reported on the publication of the Committee's final report since the Commission's last meeting and indicated work was continuing on stock indexing issues. The Committee tentatively rescheduled a meeting for December 10-12, 1986 for report preparation and to deal with the questions it anticipated would arise during the course of this meeting. Dr. G. Morishima (United States) requested any Committee assignments from the Commission or the Panels be given as much specificity as possible and the co-chairs of the Committee be given the opportunity to discuss these assignments with the Commission and Panel Chairs.

(vii) Joint Technical Committee on Chum

No report was made by the Joint Technical Committee on Chum.

(viii) Northern Boundary Technical Committee

Co-Chair Cantillon (United States) reported that the Committee had met in April and again in September to work on assignments received from the Northern Panel. Reports to be presented to the Northern Panel included:

- status of early Nass River sockeye stocks
- stock identification
- status of Portland Canal chum stocks
- steelhead catch, exchange of data.

(ix) Transboundary Rivers Technical Committee

Co-Chair Cantillon reported that the Committee had met in Whitehorse on May 22 and 23, 1986 and that minutes of that meeting had been circulated. Discussion took place concerning 1986 fishing and sampling activities and procedures for in-season exchange of information were reviewed.

Following the progress reports, the Commission Chair instructed the Panels and Joint Technical Committees to continue discussions and attempt to define issues for consideration by the Commission.

Final Plenary Session

The final plenary session, chaired by Mr. C. W. Shinnars, was held on Friday afternoon November 21. The Chair announced that the Commission had reviewed the reports of the Panels in executive session. The Commission reported it did not see the need for bilateral Panel meetings prior to the February meeting unless the Joint Technical Committees completed their work earlier than forecast. Instructions were to be forwarded to the Joint Technical Committees for work to be conducted prior to the February 1987 meeting of the Commission.

In closing remarks, the Chair and Vice-Chair concurred that the discussions initiated during this meeting did not constitute renegotiation of the Treaty, but rather were the continuation of an ongoing process of resolving issues within the existing Treaty framework. The Panel chairs and vice-chairs were instructed to determine the amount of "front-end loading" their meeting schedules require to ensure Panel and Commission momentum is maintained and to concentrate on:

- narrowing issues
- providing a narrow range of options to the Commission, and
- where possible, providing bilateral recommendations of the Panels to the Commission.

Commissioner Collinworth on adjournment thanked the Canadian section for its hospitality and contribution to a productive meeting.

3. MEETING OF THE COMMISSION: February 8-13, 1987 — Vancouver, B.C.

The first plenary session of this meeting, chaired by Mr. C. W. Shinnars, was held February 11. Mr. Shinnars, on behalf of the Commission, introduced all Commissioners to the audience in attendance. He expressed Canada's strong continuing support for the Treaty and its basic principles, and the belief that the Parties must move away from interception fisheries despite the fact that some disruption may occur. He stated the foremost need is for conservation while moving towards equity over time. For this meeting, the most pressing topic is renegotiation of the expired chapters in Annex IV of the Treaty, but both national sections are free to raise any issue of concern. One such issue, he noted, is the frustration felt by both Parties resulting from the failure to effect data exchange in a timely fashion. Regarding the question of "deeming," Canada noted the linkage between transboundary and Yukon rivers. Canada proposed a bilateral working group be established to develop a common definition of the term "deeming." Finally, he stated that the major opportunities provided by the Treaty are for better salmon management and enhancement and expressed his desire for these issues, rather than allocation, to become the real focus of Commission activities in future.

On behalf of the United States, Vice-Chair Mr. S. T. Wapato expressed complete support for the Treaty and most importantly for conservation of the resource, cooperative management, enhancement and research. He recognized the importance of equity but stated that should not occur at the expense of conservation — especially of wild stocks. Year-by-year management programs, must not continue to permit overharvest — especially for coho whose populations appear to be suffering a decline similar to that suffered earlier by chinook. Resource needs must come first with allocation issues second.

Mr. Wapato also noted Canada's concern over the Yukon River issue, but indicated that since the two governments have established a separate, bilateral negotiating process to deal with the Yukon River issue, this meeting should focus on the other issues at hand.

The Chair called for reports of Panels and Joint Technical Committees.

Northern Panel

Chair Sprout reported that the Northern Panel had made progress on much of its agenda and that discussion was continuing on coho and bilateral research needs.

Southern Panel

Chair DiDonato reported that the Southern Panel had held four bilateral sessions this week during which they had received the report of the Joint Technical Committee on Coho and a verbal report from the Joint Technical Committee on Chum. The Panel's primary focus had been on revisions to Annex IV, Chapter 5 (coho salmon) of the Treaty. The United States position is that the provisions of the Chapter are inadequate due to conservation needs while Canada, on the other hand, considers the Chapter fundamentally adequate and that the issues are of an equity nature.

Fraser River Panel

Chair Schmitt presented a preliminary accounting of the 1986 Fraser River sockeye run. He noted that spawning escapements were generally good for summer runs, but that goals were not achieved for the late run Adams River stock. The Panel accepted the error as inadvertent. He noted that the Panel has requested a 1987 research budget of \$381,000 and has developed ten questions to be answered in the Panel's investigation of TAC calculations.

Joint Northern/Southern Panel

Chair Pennoyer indicated the Northern and Southern Panels had met in joint session briefly this week and would continue discussions in separate Panel meetings. He did anticipate a second Joint Panel meeting before the end of the week.

Joint Technical Committee on Chinook

Co-Chair Fraidenburg indicated the Committee had produced a number of preliminary reports and had been meeting almost continuously during the week. He expressed his concern regarding data availability and indicated that the Committee's chinook assessments through 1986 would be available by the Commission's next meeting.

Joint Technical Committee on Coho

Co-Chair Kadowaki noted that the Committee had met twice since the Commission's last meeting and prepared a response to the Southern Panel's questions. The Committee is currently preparing its response to the Northern Panel's questions which would be available in a formal report at the next meeting. He also indicated that working papers on stock identification and alternative management strategies are in progress.

Joint Technical Committee on Chum

Co-Chair Anderson indicated that the Committee had met once since the November meeting and has provided its response to the Southern Panel's questions. The Committee has also prepared a report on the status of chum stocks in southern British Columbia and Washington State and has other reports in progress.

Northern Boundary Technical Committee

Co-Chair Peacock reported that the Committee has produced its 1986 report which deals only with 1986 fisheries.

Transboundary Rivers Technical Committee

Co-Chair Cantillon reported that the Committee had issued a report for the 1986 season which includes research activities, a statement of data and program needs, and a data summary for 1986 catches and escapements.

In closing the plenary session, the Chair announced that the Commission would retire to Executive Session to begin consideration of the issues identified for negotiation.

No further plenary sessions were held during the course of this meeting.

4. SECOND ANNUAL MEETING OF THE COMMISSION: February 21 - March 1, 1987 — Seattle, Washington March 23 - 25, 1987 — Vancouver, B.C.

First Session of the Annual Meeting

The first plenary session of the Second Annual Meeting of the Pacific Salmon Commission, chaired by Mr. C. W. Shinnars was held on February 28, 1987. The Chair welcomed participants and observers, and introduced the Commissioners.

The Chair stated in his opening remarks that the purpose of this meeting is to renegotiate expired chapters in the Annexes to the Treaty, and to establish fishery regimes for 1987. This process is expected to be completed on or before March 1, 1987, and he expressed Canada's commitment to meet these goals.

The Vice-Chair, Mr. S. T. Wapato, welcomed the Canadian delegation to the United States for the Second Annual Meeting of the Commission. He affirmed that the United States also expects to leave this meeting with an agreed package for the conduct of fisheries for 1987 and beyond, and that the United States is equally committed to achieve agreement within the time frame of this meeting.

The Chair called for progress reports from the Panels and Joint Technical Committees.

(i) Northern Panel

Chair Pennoyer reported that the Northern Panel has spent most of its time in national section meetings. The United States had presented positions on the Taku and Stikine Rivers to Canada at the end of the February 8-13, 1987 Vancouver meeting. Canada responded at the one bilateral session held so far during this meeting by presenting a proposal for a Stikine River sharing arrangement for the 1987-1991 period, and a Taku River position paper. The United States will respond at the next bilateral session which is scheduled for Wednesday, February 25.

(ii) Southern Panel

Chair DiDonato reported that the Southern Panel has met bilaterally twice during the current session. He noted that the United States had presented positions to Canada on coho and chum near the end of the February 8-13 Vancouver meeting, and that Canada had presented positions during the Sunday, February 22 session. Both sections have exchanged initial responses and discussions are continuing.

(iii) Fraser River Panel

Chair Fraser reported that a Canadian proposal had been presented to the United States near the end of the February 8-13 Vancouver meeting. A United States response in the form of a statement of principles was received by Canada early this session. Canada presented a written response to the United States yesterday, and a small committee met last evening to provide further clarification of the points of view expressed so far. It is anticipated that a United States position paper will be tabled at the next bilateral session scheduled for 1:00 p.m. today.

(iv) Joint Northern/Southern Panel

Chair Pennoyer reported that the first bilateral meeting took place Monday afternoon. The Panels in joint session received reports from the Joint Technical Committee on Chinook. The Committee reported progress on its assignments but is unable yet to provide recommendations for catch ceilings, and cannot assess whether or not the rebuilding schedule is being maintained. Concern about the state of Strait of Georgia wild stocks was expressed. It is anticipated that the Committee will be making written recommendation to the Joint Panel on induced mortality, the status of Strait of Georgia stocks, and on overages/underages. This report will be presented in draft for review by the national sections.

(v) Joint Technical Committee on Chum

Co-Chair Anderson reported that no meetings have been held.

(vi) Joint Technical Committee on Coho

Co-Chair Kadowaki reported that no meetings have been held.

(vii) Joint Northern Boundary Technical Committee

Co-Chair Cantillon reported that data exchange requests were being worked on, and a list of joint research proposals for 1987 is in preparation.

(viii) Joint Transboundary Rivers Technical Committee

Co-Chair Harrison reported that work on data exchange requests is nearly complete, and some reports have been exchanged for review.

(ix) Joint Technical Committee on Chinook

No report was presented as the Committee was meeting concurrently.

The Chair noted that these reports are interim progress reports and that no conclusions should be expected at this time in view of the fact that negotiations are still underway. Full details of the results of the negotiations will be provided at the final plenary session.

The Chair also reminded Panel Chairs and Vice-Chairs that rules of procedure regarding open and closed executive sessions are in place and should be followed. In general, Panel Chairs and Vice-Chairs should conduct meetings in a manner which will allow effective negotiations to continue.

The Commission retired to Executive Session to continue discussion and negotiation. Significant progress was made during the course of the meeting, but final resolution of the issues in front of the Commission was not reached by March 1, 1987. No further plenary sessions were held, and the meeting was adjourned March 1, 1987 to provide opportunity for detailed consultation within the respective national sections. Agreement was reached to resume discussions in Vancouver later in March 1987 to complete negotiations.

Second Session of the Annual Meeting

The second session of the Second Annual Meeting of the Pacific Salmon Commission was held in Vancouver, B.C. March 23 through March 25, 1987. The Commission met in Executive Session throughout this meeting. Agreement was reached on amendments to the respective Chapters of Annex IV to the Treaty and details were contained in a letter to governments recommending adoption (Appendix 5). These amendments have been incorporated into Annex IV of the Treaty (Appendix 6).

The Commission recommended adoption of fishery regimes for the 1987 fishing season, and beyond, to the governments of the United States and Canada. The regimes involved changes from the 1985 and 1986 arrangements for pink salmon fisheries in Dixon Entrance; chinook salmon fisheries off southeastern Alaska, British Columbia, Washington and Oregon; coho fisheries off the west coast of Vancouver Island, the Strait of Juan de Fuca and northern Puget Sound; and chum salmon fisheries in the Strait of Juan de Fuca and northern Puget Sound.

Extensive discussion took place on fishing arrangements for salmon stocks of the transboundary rivers. The discussions were concentrated in efforts to resolve approaches to new enhancement activities and increases in the Canadian share of total allowable catches. The details of these particular arrangements were proposed to be finalized at the next meeting of the Commission in Juneau, Alaska during June 1987.

The Commission also achieved clarification of certain other provisions of the Treaty, including an agreed approach to the 1987 Alaska hatchery add-ons for chinook, and an overage and underage policy for coho and chinook. The Commission strongly encouraged each Party to improve the status of information on fishing-associated mortalities to chinook.

During the course of the meetings, the Commission also conducted extensive discussions in an attempt to clarify arrangements for Fraser River sockeye and pink salmon fisheries, but agreement was not reached. The Fraser River Panel initiated discussions on fishing plans for 1987 which will be published at a later date. Discussion of the location for in-season meetings of the Panel also took place.

The Commission, in view of the extended period of time required for agreement to be reached on 1987 fishery regimes, established a Working Group on Procedural Reform. The Working Group's terms of reference included three basic responsibilities. First, the Group was asked to identify substantive issues the Commission should address that will facilitate implementation of the long-term goals of the Treaty. Second, the Group was asked to identify procedural steps the Commission should take to increase the efficiency of its deliberations. Third, the Group was charged with identifying objective criteria to be used in determining whether Commission-established fishery regimes should be retained, modified, or new regimes established. The following individuals were appointed to the Group:

- Mr. S. T. Wapato (Co-Chair), United States
- Mr. C. W. Shinnars (Co-Chair), Canada
- Mr. C. K. Walters, United States
- Mr. C. C. Graham, Canada
- Mr. J. Curtis, United States
- Mr. I. Todd, Secretariat staff
- Mr. T. C. Jensen, Secretariat staff

The Group was instructed to prepare a draft report for consideration by the Commission at its next meeting.

5. MEETING OF THE COMMISSION: June 9-11, 1987 — Juneau, Alaska

The Commission met in Executive Session for the full duration of this meeting. The major purposes of the meeting were to attempt to resolve issues concerning harvest arrangements on the transboundary rivers, to consider recommendations presented by the Fraser River Panel concerning interpretation of Annex IV, Chapter 4, and to review the draft report of the Working Group on Procedural Reform.

Despite considerable effort, the Commission was unable to reach agreement on the harvest-sharing arrangements or enhancement projects for transboundary rivers. Accordingly, Annex IV, Chapter 1 was revised to reflect the elements which remain in effect (Appendix 6).

The Commission did, however, reach the following understanding on Annex IV, Chapter 4 concerning Fraser River sockeye salmon fisheries:

1. In recognition of escapements provided from the Canadian share of the Total Allowable Catch in the 1985 to 1988 period, the United States agrees that the productions resulting from these contributions shall accrue solely to Canada and shall not be included in the calculations of the Total Allowable Catches from which the United States allocations are determined. The Parties agree to develop a means of identifying productions from these added escapements.

2. The United States aggregate harvest of sockeye in the period 1989 to 1992 shall not exceed 7 million (subject to adjustment for shortfalls that may occur due to management measures in the first four year period 1985 to 1988).

3. The United States cannot harvest in excess of the annual proportion of the Total Allowable Catch set out below:

1989	25.1%
1990	23.1%
1991	34.2%
1992	32.2%

4. While the Fraser River Panel, pursuant to paragraph 1(f), Annex IV, Chapter 4, shall determine the annual United States catch level in the 1989-1992 period, both Parties acknowledge the desire to establish for planning and management purposes a numerical harvest ceiling for the United States in each respective year so as to avoid undue disruptions of fisheries and to provide stability.

5. The Panel will plan and manage the United States fishery to harvest this numerical ceiling or the portion of the Total Allowable Catch set out above, whichever is less.

6. Notwithstanding the above limitations contained in paragraphs 2 and 3, the United States Total Allowable Catch would be adjusted to account for shortfalls created by management measures which result in the United States failing to achieve its annual proportion or numeric ceiling, whichever is less.

7. If the Panel establishes a United States harvest ceiling lower than the product of the United States proportional share and the Total Allowable Catch, and the actual harvest is less than the established ceiling, such a shortfall shall be compensated in subsequent years with the requirement not to disrupt fisheries unduly.

8. Similarly, should the United States exceed its proportional share in any year, its Total Allowable Catch in the subsequent year shall be reduced by the resulting numerical excess.

9. The United States recognizes that Canada added fish to the escapement in 1986. Consistent with the above, the United States will work with Canada to provide it the benefits of added escapement. For 1986, the United States Total Allowable Catch shall be calculated on an actual escapement level adjusted for the Canadian-added escapement and "payback" provisions shall be similarly adjusted. Unless undue disruptions of a fishery will result, payback shall occur in 1987.

The Commission also agreed that for 1987 the in-season meetings of the Fraser River Panel will be held in Canada. Some pre- and post-season meetings of the Panel will be held in the United States.

The Commission also established the following schedule of meetings for its 1987-88 agenda:

1. October 6 - 8, 1987 — Vancouver, B.C. Commission in Executive Session with Panel Chairs and Vice-Chairs, and with Technical Committee representation to begin review of the 1987 season and identify Panel and Technical Committees' assignments for the 1987/88 meeting cycle.

2. November 15 - 20, 1987 — Portland, Oregon. Commission meeting with full Panel and Technical Committees representation to conduct a post-season review and begin development of the 1988 fishery regime.

3. February 13 - 19, 1988 — Vancouver, B.C. Third Annual Meeting of the Pacific Salmon Commission to complete negotiation of the 1988 fishery regime.

Activities of the Standing Committees

PART II

ACTIVITIES OF THE STANDING COMMITTEES

1. MEETINGS OF THE STANDING COMMITTEE ON FINANCE AND ADMINISTRATION

The Standing Committee on Finance and Administration led by Commissioners Wapato and Jones continued its efforts during the period covered by this report to finalize the administrative framework of the Pacific Salmon Commission. A brief review of the major actions recommended by the Committee and adopted by the Commission follows in chronological order of meetings.

Meeting of the Committee — May 6, 1986 — Seattle

The Committee discussed in detail a base budget for 1986/87 which was presented by the Executive Secretary. The budget was approved both as to format and content. A quarterly reporting time frame was established.

The Executive Secretary presented plans for expenditure of funds carried over from 1985/86 to complete equipment purchases, fund relocation of the Commission offices, and carry out special programs. Action on these proposals was deferred pending review of program proposals by the Standing Committee on Research and Statistics, and the Joint Committee on Data Sharing. The Committee noted that final identification of obligations against 1985/86 funds must be obtained by June 30, 1986 and that actual expenditure, in accordance with financial rules, must occur prior to March 31, 1987. Revision of the Financial Rules was also approved in order to permit payment of test fishing charters from revenues generated by test fishing programs.

The Committee also discussed a number of administrative items. The Executive Secretary presented a paper on the role of the Secretariat which received preliminary consideration and was identified for in-depth review at the November 1986 meeting of the Committee. The Committee reviewed plans for relocation of the Commission offices and instructed the Executive Secretary to ensure they reflect the international status of the Commission, and to provide sufficient meeting space to accommodate the largest of the Commission's Panels or Committees.

The Committee finalized a job description for the position of Deputy Executive Secretary, noting that the Deputy's role is expected to be active and prominent, focussing on the activities of the Panels and Commission in addition to participating in the in-house administrative activities of the Secretariat.

The Committee also reviewed a draft of the table of contents for the First Annual Report, authorized the Executive Secretary to initiate a contest for development of a Commission logo, and discussed the development of a Pacific Salmon Commission handbook.

Meeting of the Committee

June 17, 1986 — Telephone Conference

The Committee discussed and adopted proposals prepared by the Secretariat for utilization of funds carried over from fiscal year 1985/86. These proposals, summarized below were recommended and adopted by the Commission at its June 23, 1986 meeting:

1. Category A.	Capital items approved for purchase Feb. 21, 1986	\$379,640.00
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2.	Category B.	Proposed acquisition of equipment to provide the Commission and its support bodies communications, data transfer and analytical capability	\$319,000.00
3.	Category C.	Office equipment for the Secretariat	\$75,500.00
4.	Category D.	Special research studies (i) Georgia Strait acoustics (ii) Overview of research needs	\$170,000.00

**Meeting of the Committee —
November 17-19, 1986 — Vancouver**

The Committee met during the fall session of the Commission. It reviewed reports of the Secretariat on expenditures through the first six months of the current fiscal year, noting that expenditures to date were lower than forecast. A budget forecast for fiscal year 1987/88 was presented which requested increased funding for the Commission's base budget. The Executive Secretary was instructed to present a restructured proposal in February designed to maintain expenditures at 1986/87 levels.

The Committee reviewed the report of the auditors Peat, Marwick, Mitchell & Co. covering the period January 1, 1986 to March 31, 1986, and recommended adoption by the Commission.

The Committee initiated a review of the draft rules of procedure including financial regulations which had been adopted provisionally by the Commission in 1985. The Committee approved changes to several of the financial regulations, but noted that further recommendations will be developed for adoption by the Commission at the Second Annual Meeting.

The Executive Secretary reported that the Department of Public Works of Canada had identified satisfactory space for the Commission's new offices at 1155 Robson Street. Treasury Board authority has been sought, and it is anticipated that the offices will be completed by March 1987.

The Committee reviewed the status of privileges and immunities granted the Commission in both Canada and the United States. It noted that privileges and immunities granted by Canada do not provide Commissioners and staff the same protection that is granted to other Commissions sited in Canada. The Executive Secretary was instructed to pursue the matter with the Department of External Affairs.

The Committee recommended formation of an Editorial Board comprising representatives from this Committee and the Standing Committee on Research and Statistics. The Commission approved formation of the Board and noted that it will report to the Commission through the Standing Committee on Finance and Administration.

The Committee reviewed progress on several other administrative matters, including:

(1) Location of Commission meetings: it was agreed that the annual meeting would be alternated between the two countries.

(2) Clarification of role of the Secretariat: administrative procedures regarding the support role of the Secretariat vis--vis functions of Panels and Technical Committees will be outlined clearly to the respective Chairs, Vice-Chairs and Co-Chairs.

(3) Date of Chair changeovers: the Committee recommended that the date on which the Chair of the Commission, the Standing Committees, and the Panels alternates between national sections be standardized and oriented around a pertinent point in the Commission's deliberative cycle.

(4) Status of electronic mail system: the Secretariat was instructed to continue examination of E-mail systems and to prepare recommendations for implementation.

(5) Allocation of costs for operation and repair of Commission-supplied electronic equipment: the Committee recommended that ongoing operational costs of the E-mail system and facsimile transmitters be transferred to the Parties effective April 1, 1987. Repair costs to hardware will continue to be borne by the Secretariat through November 1987 when this policy will again be reviewed.

(6) PSC logo contest: the Committee reviewed the fifteen entries received and selected four for consideration by the Commission. None was considered suitable and the Executive Secretary was instructed to initiate another competition with broader distribution.

Meeting of the Committee — February 10, 1987 — Vancouver

Administrative actions proposed by the Committee at this meeting had been developed by a Working Group which met in Washington, D.C. January 22, 1987. Actions recommended by the Committee and adopted by the Commission at its meeting on February 11, 1987 are summarized below.

(i) Budgetary Review for the Current Year 1986/87

Under current expenditure planning, the Commission will close the 1986/87 fiscal year with some surplus funds. The surplus stems from higher-than-expected test fishing revenues, somewhat lower than expected salary costs, and unexpended funds reserved for relocation costs. The Committee identified provisionally \$305,000 to be returned to the Parties. In addition, proposals for additional expenditures totalling approximately \$400,000 were approved within this fiscal year.

(ii) Budget for Fiscal Year 1987/88

The Commission approved the budget proposed by the Executive Secretary for fiscal year 1987/88 (Appendix 7). Expenditures have been capped in total at the same level of funding provided for fiscal year 1986/87. A budget forecast for 1988/89 is required by the end of May 1987 for incorporation within the United States budget cycle.

(iii) Secretariat Staff Structure

The Commission approved restructuring of the Secretariat staff organization including the addition of a biologist, an assistant scale analyst, and a secretary/word processor to bring the total complement to nineteen permanent full-time positions.

(iv) Amendments to Commission By-Laws

Amendments to the provisional by-laws were approved and adopted by the Commission. In accordance with procedures established in September 1985 the Commission adopted its full set of by-laws including financial regulations.

(v) Privileges and Immunities

The Executive Secretary is in communication with the Department of External Affairs continuing the Commission's efforts to obtain privileges and immunities in Canada reciprocal to those granted the Commission by the United States.

(vi) Editorial Board

The Editorial Board was formed and members were appointed as follows:

<u>Canada</u>	<u>United States</u>
D. Pethick (Vice-Chair)	P. Mundy (Chair)
F. Bernard	J. Donaldson
Staff	T.C. Jensen
I. Todd	

The Editorial Board met on February 9, 1987 and selected its officers by lot. Terms of Reference were drafted and adopted by the Commission (Appendix 8). The Board initiated discussion on policy and procedures for publication of Commission documents.

(vii) Logo Contest

The expanded contest resulted in submission of nearly two hundred entries. These entries were reviewed by the Commission and the winning entry was selected during the Annual Meeting.

(viii) Staffing

Several changes occurred to the Secretariat staff during the period covered by this report.

(a) Deputy Executive Secretary: Mr. William Matthaei was the successful candidate for the position of Deputy Executive Secretary. Mr. Matthaei joined the staff September 8, 1986. An attractive offer elsewhere led him to submit his resignation in January 1987, taking effect March 31, 1987. Mr. T.C. Jensen, formerly with the Columbia River Inter-Tribal Fish Commission was appointed Deputy Executive Secretary effective April 1, 1987.

(b) Fishery Management Staff: Mr. Steve Cox-Rogers was the successful candidate for the position of racial analysis biologist effective July 5, 1986.

(c) Administrative Staff: Mrs. Ruth Wien, administrative clerk, retired effective March 31, 1987. Ms. Ellen Mochizuki joined the staff as senior administrative clerk effective May 1, 1987. Ms. V. Beck was appointed secretary to the Deputy Executive Secretary effective June 1, 1987.

(ix) Other

The Secretariat has prepared an updated membership list for Standing Committees, Panels and Joint Technical Committees as of March 31, 1987 (Appendix 9).

2. MEETINGS OF THE STANDING COMMITTEE ON RESEARCH AND STATISTICS

The Standing Committee on Research and Statistics led by Commissioners Shinnars and Donaldson met five times during the period covered by this report; May 21-22, 1986, September 18-19, 1986, February 10 and 23, 1987, and May 11-12, 1987.

Meeting of the Committee — May 21 - 22, 1986 — Seattle

The Committee reviewed its terms of reference and concluded that changes were necessary to clarify that it is the responsibility of each Party to conduct its own research. In this light the role of this Committee is to advise the Commission on research and statistical information requirements for successful implementation of the Treaty. New terms of reference were drafted and adopted by the Commission at its November 17, 1986 meeting (Appendix 10). The Commission, at the same time, approved a recommendation of the Standing Committee on Research and Statistics to have the Joint Committee on Data Sharing recognized as a technical committee with full standing, except that its reporting relationship to the Commission will be through Research and Statistics.

The Committee discussed data sharing capability between Canada and the United States. The Committee decided to install an Electronic Mail System which would have the capability to handle routine mail correspondence between Commissioners as well as sophisticated data transfers between scientists of the two countries.

The Committee initiated discussion on processes for identification of research projects for consideration by the Commission. A Working Group of Mr. Graham (Canada) and Dr. Mundy (United States) was struck to develop a proposal for a standardized research evaluation report. The Committee also identified a strong need for an overview or strategic research plan to provide the Commission with a Treaty-based framework against which the relevance of research proposals put forward by Joint Technical Committees or Panels could be measured. The decision was made to seek the assistance of fishery consultants Shepard and Alverson to prepare an overview report by September 1, 1986.

The Committee also received presentations from the Executive Secretary regarding the format and outline of the first annual report, and the role of the Secretariat in providing support functions to the Standing Committees, Panels and Joint Technical Committees. No conclusions were reached on these subjects.

Meeting of the Committee — September 18-19, 1986 — Vancouver

The Committee received a report from the Graham/Mundy Working Group on a proposed PSC Research Project Evaluation Form, and a schematic approach outlining the research planning process. The Working Group was expanded to include Dr. Riddell (Canada) and Mr. Marshall (United States) and directed to extend the concept and report at the November meeting of the Committee.

The Committee reviewed the first draft of the Alverson/Shepard report on technical information requirements for implementation of the Treaty, and instructed the consultants to expand the report in certain areas. The final reporting date was extended to mid-October.

The Technical Committee on Data Sharing reported activities of its Working Group on Mark Recovery Statistics and the Working Group on Mark Recovery Databases. It was concluded that while these groups are making progress it was unlikely that final reports would be prepared by the April 1, 1987 deadline specified in the Memorandum of Understanding which accompanies the Treaty. It was noted that formal notification should be provided the Commission.

The Committee reviewed progress of Secretariat staff in implementing an electronic mail system, cataloguing the library collection in preparation for relocation of the Commission offices, and raised concern over the conduct of the Strait of Georgia acoustic study. The Committee also recognized the need for the development of a Pacific Salmon Commission publications and editorial policy.

Meeting of the Committee — February 10, 1987

The Committee reviewed progress of the Mundy/Graham Working Group in development of research project documentation forms. It was agreed to circulate the current draft to the Panels and Joint Technical Committees for review.

The Committee officially accepted the Alverson/Shepard report and recommended that it be published as the Commission's first technical report.

The Joint Technical Committee on Data Sharing reported that the Working Group on Mark Recovery Databases had nearly completed its work and should complete its report soon. The Working Group on Mark Recovery Statistics has been unable to meet. Consequently, the Committee on Data Sharing will be unable to present a report to the Commission by April 1, 1987 specified in the Memorandum of Understanding. The Committee does not expect to complete its work on data sharing for another full year.

Secretariat staff program activities were reviewed and the role of the Standing Committee on Research and Statistics with respect to staff scientific projects was discussed. The conclusion was reached that the Committee should have an oversight role in all Commission research activities.

The Committee reviewed a discussion paper which elaborated some concerns about the definition of its role within the Pacific Salmon Commission framework. The Committee agreed to devote its next meeting entirely to this important topic.

The first report of the Editorial Board was distributed and reviewed.

Meeting of the Committee — February 23, 1987

The Committee decided to distribute a discussion paper on the role of the Research and Statistics Committee to the Panels and Joint Technical Committees along with research project documentation drafts for their comments.

The Joint Technical Committee on Data Sharing reported that the Working Group on Mark Recovery Databases should have a finished report following its next meeting. The Working Group on Mark Recovery Statistics has made no progress, but has scheduled a meeting for February 24, 1987 to develop a list of priorities and objectives in order to meet its obligations as defined in the Memorandum of Understanding.

