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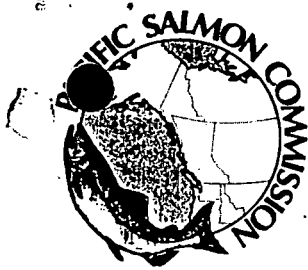
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MARCH 18, 1985

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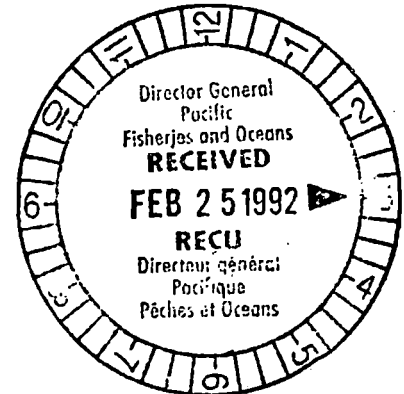
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1110-P9 VOL 38

February 20, 1992

## MEMORANDUM

TO: All members of the Pacific Salmon Commission  
FROM: J. Abramson, Secretary  
RE: Chinook Technical Report (92)-2



Please find enclosed the Chinook Technical Committee Report - Preliminary 1991 Catch and Escapement, (92)-2 dated February 13, 1992. Also, find enclosed "Canadian 1991 Catch and Sampling Report on Terminal Area Exclusions of Chinook Catches in Northern B.C.".

*J. Abramson*  
J. Abramson  
Secretary

Encl.

*Pat Chamut*  
26/2/92

*full report in records.*



## CANADIAN 1991 CATCH AND SAMPLING REPORT on TERMINAL AREA EXCLUSIONS of CHINOOK CATCHES in NORTHERN B.C.

February 6, 1991

### SUMMARY

In compliance with the 1991 Letter of Transmittal (Attachment 2), Canada is providing this brief report on catch estimates of chinook caught in the three areas described in TCCHINOOK (91)-2 and the recovery of coded-wire tags in these areas. Methods used in this report are the same as reviewed by the Chinook Technical Committee and reported in TCCHINOOK (91)-2. The sport catch survey used in the Kitimat terminal area was expanded and the area further sub-divided to improve resolution on tag recoveries and biological sampling data. Efforts were made to increase the sampling for tags and biological samples in each exclusion area.

Terminal exclusions are proposed for the Skeena and Bella Coola areas, 4,383 and 1,674 chinook respectively. No terminal exclusion exists in the Kitimat area since the estimated catch of chinook over 12 lb. in June and July does not exceed the base catch level. The estimated catch for Kitimat Area 6-1 was 2,305. However, the base catch level for each exclusion area (as specified in Attachment 2) has been included in the all-gear catch for North/Central B.C. Tag recoveries and biological sampling again demonstrated that all tagged chinook recovered in these terminal areas were from mature chinook returning to the local river. Spawning escapements to the Skeena, Kitimat, and Bella Coola rivers all exceeded their escapement goals. Escapements to the smaller natural populations in Kitimat and Bella Coola areas were more variable, but within each area the spawning escapements improved relative to 1990.

### REVIEWS BY TERMINAL AREA

#### Skeena River Area (River/Gap/Slough):

Procedures as outlined by Canada in the 1991 report to the Chinook Technical Committee were repeated, with the exception that samplers were placed aboard packers within the River/Gap/Slough (RGS) and proximal to this area. This sampling procedure was intended to increase the number of coded-wire tags recovered and to reduce possible contamination of RGS recoveries due to vessels reporting catch in this area that was caught elsewhere. The estimated RGS catch of chinook over 5 lb. was 7,283, resulting in a terminal exclusion of 4,383 (7,283 - 2,900) chinook (Table 1a). Of these, 1,883 were sampled (26% sampling rate) for adipose clips and 29 coded-wire tags were recovered. The mark rate (1.54%) in RGS was very similar to rates reported for 1989 and 1990, and all coded-wire tagged chinook over 5 lb. were from releases within the Skeena River (Table 1b).

Biological samples were collected from 635 chinook caught throughout Area 4. Most of these samples were collected in the RGS or in the adjacent fishing sub-area. Processing of these samples is incomplete but 86% of the chinook sampled in RGS exceeded 5.4 kilograms (Large Red chinook grade) and all chinook sampled in RGS were mature. Tag recoveries and biological sampling from all chinook recovered in Area 4 will be reported in June. A total of 93 coded-wire tags have been recovered throughout Area 4. Recoveries outside of the RGS were again from a wide variety of sources.

### Kitimat Sub-Area 6-1:

A creel survey similar to the 1990 survey described in the 1991 Canadian report was conducted between June 9 and August 9. The catch estimate was based on effort distribution and daily patterns, plus ramp interviews for catch and biological sampling data. Six sampling areas within Sub-area 6-1 were identified (Figure 1) and data were collected by 3 size categories (>12 lb., 5-12 lb., and <5 lb.). The estimated total catch of chinook over 12 lb. was only 2305 but effort was reduced by 37% relative to 1990 (Table 2a). This estimated catch is less than the 2,400 base catch level specified in Attachment 2 and a terminal exclusion does not exist.

Mark sampling examined 20% of the total catch but the vast majority of the sampling occurred at the head of Kitimat Arm (Sub-area A, Figure 1), and 3.8% of the chinook had adipose clips. Due to the voluntary return of heads in Canadian sport fisheries we do not know the origin of each marked chinook observed. However, all marks returned from Sub-areas A and B were from the Kitimat Hatchery. Heads voluntarily returned from throughout Statistical Area 6 continue to indicate that this inlet contains a mix of chinook stocks. However, biological samples collected throughout Area 6-1 (n = 341) indicated that all chinook 12 lb. or larger were sexually mature (Table 2b).

### Bella Coola Gillnet Area (BCGNA):

Procedures as outlined in the 1991 Canadian report were repeated in the BCGNA, except that the terminal exclusion has been calculated through the second week of July (Statistical week 7-2). This extension is proposed since the majority of the fishing and chinook catch occurred in the BCGNA and large mesh gill nets were still being used through this week. Following week 7-2, however, effort shifted to the outer portions of Area 8 and a substantial mix of chinook stocks is revealed by coded-wire tag recoveries. The estimated BCGNA catch of chinook over 5 lb. through week 7-2 was 4,624 (Table 3a), resulting in an exclusion of 1,674 (4,624 - 2,950) chinook. Sampling rates for mark incidence remained high (71%) as in previous years, and the mark incidence (2.2%) was similar to 1990. Seventy coded-wire tags were recovered from 3,242 samples (Table 3b). All but one tagged chinook was returning to the Snootli Hatchery in Bella Coola. All tagged fish were mature. One mature chinook from Kitimat Hatchery was recovered.

To protect natural chinook stocks in this Area, the upper portions of South Bentinck Arm and Dean Channel were closed to fishing. The two small chinook populations at the head of South Bentinck Arm are not well surveyed but the reported escapement (combined escapement of about 100) was similar to recent averages. The more important stock is the Dean River chinook at the head of Dean Channel. Escapement of Dean chinook increased compared to 1990 and late 1980 values (2400 vs. 2000, 1986-1990 average).

Note: Detailed lists of coded-wire tag recoveries will be provided in the June report but if desired the 1991 coded-wire tag data may be accessed directly via the Mark Recovery Database maintained at the Pacific Biological Station.

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Table 1a. 1991 Chinook catch (>5lb.) in total Area 4 and the River/Gap/Slough exclusion area, and sampling rates for coded-wire tags in the R/G/S area.

Stat. Week	Fishing Dates	Hailed Catch		Reported Sales:		Sample Size in R/G/S	Sample Rate	CWT's Recovered
		Total Area 4	R/G/S	Total Area 4	Prorated R/G/S			
71	July 1/2	1164	628	1219	658	395	60%	6
72	July 7/8,9,10	2825	1298	4009	1842	478	26%	2
73	July 14/15,16, 17,20/21	5006	3609	3183	2295	193	8%	0
74	July 22,23,24, 27/28	2193	1187	2027	1097	413	38%	5
75	July 29,30,31, Aug. 3/4	1646	732	1,458	648	190	29%	4
81	Aug. 5,6	321	279	383	333	79	24%	4
82	Aug. 11/12,13	125	77	172	106	97	92%	4
83	Aug. 18/19,20, 21	163	15	43	4	37	>100%	4
84	Aug. 25/26,27	20	0	36	0	1	>100%	0
Totals		13463	7825	12530	6983	1883	26%	29

Terminal Exclusion is estimated = 7283  
using the annual totals

Table 1b. 1991 Coded-wire tag recoveries in the RGS terminal exclusion area.