The Data Sharing Committee expressed concern about the heavy requirements of the Commission for current season data to be used in the negotiating process. The Data Sharing Committee concluded that the current process does not fit the biology of the resource, and the time pressure being placed on Joint Technical Committees increases the risk of major errors. The Research and Statistics Committee agreed that changes to the process were required, and agreed to highlight this concern in its report to the Commission.

The Committee agreed that its meetings should in future take place outside the meeting schedule of the Commission as a whole to allow more attention to be focussed on Committee business. The Committee agreed to meet twice annually; once in May and once in September.

Meeting of the Committee — May 11-12, 1987

The Committee reviewed comments received on the discussion paper concerning its role within the framework of the Pacific Salmon Commission. It was agreed that Drs. Mundy (United States) and Beamish (Canada) would incorporate the comments into a final draft document for circulation to the Committee in August 1987. The topic is to be included on the agenda for the September meeting.

The Joint Technical Committee on Data Sharing reported that the Working Group on Mark Recovery Databases will have a full report prepared in time for the June meeting of the Pacific Salmon Commission. The Working Group on Mark Recovery Statistics is now making progress and should be able to come to a consensus.

The Committee discussed development of a policy recommendation to deal with unsolicited research proposals. The Committee considered that it should use its influence to direct the type of research done by at least endorsing unsolicited proposals that are compatible with Commission research objectives.

The Committee reviewed the activities of the Working Group on Procedural Reform. The Committee stressed the need for the Commission's negotiating framework to take into account the real concerns of the Joint Technical Committees. The Committee considered a proposal to amend the rules of procedure of the Commission and to amend the terms of reference of the Standing Committee on Research and Statistics. Some of the proposals contained therein were considered to be relevant to the work of the Working Group on Procedural Reform. The Committee agreed to review this paper in detail at its next meeting.

Activities of the Panels

PART III

ACTIVITIES OF THE PANELS

1. NORTHERN PANEL

The Northern Panel successfully negotiated a new northern boundary Chapter 2, Annex IV, of the Treaty and recommended adoption by the Commission. The Panel had extensive discussions on the 1986 post-season report, cooperative research results and plans, and fishing plans for the 1987 season. These long discussions were helpful in establishing a good rapport between Canadian and United States fishermen. The Panel spent many days discussing the harvest sharing arrangements, cooperative exchanges of in-season data, and potential enhancement activities on transboundary rivers. The Panel could not provide recommendations to the Commission for the expiring sections of Chapter 1, Annex IV of the Treaty.

2. SOUTHERN PANEL

The Southern Panel met in conjunction with the Commission at its in-person meetings. The Panel held extensive discussions on the conduct of 1986 fisheries in its area of concern, and attempted to negotiate new regimes for 1987. Progress was made on all major issues, but in the end resolution was accomplished by the Commission.

The Southern Panel also held a special meeting of the Chair and Vice-Chair, with advisors, in May 1987 to elaborate on understandings of coho fisheries proposed for United States Area 7/7A. Exchanges of in-season data on coho and chum salmon fisheries took place during the 1986 fishing season.

3. JOINT MEETINGS OF THE NORTHERN AND SOUTHERN PANELS

The Northern and Southern Panels met jointly in conjunction with the Commission at its in-person meetings, and successfully negotiated fishing regimes for the 1987 and 1988 seasons. These and other agreements are reflected in the chinook Chapter 3, Annex IV of the Treaty. The Panels also developed instructions for the Chinook Technical Committee.

4. FRASER RIVER PANEL

The Fraser River Panel met in conjunction with the Commission at its in-person meetings, and in view of its special responsibilities concerning in-season management of fisheries on Fraser River sockeye and pinks, met frequently throughout the year. The Panel successfully negotiated fishing plans for 1986 and 1987, and was able to reach an understanding on interpretation of Annex IV, Chapter 4 which was adopted by the Commission.

The Panel presented a report on the 1986 Fraser River sockeye fishery at the November 1986 meeting of the Commission. The executive summary of the report follows:

1. Under the terms of the Pacific Salmon Treaty, management of the Fraser River sockeye and pink salmon fisheries in 1986 became the responsibility of the Fraser River Panel. On March 7, the Commission approved the Fraser River sockeye salmon fishery regime for 1986, which detailed the sharing of the summer-run sockeye catch and the estimated payback for the 1985 sockeye catch shortfall by the United States fishermen.

2. Regulations and a Management Plan, based on forecasts of abundance and migratory routes to the fisheries, were formulated by the Panel and adopted by the Commission in May 1986. The allocation of fishing times and, hence catch, was to be according to Treaty objectives, Commission agreements and domestic catch-allocation goals.

3. The Panel met 28 times for in-season management considerations and decisions. Regulatory decisions implementing or adjusting the Management Plan and issued as Panel Orders were made on the basis of the best data on stock sizes, migratory routes, catches and escapements available at the time. Regulatory Orders of the Panel were adopted and enforced by the Parties in their respective sections of the Panel Area, as provided in the Treaty.

4. Total return of Fraser River sockeye in 1986 was 15,834,000 salmon, 13% above the pre-season forecast of 14.0 million sockeye, and was the second-largest run since 1913. International catches, based on preliminary data, showed commercial harvests of 8,730,000 Fraser River sockeye taken by Canadian fishermen and 2,745,000 caught by United States fishermen. Non-commercial catches, included Canadian Indian subsistence catches, of 576,000 sockeye and 1,000 in the United States test fisheries; Commission test fishing accounted for 65,000 sockeye. The total catch by all users was 12,117,000 sockeye, the second-largest since 1913. Total spawning escapement was estimated at 3,717,000 sockeye, the third-largest since 1913.

5. Computation of the total allowable catch (TAC) and the Parties' shares of the TAC was predicated, in part, upon Canada's acceptance of the responsibility for providing the additional 146,000 summer-run sockeye to the escapement, that is, counting those fish as part of the Canadian commercial catch. The Panel agreed in June 1987 to exclude from the calculated TAC those fish caught in Panel-approved test fisheries and the number of jack sockeye salmon estimated to be in the escapement. Thus, the computed TAC was 11,791,000 sockeye. Based on the sharing formula and adjustments for the concurred coho-for-sockeye exchange (Annex IV, Chapter 4 of the Treaty) and the payback of the 1985 shortfall of United States catch (88,000), the United States share was calculated, preliminarily, to be 2,868,000 sockeye. The approved method of TAC computation resulted in a shortfall of 122,000 sockeye in the United States catch.

6. Domestic allocation objectives of the Parties were closely met. United States Treaty Indian catches totalled 1,350,000 sockeye while all-citizen catches in Washington State reached 1,383,000 fish. Canadian catch by gear type approximated the Minister's Advisory Council (MAC) allocation objectives with trollers harvesting 24% (vs. 23.9% per MAC guidelines), purse seines - 46.1% (vs. 46.8%) and gill nets - 30.0% (vs. 29.3%).

7. Record single-day catches in Canadian Areas 20 and 29 were the result of: a) large abundance of fish, b) compact run timing which caused very large daily abundance, and c) fishing of the migration peaks. Fisheries on late-run sockeye in the Strait of Georgia (Area 29) by Canadian purse seines and gill nets and in Area 7A by United States fishermen were permitted when the best available estimates of gross escapement upriver approached the desired goal; large catches resulted from those fisheries.

8. The pre-season goal for escapement of spawning adults was revised in-season by Canada, based on the larger-than-expected return of certain stocks, particularly those destined for the Quesnel Lake area. Post-season estimates of the net escapement totaled 836,000 summer-run sockeye versus the revised goal of 895,000 fish. The in-season estimated gross escapement of late-run stocks erroneously exceeded the goal, due to a lack of timely data on fish behavior at the echo sounding site. The estimates by Canada of actual spawning escapements, place the total at 2,822,000 adult spawners, 17.1% below the goal.

The full text of this report is available on request through the offices of the Secretariat.

Reports of the Joint Technical Committees

PART IV

REPORTS OF THE JOINT TECHNICAL COMMITTEES

The Joint Technical Committees have produced reports on 1986 salmon fisheries management and on expectations for 1987. This information, at least in preliminary form, was also contained in reports submitted by the Parties to the Commission in November 1986. Extracts from those reports are contained in Appendices 1 and 3. As a result, executive summaries of technical committee documents referred to in this section will include topics which have not been referenced elsewhere within this report. A complete listing of technical committee reports on file with the Commission is contained within Section X of this report.

1. SUMMARIES OF REPORTS OF THE JOINT TECHNICAL COMMITTEE ON CHINOOK

Assessing Progress Toward Rebuilding Depressed Chinook Stocks

Report TC CHINOOK (87)-2

The Pacific Salmon Treaty established a chinook conservation program to rebuild depressed stocks by 1998. The goal of the program is to increase production by increasing spawning escapements to levels associated with the maximum sustainable harvest.

The report describes a framework for evaluating progress towards rebuilding depressed chinook stocks which focuses on documentation of indicator stocks and identification of information requirements and analytical procedures recommended for assessment.

The Committee pointed out that from a technical perspective, determinations may be made concerning the status of individual stocks vis--vis their rebuilding schedules. Completion of rebuilding is also straightforward since an individual stock would be rebuilt when, over a period of years, spawning escapements are maintained at or near the escapement goal established by the appropriate management agency. Escapement goals are expected to be reviewed throughout the rebuilding program as productivity information becomes available. On a regional or coastwide basis, decisions must be made on the basis of the status of aggregations of stocks. Individual stocks or groups of stocks will be ahead, on, or behind schedule and the rebuilding status of other stocks may be uncertain.

Regarding the question concerning definition of rebuilding, a number of options are presented for consideration. Policy decisions must be made before conclusions can be reached concerning the status of rebuilding on a regional or coastwide basis.

In assessing the status of individual stocks under the rebuilding program, the Committee suggested three main elements must be examined: (1) spawning escapement levels; (2) fishery harvest and stock-specific exploitation rates; and (3) production responses to increases in spawning escapements. In developing the rebuilding program, the immediate objective was to stop the decline in escapements of naturally spawning chinook populations and to increase escapements subsequently. The ultimate objective, however, must be to maximize sustainable harvests. A phased approach that reflects expectations for changes in data availability and quality as the rebuilding program progresses is recommended. As more and better data become available, quantitative assessment options can be employed with less uncertainty.

Data Report of the Chinook Technical Committee on Unaccounted for Sources of Fishing Associated Mortalities of Chinook Salmon in West Coast Salmon Fisheries
Report TC CHINOOK (87)-3

The Working Group on Fishing Associated Mortality has made substantial progress in preparing a report for review by the Joint Technical Committee on Chinook. A progress report was written to meet the immediate need of the Commission during its February and March meeting. However, this progress report has not received the editorial review of the full Joint Committee and is therefore subject to revision.

The report identified factors that affect fishing associated mortality and provided an assessment of the likely direction and magnitude of those factors since implementation of the Pacific Salmon Treaty in 1985. Comparisons of changing associated mortality conditions were used by the Committee to estimate harvest rate reductions required to rebuild depressed north-migrating stocks of chinook salmon by 1998.

The report categorized sources of associated fishing mortality into three classes: retained or discarded, catch and release, and unobserved encounters. The working group also identified parameters needed by the Committee to make a quantitative assessment of the impact (in numbers of fish) of increased and decreased sources of associated fishing mortality. However, estimates of number of fish encountered or not encountered because of changes in abundance or fishing effort are not available for each area and gear and this has limited the quantitative assessment. Furthermore, even if the number of fish encountered was known, the estimates of other key parameters are needed in order to estimate impacts in terms of number of spawning fish which are members of depressed naturally spawning stocks.

This progress report presented data provided by responsible management agencies regarding each class of associated mortality for each gear type. A discussion of key data sets provided by each responsible management agency is also provided.

Chinook Technical Committee 1986 Summary Report
Report TC CHINOOK (87)-4

This report highlighted topics relating primarily to assessing progress of the Chinook Rebuilding Program in 1986. More detailed discussions of the various topics are included in several reports already presented to the PSC.

The Committee stated it was encouraged by the continued improvement in 1986 of escape-ments to many natural chinook systems which continued the pattern observed in 1985. However, the Committee presents the following recommendations and concerns.

(i) Recommendations

1. The Committee recommended that management measures be taken in 1987 and 1988 to conserve mature lower Georgia Strait chinook in order to minimize further reductions in spawning escapements. The Committee made this recommendation while acknowledging that it was still possible to rebuild these stocks under certain assumptions. Given the severely depressed status of the lower Strait stock, the Committee strongly believes that conservation of spawners in 1987-88 is critical to a realistic expectation of achieving rebuilding. Furthermore, the Committee recommended reduction of harvest rates in other fisheries to reduce the risk associated with rebuilding the upper and lower Strait of Georgia stocks (consistent with the original intent of the Chinook Rebuilding Program) and assessment of supplemental enhancement possibilities to assist the rebuilding of severely depressed populations.
2. The Committee has not been able to complete an evaluation of the impact (on the rebuilding program) of fishing associated mortalities not accounted for in catch statistics. The Committee recommended reduction of chinook non-retention fisheries in 1987 to be consistent with Treaty requirements to minimize impacts. This recommendation reflects Committee concerns over impacts of additional mortalities on rebuilding early in the program. Monitoring and assessment of non-retention fisheries should continue in 1987.
3. The Committee noted that overages occurred in 1985 and 1986, and recommended early establishment of a policy on overages and underages. This policy should allow for limited variations due to management imprecision and require prompt adjustment if cumulative deviations exceed an agreed to range.

4. The Committee recommended that non-ceilinged fisheries be managed to meet Treaty language which requires savings of depressed natural stocks from ceilinged fisheries be passed through principally to spawning escapements.

(ii) Concerns

1. Some major hatchery stocks which in the past have contributed significantly to coastal ocean fisheries are now showing severely depressed survival rates. These stocks are from Spring Creek and Robertson Creek hatcheries. Several other wild stocks also show continued depression and/or failure to rebuild. It is important to recognize that the catch ceilings established under the Pacific Salmon Treaty reflect assumptions concerning continued contribution of hatchery stocks at levels observed during the base period for model analysis. If these reductions cause a decline in total abundance, harvest ceilings could have greater than anticipated impacts upon co-mingled natural stocks.

2. Non-retention of chinook increased in 1986 in some areas and fisheries and decreased in others. While some increases were anticipated during the rebuilding program, the Committee believes that further reductions in non-catch mortalities were possible in 1985 and 1986 to fully minimize fishery impacts. Overall impacts of changes in induced fishing mortalities will be assessed in the future.

3. The Committee is concerned about the cumulative effect of quota overages, deviations from pass-through achievement, new induced fishing mortalities and reduced survivals in some major hatchery stocks. Risk of not rebuilding is increased if these biases continue to accumulate.

4. The Committee is concerned that catch overages occurred in northern B.C. and southeast Alaska in 1985 and 1986. Deficiencies in reporting and analytical procedures for in-season management can reduce the effectiveness of management measures established to implement the chinook conservation program.

5. Production from Spring Creek, Strait of Georgia, Robertson Creek and several natural spring and summer chinook stocks in Puget Sound and Columbia River stocks is expected to continue to be depressed.

2. SUMMARIES OF REPORTS OF THE JOINT TECHNICAL COMMITTEE ON CHUM

Summary Report of Southern British Columbia and Washington Chum Salmon Data for the Years Prior to 1985

Report TC CHUM (87)-1

This report is a narrative description of the status of stocks in Canada for Johnstone Strait and Georgia Strait combined; and for the west coast of Vancouver Island. For the United States, similar descriptive information is provided for Puget Sound, Washington coast, and Oregon. Narrative descriptions of major fisheries, management regimes applied, and stock assessment and forecasting techniques in use for each area are also provided.

Working Paper on Genetic Stock Identification Methods for Southern Chum Salmon

Report TC CHUM (87)-2

In the genetic method of stock identification, genetic variation is measured by examining variation in proteins as determined by electrophoresis. Electrophoresis provides a method to survey genetic variation rapidly in order to identify differences among stocks, and then uses these differences among stocks to estimate stock composition in mixed stock fisheries. Electrophoresis can be used to provide estimates of stock composition during the fishing season, thereby allowing managers to regulate commercial fisheries more effectively.

The Committee points out that the accuracy and precision, and thus reliability, of the stock composition estimates presented are dependent upon many factors. Among these are:

1. the accuracy of genotypic frequencies in the baseline
2. the magnitude and number of the differences in the markers among the stock groups that are to be distinguished
3. the proportion of stocks that have been sampled that appear in the mixture
4. the similarity of genotypic frequencies of the unsampled stocks in a region to those stocks that were sampled
5. the representativeness of the fishery sample
6. the number of fish that have been sampled
7. the analytical methods used in estimating stock compositions.

The GSI studies which have been conducted indicate that electrophoretic techniques can be used to estimate the stock composition of chum catches. However, the utility (for Pacific Salmon Commission deliberations) of estimates computed by this technique is limited at this time by questions regarding the consistency of the methods used in the two countries.

To resolve these questions, a review program will be conducted to:

1. evaluate and compare the statistical methods used to estimate stock composition and the variance of this estimate
2. evaluate the sampling design for commercial and test fisheries
3. develop a common baseline data base
4. incorporate additional stocks in the U.S. baseline
5. evaluate the utility of additional markers
6. evaluate methods to apply the stock composition estimates to catch data.

The Chum Technical Committee is developing recommendations regarding the specific tasks to be completed and an anticipated time schedule for completion of the review program.

Research Needs on Southern British Columbia and Washington State Chum **Report TC CHUM (87)-3**

This report identifies research needs for chum salmon management required for the implementation of the chum salmon chapter of the Pacific Salmon Treaty (PST). The Chum Technical Committee has been charged by the PST (Annex IV, Chapter 6) with identifying information and research needs with particular emphasis in the areas of stock composition, stock assessment and evaluation of alternative regulatory and production strategies. The implementation of the PST requires an assessment of the research conducted by the two countries, and it is the assignment of the joint technical committees to identify appropriate research topics. These PST related topics can then be considered within the research prioritization and budgeting processes of each country.

Special emphasis is placed on stock composition research as this has been identified as a high priority by the Pacific Salmon Commission (PSC), through a specific assignment to the Chum Technical Committee in November 1986. The areas of research covered in the report are those deemed most important to the satisfactory quantification of stock composition in each country's fisheries and for assessment of the levels of interception as required by the Treaty. There are other research needs for chum salmon that are important for domestic management obligations within each country. These are not addressed in this report.

The following is a summary of the immediate research needs related to stock identification. It should be remembered that the continuation of GSI sampling from the mixed stock areas is vital to long-term research needs.

(i) GSI sampling programs — Canada

1. Continue and expand the west coast Vancouver Island troll fishery sampling.
2. Continue the sampling of the Juan de Fuca Strait test fisheries.
3. Continue sampling of the Johnstone Strait test fisheries and initiate sampling of the commercial catch.
4. Continue sampling of Nitinat commercial fisheries.
5. Continue sampling of Qualicum commercial fisheries.
6. Continue and expand sampling of other Strait of Georgia fisheries, including the Fraser River mouth, that have the potential to intercept Puget Sound chum.
7. Initiate sampling to modify the Canadian baseline catalog, if additional representative stocks are identified.

- (ii) GSI sampling programs — United States
 - 1. Continue sampling of western Strait of Juan de Fuca commercial fisheries.
 - 2. Continue and expand sampling of the San Juan Islands test and commercial fisheries.
 - 3. Continue and expand sampling of the Point Roberts test and commercial fisheries.
 - 4. Initiate the development of baseline for the Strait of Juan de Fuca, Grays Harbor and Willapa Bay stocks.
 - 5. Continue sampling to complete the baseline catalog for Puget Sound stocks.
 - 6. Initiate sampling of commercial fisheries in the eastern Strait of Juan de Fuca and other areas of potential interception of Canadian chum.
- (iii) Methods and analysis
 - 1. Standardize sampling procedures.
 - 2. Standardize baseline profiles.
 - 3. Standardize analytical procedures.
 - 4. Blind test laboratories and analytical methods to evaluate accuracy and precision.
- (iv) Develop methods for apportioning catch by GSI
- (v) Alternative stock identification methods
 - 1. Conduct independent verification of GSI results.
 - 2. Examine alternative methods and their accuracy and precision (e.g., direct DNA analysis, morphometric and scale analysis, adult and/or juvenile tagging).

The following is a summary of the Committee's long-term research recommendations.

- (i) Management approaches
 - 1. Investigate current and other management approaches and evaluate relative effectiveness.
- (ii) Productivity
 - 1. Continue the development of optimum escapement goals.
 - 2. Improve methods for estimating spawning escapement.
 - 3. Improve stock specific stock/recruit information including terminal area stock composition estimates.
- (iii) Stock assessment
 - 1. Improve methods for pre-season and in-season estimation of run strength.
 - 2. Assess migration paths and diversion rates.
 - 3. Formulate a southern chum salmon run reconstruction method.
- (iv) Assess the temporal consistency of the GSI baseline

3. SUMMARIES OF REPORTS OF THE JOINT TECHNICAL COMMITTEE ON COHO

Response to Southern Panel Questions **Report TC COHO (87)-1**

This report provides responses by the Joint Technical Committee to questions raised by the Southern Panel prior to the February and March 1987 renegotiation of Annex IV, Chapter 5 of the Pacific Salmon Treaty. Topics covered include an assessment of the 1986 contribution by Canadian hatcheries to the west coast Vancouver Island troll fishery, a discussion of the current status of information and methodologies required to determine stock composition by fishery, estimated contribution of stocks of United States origin to the major south coast fisheries, a description of current coho productivity, estimates of current exploitation rates on southern British Columbia and Washington stocks, and preliminary expectations for 1987 stocks of concern.

Response to a request from the Northern Panel for information on stock composition of coho harvested in northern B.C. and southeast Alaska

Report TC COHO (87)-2

Stock composition estimates for coho catches in northern B.C. and southeast Alaska coho fisheries are currently available only from Reports of the Technical Committee on Salmon Interceptions (1971-1981) established as the result of U.S.-Canada consultations on salmon problems of mutual concern. These estimates were derived primarily from past adult tagging data and are not considered to be statistically reliable due to the lack of complete tag recovery effort in all fisheries and spawning areas. Limitations associated with this method identified include 1) recovery on spawning grounds and spawner estimation is required but extremely difficult; 2) fishery recoveries might not reflect country of origin; 3) recent stock levels and, 4) inter-annual variability is not accounted for. There are other methods which can potentially be used to develop stock composition estimates for coho in a mixed stock fishery. Although biological markers and adult tagging have been used successfully for other species, to date they have had limited success for coho.

One of the most promising methods of estimating stock composition as indicated in the Joint Coho Technical Committee response to the Southern Panel (February 7, 1987) on a parallel question involves the analysis of coded-wire tagging data of juveniles from indicator stocks which are assumed to be representative of stocks from a larger production area.

It is not possible to estimate stock composition in northern B.C. and southeast Alaska fisheries at this time using the recommended or other methodologies. Rather, what is presented is a compilation of available coded-wire tag recovery data for hatchery and wild stocks which is one component of the required data. It should be noted that these data describe the catch distribution of the tagged stock and not fishery catch composition and are highly dependent upon the location and intensity of fisheries.

For a discussion of the harvest distribution, migratory patterns, harvest rates and migratory timing of these stocks the reader is referred to the Report of the Joint Coho Technical Committee to the Pacific Salmon Commission (PSC Report TCCOHO (86)-1).

Information and Research Needs

If mutually agreed-upon coho stock composition estimates are to be derived for northern fisheries, it will be necessary to develop jointly a coordinated research program. Given the extensive areas involved, the large numbers and diverse nature of natural coho stocks in both countries, and the limited information currently available, it is anticipated that a major, long-term research and monitoring program would be required.

The feasibility of producing coho stock composition estimates for northern B.C. and southeast Alaska fisheries using stock distribution information from a series of indicator stocks and information on hatchery and wild production should be evaluated. This would require expanded coded-wire tagging programs on wild stocks in both countries but especially in Canada. In addition, research and monitoring to evaluate the magnitude of wild stock production in both countries would be required.

Feasibility of other stock identification methodologies should also be explored, especially if gross stock composition estimates involving only the resolution of country of origin are required. Some studies are currently being conducted in northern areas on several stock identification techniques by the U.S. under national Treaty support funding. Methods being explored include scale pattern analysis, GSI (genetic stock identification), parasite analysis, rare element analysis and combinatorial use of such characteristics. For fishery management purposes, a finer stock resolution will be required and experience to date would suggest that biological markers may have limited application.

Impacts of Swiftsure Bank Closure and Incidental Coho Catch Estimates for 1987
Canadian Area 20 and U.S. Areas 7/7A
Report TC COHO (87)-3
(i) Swiftsure Bank Closure

The primary effect of the Swiftsure Bank closure outlined in paragraph 3(b) of the new Coho Chapter is to reduce the impacts of releasing under-sized chinook and coho in the troll fishery. For coho, this problem is particularly severe in September when juvenile fish are recruited to the fishery. The problem for chinook occurs throughout the season. Small benefits to escapement are expected due to reduction of shaker mortality. A more direct benefit for maturing fish would occur if the catch quota is not reached since the Swiftsure Bank closure reduces the potential catch, and the catch rates in Area 21 are typically higher than for the rest of the west coast of Vancouver Island.

(ii) Incidental Coho Catch by 1987 Area 20 and Areas 7/7A Net Fisheries

Estimation of Canadian Area 20 and U.S. Areas 7/7A anticipated incidental coho catch levels pursuant to the provisions of the Coho Annex has potential policy implications regarding the possibility of directed coho fisheries. Determinations on policy matters should be resolved at the Panel or Pacific Salmon Commission levels. Therefore, the Committee has provided a range of incidental catch estimates accompanied by associated biological implications for consideration by policy decision-makers.

The incidental coho catch estimates for fisheries under the control of the Fraser River Panel, given the currently projected fishing schedule, range from 107,600 to 371,700 (average 195,900) in Area 20 and from 37,400 to 99,100 (average 55,300) in Areas 7/7A. Additional incidental catches during chum-directed fisheries in Areas 7/7A are estimated to range from 6,100 to 44,700 depending upon the magnitude of the chum harvest. Due to the number of critical factors that affect these estimates (e.g., rate of diversion, time of the fishery, stock abundance, and availability) and the vagueness of the technical assignment, the Committee was unable to provide a more precise estimate of incidental coho catch for 1987.

The uncertainty inherent in several factors that affect the incidental coho catch results in large variability associated with pre-season estimates of incidental catch levels. These factors include forecasts of run size, run timing and diversion rate through Johnstone Strait for both sockeye and pink salmon. Actual fishing periods are based upon an assessment of in-season data.

(iii) Conservation Concerns

Fisheries that may be conducted under the language of paragraph 3(d) of the Coho Chapter pertaining to anticipated incidental coho catches in 1987 Canadian Area 20 and U.S. Areas 7/7A fisheries could, when combined with impacts of all other planned fisheries, produce total impacts that are inconsistent with the conservation status of stocks of concern. This language appears to guarantee a minimum coho catch level for these fisheries. If the actual incidental catch is below anticipated levels because of lower-than-expected stock abundance, then directed fisheries in these areas might be initiated even though escapements of depressed stocks would be decreased. Conversely, if incidental catch levels are exceeded because of higher-than-expected abundance, directed coho fisheries would be precluded when stocks may be better able to withstand additional fishing pressure. However, currently available data indicate that coho catches during Fraser sockeye and pink management are not well correlated with selected coho abundance indices for Fraser and Puget Sound stocks.

4. SUMMARIES OF REPORTS OF THE JOINT NORTHERN BOUNDARY TECHNICAL COMMITTEE

Joint U.S./Canada Salmon Research: Northern Boundary Adult Tagging Report, 1982 to 1985

Report TCNB (86)-1

Emphasis of joint U.S./Canada salmon research has been on the development and application of stock separation techniques for improving the management of southeast Alaskan and British Columbian salmon resources. As a major component, a large-scale pink and sockeye salmon tagging project, coupled with incidental tagging of chum salmon, was accomplished in southern southeast Alaska by the Alaska Department of Fish and Game, and in northern British Columbia, by the Canadian Department of Fisheries and Oceans. The main purpose of tagging sockeye and pink salmon was to provide estimates of stock composition in Alaskan and Canadian fisheries of the boundary area, so that assessment could be made of numbers of fish that either country intercepted in fisheries of the other nation. Secondly, the taggings were conducted to determine migration routes and timing of Alaskan and Canadian stocks of sockeye and pink salmon for improving management of these species. Also, chum salmon were tagged to begin the description of their migrations so interceptive fisheries could be identified for future studies.

Chartered purse seine, gill net, and troll vessels were employed to capture adult pink, sockeye, and chum salmon, with the type of vessel utilized usually dictated by the type of commercial fishery present in a given area or the species of fish tagged in a particular year.

Pink, sockeye, and chum salmon were tagged and released at a variety of locations within the Clarence Strait, Tree Point, Cordova Bay, Noyes Island, Dall Island, Dixon Entrance, Hecate Strait, and Portland Inlet areas (Table 1).

Tag recovery efforts were directed towards the spawning grounds, and commercial, sport, and subsistence fisheries with main emphasis on the escapement and commercial catch.

(i) Limitations

The reported values of stock composition and interceptions should be considered along with some reservations. First, all estimates are subject to chance variations. For example, the proportion of fish with tags varies among samples of the catch from a fishery opening or among samples from the escapement from a salmon-producing river. Estimates of stock composition and interceptions are influenced by such sampling variation. Intervals within which each estimate would probably vary due to this source of error have been computed by both sides and are available in more detailed reports.

Second, a fishery is poorly characterized as having some unique stock composition. Stock composition varies within a season as well as between years.

Third, time and area resolution of estimates of stock composition is limited by numbers tagged within fishing areas and time periods (release strata). To assure numbers of recoveries are adequate, stock composition must usually be computed for release time periods of weeks rather than days. Although evaluation of stock composition in fisheries on a daily basis is desirable, such resolution is generally impractical from adult tagging.

Finally, and importantly, estimates should be considered with care because of persistent potential sources of error which cannot be practically controlled by increasing numbers tagged and recovered. Included are lost or discarded tags from the catches, the inexact allocation of caught tags to stocks, and unknown biases in estimates of numbers of tags in escapements.

Stock composition estimates for pink salmon harvested in fisheries in southern southeast Alaska and northern British Columbia were determined in 1982, 1984 and 1985. The corresponding estimates for sockeye salmon were developed in 1982 and 1983. The stock composition estimates for pink salmon in 1984 and 1985 were determined by averaging the Canadian and Alaskan estimates for each fishery. Stock composition estimates for pink salmon in 1982 and sockeye salmon in 1982 and 1983 were based entirely on Canadian analyses.

Several important features have emerged from the analysis of the tagged data. In a general sense the stock composition estimates clearly show the dominance of Canadian origin sockeye salmon in the boundary area. Of particular note is the high proportion of Canadian origin sockeye salmon taken in major Alaskan fisheries at Noyes Island, Cape Muzon and Tree Point. In contrast to the situation with sockeye salmon the proportion of Alaskan catches consisting of Canadian origin pink salmon is relatively small. However, Alaskan origin pink salmon do make a large contribution to Canadian catches in the boundary area, especially in the Area 1 and Area 3 fisheries where the percent of the catch consisting of Alaskan origin fish ranges between approximately 40% and 80%.

Another important feature of the tagging analyses is the degree of consistency in the stock composition estimate for each species and fishery between years. Despite annual variations in stock sizes, return migration routes and timing of the return migration, differences in the stock composition estimates of catch were not large. However, a comparison of the estimates for pink (1982, 1984, 1985) and sockeye salmon (1982, 1983) illustrate, with a few notable exceptions, that the stock composition within a fishery exhibit a reasonable degree of similarity between the years.

As described above, the stock composition estimate for pink salmon in 1984 and 1985 is an image of independently developed Alaskan and Canadian estimates. In 15 of the 20 cases where both Canadian and Alaskan estimates of stock composition are available, the Alaskan and Canadian estimates are within $\pm 5\%$ of each other. We believe the five situations where the difference is greater than 5% can be resolved with further collaboration.

The final aspect of note is the conversions of estimate of stock composition into estimates of the actual number of Canadian and Alaskan origin salmon harvested in Canadian and Alaskan fisheries. This operation is important in attempting to evaluate the absolute impact of the various fisheries on particular stocks. However, it should be noted that the estimates of the absolute numbers of salmon are meaningful only in terms of the year in which the catch is taken. When combined over all fisheries, the average Canadian catch of Alaskan origin pink salmon for the years 1982, 1984 and 1985 was approximately 1.6 million. The corresponding figures for the Alaskan harvest of Canadian origin pink salmon was approximately 1.2 million. In 1982 and 1983 the average Canadian harvest of Alaskan origin sockeye salmon was approximately 92,000 while the Alaskan harvest of Canadian sockeye was 651,000.

Table 1. Number of tagged pink, sockeye, and chum salmon released in southern southeast Alaska and northern British Columbia, 1982-1985.

Location	1982		1983		1984		1985	
	Pink	Sockeye	Sockeye	Chum	Pink	Chum	Pink	Chum
Noyes Island	17,200	2,813	3,047	474	5,464	164	17,968	558
Dall Island	5,757	1,433	1,039	442	9,652	106	10,298	513
Cape Fox	17,477	1,636	883	1,187	9,011	358	5,013	145
Upper Clarence St.	6,942	2,137	4,556	585	0	0	7,512	52
Middle Clarence St.	14,666	136	0	0	0	0	5,970	86
Lower Clarence St.	12,950	382	473	29	6,375	221	7,573	174
Cordova Bay	5,606	29	0	0	0	0	4,012	57
Union Bay	1,240	108	0	0	0	0	3,349	25
Alaskan Total	81,838	8,720	9,998	2,717	30,502	849	68,811	1,866
Langara Island	3,465	7,909	4,314	672	0	0	5,603	488
Dixon Entrance	12,487	47	0	0	17,293	358	9,250	924
Dundas Island	12,749	10,090	2,958	227	12,195	194	8,439	139
Tracy/Boston Rocks	17,624	5,920	1,308	654	6,490	93	7,241	436
Stephens/Porcher Is.	7,128	5,637	758	253	4,534	149	5,680	74
Portland Inlet	4,924	1,348	2,493	984	7,480	190	7,481	373
Area 5	9,473	490	306	222	5,116	211	7,005	101
Area 6	0	0	0	0	0	0	6,102	617
Canadian Total	67,895	31,405	12,137	3,012	53,108	1,195	56,801	3,152
Grand Total	149,733	40,125	22,135	5,729	83,610	2,044	125,612	5,018

Steelhead Report
Report TCNB (86)-2

The report consists of tables presenting commercial catch information for northern British Columbia while sport and commercial catch are presented for the southern southeast Alaska fishing areas.

The British Columbia catch information is compiled from annual sales slip publications for the years 1963 to 1984, while 1985 and 1986 catch data are preliminary sales slip information. When interpreting this information, caution should be taken as it is believed that a large percentage of the steelhead catch is either misreported as another species or not recorded on sales slips at all.

Assessment of an Apparent Weakness in the Early Portion of the Nass River Sockeye Run
Report TCNB (86)-3

A review of the information on timing of sockeye salmon stocks through the Nass River test fishery, and through the Meziadin fishway does not indicate a weakness in the early portion of the Nass sockeye run. The 1957 and 1959 tagging programs in the lower Nass indicated variable timing of individual stocks between years, and provided some evidence that the Fred Wright Lake stock may be a relatively late run. Escapement records do not indicate a pattern of declining abundance of spawners in any component stock.

The Committee made the following recommendations:

1. analyse 1957-59 Meziadin tagging information.
2. evaluate further the 1986 electrophoretic sampling from test fishery, and more detailed baseline sampling on the Nass River system.
3. maintain separate escapement and spawn timing records for all sockeye spawning areas within the Nass.
4. analyse age-length sex information for potential to provide stock identification and timing information.

Status of Chum Stocks in the Northern Boundary Area
Report TCNB (87)-2

This document reports on Portland Canal chum. Other chum stocks in adjacent boundary areas are included for streams in U.S. District 101 and Canadian Area 3. This extends the focus to cover boundary area stocks of highest profile in terms of conservation and interception problems. Significant chum stocks occur outside these areas but are not included in this document.

Our knowledge of chum stocks is minimal. Details of spawning escapements and catch are provided, but no good information on stock compositions, migration patterns or interception rates are available.

During initial discussions of the boundary area chum conservation problem, defining the boundary areas of particular interest became an issue. The decision was made to rely on historical tagging studies (1924-1968) and more recent sockeye/pink tagging studies (1982-1985) in which chum were tagged incidentally, to indicate the chum stocks present in the boundary area. However, information from these sources was insufficient to delineate the most representative stocks. Therefore, the areas examined in this report for status of their chum stocks were those surrounding Portland Canal; areas known to exhibit interception of U.S and Canadian chum by both countries. As described in the report, these areas are Canadian Area 3 and southern southeast Alaska District 101.

A direct comparison of escapements of chum salmon in British Columbia and Alaska is not feasible at this time. Canadian escapements are estimates of total escapement in each stream or area made by individual fishery officers. Alaskan escapement information is presented as peak escapement count for any one spawning stream. Actual escapements in any Alaskan stream could be 3 to 5 times or more the peak escapement count. What can be compared is their relative abundance over time. Peak escapement counts are certainly reflective of total abundance.

Another problem in making comparisons between escapements in British Columbia and Alaska is that Alaska has only a few systems where target escapements for chum have been established. In B.C., most major chum systems have target escapements established. In Alaska most chum salmon producing streams also have very large populations of pink salmon spawners. This makes establishment of target escapements for chum difficult because it is very difficult to even count the chum.

In spite of these problems it is clear that we have a conservation issue with chum salmon in the boundary area. Canadian escapements seldom reach or exceed the target escapement level. Canadian escapements in Portland Canal collapsed in the mid-1970s and show no signs of recovery. Fish Creek (Hyder) and Tombstone River are the largest producers of chum salmon in Portland Canal and during the past several seasons escapements in these systems have been on an increasing trend. Unfortunately, escapements to Hidden Inlet on the Alaska side in lower Portland Canal show a steep declining trend with little indication of recovery — similar to the pattern of the Canadian streams in Portland Canal.

On the other hand, there are encouraging signs; some Boca de Quadra and East Behm chum stocks have shown a recovery in the past three years. In addition, there are increases in some Portland Canal (Fish Creek and Tombstone River) and Observatory Inlet streams.

These increases in natural stock abundance, coupled with recent large Alaskan hatchery returns and the increase in effort required to harvest pink salmon have all contributed to the increased chum catch in Area 3Y, Noyes Island and Tree Point areas.

5. SUMMARY OF REPORT OF THE JOINT TRANSBOUNDARY RIVERS TECHNICAL COMMITTEE

Enhancement Opportunities for the Transboundary Rivers **Report TCTB (87)-2**

Surveys to assess transboundary rivers enhancement potential that have been undertaken to date have been done in a cursory manner. Some information on enhancement potentials has been acquired incidentally while conducting investigations for other purposes.

The information available suggests that sockeye enhancement would provide the greatest immediate benefits but that chinook and coho enhancement may also be beneficial in some areas. More investigation is needed to confirm these preliminary indications and to assess costs and benefits.

Three enhancement approaches for sockeye appear to have the greatest potential; lake stocking of fry, lake enrichment and obstruction removal. Of these, fry stocking may have the most widespread application.

Eleven lakes in the Taku, Stikine and Alsek watersheds were rated for enhancement potential on the basis of available information; Tahltan ranked highest followed by Klukshu and Tatsamenie Lakes.

On the basis of this preliminary rating the Committee divided the lakes into two categories and recommends that the highest ranking lakes be considered for feasibility studies in 1987. If funding is available it is recommended that surveys be conducted on all lakes in 1987. These studies are needed to identify factors limiting production and thus what specific enhancement tool may be appropriate.

The general approach recommended is to conduct a broad survey of a number of lakes and a detailed survey of Tatsamenie Lake which has been identified as the best potential for sockeye production in the Taku River drainage.

Investigations to assess the prevalence of fish disease in potential sockeye broodstocks and of the quality of returning adults for commercial use are also recommended.

As the harvest pattern for enhanced sockeye stocks will be mainly determined by harvest rates that can be applied to wild stocks, substantial surpluses may be available in terminal areas.

Slightly over 50% of enhanced Taku River sockeye would enter the river on average given the existing allocation formula, while in the Stikine, about 75% would enter the river.

The practicality of conducting a terminal harvest on excess enhanced sockeye should be considered during project selection as much of the Canadian catch for some enhanced stocks may have to be taken in new terminal fishing areas.

Time separation of Tahltan sockeye from other Stikine stocks could allow additional harvests of enhanced fish in both U.S. and Canadian fisheries.

Because wild and enhanced stocks are mixed in the fishing areas it may not be possible to assign a separate formula for sharing of enhanced fish for certain projects.

Evaluation of the success of projects should be undertaken through the application of techniques such as biological markers analysis and coded-wire tagging to identify individual stocks. Stock separation information will also be needed to ensure that management programs can protect natural stocks.

Two potential chinook enhancement projects identified are rehabilitation of Alsek chinook through use of the Whitehorse hatchery to incubate Klukshu chinook eggs and fry planting above the barrier on the Tuya River.

No specific projects for coho enhancement were identified but system-wide surveys are recommended.

Pink and chum salmon enhancement was not considered to be viable at this time because of the comparatively low value of these species.

6. SUMMARY OF REPORT OF THE COMBINED JOINT TRANSBOUNDARY RIVERS/NORTHERN BOUNDARY TECHNICAL COMMITTEES

Stock Identification of Sockeye Salmon Using Biological Markers **Report TCNB/TR (87)-1)**

This report was prepared to evaluate research directed at sockeye stock identification. It describes and compares the various kinds of biological markers used in differentiating sockeye populations, and explains two different approaches used to estimate sockeye stock composition in the Northern Boundary area.

It is now possible, in principle, to detect contributions to mixed-stock fisheries by up to 40 or 50 individual sockeye stocks. In practice, the need for annual resampling must be evaluated to determine if the benefits derived from reliable estimates justify the sampling costs. Therefore, the Technical Committee recommended the following research objectives:

1. resample several sockeye populations to assess long-term stability of biological markers used for stock identification
2. undertake simulation studies to assess the influence of annual variability in biological markers on the reliability of stock composition estimates based on historical data
3. continue to evaluate and to search for additional stable parasite and genetic markers
4. complete collection of baseline samples;
5. investigate the potential for using biological markers for stock identification of other Pacific salmon species.

Publications of the Pacific Salmon Commission

PART V

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, 1155 Robson Street, Vancouver, B.C. V6E 1B9.

A. ANNUAL REPORTS

Pacific Salmon Commission 1985/86 First Annual Report

This report contains a summary account of the first meetings of the Commission, and incorporates the full text of the Pacific Salmon Treaty including Annexes and Memoranda of Understanding.

B. REPORTS OF JOINT TECHNICAL COMMITTEES

i. Joint Chinook Technical Committee

1. TCCHINOOK (86)
Draft report of the Chinook Technical Committee to the Pacific Salmon Commission's Southern and Northern Panels. January 21, 1986.
2. TCCHINOOK (86)
Summary Report of the Chinook Technical Committee (1985) — Prepared for the March 1986 meetings of the Pacific Salmon Commission and Northern and Southern Panels. February 24, 1986.
3. TCCHINOOK (86)-1
Final 1985 Report of the Chinook Technical Committee. September 3, 1986.
4. TCCHINOOK (86)-2
Chinook Technical Committee Report — Preliminary Review of 1986 Fisheries. November 3, 1986.
5. TCCHINOOK (87)-1
Chinook Technical Committee Report — Preliminary Review of 1986 Fisheries. February 2, 1987. (An update of Report TCCHINOOK (86)-2 submitted November 1986.)
6. TCCHINOOK (87)-2
Assessing Progress towards Rebuilding of Depressed Chinook Stocks. February 12, 1987.
7. TCCHINOOK (87)-3
Data Report of the Chinook Technical Committee on Unaccounted for Sources of Fishing Associated Mortalities of Chinook Salmon in Westcoast Salmon Fisheries. February 1, 1987.
8. TCCHINOOK (87)-4
Chinook Technical Committee Report — 1986 Summary Report. February 26, 1987. (Revised 2/28/87.)

ii. Joint Chum Technical Committee

1. TCCHUM (87)-1
Chum Technical Committee Report — Summary Report of Southern British Columbia and Washington Chum Salmon Data for the years prior to 1985. February 1987.
2. TCCHUM (87)-2
Chum Technical Committee Report — Working Paper on Genetic Stock Identification Methods for Southern Chum Salmon. February 1987.
3. TCCHUM (87)-3
Chum Technical Committee Report — Research Needs on Southern British Columbia and Washington State Chum. February 1987.
4. TCCHUM (87)-4
Final 1985 Post Season Summary Report. August 1987.

iii. Joint Coho Technical Committee

1. TCCOHO (86)-1 Coho Technical Committee Report on 1985 Fisheries. Responses to Questions posed by the Southern Panel March 2, 1986. June 20, 1986.
2. TCCOHO (87)-1
Report of the Joint Coho Technical Committee — Response to Southern Panel Questions. February 7, 1987.
3. TCCOHO (87)-2
Coho Technical Committee Report — Response to A Request from the Northern Panel for Information on Stock Composition of Coho Harvested in Northern British Columbia and Southeast Alaska. February 1987.
4. TCCOHO (87)-3
Coho Technical Committee Report — Impacts of Swiftsure Bank Closure and incidental coho catch estimates for 1987 — Canadian Area 20 and U.S. Areas 7/7A. June 1, 1987.

iv. Joint Northern Boundary Technical Committee

1. TCNB (86)
Report of the Canada/United States Northern Boundary Technical Committee. January 8, 1986.
2. TCNB (86)-1
Northern Boundary Technical Committee Report — Joint United States/Canada Salmon Research, Northern Boundary Area Adult Tagging Report, 1982 to 1985. November 1986.
3. TCNB (86)-2
Northern Boundary Technical Committee Report — Steelhead Report. November 1986.
4. TCNB (86)-3
Northern Boundary Technical Committee Report — Assessment of an Apparent Weakness in the Early Portion of the Nass River Sockeye Salmon Run. November 1986.
5. TCNB (87)-1
Northern Boundary Technical Committee Report — U.S./Canada Northern Boundary Area 1986 Salmon Fisheries Management Report and 1987 Preliminary Expectations. January 1987.
6. TCNB (87)-2
Northern Boundary Technical Committee Report — Status of Chum Stocks in the Northern Boundary Areas. February 1987.

v. Joint Transboundary Technical Committee

1. TCTR (86)
Report of the Canada/United States Transboundary Technical Committee. Final Report. February 5, 1986.
2. TCTR (87)-1
Report of the Transboundary Technical Committee. February 8, 1987.
Appendix 1. Spawning stock size of Stikine River sockeye salmon 1986. May 1987.
3. TCTR (87)-2
Report of the Transboundary Technical Committee. Management Strategies of the Canadian Commercial Fishery on the Stikine River in 1986.
4. TCTR (87)-3
Report of the Transboundary Technical Committee. Enhancement Opportunities for the Transboundary Rivers. April 18 - 30, 1987.
5. TCNB/TR (87)-1
Report of the Northern Boundary and Transboundary Technical Committees — Stock Identification of Sockeye Salmon Using Biological Markers. February 1987.

C. DOCUMENTS SUBMITTED BY DOMESTIC AGENCIES AND THE PARTIES

i. To the Joint Chinook Technical Committee

1. *Preliminary Report on 1985 Southeast Alaska Chinook Salmon Catch and Escape-ment.* Prepared by Southeast Region, Fisheries Divisions Staff, Alaska Department of Fish and Game. January 31, 1986. (Appendix 1 to TCCHINOOK (86)-1.)
2. *Observations on Chinook Salmon Non-Retention in the 1985 Southeast Alaska Purse Seine Fishery.* Prepared by B. Van Alen and M. Seibel, Alaska Department of Fish and Game. June 1986 (Appendix 2 to TCCHINOOK (86)-1.)
3. *Observations on Chinook Salmon Hook and Release in the 1985 Southeast Alaska Troll Fishery.* Prepared by A. Davis, J. Kelley and M. Seibel, Alaska Department of Fish and Game. June 1986. (Appendix 3 to TCCHINOOK (86)-1.)
4. *Data Report on Unaccounted for Sources of Fishing Associated Mortalities of Chinook Salmon in B.C. Fisheries (1977-1986).* Prepared by the Canadian members of the Chinook Technical Committee. January 1987.
5. *State of Washington Department of Fisheries — Progress Report No. 251. 1976 to 1985 Puget Sound Chinook (*Oncorhynchus tshawytscha*) Net Catch with Regard to Pacific Salmon Treaty Obligations.* Prepared by Steven L. Shepard, Fish Biologist, Planning, Research and Harvest Management Program. January 1987.
6. *Preliminary Review of 1986 Chinook Salmon Hatchery Addon for Southeast Alaska Fisheries and Projected Addon for 1987.* Prepared by Southeast Region Staff, Fisheries Divisions, Alaska Department of Fish and Game. January 12, 1987. Revised May 18, 1987.
7. *Summary of Chinook Escapement and Harvest Rate Indicator Stocks for the Oregon Coast (Excluding Columbia River).* Prepared by R. Kaiser and S. Jacobs, Oregon Department of Fish and Wildlife. January 13, 1987.
8. *Observation on Chinook Salmon Non-Retention in the 1986 Southeast Alaska Purse Seine Fishery.* Prepared by B. Van Alen and M. Seibel, Alaska Department of Fish and Game. February 1987.
9. *Associated Fishing Induced Mortalities of Chinook Salmon in Southeast Alaska.* Prepared by Alaska Department of Fish and Game and National Marine Fisheries Service, Auke Bay Laboratory. February 1987.
10. *Georgia Strait Chinook Stock Composition: A GSI Simulation Analysis.* Prepared by National Marine Fisheries Service, Genetics Unit, Manchester, Washington and Washington Department of Fisheries, Resource Assessment and Development Unit, Olympia, Washington. February 1987.
11. *Mortality Rates of Sublegal and Legal Sized Chinook Salmon Associated with Incidental Catch during Chinook-Only Troll Closures.* Prepared by Alex Werthmeier, National Marine Fisheries Service, Auke Bay, Alaska. February 4, 1987.

12. *Southeast Alaska Regional Summary — Identification of Indicator Stocks and Assessment of Rebuilding of Natural Chinook Salmon Stocks (Appendix to TCCHINOOK (87)-2)*. Prepared by Alaska Department of Fish and Game. February 5, 1987. Updated May 22, 1987.
13. *Regional Summary for Columbia River Chinook Indicator Stocks (Appendix to TCCHINOOK (87)-2)*. Prepared by Columbia River Inter-Tribal Fish Commission. February 6, 1987.
14. *Washington Chinook Fishery Stock Composition Estimates — Results from Genetic Stock Identification Studies in Selected Washington State Fisheries*. Prepared by The U.S. Section of the Chinook Technical Committee. February 8, 1987.
15. *History of Chinook and Coho Salmon Catch in Washington State Fisheries Operating in Puget Sound and Juan de Fuca Strait*. Prepared by the Washington State Department of Fisheries. February 8, 1987.
16. *Summary of Chinook Escapement and Harvest Rate Indicator Stocks for Puget Sound and the Washington Coast*. Prepared by the Northwest Indian Fisheries Commission and the Washington Department of Fisheries with assistance from Dr. Gary Morishima and Dr. Kenneth Henry. February 9, 1987. (Appendix to TCCHINOOK (87)-2).
17. *Evaluation of Chinook Pass-Through and Evaluation of Associated harvests in Washington-Oregon Fisheries without PSC harvest ceilings*. Prepared by The Washington Department of Fisheries, The Columbia River Inter-Tribal Fish Commission, The U.S. Fish and Wildlife Service, The National Marine Fisheries Service and The Northwest Indian Fisheries Commission. February 11, 1987.
18. *Review of Natural Chinook Salmon Escapement Trends in Transboundary Rivers of Northern British Columbia and Southeast Alaska*. Prepared by Canadian Department of Fisheries and Oceans and Alaska Department of Fish and Game. February 12, 1987.
19. *Historical Catch of Chinook Salmon in Juan de Fuca Strait and the Strait of Georgia (1953-1986) and Associated Information on Stock Composition of the Catch*. Prepared by B. Riddell. February 18, 1987.
20. *Supplement to the Canadian Report on Unaccounted for Sources of Fishing Associated Mortalities: Pass-Through Related Information*. Prepared by the Canadian members of the Chinook Technical Committee. February 19, 1987.
21. *Observations on Chinook Salmon Hook and Release in the 1986 Southeast Alaska Troll Fishery*. Prepared by A. Davis, J. Kelly and M. Seibel, Southeast Region, Division of Commercial Fisheries, Alaska Department of Fish and Game, Douglas, AK. (February 19, 1987.) Updated and retitled version June 1987.
22. *Associated Fishing Induced Mortalities of Chinook Salmon in Southeast Alaska*. Prepared by the Alaska Department of Fish and Game and the National Marine Fisheries Service, Auke Bay Laboratory. February 21, 1987.
23. *Preliminary Review of 1987 Alaska Hatchery Addon of Chinook Salmon for Southeast Alaska Fisheries and Projected 1988 Hatchery addon*. Prepared by Regional Staff, Southeast Fish and Game, Juneau, Alaska. December 18, 1987.

ii. To the Joint Chum Technical Committee

1. *Washington/Oregon Chum Salmon Management and Stock Assessment for years prior to 1988*. Prepared by the United States section of the Joint Chum Salmon Technical Committee. February 1987.

iii. To the Joint Coho Technical Committee

1. *Information on Coho Salmon Stocks and Fisheries of Southeast Alaska*. Prepared by Southeast Region, Fisheries Divisions Staff, Alaska Department of Fish and Game. Juneau, AK. January 1986. (Appendix 2 to TCCOHO (86)-1.)
2. *History of Chinook and Coho Salmon Catch in Washington State Fisheries Operating in Puget Sound and Juan de Fuca Strait*. Prepared by the Washington State Department of Fisheries. February 8, 1987.
3. *Canadian Agency Report on Coho Salmon*. Prepared by Canadian Section of the Coho Technical Committee. (Appendix 1 to TCCOHO (86)-1.) June 16, 1987.
4. *Post-Season Report for 1985 U.S. Coho Fisheries from Cape Falcon, Oregon to the Washington/Canadian Border and Coho Stock Status Expectations*. June 20, 1986.

iv. To the Joint Northern Boundary Technical Committee

1. *In-season Management Rationale — Tree Point Gillnet Fishery 1986.* February 1987.
2. *Summary of the 1986 Salmon Net Fishery in Area 3, British Columbia.* February 1987.
3. *1986 In-Season Management Rationale and Post-Season Summary of the Alaskan Drift Gillnet Sockeye Fishery in District 6 and District 8.* Prepared by Alaska Department of Fish and Game. February 11, 1987.

v. To the Joint Transboundary Rivers Technical Committee

1. *Contribution of Principal Sockeye Salmon Stock Groups to Catches from Southeast Alaska's District 106 and 108 and Canada's Stikine River Fisheries, 1986.* Prepared by Kathleen A. Jensen, Glen T. Oliver and Iris Frank. Alaska Department of Fish and Game. August 1987.
2. *Separation of Principal Taku River and Port Snettisham sockeye salmon (*Oncorhynchus nerka*) Stocks in Southeastern Alaska and Canadian Fisheries of 1986 Based on Scale Pattern Analysis.* Prepared by Andrew J. McGregor and Susan L. Walls. Alaska Department of Fish and Game. Technical Data Report No. 213. August 1987.
3. *Migratory Timing and Escapement of Taku River Salmon Stocks in 1986.* Prepared by Andrew J. McGregor and J.E. Clark. Alaska Department of Fish and Game. September 1987.

vi. To the Commission by Canada

1. *A summary of the Salmonid Enhancement Program in British Columbia and the Yukon Territory.* Prepared by Canada Department of Fisheries and Oceans. November 14, 1986.
2. *Canadian catches in 1986 and Pre-Season Expectations for 1987.*
 - a) Fraser River, Northern B.C. and Yukon Division Summary Review of 1986 Salmon Fisheries and Returns.
 - b) Preliminary Review of 1986 Fisheries and Prospects for 1987. South Coast Division.
 - c) Canadian Report of the 1986 Salmon Fisheries of Northern British Columbia Including Preliminary Expectations and Fishing Plans for 1987.Prepared by Canada Department of Fisheries and Oceans. November 1986.

vii. To the Commission by the United States

1. *1986 Post-Season and 1987 Pre-Season Fishery Report.* Prepared by U.S. Section, Pacific Salmon Commission Coho, Chinook, Chum, Northern Boundary and Transboundary Technical Committees in Cooperation with State, Federal, and Tribal Fishery Management Agencies. November 1986.
2. *Enhancement Report of the United States Section, Pacific Salmon Commission.* Prepared by U.S. Section, Pacific Salmon Commission Coho, Chinook, Chum, Northern Boundary and Transboundary Technical Committees in cooperation with State, Federal, and Tribal Fishery Management Agencies.

D. TECHNICAL REPORT SERIES OF THE PACIFIC SALMON COMMISSION

1. *Technical Information Requirements for Effective Implementation of the Canada-United States Treaty concerning Pacific Salmon*. Prepared for the Pacific Salmon Commission: Natural Resources Consultants, Seattle, Washington. October 1986.

E. REPORTS OF THE FRASER RIVER PANEL

1. Report of the Fraser River Panel to the Pacific Salmon Commission on the 1986 Fraser River Sockeye Salmon fishing season. November 1986.

F. REPORTS OF THE INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

Responsibility for maintenance of the library of the former International Pacific Salmon Fisheries Commission has been transferred to the Pacific Salmon Commission. Copies of all annual reports to and including 1985, progress reports, bulletins of the IPSFC, and a library catalogue are available on request from the Pacific Salmon Commission Secretariat, 1155 Robson Street, Vancouver, B.C. V6E 1B9.

G. PUBLICATIONS BY PACIFIC SALMON COMMISSION SECRETARIAT STAFF

Cook, R.C., and I. Guthrie. 1987. *Inseason stock identification using scale pattern recognition*. In: H.D. Smith, L. Margolis, and C.C. Wood (ed.). *Sockeye Salmon (*Oncorhynchus nerka*) Population Biology and Future Management*. Can. Spec. Pub. Fish. Aquat. Sci. 96 (in press).

Auditors' Report for 1986/87

PART VI

AUDITORS' REPORT AND FINANCIAL STATEMENTS FOR THE PERIOD APRIL 1, 1986 TO MARCH 31, 1987

AUDITORS' REPORT TO THE COMMISSION

We have examined the balance sheet of the Pacific Salmon Commission as at March 31, 1987 and the statements of revenue and expenditures, fund balances and changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of the Commission as at March 31, 1987 and the results of its operations, and the changes in its financial position for the period then ended in accordance with the financial regulations adopted by the Commission applied on a basis consistent with that of the preceding period.