Stat. Week	Total age of Chinook caught				Total CWT's	No pins	Comments
	Age 3	Age 4	Age 5	Age 6			
71	1	2	1	0	4	2	All R/G/S recoveries were from Skeena River release sites:
72	0	0	1	1	2	0	
73	0	0	0	0	0	0	
74	0	1	3	0	4	1	
75	0	0	4	0	4	0	5 Terrace CDP
81	0	0	3	0	3	1	2 Fort Babine CDP
82	0	0	3	1	4	0	17 Toboggan Cr. CDP
83	0	0	2	1	3	1	
84	0	0	0	0	0	0	
Total	1	3	17	3	24	5	

Starr D:\Document\91termA6.wk1 Feb. 6, 1992

**Table 2a.** Estimated sport catch and effort in Kitimat Sub-area 6-1 based on the 1991 creel survey; plus the number of chinook sampled for mark incidence and the number of coded-wire tags observed.

Sub-Area	Parameters:	Numbers of Chinook by size			Totals by Sub-Area	
		>12 lb.	5-12 lb.	<5 lb.	Chinook Numbers	Boat Days Effort
A	Catch	1696	436	81	2213	5290
	Samples obs.	423	81	17	521	
	CWT's	14	4	1	19	
B	Catch	180	47	8	235	574
	Samples obs.	10	6	1	17	
	CWT's	1	0	0	1	
C	Catch	48	12	2	62	154
	Samples obs.	0	0	0	0	
	CWT's	0	0	0	0	
D	Catch	63	16	2	81	201
	Samples obs.	6	7	1	14	
	CWT's	0	0	0	0	
E	Catch	87	22	4	113	274
	Samples obs.	4	18	3	25	
	CWT's	1	0	0	1	
F	Catch	138	35	6	179	431
	Samples obs.	0	3	0	3	
	CWT's	0	0	0	0	
G	Catch	93	24	4	121	293
	Samples obs.	12	1	1	14	
	CWT's	2	0	0	2	
Totals	Catch	2305	592	107	3004	7217
	Samples obs.	455	116	23	594	
	CWT's	18	4	1	23	

**Table 2b.** Numbers of biological samples collected and distribution of samples by body size (weight) and maturity state of the samples.

Sub-Area	# of Biological Samples	Numbers of Samples by size			Maturity State	
		>12 lb.	5-12 lb.	<5 lb.	Mature	Immature
A	294	245	39	10	293	1
B	9	6	3	0	6	3
C	0	0	0	0	0	0
D	5	4	1	0	5	0
E	15	5	9	1	6	9
F	7	6	1	0	7	0
G	11	8	2	1	11	0
Total	341	274	55	12	328	13
% of Samples		80.4%	16.1%	3.5%	96.2%	3.8%

(Starr D:\document\91TERMA8.WK1 Feb. 6, 1992)

Table 3a. 1991 Chinook catch (>5lb.) in total Area 8 Gillnet and BCGNA, and sampling rates for coded-wire tag sampling.

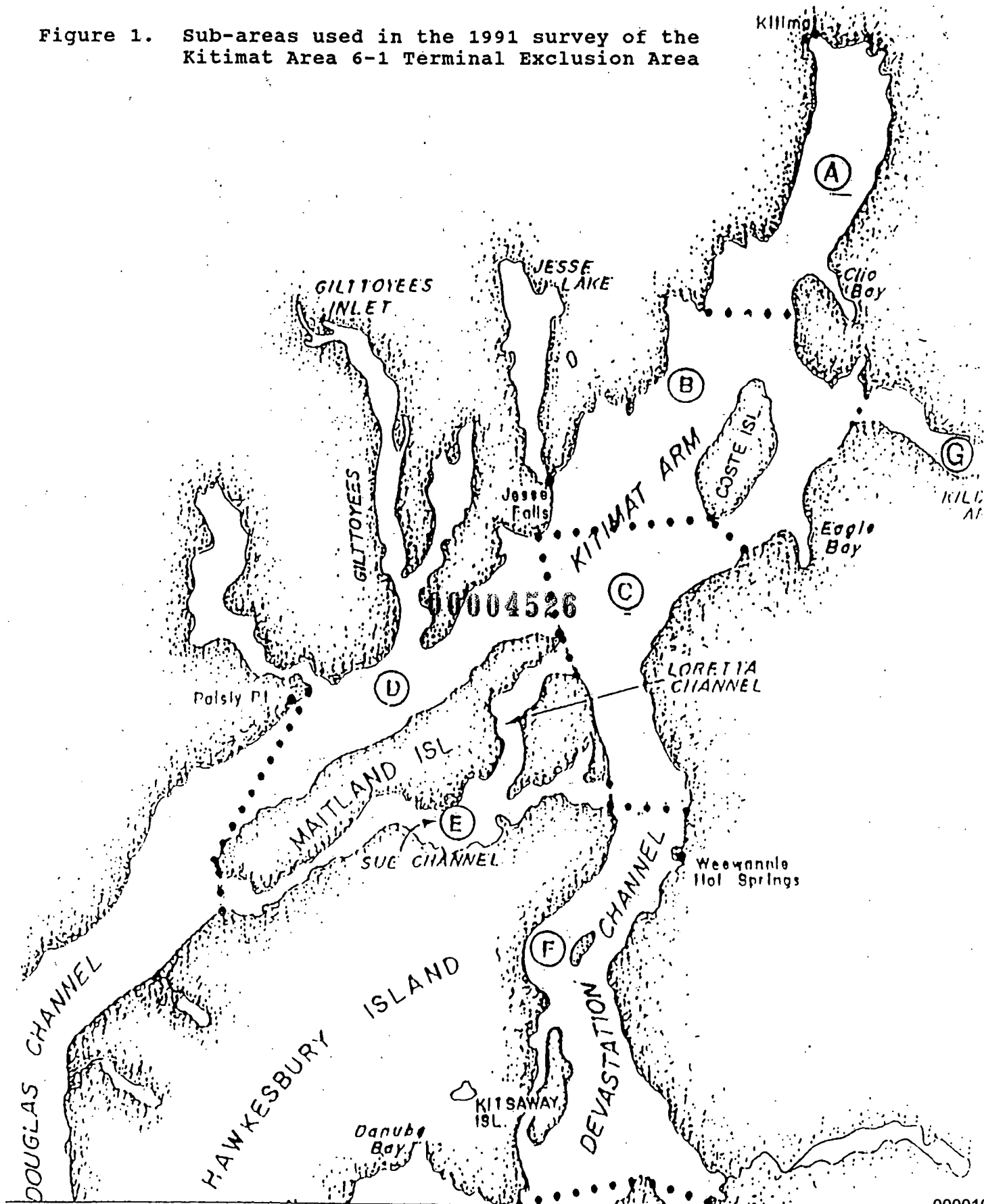
Stat. Week	Fishing Dates	Hailed Catch		Reported		% Large Mesh	Catch by large mesh	Sample Size	Sample Rate
		Total Area 8	BCGNA	Total Area 8	BCGNA				
062	June 11	524	524	588	588	100	588	396	67.3
063	June 18	1,000	1,000	1,143	1,143	100	1143	786	68.8
064	June 25	888	888	1,049	1,049	100	1049	865	82.5
071	July 01	741	601	896	727	67	487	702	96.6
072	July 8,9	1,277	1,005	1,422	1,119	25	280	493	44.1
Total to Week 072:		4,430	4,018	5,098	4,626		3,547	3,242	71.8

Terminal area exclusion = 4,624  
estimated using totals

Table 3b. 1991 Coded-wire tag recoveries in Area 8 previous to Statistical week 072. All recoveries were from the Snootli Hatchery (Bella Coola) unless otherwise stated.

Stat. Week	Total age of Chinook recovered					Total CWT's	No pins	Comments
	Age 3	Age 4	Age 5	Age 6				
062	0	4	4	2	10	0		
063	0	10	11	0	21	1		(1 Age 5 Kitimat Chinook)
064	0	3	7	2	12	1		
071	1	7	7	1	16	0		
072	4	2	5	0	11	2		
Total by Age:	5	26	34	5	70	4		

Figure 1. Sub-areas used in the 1991 survey of the Kitimat Area 6-1 Terminal Exclusion Area





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## PACIFIC SALMON COMMISSION

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MARCH 18, 1985

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### MEMO

To: Canadian members Trans-Boundary Technical Committee  
Canadian members TBR Enhancement Sub-Committee

From: I. Todd, Executive Secretary

Re: Meeting of the TBR Technical Committee April 7-10, 1992 Juneau, Alaska

---

Attached for your information is a copy of a draft agenda prepared for the April 7-10, 1992 Management Planning Meeting of the Transboundary River Technical Committee.