Coquitlam, Canada
December 2, 1987

Leat Marwick

Chartered Accountants

PACIFIC SALMON COMMISSION
Balance Sheet
March 31, 1987
(With comparative figures for 1986)

	<u>1987</u>	<u>1986</u>
<u>ASSETS</u>		
General Fund:		
Current assets:		
Cash and term deposits	\$ 1,034,331	1,049,001
Accounts receivable:		
Travel advances	2,600	-
Other	2,104	795
Interest receivable	4,598	5,693
	9,302	6,488
Prepaid expenses	48,178	16,278
Prepaid pension contributions	100,000	-
	<u>\$ 1,191,811</u>	<u>1,071,767</u>
Working Fund:		
Current assets:		
Term deposit	<u>\$ 100,000</u>	<u>50,000</u>
Fixed Asset Fund:		
Fixed assets (Note 3)	<u>\$ 520,467</u>	<u>164,209</u>
<u>LIABILITIES AND FUND BALANCES</u>		
General Fund:		
Current liabilities:		
Accounts payable and accrued liabilities	\$ 88,470	82,794
Fund balance:		
Unappropriated fund balance	274,703	28,555
Reserves (Note 4)	828,638	960,418
	<u>1,103,341</u>	<u>988,973</u>
	<u>\$ 1,191,811</u>	<u>1,071,767</u>
Working Fund:		
Fund balance	<u>\$ 100,000</u>	<u>50,000</u>
Fixed Asset Fund:		
Fund balance	<u>\$ 520,467</u>	<u>164,209</u>

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION
General Fund
Statement of Revenue and Expenditures
For the year ended March 31, 1987
(With comparative figures for the period
from March 18, 1985 to March 31, 1986)

	<u>1987</u>	<u>1986</u>
Revenue:		
Contributions of cash from contracting parties	\$ 1,430,000	1,316,000
Contribution of fixed assets from contracting parties	-	56,5240
International Pacific Salmon Fisheries Commission Trust Account	287,989	-
Gain on sale of fixed assets	2,925	-
Interest	108,941	28,494
Test fishing	<u>932,257</u>	<u>-</u>
	<u>\$ 2,762,112</u>	<u>1,401,018</u>
Expenditures:		
On behalf of International Pacific Salmon Fisheries Commission	\$ 17,806	-
Materials and supplies	58,555	15,177
Overhead	157,306	11,174
Professional services	316,730	-
Rentals	89,432	25,966
Repairs and maintenance	13,097	951
Salaries and employee benefits	787,759	110,529
Test fishing	<u>616,929</u>	<u>-</u>
Total expenditures	2,057,614	163,797
Excess of revenue over expenditures	<u>704,498</u>	<u>1,237,221</u>
	<u>\$ 2,762,112</u>	<u>1,401,018</u>

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION
Statements of Fund Balances
Year ended March 31, 1987
(With comparative figures for the period
from March 18, 1985 to March 31, 1986)

	<u>1987</u>	<u>1986</u>
General Fund:		
Fund balance, beginning of year	\$ 988,973	-
Transfer to funds:		
Fixed Asset Fund	(540,130)	(198,248)
Working Capital Fund	(50,000)	(50,000)
Excess of revenue over expenditures	<u>704,498</u>	<u>1,237,221</u>
Fund balance, end of year	<u>\$ 1,103,341</u>	<u>988,973</u>
Working Capital Fund:		
Fund balance, end of year	\$ 50,000	-
Transfer from General Fund	<u>50,000</u>	<u>50,000</u>
Fund balance, end of year	<u>\$ 100,000</u>	<u>50,000</u>
Fixed Asset Fund:		
Fund balance, beginning of year	164,209	-
Transfer from General Fund	540,130	198,248
Depreciation	<u>(183,872)</u>	<u>(34,039)</u>
Fund balance, end of year	<u>\$ 520,467</u>	<u>164,209</u>

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION
Statements of Changes in Financial Position
For the year ended March 31, 1987
(With comparative figures for the period
from March 18, 1985 to March 31, 1986)

	<u>1987</u>	<u>1986</u>
General Fund:		
Operating activities:		
Excess of revenue over expenditures	\$ 704,498	1,237,221
Add (deduct):		
Net changes in non-cash working capital		
balances relating to operations	<u>(129,038)</u>	<u>60,028</u>
Cash provided by operations	575,460	1,297,249
Financing activities:		
Transfer to Working Capital Fund	(50,000)	(50,000)
Transfer to Fixed Asset Fund	<u>(540,130)</u>	<u>(198,248)</u>
	590,130	(248,248)
(Decrease) increase in cash during the year	(14,670)	1,049,001
Cash and term deposits, beginning of year	<u>1,049,001</u>	—
Cash and term deposits, end of year	<u><u>\$1,034,331</u></u>	<u><u>1,049,001</u></u>
Working Capital Fund:		
Financing activity:		
Transfer from General Fund	\$ 50,000	50,000
Cash provided by financing activities	<u>50,000</u>	<u>50,000</u>
Cash and term deposits, beginning of year	<u>50,000</u>	—
Cash and term deposits, end of year	<u><u>\$ 100,000</u></u>	<u><u>50,000</u></u>
Fixed Asset Fund:		
Operating activity:		
Item not affecting working capital:		
Gain on sale of fixed asset	\$ (2,925)	—
Cash used for operations	<u>(2,925)</u>	—
Investing activities:		
Additions to fixed assets	(542,205)	(198,248)
Proceeds on sale of fixed assets	<u>5,000</u>	<u>—</u>
Cash used for investing activities	(537,205)	(198,248)
Financing activity:		
Transfer from General Fund	<u>540,130</u>	<u>198,248</u>
Increase in cash during the year	—	—
Cash, beginning of year	<u>—</u>	<u>—</u>
Cash, end of year	<u><u>\$ —</u></u>	<u><u>—</u></u>

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION
Notes to Financial Statements
March 31, 1987

1. 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 administration purposes.

2. Significant accounting policies:

(a) Fund accounting:

The General Fund represents funds provided annually through contributions from the Contracting Parties. Any unexpended 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 to repairs and maintenance while those expenditures which improve or extend the useful life of the assets are capitalized. Depreciation is provided using the straight-line method at rates sufficient to amortize the costs over the estimated useful lives of the assets. The rates of depreciation used are:

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

(d) Income tax:

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

(e) Foreign exchange:

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.

3. Fixed assets:

		1987		1986
	<u>Cost</u>	<u>Accumulated Depreciation</u>	<u>Net Book Value</u>	<u>Net Book Value</u>
Automobiles	\$ 61,517	12,758	48,759	4,725
Boats	66,737	13,487	53,250	2,005
Computer equipment	362,328	135,786	226,542	108,348
Equipment	243,655	53,867	189,788	46,212
Films	1,800	1,200	600	1,200
Furniture and Fixtures	1,910	382	1,528	1,719
	<u>\$ 737,947</u>	<u>217,480</u>	<u>520,467</u>	<u>164,209</u>

4. Reserves:

(a) Reserves for contractual commitments:

Contractual commitments are recognized in the accounts only to the extent that the service or goods have been delivered. Until the service or goods are delivered the obligation is recorded as a reserve against the General Fund balance.

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

	1987	1986
Fixed assets	\$ 392,460	772,140
Professional services	180,000	170,000
International Pacific Salmon		
Fisheries Commission Commitments	<u>108,000</u>	<u>-</u>
	680,460	944,140
(b) Reserve for prepaid expenses	48,178	16,278
(c) Reserve for prepaid pension contributions	<u>100,000</u>	<u>-</u>
	<u>\$ 828,638</u>	<u>960,418</u>

5. Comparative figures:

Certain comparative figures have been adjusted to conform with the financial statement presentation adopted in the current year.

Appendices

Appendix 1

A Summary of the Preliminary 1986 Canada Post-Season Fishery Report and Expectations for 1987

A. Fraser River, Northern B.C. and Yukon Division. Summary Review of 1986 Salmon Fisheries and Returns

1. Fraser River

Sockeye

The 1986 Fraser River sockeye return of nearly 16,500,000 was the largest on the cycle since the 1958 run of 19,800,000. The commercial catch was about 11,500,000 (similar to 1985) while the Indian food fisheries took an estimated 550,000 including 527,000 in the Fraser River. Test fishing charters removed an additional 80,000 sockeye for a total catch of approximately 12,130,000 pieces. Approximately 4,300,000 sockeye arrived on the spawning grounds.

Of the commercial catch 8,742,000 sockeye were taken by Canadian fishermen (nearly 500,000 more than in 1985) and 2,752,000 were taken in United States waters. Under the terms of the Pacific Salmon Treaty, the United States fishermen were entitled to 24% (plus small adjustments) of the Total Allowable Catch.

Within Canada 4,955,000 sockeye were caught in the Fraser Panel Area, 2,302,000 in Johnstone Strait, 1,456,000 in West Coast troll fisheries north of the Panel waters and a further 29,000 in northern areas, principally in Areas 1 and 2. Preliminary estimates indicate the trollers took 22.7% of the Canadian catch of Fraser sockeye, seines 48.2% and gill nets 29.1%. The troll catch was approximately 159,000 short of their allocation of 22.8% + 100,000 pieces as established by MAC while the seines and gill nets exceeded their respective allocation of 47.5% and 29.7% (less 100,000 pieces).

The 1986 Fraser River sockeye return was managed to two groups of stocks. Allocations and fisheries were designed to fish the summer and late runs separately. The summer runs, primarily composed of Seymour, Horsefly, Chilko and Stellako stocks, returned about 1,600,000 fish greater than forecast to total 4,000,000. The late runs returns were forecast to total 11,600,000 sockeye. The actual return is presently estimated at 12,400,000 (800,000 greater than forecast). Adams-Lower Shuswap and Birkenhead sockeye made up the bulk of the late run return.

The total spawning escapement for the watershed is tentatively estimated at about 4,300,000 comprised of 900,000 summer run stocks and 3,400,000 late run stocks. Evaluation of late run spawning stocks is incomplete at the time of writing. The early Stuart escapement of 29,000 spawners was close to the goal of 35,000. Horsefly and Mitchell Rivers had the largest escapements ever on this cycle indicating the reproductive potential of the sub-dominant runs to the Quesnel Lake system. The Chilko Lake and River system had a combined escapement of 339,000 spawners exceeding the target by 39,000 spawners. Early South Thompson escapements were excellent with some streams having the largest spawning escapements ever recorded. For example, the Seymour estimate of 129,000 spawners was twice the 1982 brood level of 63,000. The Scotch Creek population of 27,000 spawners was 8,000 larger than the previous high of 19,000 in 1981 and 22,000 larger than the 1982 brood level of 5,000 spawners. Several other populations (Anstey and Eagle Rivers) had escapements exceeding any previous year. The Stellako River escapement is presently estimated at 77,000 spawners, slightly less than the goal of 85,000 sockeye. The Birkenhead population was about 330,000 spawners, nearly twice the previous high of 173,000 in 1974. The late South Thompson escapement, primarily composed of Adams, Little and Lower Shuswap Rivers, is presently estimated at 3,000,000 spawners. This is near the pre-season target of 3,100,000. The success of spawning for all populations was very high. None of the stocks suffered abnormal pre-spawning mortalities except for some initial mortalities at Weaver Creek. This was attributed to the very long delay they experienced prior to moving onto the spawning grounds.

Chinook

Fraser River chinook salmon benefitted from the various conservation measures implemented coastwide to rebuild this species. Within the river the late start to the commercial fishery (August 5) and reduced weekly fishing times in the Indian food fishery, including a closure to protect early Stuart sockeye, led to increases in spawning escapements of the early and middle-timing stocks. The total spawning escapement of 109,300 to the Fraser River and tributaries above Hope was the highest on record and about 17,500 (19%) higher than the 1985 escapement and 49,300 (82%) higher than the ten year average. Escapements increased in most areas, with the largest increase over 1985 occurring in the middle Fraser area between Lillooet and Prince George (+45%). Substantial improvements also occurred in the North Thompson (+32%), lower Thompson (+29%) and in the upper Fraser area above Prince George (+14%). Escapements declined in the Hope to Lillooet area (-13%) and in the Nechako system (-17%); however, they remained above their respective ten year average.

The escapement estimate for chinook returning to the Harrison River, a major tributary of the lower Fraser River, is not yet finalized. However, it will likely be in the order of 10,000 to 20,000 based on fishery officer visual observations, which would be a substantial decline from the 1985 level. A tag and recovery program to provide an independent estimate of this stock is currently in progress.

For the entire Fraser River, the final escapement estimate for 1986 is expected to be in the 120,000 to 130,000 range, one of the largest escapements on record. Adding on the estimated in-river commercial catch of 28,500 and the food fishery catch of 15,100 brings the estimated total return of chinook to the Fraser River to 164,000 to 174,000, the second largest return since 1977.

Although increases in recorded spawning escapements in 1986 and recent years are undoubtedly due primarily to greater fish abundance, it should also be pointed out that there has generally been a more intensive effort directed toward spawning enumeration in recent years. This additional effort may have had the effect of increasing escapement estimates above what they would otherwise have been had enumeration effort remained constant.

Coho

Indices from the sockeye and chum test fisheries in the lower Fraser River indicate that the 1986 total return will be relatively low in spite of a large expected return of enhanced coho. Of the total return, an estimated 28,800 and 31,300 have been taken to date in the Area 29 commercial and Indian food fisheries respectively. At this time, there is very little information on actual spawning ground counts of Fraser River coho. Recorded returns to the hatcheries now exceed 35,000.

Chum

The pre-season forecast of the 1986 Fraser River chum run was 977,000 fish of which 406,000 or 41.6% were of enhanced origin. The harvesting of the 1986 Fraser River chum run was controlled for the third consecutive year by the "clockwork" approach developed with industry and for the first time, by a new agreement with the United States as part of the Pacific Salmon Treaty. The clockwork approach limited the overall harvest rate on Fraser chum entering Johnstone Strait while the international agreement placed an upper limit on the harvest in U.S. fisheries at Point Roberts and San Juan Islands. Based on the pre-season forecast of 2,774,000 for "inside chums" the expected harvest rate was 20% including the U.S. harvest of 80,000 chum of which 60,000 were assumed to be of Fraser origin.

In-season monitoring in Johnstone Strait indicated that the total chum run migrating through that area was above the 3,300,000 threshold level that would permit a 30% harvest rate. Consequently a total of four commercial fisheries were held in Johnstone Strait with the run size at the time of the last fishery projected to be 3,800,000. Of the total catch in Johnstone Strait of 951,000 chum 275,000 were estimated from electrophoretic analysis to be of Fraser River origin. In accordance with the "clockwork" a fishery was held in the Fraser River on October 23 taking an estimated 69,000 chum in 10 hours. This catch plus chum caught incidentally in the late sockeye fisheries brought the seasonal total commercial catch in the Fraser to 92,400. The U.S. fisheries in Areas 7 and 7A caught about 86,500 chum of which 66,300 are tentatively estimated to be Fraser River fish bringing the estimated total commercial catch of Fraser River chum to 433,700. The anticipated catch of Fraser chum in the Qualicum fishery and in various test and Indian food fisheries is expected to total about 56,000 which would give a seasonal total catch of 490,000 Fraser chum in all fisheries combined.

The best estimate of the total run of Fraser chum is derived from the addition of known or expected catches to gross escapement into the river as determined by the in-river test fisheries. The predicted gross escapement to the spawning grounds and enhancement facilities, with 58% of the run in the river on average by this date, now stands at 1,003,000 chum and after adding the expected seasonal catch of 489,600, the Fraser run size is estimated at 1,492,000 the largest on record. The seasonal exploitation rate is presently estimated at 32.8%.

2. Stikine River Fisheries, 1986

Three separate Canadian net fisheries were in operation on the Stikine River in 1986. These included: the traditional Indian food fishery which is centred around Telegraph Creek; a lower Stikine commercial gillnet fishery located from the Canada-U.S. border upstream to the confluence of the Porcupine River and including the lower portions of the Iskut River; and, a small upper Stikine commercial fishery in the vicinity of Telegraph Creek.

(a) Lower Stikine Commercial Gillnet Fishery

A total of 12,411 sockeye and 2,278 coho was caught in the lower Stikine commercial fishery in 1986. Incidental catches amounted to 1,171 chinook (including 365 jacks), 107 pink, 295 chum, and 192 steelhead. Unlike the pre-season expectation, the sockeye catch was well below the recent five year average (1981-85 excluding 1984) of 17,474.

(b) Upper Stikine Commercial Gillnet Fishery

A small commercial salmon fishery has existed near Telegraph Creek in the upper Stikine River since 1975. This year, an average of three fishermen operated their set-gillnets one day each week, selling their catch to local buyers. A total of 815 sockeye and 145 chinook (including 41 jacks) were landed over the seven days the fishery was opened between June 30 to August 11. The catch of both sockeye and chinook was slightly better than the recent five year average.

(c) Upper Stikine Indian Food Fishery

The subsistence fishery centred around Telegraph Creek harvested: 4,208 sockeye, 1,595 chinook (including 569 jacks), 2 coho, 1 pink, 12 chum, and 2 steelhead. Although the sockeye catch was below the 1981-85 average of 5,503, the chinook catch was almost double the average (802) for the same period.

(d) Escapement

(i) Chinook: Results from aerial surveys conducted on index tributaries indicated a below average chinook escapement in 1986. Surveys conducted by ADF&G personnel reported the following:

	<u>1986</u>	<u>1981-85 average</u>
Little Tahltan index	1,101	1,930
Beatty Creek	183	296

This year marked the second year of operation of a chinook enumeration weir on the Little Tahltan River; a program conducted by DFO. This year's results are compared with 1985 as follows:

	<u>Total Count</u>	
	<u>1986</u>	<u>1985</u>
Adult Return	2,893	3,146
Jacks	<u>536</u>	<u>316</u>
TOTAL	3,429	3,462

(ii) Sockeye: A total of 20,280 sockeye were counted through the Tahltan Lake weir in 1986. The weir has been in operation since 1959 and over the period 1959-85, Tahltan escapements have averaged 20,914. Due to recent increased returns to Tahltan Lake, the 1981-85 average has jumped to 40,086. The 1986 count therefore constitutes a below average return.

Through the analysis of egg diameter, the CPUE of Tahltan stocks in the lower Stikine commercial fishery, and the total in-river catch and escapement of Tahltan stocks, it is feasible to estimate the weekly harvest rates in the commercial fishery. From the harvest rate data, weekly escapements of both Tahltan and non-Tahltan are estimated. The preliminary 1986 estimated non-Tahltan escapement is 42,112. The system-wide escapement is estimated to be 62,392 which falls within the interim escapement goal range of 58,300 to 65,000.

(iii) Coho: Aerial surveys to assess index coho escapements have not yet been conducted. Final analysis of the 1986 test fishery program is not yet complete. Preliminary analysis indicates that the relative abundance of coho in the lower river was somewhat less than sockeye.

(e) Treaty Performance

Under provisions of Article VII, Annex IV, of the Pacific Salmon Treaty, in 1986 Canadian fishermen were entitled to catch 35% of total allowable catch of Stikine River sockeye or 10,000 pieces (whichever was greater), and 2,000 coho. Incidental catches of other species were permitted while the fishery targeted on sockeye and coho.

Final analysis of the 1986 Stikine sockeye run is not yet complete. Preliminary information ascertained from in-season data analysis suggests the following:

(i) Alaskan interception based on scale pattern analysis:	
	Sumner Strait 8,971
	Clarence Strait 5,962
	District 8 3,614
	Sub-Total 18,547
(ii) Canadian Catch Commercial	
	Lower Stikine 12,411
	Upper Stikine 815
.... Subsistence	IFF 4,208
	Sub-Total 17,434
(iii) Escapement	
	Tahltan 20,280
	non-Tahltan 42,112
	Sub-Total 62,392
(iv) Total Run	
	Total Catch 35,981
	Total Escapement 62,392
	Total Stock 98,373
(v) Total Allowable Catch	
	Total Stock 98,373
	Escapement Target 60,000
	TAC 38,373
(vi) Canadian Entitlement	
	35% of TAC 13,430
	Actual Catch 17,434
(vii) U.S. Entitlement	
	65% of TAC 24,942
	Estimated Interception 18,547
(viii) Escapement	
	Interim target range: 58,300 to 65,000
	1986 estimate 62,392

3. Taku River, 1986

As with the Stikine River, the 1986 management objectives for the Taku River fishery were outlined in the Transboundary Annex of the Treaty.

The Taku River gillnet fishery landed a total of 352 chinook (including 77 jacks), 14,739 sockeye, 1,783 coho, 58 pink, 110 chum, and 48 steelhead. The sockeye and coho catches were both similar to those reported in 1985; they were also below the 1981-85 averages of 17,366 sockeye and 4,781 coho. The chinook, pink, chum, and steelhead catches were all below average. This was expected for coho, chum and steelhead since the fall fishery has been severely curtailed since implementation of the Treaty.

Escapements by species were:

- Chinook: above average escapements were observed via aerial surveys in all but one of the six Taku chinook index tributaries. The 1986 cumulative index was 7,520 compared to the 1981-85 average of 5,556;
- Sockeye: preliminary results from the 1986 Taku tagging program indicated that the interim escapement target range of 71,000 to 80,000 sockeye was surpassed. Weir counts at Little Trapper, Little Tatsamenie, and Hackett River and the sockeye test fishwheel catches in the lower river all indicated a better than average return;
- Pink: gillnet catches, particularly in District 111, and low test fishwheel catches indicated a significant failure in the 1986 pink production. This was confirmed by a foot survey and carcass pitch in the major spawning tributary, the Nakina River. A preliminary estimate of Nakina pink escapement based on the tagged:untagged ratio indicated a spawning population of less than 85,000. Last year, the estimate was in excess of one million.
- Coho and Chum: final assessments of fall spawners is not yet complete. Aerial surveys will be conducted for coho and coho test fishery results will be analyzed to indicate the abundance of coho relative to the sockeye return.

As previously mentioned, the Treaty specified that in 1986 Canada was entitled to catch 15% of the TAC of Taku sockeye. Analysis of the tagging data is not yet complete; however, a preliminary estimate (modified Peterson estimate based on total tags applied, and the number of tagged and untagged fish observed in the Canadian catch plus the weir sites) gives the following indication of the Canadian fishery status with regards to Treaty performance:

- a) total in-river population: 108,655 (0.95 ci = 103,778 - 113,888);
- b) estimated U.S. interception (DIII catch X 0.85): 61,678
- c) total run: 170,333
- d) required escapement: 71,000 - 80,000
- e) TAC: 90,333 - 99,333
- f) Canadian entitlement at 0.15 TAC: 13,599 - 14,900
- g) U.S. entitlement at 0.85 TAC: 76,783 to 84,433
- h) escapement: total in-river population minus Canadian catch equals 93,916; this is 13,916 above the upper part of the interim escapement target range.

4. Alsek-Tatshenshini River

No commercial fishery exists in the Canadian portions of the Alsek drainage, although there is a major subsistence fishery and an important sport fishery. Major catches of Alsek stocks of Canadian origin occur in the Alaskan gillnet fishery located in Dry Bay at/in the mouth of the Alsek.

Catch sharing between U.S. and Canada of Alsek stocks has not been specified. The Treaty does call for a cooperative attempt to rebuild depressed chinook and early sockeye returns. Accordingly, the Canadian IFF and sport fisheries were regulated to minimize early season harvests.

Both Indian food and sport fisheries were monitored on a daily basis by a patrolman who resided at the Klukshu weir camp. Catch data in the sport fishery was derived from creel census information collected by the patrolman and/or weir personnel. The IFF catch data was summarized on a weekly basis from daily catch statistics gathered during the fishing periods. To date, the total catch by user group is as follows:

	Chinook	Sockeye	Coho
IFF	102	1,952	0
Sport	128	329	3
TOTAL	230	2,281	3

All catches are below the respective 1981-85 averages even though the returns were average to above average.

Escapement

The most reliable comparative escapement index for Alsek drainage salmon stocks is the Klukshu River weir counts. Details of this year's program appear in a later section; however, the various returns can be characterized as follows:

a) chinook - above average; b) sockeye early run - below average; late run - above average; c) coho - below average.

Treaty Performance

Both early sockeye and chinook stocks, particularly the former, have not responded to the conservation actions taken by both countries. Although the location of outside interceptions is unknown, attempts to gain some insight into this question commenced this year with a chinook CWT feasibility study. The success of this venture was marginal at best indicating the likelihood of a prolonged delay in acquiring good information. Serious consideration to enhancement of both stocks is warranted, particularly of early sockeye which may soon be absent in some years.

B. Southern Panel Area Canadian Section: Preliminary Review of 1986 fisheries and prospects for 1987

1. Review of 1986 Fisheries

The purpose of the document is to report on the past salmon fishing season as it relates to those fisheries, stocks and activities of concern to the Southern Panel.

This document is compiled at this time using preliminary catch and escapement data. The reader is cautioned as to the preliminary nature of this data.

(a) West Coast Vancouver Island Troll Fishery

Trolling for chinook, coho, and chum salmon started June 20, 1986. Trolling for sockeye and pink salmon started July 31. The Swiftsure area (Areas 21 and sub-areas 121-1, 121-2 and 123-1) remained closed until July 1 to assist conservation of early timing Canadian coho stocks.

W.C.V.I. troll catches in 1986 were a record high for chum (354,955) and near record high catch for even year cycle pink (192,950). The coho catch (2,049,574) was higher than the ceiling and chinook catch (350,251) and sockeye catch (1,742,274) was slightly less than that allocated to W.C.V.I. troll. In 1986 the chinook and coho ceilings were achieved earlier than expected and, as a result, the W.C.V.I. troll season was closed earlier (August 30) than at any time in the history of the fishery. Moreover, since June 20 was the latest troll starting date, the 1986 W.C.V.I. troll season was the shortest on record. These high catches were achieved in spite of the shortest troll season in the history of this fishery.

A summary of catch ceilings, catch allocations and resultant catches for the 1986 W.C.V.I. troll season is as follows.

Species	West Coast Vancouver Island	
	Allocation/Catch Ceiling	Catch Results
pink	No ceiling	192,950
chum	Historical proportion of commercial catch	354,955
sockeye	20.5% of Can. TAC (1,766,000 fish)	1,742,274
coho	1,750,000 fish	2,049,574
chinook	360,000 fish	350,251

(b) Strait of Georgia Troll Fishery

The Strait of Georgia troll season started 10 days earlier in 1986 over 1985. Neither the chinook nor sockeye ceilings were exceeded in 1986. Other salmon species in Georgia Strait had no ceiling for seasonal catch.

A summary of catch ceilings, catch allocations and resultant catches for the 1986 Strait of Georgia troll season is as follows:

Species	Strait of Georgia	
	Allocation/Catch Ceiling	Catch Results ¹
pink	No ceiling	5,827
chum	No ceiling	3,611
sockeye ²	2.3% of Can. TAC plus 100,000 pieces (298,000)	267,237
coho	No ceiling	175,748
chinook	48,000 fish	46,346

¹ Catch estimates based on sales slips accumulated to Oct. 22, 1986.

² Based on total run size of 16.7 million and other preliminary information.

(c) Johnstone Strait Troll - Area 12

Johnstone Strait (Area 12) was not assigned a chinook catch ceiling as such. Rather chinook catches are included in the overall ceilings.

Commercial trolling was restricted to net fishing times and area, except sub-areas 12-10 and 12-13 (Deserters group) which were open only for chinook and coho seven (7) days per week. Troll fisheries opportunities in sub-areas 12-10 and 12-13 would be limited if the troll effort exceeds 1985 levels or if the chinook troll catch in all of Area 12 exceeds 5,000 pieces.

The troll fishery was conducted in Area 12 from June 20 to September 19. Coho accounted for the largest salmon catch in 1986 at 344,817 pieces while 98,819 chum and 49,645 sockeye were taken by trollers. Pink catch was 32,012 and chinook totalled 4,056 pieces.

(d) **Johnstone Strait Net Fisheries**

(1) **Sockeye**

Catches for 1986 were down from the pre-season expectations a direct result of the decreased diversion rate through Johnstone Strait. Instead of the expected 50% diversion, the diversion was only 25%. However, catches in 1986 are greater than cycle year catches. Sockeye catches, 1986, for Area 11-13 totalled 2,174,490. This compares to 1,611,215 for 1982.

(2) **Chinook**

Net catches of chinook salmon were to be minimized. This was accomplished by the reduction in the total seasonal time and area of fishing as well as fishing effort limitation during those times in which fishing was conducted on passing stocks. For 1986 the chinook catch by nets (over 5 pounds) in Areas 11-13 totals 18,153 fish. This is compared to 43,323 in 1985 and 29,227 for the base year period of 1979-82.

(3) **Chum**

In-season management decisions in the chum salmon fishery followed the clockwork plan used since 1983.

An in-season accounting of run sizes catches and harvest rates is summarized as follows:

Area	Week	Total Catch	% Fraser Origin	Fraser Origin Catch	Total for Clockwork
Johnstone Strait (11-13)	9/1	11,088	0	0	
	9/3	68,298	37.6	25,680	
	10/2	351,032	30.2	106,012	
	10/3	288,915	10.5	53,449	
	10/4	243,279	36.9	89,770	
	Total	962,612		274,911	962,612
Qualicum (14)	10/2	8,855			
	10/3	32,650			
	10/4	42,017			
	10/5	93,500			
	11/1	97,550			
	Total	274,572		18,000	18,000
Fraser River (29)	to 9/3	23,417	100.0	23,417	23,417
	10/3	69,000	100.0	69,000	69,000
Season test catch		254,000	72.0	18,000	25,000
Season IFP		25,000	72.0	20,000	25,000
San Juan, USA		40,838	56.0	22,869	28,587
Point Roberts, USA		45,710	95.0	43,425	43,425
Total		1,466,149		489,622	1,195,040
Estimated run size				1,490,000	3,800,000
Allowable harvest rate				30.0	30.0
Total allowable catch				447,000	1,140,000
Actual catch				489,622	1,195,040
Actual harvest rate				32.9	31.4

(e) **West Coast Vancouver Island Chum Net Fisheries**

West Coast Vancouver Island chum fisheries were conducted for the Nitinat (Area 21/22) and Nootka (Area 25) stocks. The Nitinat stock is of interest here for the Southern Panel. However, to complete the details of WCVI chum, information regarding the Area 25 fishery is included.

For Area 21/22 estimates of catches and escapements indicate that run strength was about as anticipated. Where escapements to date are short (67,000 instead of 125,000) catches were considerably greater (416,800 rather than 193,000). It is expected that additional stock will appear after October 31, the date of the escapement estimate. The quality of Nitinat fish in 1986 was quite remarkably better than in previous years.

For Area 25 estimates of catches and escapements indicate that run strength was considerably less than expected. The catch was 138,415 pieces and escapement was 80,000. Anticipated catch was 300,000 and target escapement was 150,000. The hatchery was able to collect all necessary broodstock. Additional escapement may appear after October 31, the date upon which the escapement estimate was made. The quality of these fish was better than in previous years.

2. 1987 Expectations

This section presents preliminary information for the 1987 salmon season in the South Coast area for all salmon fisheries.

At this time, information required for the development of Regional management objectives and, therefore, the development of fishing plans is not available. Such information includes; the allocation of catches to each fishing gear type and adjustments or other changes to the requirements in accordance with the Canada-U.S.A. Treaty.

However, information is available on expected run sizes, allowable catches and conservation requirements. This information is presented in summary form for the major runs to the net fishing areas of Johnstone Strait, Strait of Georgia, and west coast Vancouver Island.

The abundance of Fraser River pink and sockeye returns have a major influence on the Southern fisheries. Details of the 1987 Fraser River expectations are presented elsewhere.

(a) **Johnstone Strait — Georgia Strait**

Sockeye

Local stocks, with the Nimpkish River as the main component, are expected to meet escapement requirements and provide a fishable surplus. The required escapement is 250,000 sockeye.

Pink

Local stocks are expected to return below escapement requirements with the exception of the mid-Vancouver Island, Kingcome Inlet and minor surpluses in Bond to Knight areas. Total return of study area stocks, based on a brood year escapement of 962,000 in comparison to optimum escapement requirement of 1,800,000 is projected to be just under 1.5 million. Conservation requirements for this stock will be provided for during the sockeye fishery targetting on Fraser stocks. This will be in the form of specific time and area closures, as well as the reduced fishing effort for chinook conservation.

Chum

Total chum stocks returning to the Johnstone Strait - Strait of Georgia and the Fraser River areas are expected to provide for a fishery. The enhanced stocks are expected to have harvestable surpluses primarily in the mid-Vancouver Island area. This information is summarized as follows:

WILD STOCKS

<u>Fraser</u>	<u>Johnstone Strait-Strait of Georgia</u>	<u>Total</u>
454,000	1,056,000	1,510,000

ENHANCED STOCKS

585,000	728,900	1,313,900
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TOTAL RETURNS

1,039,000	1,784,900	2,823,900
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(b) West Coast Vancouver Island

Sockeye

The outlook for sockeye is poor. Expected returns will, in part, depend on the strength of the return from the 1982 brood. The 1982 brood provided the weak 4 year old class in 1986. Preliminary estimates indicate a run size of 700,000. This would yield an allowable catch of 300,000.