I. Todd  
Executive Secretary



**TRANSBOUNDARY TECHNICAL COMMITTEE**  
**Management Planning Meeting**  
**April 7 - 10, 1992**  
**ADF&G Regional Office, Juneau, AK**

**Preliminary Agenda**

1. Review/approve minutes of the last two meetings.
2. Review the Stikine Management Model.  
Norma to give initial presentation.
3. Review in-season stock id programs.  
Kathleen to give initial presentation.
4. Determine preseason forecast of Stikine sockeye runs (Tahltan and mainstem) for 1993.
5. Review status of possible revisions to sockeye escapement goals. (e.g. Klukshu, Tahltan).
6. Present management plans for each river by each Party.
7. Determine the egg-take levels and the fry-plant distributions on the Stikine and Taku for 1992. This information will now be included in the Management Plan.
8. Finalize the 1992 Management Plan utilizing above information.
9. Finalize the 1990 Brood-Year Enhancement Report.  
Ken and Cam will see that a copy is distributed to members before the meeting.
10. Finalize our 1992 research lists.
11. Time and place of next meeting.

---

**FIELD TRIP TO SNETTISHAM**

We are planning an excursion to the Port Snettisham Central Incubation Facility for Wednesday, with possibility of doing it on Thursday if weather is bad Wednesday. The excursion will involve chartering Beavers to take us out to the facility and then retrieve us 2 or 3 hours later. The trip out takes about half an hour. The cost of chartering each Beaver is about \$600 and each Beaver takes up to 5 passengers. We are currently looking into ways to finance this.

The hatchery manager is very happy to receive us and show us around the facility. Changes in the facility are currently underway to convert chum facilities to sockeye facilities to be used by both U.S./Canada projects and Alaska projects involving thermal marking.



# PACIFIC SALMON COMMISSION

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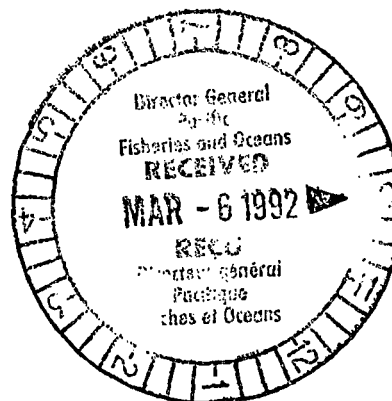
March 3, 1992

## MEMORANDUM

TO: Commissioners and Alternate Commissioners  
National Correspondents  
Panel Chairs and Vice-Chairs  
Northern Panel Members and Alternates  
Technical Committee Co-Chairs

FROM: J. Abramson, Secretary

RE: Transboundary Technical Committee Report TCTR (92)-1

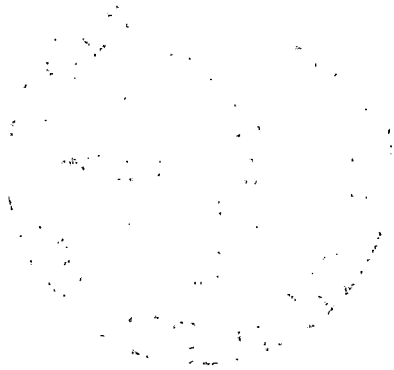


Please find enclosed the Transboundary Technical Committee Report - Transboundary River Salmon Production, Harvest and Escapement Estimates, 1990 (TCTR 92-1), dated January 1992.

J. Abramson  
Secretary

Encl.

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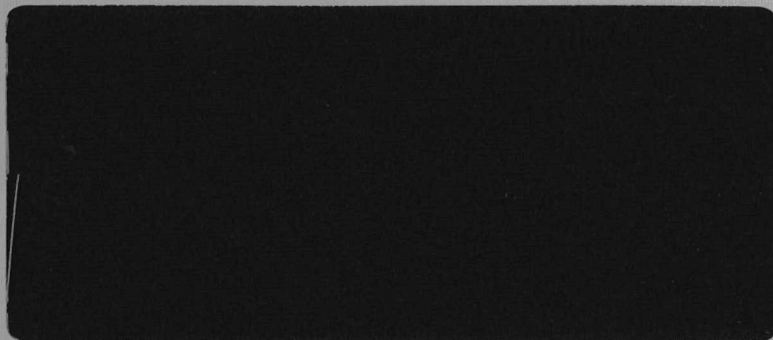
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PACIFIC SALMON COMMISSION  
TRANSBOUNDARY TECHNICAL COMMITTEE

REPORT TCTR (92)-1

TRANSBOUNDARY RIVER SALMON PRODUCTION,  
HARVEST AND ESCAPEMENT ESTIMATES, 1990

JANUARY, 1992

# TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES . . . . .	iv
LIST OF FIGURES . . . . .	v
LIST OF APPENDICES . . . . .	vi
EXECUTIVE SUMMARY . . . . .	xi
INTRODUCTION . . . . .	1
STIKINE RIVER . . . . .	1
Harvest Regulations and the Joint Management Model . . . . .	1
U.S. Fisheries . . . . .	4
Canadian Fisheries . . . . .	5
Lower Stikine Commercial Fishery . . . . .	5
Upper Stikine Commercial Fishery . . . . .	6
Indian Food Fishery . . . . .	6
Escapement . . . . .	6
Sockeye . . . . .	6
Chinook . . . . .	7
Coho . . . . .	7
Sockeye Run Reconstruction . . . . .	7
TAKU RIVER . . . . .	9
Harvest Regulations . . . . .	9
U.S. Fisheries . . . . .	9
Canadian Fisheries . . . . .	10
Escapement . . . . .	12
Sockeye . . . . .	12
Chinook . . . . .	12
Coho . . . . .	13
Pink . . . . .	13
Chum . . . . .	14
Sockeye Run Reconstruction . . . . .	14
ALSEK RIVER . . . . .	15
Harvest Regulations . . . . .	15
U.S. Fisheries . . . . .	15
Catch and Effort . . . . .	15
Sockeye Management Model . . . . .	16
Canadian Fisheries . . . . .	16
Escapement . . . . .	17



## TABLE OF CONTENTS (Cont.)

	<u>Page</u>
Sockeye . . . . .	18
Chinook . . . . .	18
Coho . . . . .	18
Run Reconstruction . . . . .	18
FIGURES . . . . .	20
APPENDICES . . . . .	34

# LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Weekly forecasts of run size and total allowable catch for Stikine River sockeye salmon as determined in-season by the Stikine Management Model, 1990 . . . . .	2
2. Run reconstruction for Stikine River sockeye salmon, 1990. The run includes those stocks which spawn above the U.S./Canada border. . .	8
3. Canadian in-season forecasts of total run size, TAC, and Canadian TAC of Taku sockeye salmon, 1990. . . . .	11
4. Taku sockeye salmon run reconstruction, 1990. . . . .	14
5. In-season U.S. forecasts of the total 1990 Alsek River catch, Klukshu River escapement, and total (Alsek River catch + Klukshu escapement) using two predictive models. . . . .	16
6. Catch and Klukshu index escapement data for Alsek sockeye, chinook, and coho salmon for 1990. . . . .	19

# LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. The Stikine River and principal U.S. and Canadian fishing areas . .	20
2. Average catches and fishing efforts compared with 1990 values for the Alaskan Districts 106 and 108 and for the Canadian commercial fisheries in the Stikine River . . . . .	21
3. Sockeye catches for the Alaskan Districts 106 and 108 and the combined Canadian fisheries in the Stikine River and Stikine sockeye escapements, 1979-1990 . . . . .	22
4. Catches of chinook, coho, pink, and chum salmon in the combined Canadian fisheries in the Stikine River, 1979-1990 . . . . .	23
5. Chinook salmon weir counts and index escapement estimates for major spawning areas and for the entire Stikine River, 1979-1990 . . . . .	24
6. The Taku River and principal U.S. and Canadian fishing areas . . .	25
7. Average catches and fishing efforts compared with 1990 values for the Alaskan District 111 commercial fishery and the Canadian commercial fishery in the Taku River . . . . .	26
8. Sockeye catches for the Alaskan District 111, the Icy and Chatham Straits, and the combined Canadian fisheries in the Taku River and Taku sockeye escapements, 1979-1990 . . . . .	27
9. Chinook index escapement estimates for major spawning areas and for the entire Taku River, 1979-1990 . . . . .	28
10. The Alsek River and principal U.S. and Canadian fishing areas . . .	29
11. Average catches and fishing efforts compared with 1990 values for the Alaskan Dry Bay commercial fishery and the Canadian combined food and recreational fisheries in the Alsek River . . . . .	30
12. Alsek sockeye catches and weir counts, 1979-1990 . . . . .	31
13. Alsek chinook catches and weir counts, 1979-1990 . . . . .	32
14. Alsek coho catches and weir counts, 1979-1990 . . . . .	33

# LIST OF APPENDICES

	<u>Page</u>
APPENDIX A:	
A.1. Weekly salmon catch and effort in the Alaskan Subdistrict 106-41 and -42 (Sumner Strait) commercial drift gill net fishery, 1990 . . . . .	35
A.2. Weekly stock proportions of sockeye salmon harvested in the Alaskan Subdistrict 106-41 and -42 (Sumner Strait) commercial drift gill net fishery, 1990 . . . . .	35
A.3. Weekly stock-specific catch of sockeye salmon in the Alaskan Subdistrict 106-41 and -42 (Sumner Strait) commercial drift gill net fishery, 1990 . . . . .	35
A.4. Weekly salmon catch and effort in the Alaskan Subdistrict 106-30 (Clarence Strait) commercial drift gill net fishery, 1990 . . . . .	36
A.5. Weekly stock proportions of sockeye salmon harvested in the Alaskan Subdistrict 106-30 (Clarence Strait) commercial drift gill net fishery, 1990 . . . . .	36
A.6. Weekly stock-specific catch of sockeye salmon in the Alaskan Subdistrict 106-30 (Clarence Strait) commercial drift gill net fishery, 1990 . . . . .	36
A.7. Weekly salmon catch in the Alaskan District 106 commercial drift gill net fisheries, 1990 . . . . .	37
A.8. Weekly stock proportions of sockeye salmon harvested in the Alaskan District 106 commercial drift gill net fisheries, 1990 . . . . .	37
A.9. Weekly stock-specific catch of sockeye salmon in the Alaskan District 106 commercial drift gill net fisheries, 1990 . . . . .	37
A.10. Weekly salmon catch and effort in the Alaskan District 108 commercial drift gill net fishery, 1990 . . . . .	38
A.11. Weekly stock proportions and stock-specific catch of sockeye salmon in the Alaskan District 108 commercial drift gill net fishery, 1990 . . . . .	38
A.12. Weekly salmon catch and effort in the Alaskan Subdistrict 106-41 test fishery, 1990 . . . . .	39
A.13. Weekly salmon catch and effort in the Alaskan District 108 test fishery, 1990 . . . . .	39
A.14. Stock compositions and stock-specific catch of sockeye salmon in the Alaskan District 106 and 108 test fisheries, 1990 . . . . .	39
A.15. Weekly salmon and steelhead trout catch and effort in the Canadian commercial fishery in the lower Stikine River, 1990 . . . . .	40
A.16. Weekly sockeye salmon stock proportions and catch by stock in the Canadian commercial fishery in the lower Stikine River, 1990 . . . . .	40
A.17. Weekly salmon and steelhead trout catch and effort in the Canadian commercial fishery in the upper Stikine River, 1990 . . . . .	40
A.18. Weekly salmon and steelhead trout catch and effort in the Canadian Indian food fishery located at Telegraph Creek, on the Stikine River, 1990 . . . . .	41

# LIST OF APPENDICES (Cont.)

	<u>Page</u>
APPENDIX A:	
A.19. Weekly salmon and steelhead trout catch and effort in the Canadian test fishery in the Stikine River, 1990 . . . . .	41
A.20. Weekly sockeye salmon stock proportions in the Stikine River test fishery, 1990. Data based on egg diameter analysis . . . . .	42
A.21. Weekly catch, CPUE, and migratory timing of Tahltan and non-Tahltan sockeye stocks in the Stikine River test fishery, 1990 . . . . .	42
A.22. Daily counts of adult sockeye salmon passing through Tahltan weir, 1990 . . . . .	43
A.23. Daily counts of sockeye salmon smolt migrating through Tahltan Lake smolt weir, 1990 . . . . .	43
A.24. Daily counts of adult chinook salmon passing through Little Tahltan weir, 1990 . . . . .	44
APPENDIX B:	
B.1. Salmon catch and effort in the Alaskan Subdistrict 106-41 and -42 (Sumner Strait) commercial drift gill net fishery, 1964-1990 . . . . .	45
B.2. Stock proportions and catches of sockeye salmon in the Alaskan Subdistrict 106-41 and -42 (Sumner Strait) commercial drift gill net fishery, 1985-1990 . . . . .	45
B.3. Salmon catch and effort in the Alaskan Subdistrict 106-30 (Clarence Strait) commercial drift gill net fishery, 1964-1990 . . . . .	46
B.4. Stock proportions and catches of sockeye salmon in the Alaskan Subdistrict 106-30 (Clarence Strait) commercial drift gill net fishery, 1985-1990 . . . . .	46
B.5. Salmon catch and effort in the Alaskan District 106 commercial drift gill net fisheries, 1964-1990 . . . . .	47
B.6. Stock proportions and catches of sockeye salmon in the Alaskan District 106 commercial drift gill net fisheries, 1982-1990 . . . . .	47
B.7. Salmon catch and effort in the Alaskan District 108 commercial drift gill net fishery, 1964-1990 . . . . .	48
B.8. Stock proportions and catches of sockeye salmon in the Alaskan District 108 commercial drift gill net fishery, 1985-1990 . . . . .	48
B.9. Salmon catch in the Alaskan Subdistrict 106-41 (Sumner Strait) test fishery, 1984-1990 . . . . .	49
B.10. Stock proportions and catches of sockeye salmon in the Alaskan Subdistrict 106-41 and -42 (Sumner Strait) test fishery, 1984-1990 . . . . .	49
B.11. Salmon catch and effort in the Alaskan Subdistrict 106-30 (Clarence Strait) test fishery, 1986-1990 . . . . .	49

# LIST OF APPENDICES (Cont.)

	<u>Page</u>
APPENDIX B:	
B.12. Stock proportions and catches of sockeye salmon in the Alaskan Subdistrict 106-30 (Clarence Strait) test fishery, 1986-1990 . . . .	50
B.13. Salmon catch and effort in the Alaskan District 106 test fisheries 1984-1990 . . . . .	50
B.14. Stock proportions and catches of sockeye salmon in the Alaskan District 106 test fisheries, 1984-1990 . . . . .	50
B.15. Salmon catch and effort in the Alaskan District 108 test fishery 1984-1990 . . . . .	51
B.16. Stock proportions and catches of sockeye salmon in the Alaskan District 108 test fishery, 1985-1990 . . . . .	51
B.17. Salmon and steelhead trout catch and effort in the Canadian commercial fishery in the lower Stikine River, 1979-1990 . . . . .	51
B.18. Sockeye salmon stock proportions and catch by stock in the Canadian commercial fishery in the lower Stikine River, 1979-1990 . . . . .	52
B.19. Salmon and steelhead trout catch and effort in the Canadian commercial fishery in the upper Stikine River, 1975-1990 . . . . .	52
B.20. Salmon and steelhead trout catch in the Canadian Indian food fishery located at Telegraph Creek, on the Stikine River, 1972-1990 . . . . .	53
B.21. Salmon and steelhead trout catch in the combined Canadian net fisheries in the Stikine River, 1972-1990 . . . . .	53
B.22. Salmon and steelhead trout catches and effort in Canadian test fisheries in the Stikine River, 1985-1990 . . . . .	54
B.23. Sockeye salmon stock proportions and catch by stock in the test fishery in the lower Stikine River, 1985-1990 . . . . .	54
B.24. Estimated proportion of inriver run comprised of Tahltan and non-Tahltan sockeye stocks, 1979-1990 . . . . .	54
B.25. Counts of adult sockeye salmon migrating through Tahltan Lake weir, 1959-1990 . . . . .	55
B.26. Aerial survey counts of non-Tahltan sockeye stocks in the Stikine River drainage, 1984-1990 . . . . .	55
B.27. Count of sockeye salmon smolt migrating through Tahltan Lake smolt weir, 1984-1990 . . . . .	56
B.28. Weir counts of chinook salmon at Little Tahltan River, 1985-1990 .	56
B.29. Index counts of Stikine chinook escapements, 1979-1990 . . . . .	56
B.30. Index counts of Stikine coho salmon escapements, 1984, 1985, 1988, 1989, and 1990 . . . . .	57
B.31. Stikine River sockeye salmon run size, 1979-1990 . . . . .	57