Chinook

The 1987 return should be the third, and weakest return, which is the result of poor survivals of several year classes. In 1986 a good showing of jacks, which had been strongly declining in 1984 and 1985, is reason for optimism for returns in 1988 and beyond. Further details will be developed in the Chinook Technical Committee.

Chum

Early predictions for enhanced stocks indicate the following chum surpluses to the two W.C.V.I. hatcheries:

Hatchery	Surplus to Hatchery Needs
Nitinat	338,000
Tlupana	307,500

The following summarizes chum brood year escapements. This information indicates that no surpluses are expected for wild stocks.

Target Area	Target Escapement	Expected Surplus	1984	Brood Year Escapement	
				1983	1982
22	125,000	338,000	76,000	8,000	22,500
23	150,000	0	17,649	36,500	119,000
24	100,000	0	54,000	47,800	73,000
25	150,000	307,500	116,037	161,100	165,400
26	100,000	0	81,300	86,200	91,200
27	100,000	0	13,850	12,000	78,100

Chum fisheries in the fall will again target on hatchery surpluses. No surpluses to the wild systems are anticipated.

C. Canadian Report of the 1986 Salmon Fisheries of Northern British Columbia Including Preliminary Expectations and Fishing Plans for 1987

This report reviews the 1986 salmon fisheries of northern British Columbia and outlines preliminary expectations and fishing plans. The document is submitted to the Pacific Salmon Commission as required in Article IV of the Canada-U.S. Treaty. The contents include a review of the 1986 northern boundary area (Canadian Statistical Areas 1-5) salmon net fisheries, the Area 1 pink troll fishery and the north coast sport, net and troll fisheries on chinook. Canadian fishery management performance relative to Treaty requirements is outlined where appropriate, and the preliminary expectations and fishing plans for 1987 for sockeye, pink and chum salmon for Areas 1, 3, 4 and 5 are provided.

1. Review of 1986 Fisheries

(a) Boundary Area Net Fisheries

(i) Area 1

The Area 1 net fishery can be separated into two distinct fisheries. The fishery on passing stocks (July to mid-August) is concentrated in the Langara Island region off the northwest corner of the Queen Charlotte Islands. This is predominantly a seine fishery harvesting passing sockeye and pink salmon bound mainly for the Skeena. Nass, Fraser and S.S.E. Alaskan stocks are also caught incidentally. The second fishery (mid-August to September) in Masset Inlet and Naden Harbour is a gillnet and seine fishery for surplus local pink and chum stocks.

The 1986 fishery on passing stocks opened July 13 and operated for a total of 9 fishing days before closing August 5. The sockeye catch totaled only 44,000 combined with a total pink catch of 190,000.

The fishery on local stocks opened August 18 with a seine pink fishery in Naden Harbour (sub-area 1-4) that operated for a total of 6 fishing days and finished September 9. The pink catch of 720,000 is a record for a Naden Harbour fishery. The Masset Inlet pink return was weak and there was no catch of pink salmon in 1986. A fall chum fishery in Masset Inlet and adjacent areas (sub-areas 1-5 and 1-6) began September 17 and finished October 15 after a total of 20 fishing days. The total catch of 42,000 chum was an exceptionally high catch for a fishery on Masset Inlet stocks.

The pink escapement to Masset Inlet of 575,000 was close to the optimum of 650,000. Naden Harbour pink escapement totaled 120,000, on target for the key streams in the inlet. The chum escapement to Masset Inlet achieved the stated optimum level of 40,000.

(ii) Area 3

The 1986 net fishery in Area 3 began on July 6 for gillnets and July 13 for seines and ended on September 3 for both gear types. Openings for gillnets totaled 21 days, with only 7.5 days of fishing for seines. The gillnet sockeye catch of 40,079 and the seine catch of 158,528 were below expectations, and reflect the low sockeye abundance. The 1986 Area 3 pink catch of 3,275,000 is an even year record high catch, and 1,914,000 or 59% of the catch was taken from sub-area 3(1-4), well below the 1973-86 average of 72%. The seine catch accounted for 94% of the Area 3 total. The total seine effort of 1,221 boat-days was only slightly above the 1973-86 average of 1,112.

The total pink escapement of 400,000 is 100,000 above the target for the area. The Nass sockeye escapement of 175,000 was below the management target of 220,000. Chum returns were poor, at about 30% of the target of 115,000.

The fishing time was greatly reduced in early July in response to a weak sockeye return to the Nass. The total sockeye return was approximately 250,000, well below the forecast of 450,000. From mid-July onward the Area 3 fishery was managed to the abundance of Skeena-Nass pinks, which was higher than anticipated. The forecast pink catch and escapement to Area 3 of 2,000,000 was almost doubled by the return of 3,700,000.

(iii) Area 4

The 1986 Area 4 gillnet season began on July 6 and ended on September 1 with a total of 21 days fishing. Seines were permitted to fish for 2 days in July (July 27 and 28) and 5.5 days in August (August 20, 21 and 25 to 28). The gillnet catch of 473,167 and the seine catch of 23,668 are about half of the long-term average, and reflect the stock strength of Skeena sockeye. The Area 4 pink catch of 1,571,111 is a record catch for even year returns. The preliminary Skeena sockeye escapement of 740,000 is less than the management target of 900,000 while the pink spawners totalled 2,200,000, well in excess of spawning requirements.

The sockeye return to the Skeena of about 1.4 million was far below the expected return of 3.0 million and as a result the fishing time during July was well below recent levels. The pink return of about 4 million was 33 % larger than forecast resulting in increased fishing time in August.

(iv) Area 5

The 1986 net season for gillnets in Area 5 began on July 6 and ended on September 8. Seines began fishing on July 13 and also ended on September 8. The total sockeye catch of 30,930 was below average, reflecting the poor return of Skeena sockeye. The pink catch of 1,560,232 was the largest even year catch since 1966. A large portion of this is Skeena stock; however, excellent returns to local Area 5 streams also contributed to the catch.

(v) Treaty Related Performance for Areas 3 (1-4) and 5-11 Pink Net Catch

Under the Canada-U.S. Treaty the outside portions of Statistical Areas 3 and 5 (Management Units 3-1, 3-2, 3-3, 3-4 and 5-11) are to be managed such that an average annual pink harvest of 900,000 is achieved.

In 1986, 1,939,915 pinks were harvested in Management Units 3 (1-4) and 5-11 combined. The 1,919,306 pink salmon harvest in sub-areas 3 (1-4) comprised 59 percent of the total Area 3 catch, while the 20,609 pink caught in 5-11 accounted for 1.3 percent of the total Area 5 catch.

The pink escapements to the Nass and Skeena were both above the management target.

The record Area 3 catch in 1986 reflects the strength of the 1986 pink return to Areas 3 and 4 and there was no increase in relative effort or catch in the outside areas. Both 1985 and 1986 have been characterized by exceptionally large pink returns to Areas 3, 4 and 5. The Skeena-Nass fisheries are managed to harvest pink surplus to Areas 3, 4 and 5. The outcome has been large or record level pink catches, and consequently the current average annual pink harvest in the "interception area" (sub-area 3 (1-4) and 5-11) has averaged 1,600,000.

(b) 1986 Area 1 Pink Troll Fishery

Following the Pacific Salmon Commission meetings in March 1986, the Area 1 pink troll fishery regime was modified to increase the total 1986 pink troll catch ceiling from 290,000 to 600,000. In consideration of this adjustment in the ceiling, an area adjacent to the Canada-U.S. boundary in northern Area 1 would be closed to the retention of pink salmon when the total Area 1 catch reached 100,000. In addition, when the total Area 1 catch reached 290,000 an additional large section of Area 1 would close to the retention of pink salmon, leaving open the area from the northeast corner of Langara Island to Rose Point. All of Area 1 would close to the retention of pink salmon if the total Area 1 catch reached 600,000.

The Area 1 pink troll fishery opened June 20, and concluded September 5 when all the north coast was closed to trolling. The pink troll catch was monitored in-season by interviewing trollers on the grounds to establish catch rates, coupled with overflights to estimate effort. The first designated non-retention area was implemented midnight July 10 when the 100,000 ceiling was reached. Then, at midnight August 7 when the pink troll catch reached 290,000 an additional area of non-retention was imposed. The total Area 1 pink troll catch is estimated to be 423,000.

(i) **Treaty Related Performance**

The in-season monitoring of the Area 1 pink troll fishery was very accurate. Sales slip records to November 14 indicate landings to July 10 (100,000 ceiling closure date) of 112,600, slightly above the in-season estimate and to August 7 (290,000 ceiling closure date) of 291,000, very close to the in-season estimate. The total Area 1 pink hail catch of 423,900 (sales slip estimate to November 14 is 417,400) is short of the overall pink ceiling of 600,000.

(c) **1986 North Coast Chinook Fisheries**

(i) **North Coast Troll**

The 1986 North Coast Chinook troll fishery operated for 78 consecutive days, between June 20 and September 5. As of November 14, there is still a discrepancy between the chinook catch of 224,000 as estimated by the in-season catch monitoring program and the sales slip total reported catch of 207,000. Although the season has been closed for over two months now the accumulation of sales slips after the season in past years has been variable. Estimates of the proportion of outstanding sales slips expected to this date range from 0 - 7%. It is too early to provide a "final" estimate.

(ii) **North Coast Net and Sport**

The combined net and sport chinook catch ceiling for 1986 was reduced from 60,000 to 56,000 as a domestic adjustment in response to the Pacific Salmon Commission decisions of March 1986 to lower the northern British Columbia chinook catch ceiling for all gear from 263,000 to 256,000.

The net catch of chinook (>5 lbs.) in the North Coast totals 45,000 (sales slips to November 14). This is a reduction from the 1985 level of 52,000 and resulted from lower incidental catches in the Area 1, 3 and 4 Skeena-Nass sockeye fisheries which were curtailed because of low sockeye abundance. The Queen Charlotte Island net catch is 7,200, compared with 13,500 in 1985. The Skeena-Nass catch of 18,000 is 25% less than 1985. The Central Coast catch of 20,000 is up 25% from 1985, due to the very large pink and chum fisheries in 1986.

The estimate of total North Coast sport catch to November 15 is 12,000, up from 9,000 for 1985. The change reflects the increased chinook abundance in the Skeena and Rivers Inlet areas, and increased effort in the Langara Island area of the Queen Charlotte Islands. The Area 6 sport catch continued to decline as effort decreased again in 1986.

(iii) **Treaty Related Performance**

The North Coast troll, sport and net chinook catch totals between 264,000 and 281,000 depending on whether the troll sales slip estimate to date of 207,000 or the in-season estimate of 224,000 is used. The low side would be very close to the ceiling of 256,000 while the high side of 281,000 would be 25,000 or 10% over the ceiling. This highlights the problem that the in-season catch monitoring program did not provide accurate chinook catch estimates in a timely manner at the critical point in the season. These reporting inaccuracies coupled with exceptionally high chinook catches (that were not anticipated) in mid to late August resulted in an overage in the troll catch.

2. Canadian Northern Boundary Area Sockeye, Pink and Chum Expectations and Fishing Plans

(a) **Introduction**

Expectations and fishing plans are still preliminary. Specific opening dates and fishing patterns are determined through consultations with industry. Since this process has not yet occurred it is too early to provide details.

(b) **Area 1 Expectations**

(i) **Sockeye**

No significant sockeye stocks are present in Area 1.

(ii) **Pink**

No local pink surplus is expected. Odd years are the "off cycle" for Queen Charlotte Island stocks.

(iii) **Chum**

Naden Harbour area brood year escapements were depressed. A small surplus (<20,000) is anticipated in Masset Inlet.

(iv) **Fishing Plans**

A fishery on Skeena-Nass bound sockeye and pink salmon is planned, and management will be based on abundance of these stocks. Pink fisheries on local stocks do not occur in odd years. A small chum fishery will be conducted in the vicinity of Masset Inlet to assess chum strength.

(c) Area 3 Expectations

(i) Sockeye

An average sockeye return to Area 3 of 450,000 is expected and should provide for an Area 3 net catch of 230,000. In addition a catch of 200,000 Skeena sockeye is anticipated for a total catch of 430,000. There is concern that this expectation may be optimistic if the coastwide sockeye depression evident in 1986 returns was to continue through 1987.

(ii) Pink

A large pink return of 1,400,000 is anticipated, sufficient to provide an Area 3 catch of 1,200,000. In addition, 1,050,000 Skeena pink should be caught in Area 3 net fisheries, for a total catch of 2,250,000. There is some concern that the severe overwintering conditions in the brood year may reduce the pink returns.

(iii) Chum

Area 3 chum stocks remain depressed. An incidental catch of 30,000 Area 3 chum and 100,000 chum bound for other areas is anticipated.

(iv) Fishing Plans

A moderate level sockeye fishery and a large pink fishery are anticipated. Measures to reduce the catch of pink, chum and chinook will continue and no significant changes in the harvest patterns are anticipated.

(d) Area 4 Expectations

(i) Sockeye

The Skeena sockeye returns in 1987 will be affected by disease problems at Fulton River spawning channels in the brood years.

The total Skeena sockeye return (to Areas 3, 4 and 5) is calculated to be 1,500,000 providing an Area 4 commercial net catch of 300,000 along with an Area 3 and 5 catch of 200,000 Skeena sockeye for a total Canadian commercial catch of 500,000. The concern over the poor coastwide sockeye return in 1986 also applies to the Skeena system.

(ii) Pink

The total Skeena pink return is forecast at 3,500,000. This is expected to provide an Area 4 catch of 1,300,000 and a catch in other areas of 950,000 Skeena pink for a total commercial catch of 2,250,000 pink of Skeena origin.

(iii) Chum

Skeena chum escapements are severely depressed and chum are only caught incidentally.

(iv) Fishing Plans

Moderate fishing pressure during July for sockeye, coupled with a large August fishery for pink is the fishing plan for 1987. No departures from the 1986 management practices are currently planned.

(e) Area 5 Expectations

(i) Sockeye

Small local stocks will not have harvestable surplus in 1987.

(ii) Pink

The expectations of a pink surplus of 325,000 is perhaps optimistic in light of the brood year overwintering conditions.

(iii) Chum

Chum stocks are depressed.

(iv) Fishing Plans

Area 5 fishing plans will be based on the abundance of Skeena sockeye and pink.

Appendix 2

A Summary of the Salmonid Enhancement Program in British Columbia and the Yukon Territory

I. Introduction

The Canada-United States Pacific Salmon Treaty requires information on salmon enhancement program operations and plans be forwarded to the appropriate Panels for review. The Canadian information is summarized for five areas: northern British Columbia, west coast of Vancouver Island, Georgia and Johnstone Straits, Fraser River, and Yukon.

II. Executive Summary

A. Current Operations

The Salmonid Enhancement Program (SEP) is a federal-provincial program designed to enhance British Columbia's five salmon and two sea-run trout species. SEP was initiated in 1977 to assist the Department of Fisheries and Oceans in reaching an objective of doubling salmonid stocks. Funding was provided to construct, operate, maintain, and assess salmonid culture facilities as well as operate existing facilities. Currently, SEP operates 28 major hatcheries and/or spawning channels, 28 community or Native band run hatcheries, 30 fishways or flow control facilities, and 10 former International Pacific Salmon Fishery Commission facilities. Smaller scale habitat improvement projects and a public involvement program also exist. Results to date indicate SEP production has become an important part of total salmonid production in British Columbia. Preliminary 1985 results indicate 14 percent of the salmon catch (20 percent by value) in sport and commercial fisheries resulted from enhancement activities. The contribution to Native food fisheries has also been significant, but the exact contribution has not been estimated at this time.

The releases and expected returns from SEP facilities are reported by area in this report.

B. Future Operations

The future operation of SEP depends on the level of funding received for the program. Along with the continued operation of existing facilities, a list of potential sites to expand the program were developed as part of a comprehensive salmon management scheme called the Salmon Stock Management Plan (Pacific Region Salmon Stock Management Plan, Fisheries and Oceans, 15 April, 1985). The Management Plan changes the nature of future SEP projects, with new facilities and expansions based on their ability to:

1. facilitate or implement proposed salmon stock management strategies, or
2. promote a harvestable surplus in a known stock fishery where salmon stock rebuilding is not possible (e.g. because of environmental conditions, habitat loss, or other factors).

This change in emphasis for salmonid enhancement means new directions for the program. These directions include:

1. restructuring and rebuilding salmon habitat,
2. building small "semi-natural" projects in diverse locations and situations, sized to stabilize natural production,
3. providing information to fishery managers and biologists, e.g. construction of counting fences,
4. designing and operating projects to extend the fishing season, disperse the fishery, and maintain and rehabilitate small stocks and streams to increase production.

Using these directions, a list of potential new facilities and expansions was prepared for salmonid enhancement as part of the Salmon Stock Management Plan. Implementation of these proposals depends on the level of spending approved for enhancement. In 1986/87 expenditures were approved for three new semi-natural spawning channels (Atnarko and Nekite (North), and Pitt (Fraser River)) and two expansions (Yakoun Fence and Bella Coola (North)).

As well, a 5 year plan for further expansion has been developed from the Salmon Stock Management Plan, with 12 new projects or expansions scheduled to begin in 1987. All expansion depends on the funding received for enhancement. None of the projects in the 5 year plan have been funded as yet.

A summary of the production capacity of the projects is shown in the area reports. Additional details are in the Salmon Stock Management Plan.

C. Northern British Columbia

The North area includes all enhancement activities on the British Columbia coast north of Cape Caution and the transboundary rivers. The major enhancement facilities are two hatcheries on the central coast, one hatchery on the Queen Charlotte Islands, three sockeye spawning channels on the Skeena River, and eleven community or Native band run hatcheries. The area also includes numerous public involvement projects.

Northern British Columbia and Yukon
Operations Summary

1. Salmon Releases (9)

<u>Species</u>	<u>Release Stage (4)</u>	<u>1980</u>	<u>1981</u>	<u>Broodyear:</u> <u>(thousands of salmon)</u>		<u>1984</u>	<u>1985</u>
				<u>1982</u>	<u>1983</u>		
Chum	Unfed Fry	258	71	99	883	908	
	Fry	6,247	10,408	8,327	14,902	20,724	
Chinook	Unfed Fry	1	55	0	0	0	
	Fry	328	412	488	929	1,309	
	Smolt	118	223	503	1,262	2,307	
Coho	Unfed Fry	34	118	131	130	72	
	Fry	114	494	1,050	1,023	922	
	Smolt	10	0	0	727	67	
Pink	Unfed Fry	146	0	10	273	24	
	Fry	909			212		
Sockeye	Unfed Fry	161,700	237,507	212,031	115,950	220,154	
	Fry				70	85	

Northern British Columbia
Operations Summary

2. Salmon Returns (5)

<u>Species</u>	<u>Salmon Return Estimate (6):</u>			<u>Design Capacity(7)</u>	<u>Broodstock Requirement</u>
	<u>1985</u>	<u>1986</u>	<u>1987</u>		
		<u>(thousands of salmon)</u>			
Chum	181.9	179.1	280.8	385	
Chinook	6.5	11.9	25.1	119	
Coho	23.1	83.8	93.5	152	
Pink	4.7	0	0	-	
Sockeye	1,986.6	2,028.8	1,745.0	1,604	

3. Actual Harvest (8)

Harvest Estimate:

<u>Species:</u>	<u>1985</u>	<u>1986</u>
	<u>(thousands of salmon)</u>	
Chum	100.2	
Chinook	0.9	
Coho	1.2	
Pink	6.5	
Sockeye	1,594.5	

Northern British Columbia
Operations Summary

4. Habitat Management

Lake Enrichment:

<u>Species/Release Stage:</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
Sockeye Smolt	1,355	7,622	6,265	5,633		

Northern British Columbia
Operations Summary

5. Planned Changes

<u>Design</u>	<u>Type</u>	<u>Chum</u>	<u>Design Capacity (7)</u> <u>Chinook</u> <u>Coho</u> (thousands of salmon)		<u>Pink</u>	<u>Sockeye</u>	<u>Completion Date</u>
Atnarko	spawning channel				235		1986
Nekite	spawning channel & fishway	60					1987
Bella Coola	hatchery expansion		33				1989
Yukon Fence	upgrade				50		1986

Northern British Columbia
Operations Summary

6. Future Plans (9)

<u>Facility</u>	<u>Type</u>	<u>Chum</u>	<u>Design Capacity (7)</u> <u>Chinook</u> <u>Coho</u> (thousands of salmon)		<u>Pink</u>	<u>Sockeye</u>
Yakoun	spawning channel			2	50	
Ft. Babine	spawning channel					46
Morrison	spawning channel & flow control					7
Skeena Slough		8			11	
Kitimat	side channel					37
Kwatna	side channel	5			50	
Washwash/Nziana	channel improvements					166
Mathers	expansion	40			13	
Pallant	expansion	72	1	5	50	
Pallant	satellite (Copper)		14	17		
Dean Fence		4				
S. Bentinck	pilot	20		2		
Quaal R. Fence		7			63	
Mussel R. Fence		4			13	
Clatse R. Fence					8	
Roscoe R. Fence		5				
Kemano	pilot	30	7	2	2	

D. West Coast of Vancouver Island

The West Coast area includes all enhancement activities from the Strait of Juan de Fuca up to Cape Scott. The major enhancement activities are three hatcheries and four community or Native band run hatcheries. The area also includes numerous public involvement projects.

West Coast Vancouver Island

Operations Summary

1. Salmon Releases (9)

Species	Release	Broodyear:					
	Stage(4)	1980	1981	1982	1983	1984	1985
				(thousands of salmon)			
Chum	Unfed Fry	4	34	248	18	4	
	Fry	11,256	41,179	27,396	36,817	45,984	
Chinook	Unfed Fry		3				
	Fry	34	378	149	62	103	
	Smolts	9,447	8,351	11,733	13,131	13,093	
Coho	Unfed Fry	198	139	240	106	95	
	Fry	122	798	2,520	1,451	2,051	
	Smolts	991	1,029	1,375	1,729	N/A	
Pink	Unfed Fry	1				81	
Sockeye	Unfed Fry	23	93	59	26		

West Coast Vancouver Island

Operations Summary

2. Salmon Returns (5)

<u>Species</u>	<u>Salmon Return Estimate (6):</u>			<u>Design Capacity(7)</u>	<u>Broodstock Requirement</u>
	<u>1985</u>	<u>1986</u>	<u>1987</u>		
	(thousands of salmon)				
Chum	542.4	571.5	604.3	484	
Chinook	153.5	158.6	262.4	423	
Coho	150.0	94.5	157.3	190	
Sockeye	0.7	0.6	0.3		

3. Actual Harvest

Harvest Estimate (8):

<u>Species:</u>	<u>1985</u>	<u>1986</u>
	(thousands of salmon)	
Chum	1,590.8	
Chinook	29.7	
Coho	29.2	
Sockeye	159.1	

West Coast Vancouver Island

Operations Summary

4. Habitat Management

Lake Enrichment:

<u>Species/Release Stage:</u>	<u>Broodyear:</u>				
	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
Sockeye					
Smolt	14,613	24,100	15,810	16,809	

West Coast Vancouver Island

Operations Summary

5. Future Plans (9)

<u>Facility</u>	<u>Type</u>	<u>Chum</u>	<u>Design Capacity (7)</u>		<u>Pink</u>	<u>Sockeye</u>
			<u>Chinook</u>	<u>Coho</u>		
			(thousands of salmon)			
Nitinat	expansion		40			
Robertson	expansion		45			
Kennedy Fence						21

E. Georgia and Johnstone Straits

The majority of enhancement facilities in British Columbia are in the Georgia Strait area. This area includes all the water inside of Vancouver Island. The major enhancement activities include six hatcheries, two spawning channels and hatcheries, eight community or Native band run hatcheries, and six side channels. The area also includes numerous public involvement projects.

Georgia and Johnstone Straits

Operations Summary

1. Salmon Releases (1)

<u>Species</u>	<u>Release Stage (4)</u>	<u>1980</u>	<u>1981</u>	<u>Broodyear:</u>		<u>1984</u>	<u>1985</u>
				<u>1982</u>	<u>1983</u>		
				(thousands of salmon)			
Chum	Unfed Fry	76,055	51,914	91,425	83,556	2,073	
	Fry	10,125	10,254	15,838	12,439	12,885	
Chinook	Unfed Fry				1		
	Fry	258	100	335	263	167	
	Smolt	9,385	7,143	7,770	9,194	11,817	
Coho	Unfed Fry	766	232	990	392	254	
	Fry	1,084	5,337	5,468	4,968	6,159	
	Smolt	4,072	3,607	4,395	8,032	N/A	
Pink	Unfed Fry	3,463	7,761	2,500	7,563	3,741	
	Fry	2,037	492	423	525	2,296	
Sockeye	Unfed Fry	2,500	1,424	1,634	2,403	2,711	
	Fry		26	40			

Georgia and Johnstone Straits

Operations Summary

2. Salmon Returns (5)

<u>Species</u>	<u>Salmon Return Estimate (6):</u>			<u>Design Capacity(7)</u>	<u>Broodstock Requirement</u>
	<u>1985</u>	<u>1986</u>	<u>1987</u>		
		(thousands of salmon)			
Chum	665.9	854.4	818.5	916	
Chinook	161.1	190.5	312.9	494	
Coho	492.9	762.0	547.7	890	
Pink	57.6	37.7	235.3	354	
Sockeye	20.6	15.2	19.4	14	

3. Actual Harvest (8)

Harvest Estimate:

Species:	<u>1985</u>	<u>1986</u>
	(thousands of salmon)	
Chum	582.4	
Chinook	44.0	
Coho	318.0	
Pink	59.1	
Sockeye		

Georgia and Johnstone Straits

Operations Summary

4. Habitat Management

Lake Enrichment:

Species/Release Stage:	<u>1980</u>	<u>1981</u>	Broodyear:		<u>1984</u>	<u>1985</u>
			<u>1982</u>	<u>1983</u>		
Sockeye Smolt		6,600	8,852	8,232		

Georgia and Johnstone Straits

Operations Summary

5. Future Plans (9)

<u>Facility</u>	<u>Type</u>	<u>Design Capacity (7)</u>			<u>Pink</u>	<u>Sockeye</u>
		<u>Chum</u>	<u>Chinook</u>	<u>Coho</u>		
			(thousands of salmon)			
Adam R.	side channel			1	35	
Bond R.	spawning channel				200	
Kakweikan	spawning channel			4	910	
Glendale	spawning channel			4	1,000	
Ahnuhati	spawning channel	22		4	250	
Campbell R.			5	1		
Orford	spawning channel	200				
Phillips channel	expansion	1	1	1	275	
Upper Phillips	spawning channel	1	1	1	400	20
Bute Inlet	hatchery		13			
Bear	expansion				50	
Little Qualicum	expansion		10			
Tenderfoot Rehabilitation	expansion				15	
Squamish Estuary Rehabilitation		2		4		
Iona Estuary Rehabilitation		14	3	1		

E. Fraser River

The Fraser River area includes all the river's drainage system. The major enhancement activities include 10 hatcheries, one spawning channel, four community or Native band run hatcheries, and seven side channels. The area also includes numerous public involvement projects.

Fraser River Operations Summary

1. Salmon Releases (1)

Species	Release	Broodyear:					
	Stage (4)	1980	1981	1982	1983	1984	1985
				(thousands of salmon)			
Chum	Unfed Fry	5,305	5,622	6,019	5,888	5,281	
	Fry	2,023	7,140	17,805	21,324	25,179	
Chinook	Unfed Fry		2	45			
	Fry	158	324	404	212	425	
	Smolt	57	481	3,302	4,393	5,399	
Coho	Unfed Fry	15	36	149	83	89	
	Fry	123	114	198	815	1,584	
	Smolt	146	312	1,165	3,188	N/A	
Pink	Unfed Fry		1,572		166		
	Fry			784		340	
Sockeye	Fry			15			

Fraser River Operations Summary

2. Salmon Returns (5)

<u>Species</u>	<u>Salmon Return Estimate (6):</u>			<u>Design Capacity(7)</u>	<u>Broodstock Requirement</u>
	<u>1985</u>	<u>1986</u>	<u>1987</u>		
	(thousands of salmon)				
Chum	203.1	345.2	407.1	501	
Chinook	10.1	31.9	49.3	137	
Coho	134.2	296.5	367.4	504	
Pink	6.7	0	49.9	50	

3. Actual Harvest (8)

Harvest Estimate:

<u>Species:</u>	<u>1985</u>	<u>1986</u>
	(thousands of salmon)	
Chum	27.0	
Chinook	16.9	
Coho	89.6	
Pink	7.0	

Fraser River

Operations Summary

5. Future Plans (9)

<u>Facility</u>	<u>Type</u>	<u>Design Capacity (7)</u>		<u>Pink</u>	<u>Sockeye</u>
		<u>Chum</u>	<u>Chinook</u> (thousands of salmon)	<u>Coho</u>	
Tachie	channel improvements				64
Driftwood	spawning channel				302
Horsefly	spawning channel				140
Chilco	spawning channel				496
Lower Thompson	side channel			50	
Bonaparte	fishway		10	2	
Chilliwack	spawning channel			125	
Pitt River	spawning channel				82
Upper Adams	transplant				25
Bonaparte Fence			3		
Chilco Lake	lake enhancement				235
Quesnel Lake	lake enhancement				260
Pitt Lake	lake enhancement				128

G. Yukon

Facility: **Whitehorse**

Area: Yukon
Program: Facility Operations
Type: Hatchery

<u>Species/Release Stage:</u>	<u>Broodyear:</u>					
	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
Chinook Fry					127	

Appendix 3

A Summary of the Preliminary 1986 United States Post-Season Fishery Report and Expectations for 1987

A. Chinook and Coho Report

General Comments:

The scope and content of this document is severely limited by the November reporting date. The 1986 statistics presented in this report are preliminary. Ocean chinook fisheries have not been completed; inside fisheries impacting chinook and coho will be conducted for several more weeks. Escapement estimates for the 1986 run and 1987 pre-season forecasts will not be available until late February 1987. Additional information will be forthcoming in agency reports which will be provided at a later date.