# LIST OF APPENDICES (Cont.)

	<u>Page</u>
APPENDIX C:	
C.1. Weekly salmon catch and effort in the Alaskan District 111 commercial drift gill net fishery, 1990 . . . . .	58
C.2. Weekly salmon catch and effort in the Alaskan District 111 test gill net fishery, 1990 . . . . .	58
C.3. Weekly stock proportions of sockeye salmon harvested in the Alaskan District 111 commercial drift gill net fishery, 1990 . . . . .	58
C.4. Weekly stock-specific catch of Taku sockeye salmon harvested in the Alaskan District 111 commercial drift gill net fishery, 1990 . . . .	59
C.5. Weekly salmon and steelhead trout catch and effort in the Canadian commercial fishery in the Taku River, 1990 . . . . .	59
C.6. Weekly stock proportions of sockeye salmon harvested the Canadian commercial fishery in the Taku River, 1990 . . . . .	59
C.7. Weekly stock-specific catch of sockeye salmon in the Canadian commercial fishery in the Taku River, 1990 . . . . .	60
C.8. Weekly salmon and steelhead trout catch in the Canadian test fishery in the Taku River, 1990 . . . . .	60
C.9. Weekly stock specific-catch of sockeye salmon in the Canadian test fishery in the Taku River, 1990 . . . . .	60
C.10. Mark-recapture estimate of above border run of sockeye and coho salmon in the Taku River, 1990 . . . . .	61
C.11. Daily counts of salmon passing through Nahlin River weir, 1990 . .	62
C.12. Daily counts of salmon passing through Little Tatsamenie weir, 1990 . . . . .	63
C.13. Daily counts of salmon passing through Little Trapper Lake weir, 1990 . . . . .	65
C.14. Daily counts of salmon passing through Nakina River weir, 1990 . .	66
C.15. Daily counts of salmon passing through Speel Lake weir, 1990 . . .	67
C.16. Daily counts of salmon passing through Crescent Lake weir, 1990 . .	68
APPENDIX D:	
D.1. Salmon catches and effort in the Alaskan District 111 commercial drift gill net fishery, 1964-1990 . . . . .	69
D.2. Stock proportions and catches of sockeye salmon in the Alaskan District 111 commercial drift gill net fishery, 1983-1990 . . . . .	69
D.3. Proportion of Taku River sockeye salmon in the Alaskan District 111 commercial drift gill net catch, 1983-1990 . . . . .	70
D.4. Salmon catch in the U.S. subsistence and personal use fisheries in the Taku River (1967- 1990) . . . . .	70

# LIST OF APPENDICES (Cont.)

	<u>Page</u>
APPENDIX D:	
D.5. Salmon and steelhead trout catch and effort in the Canadian commercial fishery in the Taku River, 1979-1990 . . . . .	70
D.6. Sockeye salmon stock proportions and catch by stock in the Canadian commercial fishery on the Taku River, 1986-1990 . . . . .	71
D.7. Salmon and steelhead trout catch in the Canadian test fishery in the Taku River, 1987-1990 . . . . .	71
D.8. Sockeye salmon escapement counts of Taku River and Port Snettisham stocks, 1983-1990 . . . . .	71
D.9. Aerial survey index escapement counts of large (3-ocean and older) Taku River chinook salmon and estimated escapements of large chinook salmon to the entire Taku drainage, 1977-1990 . . . . .	72
D.10. Taku River (above border) coho salmon salmon run size, 1987-1990 .	72
D.11. Escapement counts of Taku River coho salmon, 1984-1990 . . . . .	73
D.12. Taku River sockeye salmon run size, 1984-1990 . . . . .	73
APPENDIX E:	
E.1. Weekly salmon catch and effort in the U.S. commercial fishery in the Alsek River, 1990 . . . . .	74
E.2. Weekly salmon catch and effort in the Canadian food and sport fisheries in the Alsek River, 1990 . . . . .	74
E.3. Daily counts of salmon passing through Klukshu River weir, 1990 . .	75
E.4. Salmon catch and effort in the U.S. commercial fishery in the Alsek River, 1964-1990 . . . . .	77
E.5. Salmon catch in the U.S. subsistence fishery in the Alsek River, 1976-1990 . . . . .	77
E.6. Salmon catches in the Canadian Indian food and sport fisheries in the Alsek River, 1976-1990 . . . . .	78
E.7. Klukshu River weir counts of chinook, sockeye, and coho salmon, 1976-1990 . . . . .	78
E.8. Alsek River sockeye counts from U.S. and Canadian aerial surveys and from the electronic counter at Village Creek, 1985-1990 . . . . .	79
E.9. Aerial survey index counts of Alsek chinook salmon escapements, 1984-1990 . . . . .	79
E.10. Aerial survey counts of coho salmon from U.S. lower Alsek River tributaries, 1984-1990 . . . . .	79



## EXECUTIVE SUMMARY

Estimates of catches and escapements of Pacific salmon returning to the transboundary Stikine, Taku, and Alsek Rivers for 1990 are presented and compared with historical patterns. Relevant information pertaining to the management of appropriate U.S. and Canadian fisheries is presented and the use of in-season management models is discussed.

The 1990 Stikine sockeye run was estimated at 67,200 fish, of which 29,800 fish were harvested in various fisheries and 37,400 escaped to spawn. The estimated U.S. marine commercial and test fishery catches of Stikine sockeye salmon were 9,400 and 400 fish, respectively; the Canadian inriver commercial, Indian food, and test fishery catches were 15,000, 3,000, and 1,900 fish, respectively. The preseason forecast of 94,000 sockeye salmon overestimated the actual run. In-season, the Stikine Management Model also overestimated the Stikine sockeye run, predicting a total run size of 140,700 fish the week of July 1 and between 95,700 to 125,000 thereafter. This overestimation was due in large part to misclassification problems of the in-season stock composition analysis which, compared to post season estimates, overestimated the catch of Stikine sockeye salmon in the U.S. catches. The model, however, did correctly predict a smaller than average portion of the run being from the Tahltan stock. Estimates of the total allowable catch (TAC) are derived from predictions of the total Stikine River run. Both Canada and the U.S. harvested less than the TAC allowed by the management model but were slightly over the allowable harvest range estimated from the postseason analysis. Due to the low run size of the Tahltan stock (26,200 fish) and, in spite of a low exploitation rate (40%) on this stock (2,200 fish in marine catches and 8,100 fish in inriver catches), the resulting spawning escapement to Tahltan Lake (14,900 fish) was below the 20,000 to 40,000 goal range established by the Transboundary Technical Committee. The escapement of 22,500 non-Tahltan Stikine sockeye salmon fell within the escapement goal range for that stock group.

The chinook catch in Canadian fisheries in the Stikine River was a record 3,200 fish (including the second highest catch of jacks on record; 1,000), approximately 49% more than the 1980 to 1989 average, with approximately 72% harvested in commercial fisheries and 28% harvested in the Indian food fishery. The U.S. marine catch in the District 106 and 108 mixed stock fisheries was 2,700 fish, approximately 80% more than the 1980 to 1989 average catch. Chinook spawning escapements were near average in 1990, with a count of 4,400 large adults through Little Tahltan weir and a total inriver escapement estimate of 17,600 large fish. The total escapement was near the 1985 to 1989 average of 18,200 fish but was below the escapement goal range of 19,800 to 25,000 fish.

The Stikine coho run was relatively strong in 1990. The U.S. marine harvest of Stikine River coho salmon is not known since there is no stock identification program in place; however, total coho gill net catch in District 106 was more than twice the 1980 to 1989 average. The Canadian coho catch was just over 4,000 fish, near the Treaty entitlement. Coho aerial survey escapement counts were above average.

The Stikine River runs of pink and chum salmon are typically very small. In 1990, Canadian catches of these two species were approximately 500 fish each.

This is approximately half the 1980 to 1989 average for pink salmon and near average for chum salmon.

The 1990 total Taku sockeye run was estimated at 224,300 fish and included a catch of 131,500 fish and an escapement of 92,800 fish. The estimated U.S. marine commercial and inriver personal use catches were 108,500 and 1,600 fish, respectively, records in both fisheries. Canadian commercial, Indian food fishery, and test fishery catches were 21,100, 100, and 300 fish, respectively. The Pacific Salmon Treaty defines harvest sharing of Taku River sockeye salmon as 18% of the TAC to Canada and 82% to the U.S. Since the escapement goal set by the Transboundary Technical Committee is expressed as a range, 71,000 to 80,000 fish, the resulting TAC is also determined as a range. In 1990, Canada took 14% to 15% and the U.S. took 72% to 76% of the TAC. The estimated spawning escapement for Taku sockeye salmon exceeded the upper level of the escapement goal range.

The chinook catch in the Canadian commercial fishery in the Taku River was 1,400 fish, more than three times the 1980 to 1989 average. The catch in the U.S. District 111 mixed stock fishery was 3,500 fish, approximately 67% higher than the 1980 to 1989 average. Above average escapements were observed in most of the Taku chinook tributaries surveyed in 1990. The estimated escapement of chinook salmon to the entire drainage was 21,300 to 24,500, the largest since the methodology was standardized in 1974, but still less than the escapement goal range of 25,600 to 30,000 fish.

The Taku coho run was strong in 1990. The U.S. harvest of coho salmon in the District 111 mixed stock fishery was a record 67,300 fish, 81% greater than the 1980 to 1989 average. The Canadian coho catch was 3,200, close to the Treaty limit of 3,000 fish. The above-border run size was estimated to be 75,000 to 85,000 coho salmon.

The catches of pink and chum salmon in the U.S. District 111 fishery were 153,000 and 145,500 fish, respectively, below the 1980 to 1989 average for pink salmon and above average for chum salmon. The catch of summer run chum salmon, comprised of coastal Alaskan wild and hatchery stocks, was a record, while the fall run of chum salmon, typically comprised of Taku River and Port Snettisham stocks, was weak. Canadian inriver catches included 400 pink and 12 chum salmon, a fraction of the 1980 to 1989 averages for both species.

The sockeye run to the Alsek River was above average as indicated by average U.S. terminal and Canadian catches and above average escapement counts. The U.S. Dry Bay catch was 17,000 sockeye salmon, near the 1980 to 1989 average catch. The Canadian sport fishery catch of 400 fish and Indian food fishery catch of 2,000 sockeye salmon were near the 1980 to 1989 averages. The count of 26,000 sockeye salmon through Klukshu weir was approximately 40% more than the 1980 to 1989 average, although the early run component was weak.

The chinook run to the Alsek River was about average. The U.S. Dry Bay catch of 100 fish was approximately one-fifth of the 1980 to 1989 average catch. The Canadian sport and Indian food fishery catch of 700 fish was approximately 60% greater than the 1980 to 1989 average. The chinook count through the Klukshu River weir; 1,900 fish, was below the 1984 to 1989 average of 2,300 fish.

The coho run to the Alsek River was poor. The U.S. Dry Bay coho catch of 1,400 fish was one-fourth the 1980 to 1989 average and the Canadian food and sport fishery catch of 100 fish was near average. The Klukshu weir count of 300 fish was less than one-third the 1980 to 1989 average.

The U.S. Dry Bay pink and chum salmon catches of zero and 500 fish, respectively, were near average for pink salmon and 55% of the 1980 to 1989 average for chum salmon. There are no recorded Canadian catches of pink or chum salmon in the Alsek River.

## INTRODUCTION

This report presents the 1990 catch and escapement data for Pacific salmon runs to the transboundary Stikine, Taku, and Alsek Rivers and discusses management actions taken during the season. Catch and effort data are presented by management week (U.S. statistical week) for each river for both U.S. and Canadian fisheries. Spawning escapement data for most species are reported from weir counts or other escapement monitoring techniques. Sockeye runs to the three rivers are reconstructed using harvest data and spawning escapement estimates.

## STIKINE RIVER

Stikine River salmon are harvested by U.S. gill net fisheries in Alaskan Districts 106 and 108, by Canadian commercial gill net fisheries located in the lower and upper Stikine River, and by a Canadian Indian food fishery in the upper portion of the river (Figure 1). Additional catches of unknown quantity are taken in Alaskan troll and seine fisheries and in Alaskan sport fisheries near Wrangell and Petersburg. A small sport fishery also exists in the Canadian portion of the Stikine drainage.

### *Harvest Regulations and the Joint Management Model*

The harvest and management of Stikine River salmon stocks for the period 1988 to 1992 is governed by Annex IV, Chapter I, of the Pacific Salmon Treaty as negotiated by the Pacific Salmon Commission in February of 1988. Sharing arrangements for sockeye salmon are:

Total Sockeye Allowable Catch		Canadian Allowable Catch	
From	To	Minimum	Maximum
0	0	4,000	4,000
1	20,000	10,000	15,000
20,001	60,000	15,000	20,000
60,001	infinity	20,000	30,000

Under this annex the U.S. is allowed to catch the remainder of the total allowable sockeye catch after the Canadian allowable catch is subtracted from the total. However, even when the calculated total allowable catch (TAC) for the U.S. is low or zero, incidental catches of Stikine sockeye salmon are allowed in District 106. In addition, Canada is restricted to an annual catch of 4,000 coho salmon. This schedule, which is conditionally in effect until 1992, is tied to a commitment by the Parties to undertake a cooperative sockeye enhancement program commencing in 1989.

Prior to the 1990 season, the Transboundary Technical Committee updated the management plan and determined new parameters for input into the in-season run forecast model, referred to as the Stikine Management Model. Details regarding these subjects appear in "Salmon Management Plan for the Transboundary Rivers", Pacific Salmon Commission Transboundary Technical Committee Report TCTR (90)-2, April 1990. As required by the annex, a preseason forecast of the total Stikine sockeye run was made to guide the initial fishing patterns of U.S. and Canadian fisheries. The preseason forecast for 1990 was 94,000 sockeye salmon. Beginning the first week of July, in-season forecasts of total run size and TAC produced by the Stikine Management Model and based on catch-per-unit-effort (CPUE) data were used to assist in determining weekly fishing plans (Table 1).

Table 1. Weekly forecasts of run size and total allowable catch for Stikine River sockeye salmon as determined in-season by the Stikine Management Model, 1990. The run size is estimated from the preseason forecast in weeks 25 and 26, from the average model predicted run size (district and inriver predictions) for week 27, and from the inriver cumulative CPUE of all sockeye salmon for the remaining weeks.

Stat. Week	Start Date	Forecasts		U.S. Fishing Regime			Canada TAC	Cumulative Catch	
		Run Size	TAC	6	8	TAC		U.S.	Canada
Model Generated by U.S.									
25	17-Jun	94,000	34,000	I	D	14,000	20,000	2,688	0
26	24-Jun	94,000	34,000	I	D	14,000	20,000	6,808	285
27	01-Jul	140,690	80,690	I	D	50,690	30,000	11,614	1,580
28	08-Jul	95,671	35,671	I	D	15,671	20,000	19,215	2,560
29	15-Jul	106,106	46,106	I	D	26,106	20,000	35,241	9,223
30	22-Jul	110,962	50,962	I	D	30,962	20,000	28,904 <sup>a/</sup>	10,445
31	29-Jul	105,128	45,128	I	D <sup>b/</sup>	25,128	20,000	35,273	13,104
32	05-Aug	104,970	44,970	I	D <sup>b/</sup>	24,970	20,000	38,332	16,827

Model Generated by Canada

25	17-Jun	94,000	34,000	I	D	14,000	20,000	2,781	0
26	24-Jun	94,000	34,000	I	D	14,000	20,000	6,808	285
27	01-Jul	140,690	80,690	I	D	50,960	30,000	12,571	1,580
28	08-Jul	95,671	35,671	I	D	15,671	20,000	19,127	4,298
29	15-Jul	125,048	65,048	I	D	35,048	30,000	35,103	9,606
30	22-Jul	111,381	51,381	I	D	31,381	20,000	35,103 <sup>c/</sup>	12,285
31	29-Jul	105,635	45,635	I	I	25,635	20,000	45,091	13,837
32	05-Aug	105,841	45,841	I	I	25,841	20,000	48,574	16,704
33	12-Aug	102,707	42,707	I	I	22,707	20,000	38,268 <sup>a/</sup>	17,150
34	19-Aug	98,827	38,827	I	I	18,827	20,000	38,268 <sup>c/</sup>	17,646
35	26-Aug	97,770	37,770	I	I	17,770	20,000	57,881	17,848
36	02-Sep	108,848	48,848	I	I	28,848	20,000	57,881 <sup>c/</sup>	17,848

I indicates indirect fishery allowed; D indicates directed fishery allowed.