1. Chinook

Alaska

Commercial Troll Fisheries: The southeast Alaska troll fishery harvested 236,000 chinook during the 1986 season. The troll fishery was managed under an all-gear (commercial and recreational) chinook catch ceiling of 263,000, including a 9,000 Alaska hatchery add-on as established by procedures approved by the Pacific Salmon Commission. Approximately 23,000 chinook (10%) were taken during the winter troll fishery with 213,000 (90%) being harvested during the summer season. Most of the southeast Alaska troll chinook harvest occurs in state waters within 3 miles of the surfline and in inside waters.

Recreational Fisheries: southeast Alaska recreational fisheries harvested an estimated 22,000 chinook in 1986, about 3,000 (12%) below the 1985 catch.

Net Fisheries: In 1986 southeast Alaska net fisheries harvested an estimated 22,000 chinook salmon incidental to the harvest of over 50 million salmon of other species. There were no directed net fisheries on chinook salmon. The 1986 harvest of chinook by net fisheries was approximately 40% below the 1985 harvest of 36,000.

Management Under the Pacific Salmon Treaty:

Catch Ceiling: Southeast Alaska fisheries were managed under an all-gear (commercial and recreational combined) ceiling of 254,000 chinook. A hatchery add-on, using procedures approved by the Pacific Salmon Commission, of 9,000 chinook brought the total ceiling for these fisheries to 263,000. The total catch is estimated at 280,000, approximately 6% in excess of the established ceiling.

Transboundary Area: No fisheries were directed at transboundary chinook stocks.

Spawning Escapements: Total chinook salmon escapements to southeast Alaska and transboundary rivers were estimated to be about 46,000, an increase of 24% over the 1985 escapement of 37,000. Escapements in 1986 increased in 9 of the 11 index systems and decreased in 2 compared to 1985.

1987 Expectations: Projections for 1987 southeast Alaska chinook salmon returns are not available at this time.

Washington, Oregon and California

Ocean Fisheries: Ocean fisheries south of the Washington-British Columbia border were not constrained by chinook catch ceilings established by the Pacific Salmon Commission. In many areas, 1986 ocean troll and sport fisheries off the coasts of Washington, Oregon, and California operated under chinook ceilings developed through domestic management processes. Ceiling levels established through the Pacific Fishery Management Council reflect allowable catch levels after adjustments are made for shaker mortality and coho management concerns.

In the area south of Cape Falcon to Cape Blanco, chinook management was directed at Oregon coastal natural stocks. Between Cape Blanco and Point Delgada, chinook management was directed at Klamath River fall stocks. South of Point Delgada, management was directed at Sacramento River chinook. The combined recreational and troll harvests in these areas were designed to achieve escapement objectives for these stock groups.

In the area north of Cape Falcon, chinook fisheries were constrained primarily by concerns for certain depressed Columbia River stocks. The combined impacts of all ocean fisheries in 1986 were expected to result in a river-mouth escapement below the normal goal for Spring Creek Hatchery chinook.

Commercial Troll Fisheries:

1. Catches: Catches by state are reported below.
 - a) The Washington troll chinook harvest of 46,300 fish was 10% lower than the catch taken in 1985. Treaty Indian (catch plus unanticipated hooking mortality for the May 1 through September 30 period in ocean management areas) and nontreaty trollers caught 12,700 and 33,600 chinook, respectively.
 - b) Oregon trollers harvested 388,400 chinook in 1986 compared to 210,000 in 1985. Only a small portion of this catch is taken from far-north migrating stocks of concern to the Pacific Salmon Commission.
 - c) The 1986 chinook catch by California trollers was 632,500 compared to 380,300 fish taken in 1985. Chinook harvested off California are of California and southern Oregon origin.
2. Ceilings:

Five ceilings were established for Ocean troll fisheries for chinook off the coasts of Washington, Oregon, and California through domestic processes of the Pacific Fishery Management Council. The Treaty troll chinook ceiling was the only chinook ceiling (recreational or commercial) in the area north of Cape Falcon to the Washington-British Columbia border which was reached in 1986.

Ocean Recreational Fisheries

1. Catches:
 - a) The Washington ocean recreational chinook catch was 21,000 fish, 25% below the number taken in 1985.
 - b) The Oregon ocean recreational catch of 23,400 chinook was 58% below the number taken in 1985.
 - c) The California ocean recreational catch of 128,600 chinook was 11% below the number taken in 1985.

Inside Fisheries

Puget Sound Marine and Freshwater Sport: 1986 estimates are not available at this time.

Strait of Juan de Fuca: The Treaty troll fishery in the Strait of Juan de Fuca harvested a total of 29,000 chinook (including 2,100 chinook taken during May 1 - September 30 in Area 4B which are counted towards the total Treaty ocean troll ceiling). The net fishery in this area harvested 15,100 chinook (100 nontreaty; 15,000 Treaty). All the nontreaty catch was taken incidentally during fisheries under control of the Fraser River Panel. The Treaty net catch was taken incidentally during gillnet fisheries under the control of the Fraser River Panel, directed chum fisheries, and directed chinook fisheries.

San Juan Islands, Area 7/7A: The chinook harvest in this area totaled 20,000 (12,600 nontreaty and 7,300 Treaty). The harvest was taken incidentally during fisheries under the jurisdiction of the Fraser River Panel and during chum-directed fisheries. No directed chinook fisheries were conducted in this area.

Other Puget Sound: A total of 140,100 chinook have been taken by net fisheries operating in other areas of Puget Sound. These fisheries operate primarily in terminal areas and harvest summer/fall stocks.

Washington Coast: A total of 21,900 chinook (spring, summer and fall races combined) have been taken in Washington coastal net fisheries (8,400 north coast; 6,600 Grays Harbor; 6,900 Willapa Bay).

Columbia River: The Columbia River chinook net fisheries have harvested 276,300 chinook (all races combined); the lower river sport fishery has taken approximately 38,500 chinook.

Spawning Escapements: Chinook escapement data for the 1986 season are not available at this time.

Pass Through: The effectiveness of management measures in passing chinook from depressed stocks through to spawning escapements cannot be fully assessed at this time since fisheries impacting chinook are still in progress and spawning escapement estimates are not available.

The Strait of Juan de Fuca is the only area where significant increases in mixed-stock chinook harvests were observed. Abundance of chinook stocks in the Strait appears to have been higher than that observed in recent years, based upon increased catch levels. The conduct of this fishery did not change significantly from previous years, although increased effort was observed in Statistical Area 5. The total Treaty troll chinook catch in the Strait of Juan de Fuca approached 29,000 by mid-October, compared to a 1985 season total of 12,000. The 1986 harvest by this fishery is a record high, surpassing the previous high of 20,400 taken in 1983. Treaty marine gillnet harvests in this area were 15,000, compared to 6,800 taken in 1985 and a previous record high of 11,800 caught in 1983. A substantial portion of the marine gillnet catch is taken by set nets targeting on large chinook. Anecdotal information indicates that recreational harvests in the Strait of Juan de Fuca may also be above recent historical levels. Adequate information is not available to permit assessment of impacts of these increased catch levels upon pass through of depressed chinook stocks.

A description of measures undertaken in response to chinook conservation concerns is provided below for information.

Harvest levels for ocean fisheries off the coasts of Washington and northern Oregon have been substantially reduced from those experienced during the early 1980s in response to concerns for certain depressed Columbia River stocks. In the area north of Cape Falcon, the area used for management of Columbia River stocks by the Pacific Fishery Management Council, all 1986 commercial troll and recreational fishery chinook catches were below ceiling levels with the exception of the harvest by the Treaty troll fishery (12,450 catch plus 250 hooking mortality allowance applied in-season, compared to a ceiling of 12,500).

Regulations for Puget Sound sport and net fisheries were enacted to protect depressed spring chinook stocks. Maximum size limits and time/area closures were continued for Treaty troll and recreational fisheries. For the first time, test fisheries were conducted in Carr Inlet to document clearance of spring chinook prior to opening sport fisheries in the area. A record number of spring chinook eggs were taken at Minter Creek and Manchester facilities (2 million eggs total). Outplanting of progeny from hatchery operations is anticipated as part of a spring chinook rebuilding effort.

Depressed Green-Duwamish summer/fall stocks were protected through the institution of sport and net fishery closures in Elliott Bay and in-river during the entire chinook management period. A maximum impact of 2,200 chinook was established for incidental catch during coho-directed fisheries. Coho fisheries in the area were instituted only after test fisheries indicated clearance of chinook. The total incidental catch of chinook by commercial net fisheries in Elliott Bay and in-river was approximately 1,700. It is anticipated that fish from the Washington Department of Fisheries hatchery facility on the Green-Duwamish system will be outplanted to supplement chinook production in areas with inadequate wild spawning.

For the Washington coast, no directed net fisheries were conducted on the stocks of concern (Quillayute spring, Grays Harbor spring and fall stocks).

In the Columbia River, no directed commercial net fisheries were conducted on depressed upriver spring and summer stocks to address pass through needs. A Treaty Indian ceremonial and subsistence fishery harvested approximately 7,100 upriver spring chinook from a total run size of 118,200 adults above Bonneville Dam. Approximately 50 summer chinook were taken incidentally during fisheries directed at sockeye. During the fall season, fisheries were structured to maximize harvest of upriver bright chinook, lower river hatchery tule chinook, and coho stocks while protecting the depressed Spring Creek tule hatchery stock. In-river returns of the Spring Creek stock were below pre-season expectations. Highly preliminary data indicate that approximately 6,000 of 267,000 chinook taken in fall fisheries may be of Spring Creek origin. The total number of eggs at Spring Creek Hatchery was about 11.5 - 12.0 million, compared to a 1985 egg-take of 13.5 million. The 1986 Spring Creek egg-take goal was nearly achieved because of successful adult trapping efforts at Bonneville Dam, an above average proportion of females in the run, larger average fecundity of females, and a transfer of eggs from Little White Salmon hatchery.

1987 Expectations: Abundance forecasts for chinook will become available in February of 1987. Disease in the 1984 brood releases is expected to negatively impact 1987 Spring Creek Hatchery returns.

2. Coho

Alaska

Troll Fishery: The southeast Alaska troll fishery harvested an estimated 2.2 million coho in 1986. This was an all-time record, exceeding the prior record of 2.0 million taken in 1951. Preliminary CWT analysis indicates that Alaskan hatcheries contributed several hundred thousand coho to the 1986 troll harvest. The major portion of the southeast Alaska troll coho harvest occurs in State waters within 3 miles of the surfline. The large 1986 coho return continued the pattern of strong coho returns to southeastern Alaska since the early 1980s.

Recreational Fishery: A direct estimate of the 1986 southeast Alaska recreational coho harvest is not currently available; however, it is expected to be in the range of 40-60 thousand, similar to that of previous years. The major portion of the recreational coho harvest occurs in marine fisheries adjacent to the larger communities in southeast Alaska.

Net Fisheries: Southeast Alaska net fisheries harvested an estimated 1.1 million coho in 1986 with the catch being split nearly equally between purse seine and gillnet fisheries. Coho are taken both in directed net fisheries and incidental to the harvest of other species. The 1986 harvest represents a near record. Southeast Alaska hatcheries contributed significantly to the 1986 net coho harvest but specific estimates are not currently available.

Spawning Escapements: Complete information on 1986 coho escapements to southeast Alaska systems is not currently available. Preliminary data indicate that relatively strong escapements appear to have occurred in central and southern portions of the region. However, coho escapements in northern inside areas and the Yakutat area appear to be average or below average as a result of weaker returns to those areas.

1987 Expectations: Formal forecasts are not made for southeast Alaska coho returns. However, coho returns in 1987 are expected to continue the pattern of strong returns occurring since the early 1980s as a result of favorable environmental conditions. Southeast Alaska hatcheries are again expected to contribute significantly to 1987 fisheries.

Washington, Oregon and California

Ocean Fisheries: No specific management regimes were established by the Pacific Salmon Commission for coho fisheries off the coasts of Washington, Oregon and California. Ocean troll and sport fisheries in this area operated under coho ceilings developed through domestic regulatory processes of the Pacific Fishery Management Council.

Commercial Troll Fisheries:

Catches:

- a) The Washington troll coho harvest of 158,700 fish was 26% lower than the catch landed in 1985. Treaty Indian and nontreaty trollers caught 84,500 and 74,200 coho, respectively.
- b) Oregon trollers harvested 437,200 coho in 1986 compared to 84,100 in 1985.
- c) The 1986 coho catch by California trollers was 35,500 compared to 11,000 fish taken in 1985.

Ocean Recreational Fisheries:

Catches:

- a) The catch landed in Washington was 173,000 fish, 3% below the number taken in 1985.
- b) The Oregon ocean recreational catch of 211,500 coho was 16% above the number taken in 1985.
- c) The California ocean recreational catch of 16,800 coho was 18% above the number taken in 1985.

Inside Fisheries:

Puget Sound sport fishery: Catch estimates are not available at this time for the 1986 fishery.

Strait of Juan de Fuca: The Treaty troll fishery (excluding Area 4B May 1 through September 30 catch) harvested 4,600 coho; 32 coho were reported as being harvested in this area by nontreaty troll gear operating in this area under Fraser River Panel jurisdiction. The net fishery in this area harvested 59,100 coho (1,000 nontreaty; 58,100 Treaty). All the nontreaty catch was taken incidentally during fisheries under control of the Fraser River Panel. The Treaty net catch was taken incidentally during gillnet fisheries under the control of the Fraser River Panel and directed at chum and coho.

San Juan Islands Area 7/7A: The coho harvest in this area totaled 69,800 (49,500 nontreaty and 20,300 Treaty). The harvest was taken incidentally during fisheries under the jurisdiction of the Fraser River Panel and during chum-directed fisheries. No directed coho fisheries were conducted in this area.

Other Puget Sound: A total of 929,500 coho have been taken by net fisheries operating in other areas of Puget Sound.

Washington Coast: A total of 150,300 coho have been taken in Washington coastal net fisheries (39,600 north coast; 24,400 Grays Harbor; 86,300 Willapa Bay).

Columbia River: The Columbia River coho net fisheries have harvested 408,300 coho; the lower river sport fishery has taken approximately 100,000 coho.

Management Actions Under the Pacific Salmon Treaty: Coho catches in the Strait of Juan de Fuca net fisheries were limited to incidental harvests taken during Fraser sockeye management, chum management, and Treaty coho-directed gillnet and troll fisheries. No directed coho fisheries were conducted in Area 7/7A.

Escapements: Coho escapement data for the 1986 season are not available at this time for Washington, Oregon and California stocks.

1987 Expectations: Abundance forecasts for Washington, Oregon and California coho stocks will become available in February of 1987. Preliminary information indicates that 1987 wild coho production from Puget Sound may be significantly reduced due to low summer flow conditions.

B. Preliminary Review of 1986 Washington Chum Fisheries in the Strait of Juan de Fuca, San Juan Islands and Southern Georgia Strait (Point Roberts), and Preliminary 1987 Expectations of Puget Sound Chum Abundance (October 1986)

Introduction:

This report provides a preliminary review of the 1986 fishing season and a preliminary indication of 1987 run size expectations, and is subject to correction and revision as additional information becomes available and additional fisheries are conducted. Most terminal area Washington chum fisheries are just beginning and many of the mixed stock fisheries are still ongoing. Therefore, this report is restricted to a description of the management actions and harvests, through late October, for those fisheries of most concern under the Pacific Salmon Treaty. Preliminary forecasts are provided for Puget Sound origin stocks only.

The fisheries in U.S. waters that are believed to harvest a significant proportion of Canadian origin chum salmon are those in the Strait of Juan de Fuca (Areas 4B, 5 and 6C), the San Juan Islands (Area 7) and Point Roberts (Area 7A). The majority of the harvest in the Strait of Juan de Fuca is believed to be of U.S. origin, and management of this limited effort Treaty Indian gillnet fishery has generally been aimed at the needs of Puget Sound origin stocks. Fisheries in Areas 7 and 7A are believed to harvest primarily Canadian origin chum salmon and are the only Washington chum fisheries for which a specific 1986 fishing regime was defined by the Pacific Salmon Commission. Other chum fisheries in Washington waters are primarily terminal fisheries which harvest stocks of local origin. Complete catch data from these fisheries will not be available until later in the season.

Management Strategy:

The management strategy utilized for Areas 4B, 5 and 6C for 1986 is basically unchanged from what has been used in recent years. This fishery is restricted to Treaty Indian gillnet gear, fishing a 5 day per week schedule throughout the chum management period (9/28 - 12/6). This fishery tends to be limited by adverse weather conditions experienced in late October and early November, and is usually discontinued by mid-November. No other regulation of this fishery has been enacted for 1986.

The management regime for Areas 7 and 7A was established by the Pacific Salmon Commission at their March 1986 meeting. The agreement called for the fishery in these areas to be managed on the basis of and consistent with the Canadian "clockwork" plan.

Updates of run size from the Johnstone Strait fishery are now indicating a run size of 3.8 million. The manner in which the run size has been updated and the possible consequences to the objectives of the clock work plan have raised some concerns with U.S. managers. This concern is still being discussed as an in-season management issue.

Fishery Review:

The fishery in Areas 4B, 5 and 6C is exhibiting a higher than expected catch level, similar to that experienced in 1985. Catch data through the 25th of October indicate a total catch of 33,127, with strong catches through mid to late October as in 1985. It is believed that this again represents an abnormal catch rate for this area due to extremely favorable fishing conditions. The month of October again provided extremely dry, mild weather allowing fishermen to maximize their fishing opportunities with good fish availability. This fishery is continuing according to the pre-season plan and catch totals will continue to increase.

The total harvest in Areas 7/7A has exceeded the harvest ceiling of 80,000, with a catch reported through 10/25 of approximately 90,000 chum. This overharvest is due primarily to better than expected catches in the Treaty Indian fishery. An examination of the distribution of harvest between Areas 7 and 7A during the directed chum fishery shows more of the catch being taken in area 7. However, the total chum catch from these Areas is distributed similar to the historical pattern due to the harvest of chum taken in Area 7A during the late sockeye fishery.

Spawning Escapement:

Spawning escapement estimates for Washington origin chum stocks will not be available until the late spring of 1987. The major chum runs are just now entering inside waters and terminal fishing Areas. Chum spawning does not occur for most Washington runs until November and December, with some late spawning activity continuing into March. Pre-season forecasts of chum abundance in Puget Sound were for a small even year chum run, which would allow only modest terminal harvests. However, all major Puget Sound stocks are expected to return sufficient numbers of fish to achieve the spawning escapement objectives.

1987 Expectations for Puget Sound Stocks:

Pre-season expectations for the 1987 season are extremely preliminary at this early date. Official forecasts for management planning within Puget Sound will not be developed until June. The most recent years' data appear to be the most significant for forecasting chum runs and these preliminary expectations could change significantly when 1986 escapements and run size information are included in the methodology. Forecasts for other Washington origin chum stocks are not available at this time.

The preliminary 1987 expectation for early Puget Sound chum stocks, both hatchery and wild, is for a run of 14,500. This is a below average odd year return. Early chum return concurrently with significant hatchery coho returns and are managed secondary to coho management needs.

The normal timed Puget Sound chum stocks are expected to return 251,000 wild fish and 419,000 hatchery fish, for a total of 670,000. The wild forecast is significantly below the recent average odd year return, and some individual stocks are expected to return near or below their escapement objective. The stock of most concern in 1987 will be the Skagit River. The total wild return to the Skagit is forecast at 31,000, with an odd year escapement objective of 38,900. Other Puget Sound stocks, such as those returning to south Puget Sound, show expected returns which would allow only limited harvest.

Late returning Puget Sound chum stocks are forecast for 1987 at 35,000 wild fish and 7,100 hatchery fish, for a total of 42,100. This would be an average odd year late chum return.

The total 1987 returns of all chum stocks to Puget Sound are forecasted to be 300,500 wild fish and 426,300 hatchery fish, for a total of 726,800. It is significant to note that the hatchery return is expected to significantly outnumber the wild return, which is unusual for Puget Sound chum.

C. Preliminary Post-Season Report on 1986 Taku/Snettisham Fishery Performance

King:

During the 1986 season a total of 2,747 king salmon were caught in the District 111 drift gillnet fishery. Approximately 515 were Taku River spawners. Escapements were very good in the Taku River drainage, the third largest since 1975, and were comprised mainly of 4 and 6 year fish. The 5-year-old component was very weak. Large catches of feeder kings during late June and July prompted night closures during statistical weeks 26, 29 and 30. King catches during periods with night closures were approximately 50% smaller than for those periods without night restrictions.

Sockeye:

The total 1986 sockeye harvest of 72,107 is slightly below the 10 year average of 76,000 sockeye. This includes an estimated 6,282 sockeye bound for Port Snettisham, representing 10.7% of the total harvest as shown through scale analysis. During the previous three seasons, the Snettisham system has contributed 16 to 24 percent of the District 111 catch. Port Snettisham sockeye escapements were very poor in 1986 in spite of large area and time closures in Port Snettisham and Stephens Passage. Speel and Crescent Lake weir counts were 5,858 and 3,414 sockeye, far below the escapement goals of 12,000 and 22,000 sockeye respectively. Sockeye CPUE was low during the initial weeks of the summer fishery. By statistical week 28, historically a peak week of the fishery, cumulative sockeye CPUE was 46% below the 10 year average. Consequently, fishing time was restricted and extensions were not allowed until statistical week 31 when it became apparent through increased fishing success that the sockeye run strength had improved.

Based on the Canyon Island fish wheel tagging and subsequent Canadian fishery, weir and spawning ground tag recoveries, the total Taku River drainage sockeye escapement is estimated at 90,000 fish with a confidence interval of - + 15,000 sockeye. Trapper and Tatsamenie Lake weirs each had twelve thousand sockeye pass through this year, approximately the same number of sockeye that passed through each weir in 1985.

Pink:

The 1986 total pink harvest of 16,430 was far below the pre-season estimated catch of 115,000 fish. Total escapements for the Taku are unknown but based on aerial surveys, foot surveys and Nakina weir carcass counts, they are considered some of the worst on record and far below the 150,000 escapement goal. Stephens Passage pink catch and escapements were also depressed.

Coho:

The 1986 District 111 harvest of 29,167 coho is 18% below the 10 year average. However, based on good early coho escapements in the lower Taku River, this catch is probably reflective of low effort levels during the fall fishery instead of poor run strength. Coho CPUE was above average during most of the fall fishing periods. No additional time was granted this year to harvest hatchery coho returning in Port Snettisham in order to satisfy brood stock requirements.

Chum:

The summer chum salmon catch of 29,000 is above the 10 year average catch of 21,240. In-season tag recoveries indicate Port Snettisham hatchery contributed 12,000 chum (41%) of this catch. The majority of the summer chums were caught incidentally to the sockeye salmon fishery in District 111. In July, during the five additional 24 hour fishing periods in the southern portion of Section 11B and in Section 11C, 6,700 chum were caught. This area was opened to evaluate the extent of the Snettisham hatchery chum contribution in areas not normally fished for sockeye salmon. The magnitude of this year's chum catch in this area is similar to 1985, indicating the majority of the returning Snettisham hatchery chum migrate from the north passing through the traditional sockeye salmon fishing areas. The fall chum harvest (beginning statistical week 34) of approximately 30,000 fish is 45% below the 10 year average.

Although fishing effort was minimal, chum CPUE was very low indicating chum run strength was weak. Early chum index area escapement counts were poor.

D. Preliminary Post-Season Report on 1986 Alsek River Fishery Performance

Introduction:

Salmon fisheries for Alsek River salmon include an Alaskan set net fishery in Dry Bay at the mouth of the Alsek, and Canadian Indian food and sport fisheries in the Tatshenshini River and tributaries. Sockeye and coho are the predominant species taken in the Dry Bay fishery while sockeye and chinook comprise the majority of the Canadian catch. Under the terms of the U.S.-Canada Treaty, both countries were required to take appropriate management actions in 1986 to continue the process of rebuilding early sockeye and chinook stocks to achieve escapement goals.

In Alaska, the Dry Bay fishery was open a total of 34 days, well below the 1976-1984 average of 46 days but about average for the past five years. The total Dry Bay salmon catch of 26,400 fish was twice the 1985 catch of 11,300 and 67% of the 1976-1984 average of 39,400.

Sockeye:

The 1986 outlook for sockeye returns to the Alsek River system based on brood year spawning escapements, sex composition and assumptions about productivity and age composition of returns was for an above average run of 83,000 fish. However, restrictions in both Canadian and Alaskan fisheries were continued for the fourth year during 1986 to help rebuild early run sockeye which were not expected to provide a harvestable surplus.

The harvest and escapement are recorded below compared to historic levels:

	<u>1986</u>	<u>1985</u>	<u>1980-84 Average</u>	<u>1976-84 Average</u>
Alaska Commercial Dry Bay Fishery	24,000	5,600	22,100	29,000
Alaskan Subsistence	100	100	100	100
Klukshu River Weir Index Escapement	23,000	17,300	17,400	15,400

Conservation measures to increase the early run sockeye escapement resulted in no increase into Klukshu Lake over the 1981 brood year. This was also the situation in 1985 and it may be the cold spring conditions during both years that delayed escapement timing. The escapement of later returning sockeye in 1986 was slightly above the parent year level of 20,000. The 1986 preliminary Klukshu weir count was 23,000 sockeye. Assuming Klukshu represents 60% of the total Alsek sockeye escapement, the total Alsek River escapement, approximated 36,000. This escapement estimate falls within the escapement goal range of 33,000 - 58,000. The estimated return (catch plus escapement) in 1986 appears to have been in the order of 60,000 implying an overall harvest rate of 43%. This return was below the projected return of 83,000.

This is the second year that an in-season total run estimate was made during the season by U.S. managers using historical exploitation rates and cumulative catches. The 1986 model suggested that at the current effort levels and two day fishing periods an escapement to Klukshu Lake of 22,000 fish should be attained which was within the escapement goal range of 20,000 to 30,000. This estimate proved to be extremely accurate as it was during the 1985 season.

Coho:

The 1986 Dry Bay coho harvest of 1,325 was extremely poor. Fishing effort ranged from 3 to 11 fishermen participating each week which was below average. Normal three-day weekly fishing periods were allowed during most of coho season from late August until the last week of the season when only two days were allowed. The fishery closed early on September 17. Contributions of Alsek River coho to the outside troll fishery is unknown. Tag returns in 1986 from adjacent Yakutat foreland streams may give some insight to the Alsek coho ocean exploitation. Coho escapement counts have not yet been conducted.

Chinook:

Brood year escapement for chinook suggested that the 1986 return would be below average with a pre-season total run estimate of 9,900. Since recent average escapements have been lower than the goal range of 7,200 to 12,500 it was recommended that efforts to rebuild the runs be continued.

The 1986 Klukshu weir index escapement of chinook was 2,708 which is relatively good and indicates the overall Alsek River escapement was approximately 5,400 fish. The 1986 Alsek River chinook harvest and historical comparison are as follows:

	<u>1986</u>	<u>1985</u>	<u>1980-84 Average</u>	<u>1976-84 Average</u>
Alaska Commercial Dry Bay Fishery	477	200	600	1,100
Alaskan Subsistence Fishery	50	50	50	50
Klukshu River Weir Index Escapement	2,708	1,300	2,200	2,500

E. Preliminary Post-Season Report on 1986 Boundary Area Fisheries Performance

1986 Salmon Forecast:

Formal forecasts are not made for species of salmon other than pinks. The 1986 pink salmon forecast indicated a point return of 37.9 million fish. At this level of return, assuming the attainment of a 6 million escapement goal, a harvest of 31.9 million pink salmon was indicated.

Review of 1986 Season:

District 104

The District 104 seine fishery opened by regulation on July 7. The U.S.-Canada Treaty calls for limiting the sockeye catch in that fishery during the period 1985 through 1988 to a maximum 4 year total of 480,000 prior to statistical week 31. The 1986 management plan for the district called for a guideline harvest level of 120,000 during the first 3 weekly fishing periods. In 1985 a total of 4 daily fishing days were provided for during the first three weeks with an attendant harvest of 101,000 sockeye. In 1986 a total of 6 days were fished, between July 6 and July 26. The sockeye harvest amounted to 91,000. The boat days expended during the first three weeks in 1985 amounted to 392 compared with 807 in 1986 indicating sockeye availability was less during that same period in 1986.

During the 1986 season a total of 444,000 sockeye were harvested in District 4. About 20% of the sockeye were taken prior to statistical week 31 in 1986 compared to an average of 44% during the period 1980-85.

Although gear levels were moderate during the early portion of the season, they increased dramatically during the weeks of peak pink salmon abundance. During the peak week, statistical week 32, some 220 seine vessels fished in District 4 and harvested over 8 million salmon.

Returns to Districts 1, 2 and 3 were above forecasts as reflected by the catches and escapement in those districts. The pink catch in District 3 of just over 7 million was the second highest on record. Escapements in District 3 were the highest on record. Distribution in the District 3 escapements was extremely good. Despite heavy catches in both Districts 3 and 4, the escapement index to District 3 streams will amount to about 5.7 million pink salmon, over 3 times the published goal level.

Tree Point

The Tree Point gillnet fishery opened by regulation for the 1986 season on the third Sunday in June, June 15.

Sockeye catches were below average during the first 4 weeks of the fishery. The fishing period was reduced during the second week to 3 days, the third week 1 ½ days and the fourth week 2 days in response to this low abundance. Gear levels were slightly below average during that same period. At the same time chum catches were somewhat above average after excluding supplemental contribution.

Beginning on July 13 (statistical week 29) and extending through September 6 (statistical week 36) the Tree Point gillnet fishery was managed according to the Pink Salmon Management Plan. The Plan provides by regulation that the gillnet fleet fish on a schedule that is tied to the seine fishery fishing time when the two fleets are harvesting concurrently on the same stocks of pink salmon.

Over the period 1980-85, an average of 56% of the season sockeye catch has been harvested through the 29th statistical week. By comparison, 54% was harvested by that same time in 1986. The sockeye harvest peaked during the 29th statistical week, July 13 through 19.

In the interest of chum conservation and in keeping with the Treaty between the U.S. and Canada, Portland and Pearse Canals remained closed throughout the entire 1985 season north of Akeku Point which lies at the southern entrance to Edward Passage in Lower Pearse Canal. Chum escapements into Fish Creek, a tributary to the Salmon River, were projected to be slightly less than goal level, although a figure reflecting total escapement is not yet available. Tombstone River chum escapements were also thought to be below goal level.

Effort levels for the season were above the past 6 year average (1980-85). The number of boat days fished in 1986 amounted to 5,567 compared to a 6 year average of 4,726.

It should be noted that, as a preliminary estimate, supplemental chum comprised about 13% (36,000) of the total Tree Point chum harvest.

Management Performance Relative to Treaty Requirements:

District 4

The U.S.-Canada Treaty calls for a maximum harvest of 480,000 sockeye from District 4 prior to statistical week 31 over the period 1985 through 1988. In 1985 a total of 101,000 sockeye were taken prior to that statistical week and in 1986 91,000.