<sup>a/</sup> Cumulative U.S. catch decrease due to use of a modified analytical technique to estimate the Stikine component of the catch to minimize misclassification problems.

<sup>b/</sup> The U.S. fishing regime for District 108 as written in the annex is based on TAC and the cumulative catch in District 106. By week 30 the U.S. total cumulative catch was estimated as being greater than the TAC. Therefore, although the Treaty says directed fisheries may take place in District 108 after this time, the remaining TAC is zero and no more Stikine sockeye salmon should be taken.

<sup>c/</sup> Where U.S. cumulative catch is the same in succeeding weeks, catch data was not available in the succeeding week when the model was run.

The preseason forecast of 94,000 Stikine sockeye salmon indicated a slightly below average run (1980 to 1989 average was 99,602 fish). In-season predictions of total run ranged from 95,671 to 140,690 sockeye salmon; U.S. and Canadian weekly predictions differed because different updates of catch and stock composition estimates were used by each country (Table 1). The high prediction in week 27 was due largely to a high catch estimate for Stikine stocks in District 106-41. After week 27, the run forecasts were based on inriver CPUE only and stabilized in the 96,000 to 125,000 range. By the end of the fishing season, the Stikine Management Model predicted a total run of 108,848 Stikine sockeye salmon with a total TAC of 48,848 fish, a Canadian TAC of 20,000 sockeye salmon, and a U.S. TAC of 28,848 sockeye salmon.

At the end of the season, the model predicted a cumulative catch of 57,881 and 17,848 Stikine sockeye salmon in the U.S. and Canadian fisheries, respectively; the final postseason catch estimates are 9,420 Stikine sockeye salmon in the U.S. fisheries and 18,024 in the Canadian fisheries. The in-season estimates of stock composition in the U.S. catches in 1990 were not accurate due to large differences in the scale growth patterns between 1989, used as in-season standards, and 1990 returns. During the early part of the season, it was obvious the Stikine component of the U.S. catch was being overestimated and adjustments to the in-season analysis were made that partially corrected this. This adjustment was applied in week 30 in the U.S. model runs and in week 33 in the Canadian model runs as seen by the decrease in cumulative catch (Table 1).

An in-season examination of age composition and brain parasite (*Myxobolus neurobius*) occurrence both indicated a lower proportion of Stikine sockeye than was estimated by scale pattern analysis. Had the non-Tahltan Stikine stock group been a major component of the District 106 catch, as the SPA indicated, then age-0.+ fish, which normally make up 9% to 20% of the non-Tahltan Stikine component, should have been present in more than the trace amounts that were found in the catch samples. Tahltan fish have a zero parasitism rate, non-Tahltan Stikine fish, a 30% rate, and Alaskan fish, nearly 100%. The rate observed in a sample of 150 sockeye salmon from the Sub-district 106-41 catch was 40%, indicating a substantial number of Alaskan fish. In-season SPA was apparently misclassifying Alaskan fish as Stikine fish. This was obvious in a test analysis where the in-season SPA was applied to a catch sample from the District 101, where Stikine fish are not present in significant numbers. Results showed a 40% occurrence of Stikine fish in the District 101 catch. An adjustment to the in-season SPA was obviously warranted. Quadratic analysis of scale patterns was used with discriminant functions built from the scale patterns of age-1.2 fish from 1989 escapement samples. Use of these functions to classify the age-1.3 fish in the 1990 catch resulted in much lower estimates of Stikine River fish in the District 101 catch and in estimates of the contribution of Alaska stocks in the District 106 catches which were closer to those supported by the brain parasite and age composition data. Therefore, the stock compositions were re-estimated for previous weeks and the quadratic analysis was used for the remainder of the in-season analysis.

## U.S. Fisheries

In 1990, the District 106 commercial gill net fishery catch was 2,107 chinook, 185,805 sockeye, 164,211 coho, 319,186 pink, and 73,232 chum salmon (Appendix A.7). The catch in the District 108 fishery was 557 chinook, 11,574 sockeye, 8,218 coho, 13,822 pink, and 9,382 chum salmon (Appendix A.10). Catches of chinook, sockeye, coho, and chum salmon were above the 1980 to 1989 averages and pink salmon catches were below average (Figure 2). Test fisheries were conducted in Subdistrict 106-41 and District 108 to help managers ascertain in-season the run strength of various salmon species. Test fisheries catch low numbers of fish compared to commercial fisheries (Appendices A.12 and A.13). Annual commercial and test fishery catches from 1964 for these districts are provided in Appendix Tables B.1 through B.16. Catches of each species in District 106 and 108 fisheries consist of fish from several stocks; the contribution of Stikine River stocks is estimated only for sockeye salmon.

Postseason analysis of stock compositions in U.S. marine catches was based on linear discriminant function analysis of scale patterns with functions derived from 1990 escapement standards. The in-season estimate of the contribution of Stikine River sockeye salmon to the District 106 catch was approximately nine times higher than that of the postseason analysis (18.6% compared to 2.1%) (Figure 3). The Sumner Strait fishery (Subdistricts 106-41 and 106-42) harvested 2,712 Stikine sockeye salmon (Appendix A.3), which was 2.6% of the total sockeye harvest in that fishery. The Clarence Strait fishery (Subdistrict 106-30) harvested 1,189 Stikine sockeye salmon (Appendix A.6), which was 1.5% of the total sockeye catch. The terminal area fishery near the mouth of the Stikine (District 108) harvested 5,519 Stikine fish (Appendix A.11), which was 47.7% of the total sockeye catch. Thus, an estimated total of 9,420 Stikine sockeye salmon was taken in U.S. gill net fisheries in Districts 106 and 108.

The 1990 fishing season in Districts 106 and 108 was open from June 17 to September 24. During the first three weeks of the fishery, both District 106 and 108 were restricted to a two-day fishery each week due to the average to below average CPUE in both districts. During this time period, the Stikine Management Model indicated a strong run to the Stikine River and District 108 remained open. After the first two days of fishing during the fourth week, the sockeye CPUE was 10% above the 1980 to 1989 average despite the poor weather. The Stikine Management Model continued to indicate a good run to the Stikine River and a 24-hour extension was given. Sockeye catches during the fifth through the eighth week of fishing were average or above average in both districts. Fishing pressure in District 106 during weeks five through eight was 17% to 37% above average, so fishing time was limited to two days each week except during the sixth week, when the fishing time was extended for one day. The extension was given because the sockeye CPUE was 35% to 40% above average. The District 106 and 108 sockeye harvests of 185,805 and 11,574 fish, respectively, exceeded the 1980 to 1989 averages of 145,666 and 4,943 fish, respectively.

During the 1990 season, the District 106 drift gill net fishery was open for 34 days from June 17 to September 24, 17% above the 1980 to 1989 average of 29 days. Subdistricts 106-41, 106-42, and 106-30 were all open simultaneously each week throughout the season with an area restriction for Salmon Bay used during part of the fishery. In 1990, the District 108 openings coincided with District 106

openings and totaled 34 days, more than twice the 1980 to 1989 average of 16 days. Area restrictions were used for the first two weeks around the mouth of the Stikine River to protect the Stikine chinook run. Area restrictions were also used during portions of the fishery in Frederick Sound to protect chinook stocks. Fishing effort in District 106 started out above average and generally remained above the 1980 to 1989 average throughout the entire fishery.

### **Canadian Fisheries**

The catches in the combined Canadian commercial and Indian food fisheries in the Stikine River in 1990 included: 2,250 large chinook, 959 jack chinook (fish which weigh less than 2.27 kg), 18,024 sockeye, 4,037 coho, 496 pink, and 499 chum salmon and 199 steelhead trout (Figure 4 and Appendices A.15- A.18). Catches of chinook salmon were above the 1980 to 1989 average while catches of all other species designated were below average (Appendices B.17-B.22). A test fishery to determine migratory timing and stock composition of the sockeye run and run timing and relative abundance of coho salmon was conducted again in the lower Stikine River. The test fishery was located just upstream from the Canada/U.S. border. Test fishery catches included: 231 chinook, 1,940 sockeye, 405 coho, 47 pink, and 77 chum salmon and 24 steelhead trout (Appendices A.19-A.21).