Tree Point

The U.S.-Canada Treaty specifies that the District 1-A and 1-B gillnet fishery be limited in a manner that will result in an average annual harvest of 130,000 sockeye. The 1986 season harvest of sockeye in the Tree Point gillnet fishery totalled 145,000.

1987 Salmon Forecast - Southern Southeast Alaska:

Due to extreme environmental conditions during the winter of 1985-86, the 1987 pink salmon returns are expected to be lower than recent years. The midpoint forecast will be 27.2 million total run (preliminary). The past 5 year annual average (1982-86) is 37.6 million. Since the escapement level is presumably constant, the reduction will come directly out of the harvest. Subtracting the escapement goal of 6 million the point harvest estimate is 21.2 million. The past 5 year average (1982-86) is 28 million.

Distribution in the return should be somewhat mixed with weaker returns occurring to the mainland areas and stronger returns to the island systems. Production from smaller watersheds could contribute proportionately less than usual because of severe freezing conditions.

F. Preliminary Post-Season Report on 1986 Stikine/Prince of Wales Fishing Performance

During the 1986 season the Section 6A drift gillnet fishery was open for 31 days and Sections 6B and 6C were open for 32 days from June 15 to September 23. This is slightly above the average fishing time allowed during the past 10 years of 29 days. Portions of District 8 were open for 22 days from June 15 to September 10. This was above the 10-year average of 15 days. Some type of an area restriction was always in effect in District 8.

The fishing effort in District 6 started out high during the sockeye season and remained high throughout the entire gillnet fishery. The cumulative numbers of boats/week was the highest on record for District 6 while the District 8 effort was far below the 10-year average. Weekly fishing effort in District 6 from the beginning week of the season through the second week of September ranged from 89 to 173 boats.

Chinook:

During the 1986 season the District 6 and 8 drift gillnet fisheries harvested 1,724 and 102 chinook respectively. The majority of the chinook caught in District 8 were probably Stikine River spawners and are harvested incidentally during the sockeye fishery. Area restrictions were implemented throughout the sockeye season to keep the chinook harvest to a minimum. In District 6 the vast majority of the chinook harvested are feeders that are caught incidentally throughout the entire season. These feeders originate from a variety of stocks. Escapements to the Stikine River drainage were just below average this year.

Sockeye:

During the 1986 directed Stikine sockeye season, the District 8 gillnet fishery was opened from June 15 to June 30 for a total of 4 days, and the District 6A fishery was open for 6 days between June 15 and July 1.

Pre-season expectations were for a strong sockeye run to the Stikine River. Although effort was high, catches were poor during the first three weeks in District 6 and the fishery was limited to 2-days per week. After the third week, it was apparent that the run was much weaker than anticipated. To guarantee 10,000 fish to the Canadian fishery and to attempt to achieve near goal escapement levels, the Section 6A fishery in Sumner Strait was closed during the fourth and fifth week of the fishery. Additionally, the terminal fishery in District 8 was closed during the third through the fifth week of the season. The District 8 fishery was kept closed during the fifth fishing week in spite of indications of strong chum runs into the Frederick Sound portions of District 8.

During the entire season, preliminary stock composition estimates indicate about 17,000 (11%) of the 150,000 sockeye harvested in District 6 and 8 were of Stikine origin. Preliminary analysis of scale samples also indicated during any individual week the Stikine proportion of the harvest in District 6 never exceeded 22 percent of the catch.

Pink:

The 1986 District 6 pink salmon harvest of approximately 308,000 is slightly above the 20-year average harvest and is almost twice the average catch during the last 5 even years. Pink salmon escapements were good in District 6 and were fairly uniform throughout the area.

The pink salmon harvest of 4,901 in District 8 is far below the 20-year average harvest and is slightly below the average catch during the last 5 even years. The majority of the pink salmon harvest in District 8 occurred in Frederick Sound during the chum salmon fishery. Pink salmon escapements throughout District 8 were slightly below average.

Coho:

Good landings of coho salmon occurred in District 6 during the sockeye and pink salmon seasons. Prior to directed coho management which began on August 31, 60 percent of the total coho catch was harvested. Due to the good, early coho catches, District 8 was opened in mid-August to test the strength of the coho run to the Stikine River. Effort was low in District 8 while weekly catches ranged from average to below average. District 8 was closed in mid-September, two weeks earlier than District 6. The District 8 coho harvest of 7,439 is below the recent 10-year average harvest of 9,500 fish. The seasonal catch of approximately 195,000 coho salmon in District 6 is the highest ever recorded and is more than twice the old record catch of 93,400 coho. Preliminary coded-wire tag information shows that hatchery fish contributed 20 percent of the total harvest or about 38,000 coho. Due to high rainfall and poor surveying conditions throughout October, a good assessment of the coho escapements may not be accomplished this season.

Chum:

The District 6 chum salmon harvest of 82,333 fish is approximately 2 1/2 times the recent 10-year average harvest of 31,200 and is the second highest catch on record. All of the chum salmon harvested in District 6 are caught incidentally while targeting on sockeye, pink and coho salmon. The District 8 chum salmon harvest of 5,928 is also approximately 2 1/2 times the recent 10-year average harvest of 2,200 fish. In 1986 the chum salmon harvest in Frederick Sound made up 95 percent of the total District 8 chum salmon catch. This is a small fishery that targets on chum salmon heading to the systems in the Frederick Sound portion of District 8 and the north arm of the Stikine River. Chum salmon escapements appear to be about average.

Appendix 4

A Summary of Salmonid Enhancement Programs in Southeast Alaska, Washington and Oregon

The United States-Canada Pacific Salmon Treaty requires that information on salmon enhancement programs be developed and forwarded to appropriate panels for review. Information required is summarized for five major areas along the U.S. coast: northern southeast Alaska, southern southeast Alaska, Puget Sound, Columbia River, and coastal Washington and Oregon.

A. Northern Southeast Alaska

The State of Alaska operates two hatcheries in northern southeast Alaska: Hidden Falls Hatchery is located on the northeast tip of Baranof Island, and Snettisham Hatchery is located in the head of Speel Arm in Port Snettisham, which is 40 miles south of Juneau. These hatcheries became operational in 1979 and 1981, respectively. Both facilities have been recently completed to their design specifications.

The current adult production capacity of state enhancement activities in northern southeast Alaska is 71,000 chinook salmon, 1,758,000 chum salmon, and 17,500 coho salmon annually. Adult salmon production is achieved with hatcheries, fish ladders, lake stocking, lake fertilization, remote releases, and habitat modification.

Private nonprofit (PNP) hatchery permits have been issued by the Alaska Department of Fish and Game (ADF&G) for 11 sites in northern southeast Alaska. These permits delineate the maximal number of eggs from each species that can be incubated annually. State statutes allow the PNP hatchery operator to harvest a portion of the return to recover the costs of building and operating the facility.

Hatcheries are currently in operation at eight of the permitted sites. In addition, scientific/educational permits have been issued for three hatchery projects in schools, one spawning channel, and two stream-side incubator projects.

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS) has two research hatcheries in northern southeast Alaska: one is located in Little Port Walter on the southeast end of Baranof Island, and the other is located on Auke Creek in Auke Bay. Both of these facilities conduct salmonid research; their broodstock requirements, adult returns, and operational plans vary depending on experimental designs. Contribution to the fisheries is secondary to experimental results.

1. Operational Summary for 1980-1985

A summary of releases from salmon production facilities (hatcheries, instream incubation facilities, spawning channels, etc.) are provided in Table 1.

2. Marking Evaluation Strategies Applied

As our release numbers indicate, we are still in the broodstock development phase in northern southeast Alaska. We have completed the construction of facilities in the area and are now maximizing their rearing/incubation potentials. Changes in the operation have expanded the production potential.

The production from the state government's operational activities is determined through an extensive coded-wire tagging and sampling program whose primary objective is to estimate the harvest from enhancement projects, including hatchery/project marine survivals, commercial fishery contributions by gear type, run timing, and catch distribution. Operational fine tuning is also a goal of our mark-recovery program; fish culture technology, diet performance, and broodstock performance are other areas that are being addressed with information obtained from mark-recovery data.

Evaluation programs for all chinook and coho salmon production from PNP hatcheries are based on coded-wire tagging (CWT) of juvenile fish and the recovery of marked adults in interception fisheries and at the hatchery rack. Some evaluation programs for chum salmon are also based on coded-wire tags; however, most of the PNP hatcheries in northern southeast Alaska depend on rack returns and estimated interception or marine-survival rates to evaluate hatchery performance. Evaluation programs for pink salmon production depend on rack returns and estimated interception and marine-survival rates.

Generally, all the fish at federal facilities are hand-counted and coded-wire tagged; the exceptions are pink salmon at Auke Creek Hatchery that are counted but not marked. The fish having CWTs are marked according to experimental design requirements. All the returning fish are examined for marks at the hatchery weir. Sampling of the common-property fisheries for marked fish is conducted by ADF&G; reporting of harvest estimates for marked fish is also provided by that agency. Harvest estimates for fish from federal facilities were provided by the ADF&G Tag Lab.

3. Summary of Salmon Returns

The return estimates (Table 2) were generated through a number of means. The primary method was through expansion of the coded-wire tag recovery data from the common-property fisheries. Other methods included the enumeration of fish at the hatchery rack and calculations of other return projections through assumed marine-survival rates and/or assumed interception rates in the fisheries (as reported by the PNP operators or hatchery biologists) catch estimates from area management staff, processor information (fish tickets), and sport fish creel-census data.

Table 1 Number of salmon released in northern southeast Alaska from production facilities.^a

Species and Life Stage at Release ^b	Date of Release					
	1980	1981	1982	1983	1984	1985
Chinook						
fry	0	0	0	0	0	0
fingerling	0	0	0	0	142,000	96,000
smolt	175,000	64,000	66,000	451,000	700,000	421,000
Chum						
fry	284,000	1,021,000	781,000	4,739,000	11,158,000	13,853,000
fingerling	3,850,000	12,302,000	20,312,000	31,339,000	35,010,000	40,519,000
Coho						
fry	0	0	0	0	476,000	0
fingerling	0	0	249,000	268,000	0	68,000
smolt	184,000	115,000	85,000	494,000	749,000	251,000
Pink						
fry	10,220,000	5,528,000	24,410,000	29,281,000	71,459,000	23,938,000
fingerling	0	0	0	0	53,000	18,931,000
Sockeye						
fry	0	0	0	0	0	0

^a Release figures as reported to ADF&G by the hatchery operators. Some figures are based on estimates; others on actual counts. Numbers are rounded to nearest 1000.

^b "fry" includes emergent fry and fed fry less than twice their weight at emergence. "fingerling" includes juvenile salmon that are equal to or greater than twice their weight at emergence. "smolt" includes juvenile chinook and coho that have been reared until physiologically adapted to the marine environment. Both age-zero and age-one smolts are included.

Table 2 Numbers of salmon returning from production facilities in northern southeast Alaska.^a

Species	1980	1981	1982	1983	1984	1985
Chinook						
Returns	1,900	900	1,300	1,400	2,700	4,500
Brood Stock Needs	0	900	1,100	1,100	1,200	1,200
Design Capacity	0	62,700	73,800	81,200	85,000	89,000
Chum						
Returns	100	4,500	82,600	128,800	615,200	502,200
Brood Stock Needs	73,400	155,300	197,000	197,000	199,000	180,000
Design Capacity	976,100	2,028,400	2,597,700	2,597,700	2,616,100	2,490,100
Coho						
Returns	1,600	2,300	3,900	9,000	28,900	61,500
Brood Stock Needs	150	2,600	2,600	3,300	4,100	4,100
Design Capacity	3,700	59,400	59,400	74,900	94,100	85,900
Pink						
Returns	12,900	210,400	124,500	275,200	533,700	1,719,000
Brood Stock Needs	18,400	53,800	84,900	84,900	108,000	102,100
Design Capacity	163,600	631,600	984,200	984,200	1,244,200	1,244,200

^a Estimates based on coded-wire tag recoveries, actual returns to the hatcheries, assumed marine survival rates, and/or assumed interception rates in fisheries. Estimates based on actual returns to hatcheries in conjunction with assumed marine survival rates and/or assumed interception rates in fisheries. Numbers are rounded to nearest 1000. Data does not include brood stock needs or design capacity for Auke Creek or Little Port Walter.

4. Habitat Management

Habitat enhancement in the Tongass National Forest (TNF) is accomplished through the U.S. Forest Service (USFS) Salmon and Steelhead Habitat Opportunities (SSHO) program; ADF&G and the regional aquaculture associations are participants in this cooperative program. Table 3 summarizes (by activity) the 30 salmon habitat enhancement projects completed on the TNF during 1980-1985. These projects include a broad mix of structural and non-structural improvements, such as major fishways, instream habitat structures, and lake fertilization.

Table 3. Habitat enhancement projects in the Tongass National Forest (northern southeast Alaska), 1980-1985

Habitat Enhancement activity & number	Potential production (fish in thousands)	Species enhanced
Fishways (10)	145.2	Coho, Chinook, Chum, Sockeye
Instream Habitat struct. (6)	1.5	Coho Lake
Fertilization (2)	300.0	Sockeye, Chinook
Lake Stocking (6)	30.0	Coho, Chinook Debris
Removal (6)	N/A	Coho

Table 4 provides a summary of harvest production and species benefited by completed projects on the TNF in northern southeast Alaska during 1980-1985. These enhancement projects will increase salmon spawning and rearing habitat by more than 4000 acres of previously barren and underutilized lakes and streams. Chinook, coho and sockeye salmon are the emphasized species of SSHO; however, chum and pink salmon production has been enhanced as well. Completed projects have the potential to add an estimated 467,000 salmon to southeast Alaska fisheries. All projects are currently undergoing broodstock development. Harvest estimates attributable to these enhancement activities are not available.

Planned Changes Within Existing Operations That Would Modify Species Emphasis or Design Capacity:

Plans are currently being developed to expand chum salmon production from both Hidden Falls and Snettisham Hatcheries in spring 1987 through the development of additional facilities for short-term saltwater rearing prior to release. These facilities would be developed at remote sites. Plans for chinook salmon expansion at Medvejie Creek Hatchery are being considered.

5. Plans for New Projects

No new production facilities have been funded for construction in northern southeast Alaska. Plans are currently being considered for a new hatchery at Baranof Warm Springs on the east side of Baranof Island. This facility would benefit all gear groups in northern southeast Alaska.

Table 4. State, PNP and federal salmon production facilities, activities, and estimated total salmon harvest in 1985 and 1986. (*See page 91.*)

Table 4.	Agency, Activity, Species	Estimated Harvest	
		1985	1986
1. State			
	Hidden Falls Hatchery		
	chinook	100	100
	chum	373,000	586,600
	Snettisham Hatchery		
	chinook	300	600
	chum	21,800	27,500
	coho	6,600	2,500
2. Private Nonprofit and Scientific/ Educational			
	Burro Creek		
	chum	200	500
	pink	12,000	3,000
	Gannuk Creek		
	chum	0	100
	pink	0	0
	Kowee Creek		
	chum	N/A	N/A
	pink	N/A	N/A
	Medvejie Creek		
	chinook	0	0
	chum	600	65,200
	coho	400	1,300
	Port Armstrong		
	pink	74,000	20,000
	Salmon Creek		
	chum	100	200
	coho	17,800	0
	pink	N/A	0
	Sheep Creek		
	chum	N/A	N/A
	pink	712,500	N/A
	Sheldon Jackson College		
	chum	300	500
	coho	1,400	200
	pink	68,900	N/A
	Sandy Bay		
	chum	0	0
	pink	0	0
	Port Camden		
	chum	0	0
	Haines Spawning Channel/ Stream-side Incubator		
	chum	0	0
	coho	0	0
	Klehini River Stream-side Incubator		
	chum	0	0
	Kake City School		
	pink	0	0
	Pullen Creek		
	pink	0	0
3. Federal			
	Auke Creek Hatchery		
	chum	N/A	N/A
	coho	600	100
	pink	N/A	N/A
	Little Port Walter		
	chinook	1,200	1,300

B. Southern Southeast Alaska

The State of Alaska operates four hatcheries in southern southeast Alaska: (1) Beaver Falls Hatchery is located 13 miles south of Ketchikan on George Inlet, (2) Crystal Lake Hatchery is located 17.5 south of Petersburg on Mitkof Island; (3) Deer Mountain Hatchery is located in Ketchikan, and (4) Klawock Hatchery is located 2 miles east of Klawock on Prince of Wales Island.

Beaver Falls began operating in 1974 as a chum salmon incubation facility; in 1985 it was changed to sockeye salmon. Crystal Lake hatchery was built in 1972 for the incubation and rearing of chinook, coho, and chum salmon. Deer Mountain Hatchery was originally built by the Ketchikan Chamber of Commerce in 1955; the Fisheries Rehabilitation, Enhancement and Development (FRED) Division of ADF&G assumed control of the facility in the early 1970s. Since then the facility has undergone extensive remodeling, and its current priorities are the experimental incubation and rearing of chinook and coho salmon. Klawock Hatchery was built in 1977 for chum and coho incubation and rearing; however, in 1986 that emphasis was changed to sockeye salmon.

The current adult production capacity of state enhancement activities in southern southeast Alaska is 75,300 chinook, 132,000 chum, and 38,800 coho salmon annually. Adult salmon production is achieved through the use of hatcheries, fish ladders, lake stocking, lake fertilization, remote releases, and habitat modification. Private nonprofit (PNP) hatchery permits have been issued for seven sites in southern southeast Alaska. Hatcheries are in operation at five of these sites. In addition, scientific/educational hatchery permits have been issued to three schools in the region for small-scale incubation projects.

The Tamgas Creek Hatchery, located on the Annette Island Reserve, is a salmon hatchery owned and operated by the Metlakatla Indian community and the Bureau of Indian Affairs. Tamgas Creek Hatchery has been operating since 1978 as an incubation and rearing facility for chinook, coho, chum, and pink salmon. The production emphasis is now shifting from chum salmon to chinook and coho salmon. Harvest by species is projected to be 100,000 chum, 300,000 coho, and 200,000 chinook salmon.

1. Operational Summary For This Area (1980-1985)

A summary of salmon releases from production facilities (hatcheries, instream incubation facilities, spawning channels, etc.) is provided in Table 5.

Table 5 Number of salmon released in southern southeast Alaska from production facilities by species and life stage at release.^a

Species Life Stage	1980	1981	1982	1983	1984	1985
Chinook						
fry	0	0	78,000	0	0	0
fingerling	0	0	0	0	145,000	341,000
smolt	86,000	108,000	598,000	500,000	1,440,000	1,606,000
Chum						
fry	2,423,000	7,366,000	6,344,000	7,085,000	2,000,000	9,906,000
fingerling	2,805,000	27,042,000	17,792,000	31,722,000	33,831,000	70,782,000
Coho						
fry	0	0	0	2,246,000	1,865,200	1,200,000
fingerling	0	0	0	22,000	38,000	364,000
smolt	820,000	1,776,000	1,313,000	2,525,000	4,312,000	10,606,000
Pink						
fry	357,000	2,100,000	4,740,000	3,509,000	2,702,000	1,200,000
fingerling	0	0	0	3,890,000	3,289,000	1,650,000
Sockeye						
fry	43,000	0	0	0	559,000	788,000

^a Release figures as reported to ADF&G by the hatchery operators. Some figures are based on estimates; others on actual counts. Numbers are rounded to nearest 1000. "fry" includes emergent fry and fed fry less than twice their weight at emergence. "fingerling" includes juvenile salmon that are equal to or greater than twice their weight at emergence. "smolt" includes juvenile chinook and coho that have been reared until physiologically adapted to the marine environment. Both age-zero and age-one smolts are included.

Brief Discussion of Applied Marking/Evaluation Strategies:

As our release numbers indicate, we are still in the brood-stock development phase in southern southeast Alaska. We have completed the construction of facilities and are now maximizing their rearing/incubation potentials. Changes in the operation have expanded the production potentials.

The production from the state government's operational activities is being determined through an extensive coded-wire tagging and sampling program; the primary objective is to estimate the enhancement projects' contribution to the common-property fisheries. This includes hatchery/project marine survivals, commercial fishery contributions by gear type, run timing, and catch distribution. Fish culture technology, diet performance, and brood-stock performance are other questions that are being addressed with information obtained from mark-recovery data.

Evaluation programs for all chinook and coho salmon production from PNP hatcheries are based on coded-wire tagging of juvenile fish and the recovery of marked adults in interception fisheries and at the hatchery rack. Some evaluation programs for chum salmon are also based on coded-wire tags; however, most of the PNP hatcheries in southern southeast Alaska depend on rack returns and estimated interception or marine survival rates to evaluate hatchery performance for this species. Evaluation programs for pink salmon production depend on rack returns, estimated interception in fisheries, and estimated marine survival rates.

Evaluation of all chinook, coho, chum, and pink salmon production from Tamgas Creek Hatchery are based on coded-wire tagging of juvenile fish and the recovery of marked adults in interception fisheries and at the hatchery rack. However, in 1985 less than 2.0% of all fish released were marked.

2. Summary of Salmon Returns

(This information is provided in Table 6)

Brief Discussion on Estimation of Return:

The contribution estimates were generated through a number of methods; the primary one is expansion of the coded-wire tag recoveries obtained in the common-property fisheries. Additional count information is obtained at the hatchery rack. Other return estimates were calculated through assumed marine-survival rates and/or assumed interception rates in the common-property fisheries as reported by the PNP operators or hatchery biologists, catch estimates from area management staff, processor information (fish tickets), and sport fish creel-census data.

Table 6 Number of salmon returning from production facilities in southern southeast Alaska.^a

	1980	1981	1982	1983	1984	1985
Chinook						
Returns	6,100	3,100	10,600	4,400	11,500	20,300
Brood Stock Needs	800	800	900	1,500	1,500	3,200
Design Capacity	42,400	42,400	46,100	83,100	83,100	177,200
Chum						
Returns	7,200	5,800	5,500	9,200	182,900	153,700
Brood Stock Needs	78,400	79,200	79,200	132,300	132,300	141,400
Design Capacity	1,248,700	1,269,900	1,269,900	2,994,500	2,994,500	2,973,500
Coho						
Returns	2,400	4,200	38,300	18,700	32,700	94,800
Brood Stock Needs	3,800	3,800	4,400	6,300	6,700	5,700
Design Capacity	87,000	87,000	131,200	372,800	415,400	415,400
Pink						
Returns	2,300	17,900	7,200	20,500	80,200	92,700
Brood Stock Needs	10,600	10,600	11,800	11,800	17,700	17,700
Design Capacity	68,600	68,600	76,200	76,200	114,300	114,300

^a Estimates based on coded-wire tag recoveries, actual returns to the hatcheries, assumed marine survival rates, and/or assumed interception rates in fisheries. Number rounded to nearest 100. Does not include brood-stock needs or design capacity for Tamgas Creek Hatchery.

3. Habitat Management

Habitat enhancement on the TNF is accomplished through the SSHO program. Table 7 summarizes by activity the 10 salmon habitat enhancement projects completed on the TNF during 1980-1985. Projects include a broad mix of structural and non-structural improvements, such as major fishway construction, instream habitat structures, and lake fertilization.

These enhancement projects that have been completed in southern southeast Alaska will increase salmon spawning and rearing habitat by more than 2000 acres of previously barren and underutilized lakes and streams. Chinook, coho, and sockeye salmon production has been emphasized by SSHO, although chum and pink salmon runs have been enhanced as well.

Completed projects have the potential to add an estimated 375,500 salmon to the region's fisheries. All projects are currently undergoing brood-stock development. Harvest estimates attributable to these enhancement activities are not available.

Table 8 provides a summary of harvest production and species benefitted by completed projects in the TNF in southern southeast Alaska during 1980-1985.

Planned Changes Within Existing Operations That Would Modify Species Emphasis or Design Capacity:

No new production facility expansion projects are funded in southern southeast Alaska. Similarly, no new production facilities have been funded.

Planning for expanded production in southern southeast Alaska is progressing. We hope to provide some details concerning these plans in the next draft of this report.

C. Puget Sound

1. Enhancement Operations Summary

Salmon enhancement operations in Puget Sound consist of hatcheries operated by State of Washington Department of Fisheries, United States Fish and Wildlife Service, Indian Tribes, educational entities, and individual cooperative projects. Additionally there are many stream enhancement or habitat improvement projects. There are currently no private non-profit operations in Puget Sound.

The production from the various enhancement activities is being evaluated through an extensive coded-wire tagging and sampling program.

Table 8 provides the release data for all enhancement projects in Puget Sound, and Table 9 presents return data to propagation facility racks or other adult capture sites for the years 1980-1985. The expansion of these numbers to include harvest has not been performed. Earlier years (1980-1982) data for brood stock needs do not reflect tribal and federal programs.

Harvest estimation by region of origin is one of the major efforts of the WDF Harvest Management Section. Estimations are made based on coded-wire tag data and various computer simulations for run reconstruction. Table 10 illustrates the estimated harvest from enhancement efforts by region of origin.

Habitat management and enhancement activities involve many entities in the Puget Sound area including state agencies, Indian tribes, federal agencies, county governments, industry, and private citizens. Volunteers are encouraged under the Volunteer Fisheries Resource Program to be involved with the environment in positive ways for fisheries resources. Their involvement may include education or actual small scale stream enhancement.

Table 7. Habitat enhancement projects in the Tamgass National Forest (southern southeast Alaska), 1980-1985.

Habitat Enhancement activity & number	Potential Production	
	(fish in thousands)	Species enhanced
Fishways (2)	175.5	Coho, Pink, Chum,
Sockeye Instream		
Habitat struct. (2)	2.0	Coho
Lake Fertilization (2)	132.0	Sockeye, Chinook
Lake Stocking (2)	6.0	Coho, Chinook
Spawning Channel (2)	60.0	Chum, Pink

Table 8. Listing of salmon production facility activities with estimated total salmon harvest in 1985 and 1986.

Agency, Activity, Species		Estimated Harvest*	
		1985	1986
1. State			
Beaver Falls Hatchery			
chum		93,300	9,700
sockeye		0	0
Crystal Lake Hatchery			
chinook		5,000	2,200
chum		200	400
coho		18,000	22,600
Deer Mountain Hatchery			
chinook		1,800	1,000
coho		2,900	2,500
Klawock Hatchery			
chum		5,300	11,700
coho		52,900	2,500
sockeye		0	0
2. Private Nonprofit and Scientific-Educational			
Burnett Inlet			
chum		5,600	8,600
pink		45,000	16,000
Meyers Chuck			
pink		500	0
Neets Bay			
chinook		1,400	6,900
chum		205,100	101,700
coho		77,500	133,800
Whitman Lake			
chinook		2,100	300
chum		69,400	52,000
coho		22,000	93,600
Santa Anna Inlet			
pink		0	0
chum		0	0
Beaver Falls			
sockeye		0	0
Hollis High School			
chum		0	0
Petersburg High School			
pink		0	0
Houghtaling Elementary School		chum	0
3. Other			
Metlakatla, Tamgass Hatchery			
chinook		32	135
chum		55	88
coho		10,700	48,800
pink		N/A	N/A
4. Cooperative Activities			
Marx Creek Spawning Channel			
chum		N/A	N/A
coho		N/A	N/A
pink		N/A	N/A

* Numbers rounded to nearest 100.

Table 8. Number of salmon released in Puget Sound from all enhancement projects by species and life stage at release, 1980-1985 (Numbers rounded to nearest 1000).

	1980	1981	1982	1983	1984	1985
Chinook						
fry	1,450,000	15,000	186,000	545,000	13,000	38,000
fingerling	44,517,000	52,924,000	65,703,000	65,549,000	62,197,000	61,287,000
smolt	4,897,000	4,707,000	4,584,000	3,071,000	6,555,000	3,333,000
Chum						
fry	10,328,000	14,824,000	4,687,000	15,429,000	371,000	3,463,000
fingerling	59,463,000	60,866,000	37,520,000	50,496,000	49,078,000	87,953,000
Coho						
fry	5,247,000	13,005,000	10,971,000	8,453,000	9,086,000	7,243,000
fingerling	5,312,000	11,704,000	14,713,000	11,251,000	13,249,000	17,679,000
smolt	19,376,000	21,127,000	20,015,000	14,575,000	15,792,000	18,319,000
Pink						
fry	1,889,000	0	200,000	3,000	737,000	0
fingerling	2,980,000	0	1,787,000	0	401,000	0
Sockeye						
fry	11,071,000	10,410,000	4,567,000	0	0	0
fingerling	0	0	0	0	0	0

Figures were obtained from the Washington Department of Fisheries HISTORY database.

Table 9 Numbers of salmon returning to hatchery racks from enhancement projects in Puget Sound by species 1980-1985 (Numbers rounded to nearest 100).

	1980	1981	1982	1983	1984	1985
Chinook						
Returns	44,100	44,200	44,000	46,700	57,300	46,900
Brood Stock Needs	41,400	36,700	44,400	39,500	39,300	39,900
Design Capacity	41,400	36,700	44,400	39,500	39,300	39,900
Chum						
Returns	69,900	37,200	54,800	42,500	96,800	91,300
Brood Stock Needs	48,700	50,300	46,800	58,700	52,000	54,600
Design Capacity	48,700	50,300	46,800	58,700	52,000	54,600
Coho						
Returns	240,400	208,800	149,500	167,300	205,000	128,300
Brood Stock Needs	52,400	36,300	32,700	48,100	44,600	42,600
Design Capacity	52,400	36,300	32,700	48,100	44,600	42,600
Pink						
Returns	0	6,100	0	0	0	23,900
Brood Stock Needs	0	14,000	0	0	0	6,100
Design Capacity	0	14,000	0	0	0	6,100
Sockeye						
Returns	0	0	0	0	0	0
Brood Stock Needs	0	0	0	0	0	0
Design Capacity	0	0	0	0	0	0

Table 10 Harvest in Puget Sound by species, for all gears and users, of Puget Sound origin salmon in 1985 and 1986 (Numbers rounded to nearest 100).

Agency, Activity, Species	Estimated Harvest*	
	1985	1986
Straits		
Chinook	0	200
Coho	10,900	14,700
Normal Chum	0	1,100
Early Chum	0	0
Late Chum	0	0
Nooksak		
Chinook	64,200	69,500
Coho	154,600	138,100
Normal Chum	1,900	3,400
Early Chum	0	0
Late Chum	0	0
Skagit		
Chinook	100	200
Coho	5,400	17,200
Normal Chum	0	0
Early Chum	0	0
Late Chum	0	0
Hood Canal		
Chinook	4,900	6,900
Coho	22,700	15,700
Normal Chum	208,300	239,900
Early Chum	0	0
Late Chum	0	0
Stillaquamish-Snohomish		
Chinook	1,500	1,200
Coho	34,600	31,100
Normal Chum	0	1,500
Early Chum	0	0
Late Chum	0	0
South Sound		
Chinook	23,800	33,800
Coho	341,800	515,400
Normal Chum	51,600	64,400
Early Chum	5,000	7,700
Late Chum	5,900	2,300

*Estimated catches using data from run reconstruction. This data should be considered preliminary and should be reconciled with the appropriate species technical committee.

Washington Department of Fisheries has many large scale projects under the Salmon Habitat Enhancement Program. Projects under this auspices have also encouraged cooperative efforts between tribes, industry, and other governmental agencies.

2. Planned Modifications

No major modifications are envisioned within the WDF facilities of the Puget Sound Region. Several tribal facilities are currently undergoing substantial upgrading and renovation. Operational changes occur with changing management options but none are foreseen at the present.

3. Plans for New Projects

There are currently three possible projects which are being considered but no funds have been allocated for construction although some funds have been allocated for the design phase on at least one of the projects.

Nisqually Tribe-Clear Creek National Fish Hatchery:

This facility if constructed would be located on a tributary of the Nisqually River and be primarily a fall chinook rearing facility. Release numbers have been estimated at 6 million but no estimate of returns has been made.

Squaxin Tribe-Skookum Creek Hatchery:

Squaxin Tribe in conjunction with WDF is exploring an additional rearing and release site for fall chinook on Skookum Creek near Shelton. The size of this facility and numbers to be released is unknown at present.

University of Washington:

This facility, if built, would replace the current hatchery at the University of Washington. While it is exclusively used for research, the releases from the facility could be large enough to impact planning efforts.

D. Columbia River

Anadromous Pacific Salmon prior to hydro development migrated approximately 1200 miles upriver to Lake Win-dermere, British Columbia. They also utilized the upper Snake River, being found in the headwaters of the Owyhee River, Nevada. Hydropower developed during the last 100 years has eliminated much of the habitat once used by salmon. As a result of this development, many salmon populations in the basin are currently being maintained with artificial production programs. Federal, State, Tribal, and private entities are all involved in the rearing of salmon released each year.

In addition to hatchery production, numerous habitat projects have been completed and many others are planned. Fishways, irrigation screening, stream clearance, bank stabilization, fencing, and instream structures have been and are in the process of being completed over much of the basin.

There are numerous active enhancement programs in the region. They include the "Fish and Wildlife Program" adopted by the Northwest Power Planning Council in 1982, Columbia River Fisheries Development Program active since 1949, and Lower Snake River Compensation Plan. In addition, many enhancement programs are supported as mitigation for Federal, public, and private hydroelectric projects.

1. Operations Summary for the Columbia River (1980-1985)

There were approximately 48 major salmon production facilities which released a minimum of 160 million salmon (Idaho releases not included) per year for the 1980 to 1985 period (Table 12). Chinook (*O. tshawytscha*) and coho (*O. kisutch*) salmon are the predominate species reared with chum salmon (*O. keta*) released in small numbers. Detailed release numbers for each hatchery by year can be obtained by contacting the U.S. Fish and Wildlife Service, and the State fishery agencies of Oregon, Washington, and Idaho.

Estimates of total salmon produced and numbers harvested were generated using tag recovery information obtained from the various ocean and inland fisheries. As indicated above, most of these studies were not designed to measure total contribution or harvest from normal hatchery production so may or may not approach reality.

Total number of returning salmon (defined as harvest + return + natural escapement) by species and year, brood stock requirements, and design capacity is given in Table 13.

Estimates from all of Idaho and Oregon State facilities and the remaining USFWS hatcheries (Entiat, Leavenworth, Warm Springs, Dworshak, Hagerman, and Kooskia) are not available at this time. The estimates were derived from tagged recoveries and were obtained from WDF's data collection system and from USFWS summaries.

2. Habitat Management

Habitat enhancement work in the Columbia Basin is accomplished by the State fishery agencies of Oregon, Washington, and Idaho, tribes, BLM, and U.S. Forest Service. The NMFS and BPA are involved as funding sources for various projects. Enhancement activities include maintaining existing projects such as fishways and irrigation screens in addition to initiating new projects.

Table 12. Number of Salmon Released into the Columbia River Basin by Species and Life Stage From Production Facilities During 1980 To 1985 (Numbers are in 1000s, Idaho releases not included).

	1980	1981	1982	1983	1984	1985
Chinook						
Fry	11,761	1,049	6,462	8,470	1,967	5,643
Fingerling	103,892	109,997	102,043	100,661	107,793	80,511
Smolts	19,851	22,176	17,033	14,537	23,678	23,783
Coho						
Fry	3,532	27,919	1,826	4,364	1,987	1,458
Fingerling	7,005	9,020	5,368	9,788	7,027	20,131
Smolts	29,360	32,625	27,721	27,033	30,059	28,950
Chum						
Fry	1,770	652	799	306	84	934
Fingerling	6	44	56	160	31	187

Table 13. Numbers of salmon returning (defined as harvest + return + natural escapement) from rearing Facilities in the Columbia Basin By Species and Year for the Period 1980 TO 1985 (Idaho, Oregon, and Some USFWS Numbers not Included, numbers in hundreds).

	1980	1981	1982	1983	1984	1985
Chinook						
Returns	343.9	319.5	267.9	313.0	342.7	327.1
Brood Stock Needs						52.8
Design Capacity						N/A
Coho						
Returns	202.2	137.0	181.0	138.0	131.3	116.6
Brood Stock Needs						38.2
Design Capacity						N/A
Chum						
Returns						N/A
Brood Stock Needs						N/A
Design Capacity						N/A

Brood stock needs include all WDF and USFWS facilities. ODFW, IDFG, and private hatcheries not included.

3. Tabular Listing of Salmon Production

Table 14 lists the estimated harvest from Columbia River hatcheries. The 1986 harvest of fall chinook, coho, and chum is not complete as of this date. The 1986 numbers are a projection of what the harvest is expected to be. Information was supplied by the Harvest Management Division of WDF. Harvest data is not available for individual hatcheries.

Table 14. Estimated Harvest by Species From Enhancement Facilities In the Columbia Basin.

	Harvest	
	<u>1985</u>	<u>1986</u>
Columbia River Total (caught in Washington waters)		
Chinook	109,400	167,700
Coho	216,200	1,092,500
Chum	0	0

4. Harvest Associated with Habitat Management

No harvest estimate is available for habitat management.

5. Planned Changes Within Existing Operations

Production facilities — Numerous production and release location changes are planned which may affect harvest. A list of the specific changes can be found in Appendix "B" of the Columbia River Management Plan which originated from the U.S. versus Oregon settlement.

6. Habitat Management

No changes are foreseen at this time.

7. Plans for New Projects

Production Facilities:

1. Clearwater Anadromous Hatchery
Location - Idaho
Expected completion date - December 1989
Juvenile Production - 1.37 Million Spring Chinook Smolts
Brood Stock Needs - 3,000 Adults
Adults to be Produced - Designed to return 12,200 Adults to the Snake River.
Major Fisheries - Columbia River Sport And Commercial, Unknown for Ocean Fisheries.
2. Rock Island Hatchery
Location - Washington
Status - In the initial planning stage. Will produce 50,000 pounds of Chinook smolts. Chelan County PUD will construct and fund operation and maintenance. Expected completion date is 1989 or 1990.
3. See Appendix B of The Columbia River Management Plan. No plans have been developed but a list of production increase goals are presented.

8. Habitat Projects Planned

Oregon — A total of 81 Unscreened irrigation diversions have been identified for screening in Northeast Oregon between 1986 AND 1990. An additional 63 screens will be updated and improved during the same period. These screens are to be located in areas to be receiving increased hatchery releases during this period. Native Spring Chinook should also benefit. There is no estimate of adults that will be produced.

Washington — No information.

Idaho — No information.

U.S. Forest Service — No information.

Tribes — No information.

E. Coastal Washington and Oregon

1. Introduction

The Washington and Oregon coastal area includes all drainages except the Columbia River between the Olympic Peninsula tip in the north, to the California - Oregon border in the south. Anadromous salmon are found in every major coastal stream emptying in to the Pacific Ocean.

In the north, along the Washington coast, artificial production facilities are operated by the USFWS, WDF, and Tribal entities. Chinook, coho, chum, and a few sockeye salmon are the species reared in hatcheries and benefiting from habitat enhancement.

In the south, along the Oregon coast, artificial production facilities are operated by ODFW and Private operators. Private hatcheries have accounted for more than 50 percent of releases from coastal Oregon in some years. Chinook, coho, and chum salmon are three species targeted for enhancement.

Habitat enhancement activities include maintaining existing facilities such as fishways and irrigation screens in addition to initiating new projects. Oregon, Washington, U.S. Forest Service, Bureau of Land Management, and Tribes (Makah, Quileute, Hoh, Quinault) are all active participants.

2. Operations Summary for the Washington - Oregon Coastal Area 1980-1985

A total of 33 salmon production facilities were operating during this period. Releases ranged from 65 to 88 million each year between 1980 and 1985 (Table 15). Releases from private hatcheries have ranged from 14 percent in 1985 to 36 percent in 1981 of all salmon released in this area. Chinook, coho, and chum salmon are the predominate species reared with sockeye released in small numbers. Detailed release information can be obtained by contacting the USFW, and the state fishery agencies of Oregon and Washington.

Estimates generated in Table 16 were made by expansion of coded-wire tag recoveries in the various fisheries, hatchery returns and stream surveys.

3. Habitat Management

Habitat enhancement work in the Washington-Oregon coastal area is accomplished by the State fishery agencies, Forest Service, Bureau of Land Management, and Tribes. Existing projects such as fishways and irrigation screens are maintained in addition to initiating new projects.

Total number of returning salmon (defined as harvest + return + natural escapement) by species and year, brood stock requirement, and design capacity is given in Table 16.

Table 15. NUMBERS OF SALMON RELEASED INTO COASTAL OREGON AND WASHINGTON WATERS, FROM PRODUCTION FACILITIES BY SPECIES AND LIFE STAGE FOR THE PERIOD 1980 TO 1985 (NUMBERS ARE IN THOUSANDS).

	1980	1981	1982	1983	1984	1985
Chinook						
fry	0	525	411	1,113	1,212	1,323
fingerling	8,128	10,560	9,868	9,120	7,207	12,816
smolt	5,099	4,261	5,151	6,838	6,276	6,340
Coho						
fry	5,371	2,935	7,477	5,078	272	7,949
fingerling	14,264	10,278	18,681	8,927	9,618	17,207
smolt	30,040	42,984	40,195	29,607	28,546	24,593
Chum						
fry	3,137	6,005	2,166	6,408	1,497	1,472
fingerling	4,917	10,206	4,014	17,110	10,161	13,587
Sockeye						
fry	0	0	98	0	0	200
fingerling	326	297	371	476	10	0

Table 16. Number of Salmon Returning (defined as harvest + returns + natural escapement) From Rearing Facilities In Coastal Oregon and Washington Waters By Species and Year for the Period 1980 to 1985 (numbers include only WDF hatcheries).

	1980	1981	1982	1983	1984	1985
Chinook						
Returns	7,000	5,000	5,400	5,700	10,000	9,600
Brood Stock Needs						2,300
Design Capacity						N/A
Coho						
Returns	37,800	60,200	58,500	41,700	85,500	48,100
Brood Stock Needs						2,500
Design Capacity						N/A
Chum						
Returns	7,200	2,100	11,000	5,400	8,100	14,900
Brood Stock Needs						4,100
Design Capacity						N/A

Includes USFWS, Tribal, and WDF facilities.

Appendix 5

Recommendations of the Commission to the Parties for Amendments to Annex IV and other understandings to give effect to the agreed fishery regime for 1987

PACIFIC SALMON COMMISSION

March 7, 1986

The Right Honourable Joe Clark
Secretary of State
for External Affairs
Ottawa, Ontario

The Honourable Tom Siddon
Minister of Fisheries and Oceans
Ottawa, Ontario

The Honorable George P. Shultz
Secretary of State
U.S. Department of State
Washington, D.C.

The Honorable Malcolm Baldrige
Secretary of Commerce
U.S. Department of Commerce
Washington, D.C.

Dear Sir:

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

In accordance with Article XIII, Paragraph 2 of the Treaty, the Commission recommends that Chapters 2, 3, 5, and 6 of Annex IV be amended to read in accordance with the attached proposed texts. Pursuant to Article XIII, Paragraph 3 of the Treaty, amendments to the Annex may be implemented through an exchange of notes between the Governments. The Commission expects that the relevant management agencies will manage fisheries under their responsibility in the recommended manner during the 1987 fishing season. The Commission recommends that an exchange of notes occur implementing these proposals as soon as possible.

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

1) With respect to Annex IV, Chapter 1, in response to proposals from the Northern Panel, the Commission agrees to recommend the following arrangements regarding transboundary rivers:

“Recognizing that the Parties have had difficulty in agreeing to new fishing arrangements for the Taku and Stikine rivers in 1987 and beyond, and recognizing that significant benefits can accrue to both Parties from natural production and joint enhancement programs, the Parties agree to defer the resolution of Annex IV, Chapter 1, to June 1987, in order to permit the Transboundary Technical Committee time to formulate and evaluate specific proposals and recommendations for transboundary enhancement.

“Accordingly, the Parties agree to begin the required pre-project background studies and investments in 1987 to determine the potential benefits to be derived from enhancement in the Stikine, Taku and Alsek rivers. Prior to June 1987, the Transboundary Technical Committee will evaluate the feasibility, cost and benefits of alternative projects in the Taku and Stikine rivers.

“The Parties agree to review the Transboundary Technical Committee recommendations and decide on commitment to project initiation and schedules for implementation and harvest sharing arrangements. In 1987, the Canadian harvest share in the Stikine and Taku rivers will be increased if agreed-to enhancement commitments are made. Future adjustments in harvest shares will be negotiated in 1988 subject to joint agreement on proposed enhancement. It is understood that Canadian harvest shares will be returned to 1986 levels in 1988 if joint enhancement is terminated either due to Canadian unilateral withdrawal from jointly agreed-to enhancement activities, or agreement that the project is not technically feasible or does not provide adequate benefits. The 1988 negotiations will establish criteria and a timetable for evaluation of the enhancement program.”

2) With respect to Annex IV, Chapter 3, paragraph d(1), in 1987 the southeast Alaska all-gear catch of chinook as specified in Annex IV, Chapter 3, Paragraph d(1) shall be adjusted by a new Alaska hatchery add-on to be calculated inseason. The preseason expectation for the 1987 add-on is 22,500 chinook salmon.

3) With respect to Annex IV, Chapters 3 and 5, the Commission has agreed to an overage and underage policy for coho and chinook in 1987 and 1988. The Commission has directed the Working Group on Overages and Underages to elaborate on the application of this policy when the Commission agrees to changes in catch ceilings.

4) With respect to Annex IV, Chapter 5, the Commission agrees that there shall be no adjustment for deviations in actual catch from the target ceilings for coho harvested in the 1985 and 1986 west coast of Vancouver Island troll fishery.

5) With respect to the matter of fishing associated mortalities, the Commission as strongly as possible encourages each Party to pursue through all available means additional funding and other resources needed to expand and improve observer programs in order to identify with precision the magnitude of those mortalities.

The Commission hopes that these recommendations will meet with your approval.

Sincerely,

C. Wayne Shinnars
Chairman
Pacific Salmon Commission

Appendix 6

Revised Annex IV to the Pacific Salmon Treaty in effect for 1987

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

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

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

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

- (a) the Stikine River:
 - (i) (expired);
 - (ii) (expired);
 - (iii) in the years 1985 through 1995, the Parties shall take appropriate management action to ensure that the escapement goal of 19,800 to 25,000 chinook salmon in the Canadian portion of the Stikine River is achieved by 1995;
 - (iv) (expired);
 - (v) (expired);
- (b) the Taku River:
 - (i) (expired);
 - (ii) (expired);
 - (iii) in the years 1985 through 1995, the Parties shall take appropriate management action to ensure that the escapement goal of 25,600 to 30,000 chinook salmon in the Canadian portion of the Taku River is achieved by 1995.

4. The Parties agree that if the catch allocations set out in paragraph 3 are not attained due to management actions by either Party in any one year, compensatory adjustments shall be made in subsequent years. If a shortfall in the actual catch of a Party is caused by management 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:
- (a) recognizing that chinook and early run sockeye stocks originating in the Alsek River are depressed and require special protection, and in the interest of conserving and rebuilding these stocks, the necessary management actions shall continue until escapement targets are achieved;
 - (b) (expired).
6. The Parties agree to consider cooperative enhancement possibilities and to undertake as soon as possible on the feasibility of new enhancement projects on the Transboundary Rivers and adjacent areas for the purpose of increasing productivity of stocks and providing greater harvests to the fishermen of both countries.
7. Recognizing that stocks of salmon originating in Canadian sections of the Columbia River constitute a small portion of the total populations of Columbia River salmon, and that the arrangements for consultation and recommendation of escapement targets and approval of enhancement activities set out in Article VII are not appropriate to the Columbia River system as a whole, the Parties consider it important to ensure effective conservation of up-river stocks which extend into Canada and to explore the development of mutually beneficial enhancement activities. Therefore, notwithstanding Article VII, paragraphs 2, 3, and 4, during 1985, the Parties shall consult with a view to developing, for the transboundary sections of the Columbia River, a more practicable arrangement for consultation and setting escapement targets than those specified in Article VII, paragraphs 2 and 3. Such arrangements will seek, to inter alia,
- (a) ensure effective conservation of the stocks;
 - (b) facilitate future enhancement of the stocks on an agreed basis;
 - (c) avoid interference with United States management programs on the salmon stocks existing in the non-transboundary tributaries and the main stem of the Columbia River.

Chapter 2

NORTHERN BRITISH COLUMBIA SOUTHEASTERN ALASKA

1. Considering that the chum salmon stocks originating in streams in the Portland Canal require rebuilding, the Parties agree in 1987 to jointly reduce interception of these stocks to the extent practicable and to undertake assessments to identify possible measures to restore and enhance these stocks. On the basis of such assessments, the Parties shall instruct the Commission to identify long-term plans to rebuild stocks.
2. With respect to sockeye salmon, the United States shall
- (a) during the period of 1985 through 1988, limit its purse seine fishery in District 4 in a manner that will result in a maximum four-year total catch of 480,000 sockeye salmon prior to United States statistical week 31; and,
 - (b) limit its drift gillnet fishery in Districts 1A and 1B in a manner that will result in an average annual harvest of 130,000 sockeye salmon.
3. With respect to pink salmon, Canada shall
- (a) limit its net fishery in Areas 3-1, 3-2, 3-3, 3-4, and 5-11 in a manner that will result in an average annual harvest of 900,000 pink salmon;
 - (b) in 1987, the pink salmon troll fishery in the most northerly portion of Area 1 in management units 101-4, 101-8 and 101-3 north of 54 degrees 37 minutes N and 103 north of 54 degrees 37 minutes N will close to pink salmon trolling when the Area 1 pink troll catch reaches 300,000;
 - (c) in addition, when the 1987 Area 1 pink troll catch reaches 800,000 in management units 101-3, 101-5, 101-6, 101-7, 101-9, 101-10, 1-2, 1-3, 1-5, and 1-7 will also close to pink salmon trolling; and,
 - (d) for the purposes of this agreement, in 1987, the troll pink catch in management units 101-1, 101-2, and 1-1 is not considered to be part of the Area 1 pink catch.

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.

Chapter 3

CHINOOK SALMON

1. Considering the escapements of many naturally spawning chinook stocks originating from the Columbia River northward to southeastern Alaska have declined in recent years and are now substantially below goals set to achieve maximum sustainable yields, and recognizing the desirability of stabilizing trends in escapements and rebuilding stocks of naturally spawning chinook salmon, the Parties shall
 - (a) instruct their respective management agencies to establish a chinook salmon management program designed to meet the following objectives:
 - (i) halt the decline in spawning escapements in depressed chinook salmon stocks; and,
 - (ii) attain by 1998, escapement goals established in order to restore production of naturally spawning chinook stocks, as represented by indicator stocks identified by the Parties, based on a rebuilding program begun in 1984.
 - (b) jointly initiate and develop a coordinated chinook management program;
 - (c) 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.

- (d) ensure that
- (i) in 1987 and 1988, the annual all-gear catch in southeast Alaska shall not exceed 263,000 chinook salmon;
 - (ii) in 1987 and 1988, the annual all-gear catch in northern and central British Columbia shall not exceed 263,000 chinook salmon;
 - (iii) in 1987 and 1988, the annual troll catch off the west coast of Vancouver Island shall not exceed 360,000 chinook;
 - (iv) in 1987 and 1988, the total annual catch by the sport and troll fisheries in the Strait of Georgia shall not exceed 275,000 chinook; Canada will undertake management measures to minimize further reductions in spawning escapements in 1987 and 1988;
 - (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 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; 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.
- (e) establish 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) by December 1987, the Chinook Technical Committee shall
 - a. complete a technical review of Party reports on associated fishing mortalities;
 - b. complete an evaluation of all sources of associated fishing mortalities coastwide in all marine and freshwater fisheries as requested by the Commission in March 1986;
 - 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; and,
 - d. estimate the magnitude of all quantifiable sources of associated fishing mortalities, estimate 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;
 - (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;

- (f) manage all salmon fisheries in Alaska, British Columbia, Washington and Oregon, so that the bulk of depressed stocks preserved by the conservation program set out herein principally accrue to the spawning escapement;
 - (g) establish at the conclusion of the chinook rebuilding program fishery regimes to maintain the stocks at optimum productivity and provide fair internal allocation determinations. It is recognized that the Parties are to share the benefits of such coastwide rebuilding and enhancement, consistent with such internal allocation determinations and this Treaty; and,
 - (h) exchange annual management plans prior to each season.
2. The Parties agree that enhancement efforts designed to increase production of chinook salmon would benefit the rebuilding program. They agree to consider utilizing and redirecting enhancement programs to assist, if needed, in the chinook rebuilding program. They agree that each region's catches will be allowed to increase above established ceilings based on demonstrations to the Commission and assessments by it of the specific contributions of each region's new enhancement activities, provided that the rebuilding schedule is not extended beyond 1998, and provisions of Subsection 1(d)(vi) of this Chapter are adhered to.
3. The Parties shall submit a report to the Commission by December 1987 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 1987, and the likelihood of achievement of these goals by 1995; and,
 - (c) cooperatively developed management options to be identified by December 1987 and initiated in 1988 and following seasons to ensure rebuilding of chinook stocks in the transboundary rivers which are identified in 3(b) as requiring further management actions.

Chapter 4

FRASER RIVER SOCKEYE AND PINK SALMON

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

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

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

- (b) that

- (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 of 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.

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;
 - (xiii) work to develop, under the direction of the Joint Northern and Southern Panels, standard methodologies for coho stock and fishery assessment; and,
- (c) unless otherwise agreed, in any area where fisheries of one Party may intercept coho stocks originating in the rivers of the other which require conservation action or such other action as the Commission may determine, that Party will endeavor to limit incidental coho catches in fisheries targeting on other species.

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 1987 and 1988, the west coast of Vancouver Island (Canadian Management Areas 21, 23, 24, 25, 26, 27, 121, 123, 124, 125, 126, 127, and 130-1) troll harvest shall not exceed 1.8 million coho;
 - (b) for 1987 and 1988, 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 1987 and 1988, 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 1987 and 1988, 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 1989 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 1988 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.

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 1987, 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 1987,
 - (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 1987, 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 shall 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 1987 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 1987, Canada shall expand electrophoretic sampling of chum harvested by the west coast Vancouver Island troll fishery, including samples taken from the Southern area catch (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 7

Approved Budget for Fiscal Year 1987/88 and Comparison with Fiscal Year 1986/87

	<u>1986/87</u>	<u>1987/88</u>
Staff Salaries	\$ 730,750	\$ 892,011
Staff Benefits	63,750	82,292
Transportation of People and Things	70,000	63,650
Rents, Communications and Utilities	167,600	122,834
Printing and Reproduction	60,000	43,000
Other Services	247,900	107,633
Supplies and Materials	40,000	68,580
Equipment	<u>50,000</u>	<u>50,000</u>
 TOTAL	 <u>\$ 1,430,000</u>	 <u>\$ 1,430,000</u>

Appendix 8

Terms of Reference for the Editorial Board of the Pacific Salmon Commission

1. Membership

The Editorial Board shall comprise not more than three representatives from each Party, including at least one representative from the Standing Committee on Finance and Administration and one from the Standing Committee on Research and Statistics. The Executive Secretary or his designate shall be a member of the Board. The Secretariat shall provide administrative support to the Editorial Board.

2. Reporting

The Editorial Board shall be a subcommittee of the Standing Committee on Finance and Administration and shall report to the Commission through that Committee.

3. Responsibilities

The Editorial Board shall be responsible for:

- a. Ensuring overall quality and utility of Commission documents.
- b. Development of policy concerning types and series of documents to be published by the Commission.
- c. Development of policy related to distribution of Commission documents.
- d. Establishment of standards of format for delivery of draft documents to the Secretariat, including standardization of computer wordprocessing software, disc-size, etc.

Appendix 9

Membership Lists for Standing Committees, Panels and Joint Technical Committees as of March 31, 1987

U.S.A.

Canada

(a) Standing Committee on Finance and Administration

S.T. Wapato (Vice-Chair)
B. Kefauver
C.K. Walters
T.C. Jensen

G.E. Jones (Chair)
C.C. Graham
D. Pethick

Editorial Board

P. Mundy (Chair)
J. Donaldson
T.C. Jensen

D. Pethick (Vice-Chair)
F. Bernard

(b) Standing Committee on Research and Statistics

J. Donaldson (Chair)
K. Parker
D. Bevan
P. Mundy

W. Shinnars (Vice-Chair)
P. Greene
B. Riddell
F. Bernard

(c) Fraser River Panel

R. Schmitt (Chair)
L. Loomis
G.I. James
E. Manary
R. Turner
R. Zuanich
G. Kruse
R. Suggs

F.J. Fraser (Vice-Chair)
M. Williams
E. Birch
R. Kendall
H. Matsuzaki
M. Forrest
M. Griswold
J. Hill
L. Wick
E. Kremer
M. Hunter

(d) Southern Panel

G. DiDonato (Chair)
C. Morganroth
S. Boley
J. Martin
R. Whitener
R. Schmitt
D. Bevan
K. Bringham
M. Cedergreen
B. Bohn
T. Williams
J. Van Meter

E. Kremer (Vice-Chair)
S. Steele
R. Clifton
T. Davis
B. Duncan
R. Fowler
J. Lenic
F. Penland
W. Peterson
E. Safarik
E. Larson
D. Tribe

(e) Northern Panel

S. Pennoyer (Vice-Chair)
D. Cantillon
G. Slaven
G. Bruce
B. Wallace
W. Wiley
E. Krygier
L. Dalton
O. Haynes
J. Winther
R. McVey
J. Brooks

P. Sprout (Chair)
H. Clifton
M. Forand
D. Maxwell
G. Jaltema
L. Iverson
R. Kendel
B. Lefeaux-Valentine
J. Malcolm
A. Ronneseth
F. Tanaka

(f) Joint Technical Committee on Chinook

M. Fraidenburg (Co-Chair)
T. Cooney
D. Bevan
G. Freitag
D. Pitman
K. Henry
S. Ignel
R. Kaiser
S. Marshall
G. Morishima
T. Roth
H. Schaller
M. Seibel
T. Wright

B. Riddell (Co-Chair)
P. Starr
K. Pitre
D. Peacock
T. Shardlow

(g) Joint Technical Committee on Coho

G. Morishima (Co-Chair)
T. Cooney
M. Grayum
R. Hayman
K. Henry
M. Hunter
R. Kaiser
R. Wunderlich

R. Kadowaki (Co-Chair)
K. Pitre
N. Shubert
T. Shardlow
T. Pendray
L. Lapi
K. Wilson

Northern Coho

A. Anderson
J. Helle
B. Van Alen
M. Seibel
L. Shaul

(h) Joint Northern Boundary Technical Committee

D. Cantillon (Co-Chair)	D. Peacock (Co-Chair)
G. Freitag	L. Jantz
J. Helle	M. Henderson
S. Hoffman	L. Enderud
G. Oliver	
J. Olsen	
J. Valentine	

(i) Joint Transboundary Rivers Technical Committee

D. Cantillon (Co-Chair)	R. Harrison (Co-Chair)
A. Anderson	S. Johnston
W. Bergman	C. Wood
P. Kissner	M. Henderson
S. Marshall	
J. Olsen	

(j) Joint Technical Committee on Chum

G. Graves (Co-Chair)	D. Anderson (Co-Chair)
D. Haring	A. Gould
K. Henry	T. Brackam
N. Lampsakis	S. Heizer
R. Boomer	R. Harrison
B. Tweit	M. Farwell

(k) Joint Technical Committee on Data Sharing

D. Bevan (Co-Chair)	L. Lapi (Co-Chair)
K. Henry	J. Bjerring
R. Marasco	D. Schutz
G. Morishima	M. Hamer
P. Roger	V. Palermo
T. Wright	T. Hoyt
S. Marshall	J. Schnute
J. Clark	T. Mulligan
K. Newman	P. Starr
F. Delibero	
S. Mathens	
K. Johnson	
B. Johnson	
C. Corrarino	
D. O'Connor	

Appendix 10

Amended Terms of Reference for the Standing Committee on Research and Statistics

The Committee shall consist of two Commissioners and two technical advisors from each Party plus the Executive Secretary of the Pacific Salmon Commission or his designee. The Committee shall:

- (1) develop an overall plan of research, information collection and analysis for the Parties' assistance in planning activities to meet Treaty obligations;
- (2) review plans and results of projects developed by the Parties and the Commission; and assist in defining research priorities;
- (3) provide scientific advice to the Commission on research and statistics;
- (4) through the Committee on Data Sharing, direct the compilation and maintenance of databases established by the Commission, and recommend policies and procedures for data compilation and dissemination of fishery-related statistics and environmental information;
- (5) facilitate consultation and cooperation between Parties with respect to the coordination of research programs, evaluation and exchange of scientific information and views relating to stocks and fisheries involved in this Treaty;
- (6) review activities of appointed Technical Committees and provide for evaluation of scientific reports submitted to the Panels and/or the Commission;
- (7) advise on processes for deliberation on technical issues or for resolving technical disputes;
- (8) develop, coordinate, and review editorial policies and procedures related to the research and statistical activities of the Commission;
- (9) perform other duties as requested by the Commission.