### **Lower Stikine Commercial Fishery**

The Canadian commercial fishery catch in the lower Stikine River was 1,569 large chinook, 680 jack chinook, 14,530 sockeye, 4,020 coho, 496 pink, and 499 chum salmon and 188 steelhead trout in 1990 (Appendix A.15). The sockeye catch was 96% of the 1980 to 1989 average of 15,168 fish (Appendix B.17).

The fishery commenced at noon on Monday, June 25 (statistical week 26), for a two-day opening. The sockeye catch and CPUE for the first week of the season was below average. However, fish availability improved over the subsequent three weeks and weekly catches and CPUE values were above average for each of statistical weeks 27 through 29. Preliminary catch and effort inputs to the Stikine Management Model for week 29 resulted in a predicted run of 125,048 sockeye salmon, which translated into a Canadian catch quota of 30,000 fish. In response, fishing time for week 29 (July 15 to 21) was increased to three days. The forecast for this week using updated catch numbers for that week declined to 119,195 sockeye salmon and the Canadian quota decreased to 20,000 sockeye salmon.

By statistical week 30 (July 22-28), the run forecasts began to decline and the lower Stikine commercial fishery was reduced to one day per week for weeks 30 and 31. Thereafter, and until the end of the sockeye fishery, fishing times were adjusted according to the guideline weekly catch quotas and run strength. A precipitous drop in the CPUE in week 33 (August 12-18) marked a somewhat early end to the sockeye season. Generally, the weekly sockeye CPUE was below the 1980 to 1989 average for the latter half of the season. With a final in-season sockeye run forecast of approximately 108,400 fish, the TAC for Canadian fisheries was 20,000 sockeye salmon (according to Annex provisions). Allowing for the sockeye catch in the upper Stikine fisheries, the total allowable lower



Stikine catch was 16,506 fish. The actual catch of 14,530 sockeye salmon in the lower Stikine commercial catch was 1,976 fish below this target.

Management emphasis switched to coho towards the end of August and the fishery was restricted to two days per week during the early part of the coho season (weeks 34 and 35, August 19 to September 1) due to below average coho CPUE. Additional time was fished in the subsequent two weeks as the run strength improved and CPUE values approached and exceeded average values. The final fishing period (week 38, September 16 to 22) was reduced to two days, in spite of a coho CPUE that was 47% above average, to keep the total harvest in line with the 4,000 coho allocation; a total of 4,020 coho salmon was harvested in the lower Stikine commercial fishery.

Twenty license holders participated in the fishery throughout the season with an average of 11 present each week. Effort was similar to the previous two years, 328 boat-days in 1990 compared to 325 in 1989 and 320 in 1988, well below the 1980 to 1989 average of 455 boat-days. Each license holder was allowed the use of one gill net with a maximum length of 135 meters. A maximum mesh size restriction of 146 mm (to July 15) was implemented to reduce the incidental catch of chinook salmon. As in past years, both drift and set netting techniques were utilized.

#### **Upper Stikine Commercial Fishery**

A small commercial fishery has existed near Telegraph Creek on the upper Stikine River since 1975. The catch recorded in 1990 included 472 sockeye (approximately 77% of the 1980 to 1989 average catch of 613 sockeye salmon), and 68 chinook salmon, including 20 jack (compared to the 1980 to 1989 average of 110 chinook salmon). Fishing effort was similar to that in previous years with one to four people fishing one day per week from late June through the second week of August.

#### **Indian Food Fishery**

The catch taken at the Indian food fishery, centered around Telegraph Creek, was 892 chinook (including 259 jacks), 3,022 sockeye, and 17 coho salmon. The chinook catch was below the 1980 to 1989 average of 1,013 fish, and the sockeye catch was 73% of the 1980 to 1989 average of 4,134 fish and reflected the below average run of Tahltan sockeye salmon. Weekly catches in 1990 and annual catches since 1975 are listed in Appendices A.18 and B.20.

### ***Escapement***

#### **Sockeye**

A total of 14,927 sockeye was counted through the Tahltan Lake weir in 1990. The count was 71% of the 1985 to 1989 average count of 21,083 fish and below the escapement goal range of 20,000 to 40,000 fish (Appendix B.25). The final in-season Stikine Management Model prediction of the Tahltan escapement was 24,701 sockeye salmon, 9,774 above the weir count.

The total spawning escapement for the non-Tahltan stock group is estimated indirectly by computing the ratio of Tahltan to non-Tahltan stocks in the total inriver sockeye run using the stock compositions, estimated with egg diameter analysis, from the inriver test fishery. The ratio is then applied to the estimated inriver Tahltan run size which results in an estimate of the total non-Tahltan run size. The non-Tahltan escapement is estimated by subtracting the estimated catches of non-Tahltan sockeye in the Canadian fisheries. The postseason estimate of non-Tahltan escapement was 22,495 fish, while the final estimate derived in-season from the Stikine Management Model was 34,327 sockeye salmon. Aerial surveys of non-Tahltan sockeye escapement index areas indicated near average numbers of spawners in 1990 (Appendix B.26).

### **Chinook**

For the sixth consecutive year, an enumeration weir was utilized in 1990 to assess the total Little Tahltan River chinook escapement. The 1990 count of 4,392 large adults was slightly below the 1985 to 1989 average of 4,559 while the jack count of 417 was above the 1985 to 1989 average of 375 fish. The chinook escapement (large adults) to the entire Stikine drainage, estimated by multiplying the Little Tahltan Weir count by a factor of 4, was 17,568 fish (Figure 5), near the 1985 to 1989 average of 18,236 fish, but still below the escapement goal range of 19,800 to 25,000 fish. Results from aerial surveys conducted on other tributaries also indicated an average chinook escapement in 1990. Counts for 1990 were: Little Tahltan River, 1,755; Beatty Creek, 271; Tahltan River, 2,134; and Andrew Creek, 664 chinook salmon. The index counts were above the 1985 to 1989 average for Tahltan River and Andrew Creek and below average for Little Tahltan River and Beatty Creek.

### **Coho**

As indicated by the coho catch in the lower Stikine commercial fishery, coho run strength was below average early in the season, was greatest during week 38 (September 16-22), and remained strong during the middle and late season. The CPUE was above the 1980 to 1989 average at the close of the fishery when the quota of 4,000 fish was caught. As in 1986 through 1989, the lower Stikine test fishery was extended to cover the coho migration to determine run timing and relative abundance. If one assumes equal catchability of sockeye and coho salmon in the test fishery nets (unproven assumption), the relative magnitude of the coho run was 36% of the sockeye run. This technique indicated an inriver coho run of 20,659 fish, which was approximately 77% of the 1986 to 1989 average of 26,800 fish. However, aerial surveys of coho index streams indicated an above average run.

### ***Sockeye Run Reconstruction***

The postseason estimate of the total run of Stikine sockeye salmon was 67,242 fish of which 41,013 were non-Tahltan stocks and 26,230 were of Tahltan origin (Table 2). This total run size is 68% of the 1980 to 1989 average run size of 99,602 sockeye salmon. The postseason estimate is based on catch and escapement

data, inriver egg-diameter stock composition data, inriver test fishery run timing data, and scale pattern stock composition data from Districts 106 and 108. The Stikine Management Model, which predicts run size from in-season CPUE and stock composition data, overestimated the total run size by 62%; the final estimate from the model was 108,848.

The Tahltan escapement, counted at a weir, was 14,927 sockeye salmon, 42% below the final in-season Model prediction of 25,673 fish. The postseason estimate of the total escapement to the Stikine River was 37,422 sockeye salmon, 58% of the 1980 to 1989 average.

The estimated smolt-to-adult 1990 return for Tahltan sockeye salmon was 4.0%, slightly below the 1986 to 1989 average of 4.5%. The smolt count in 1990 totalled 607,645 fish, roughly 90% of which originated from the 1988 escapement of 2,536 sockeye salmon. This represents an estimated egg-to-smolt survival of 17% (assumed average fecundity and equal sex ratio), approximately seven times the assumed standard for wild sockeye salmon.

Table 2. Run reconstruction for Stikine River sockeye salmon, 1990. The run includes those stocks which spawn above the U.S./Canada border.

	Tahltan	non-Tahltan	Total
Escapement	14,927	22,495	37,422
Canadian Harvest			
Indian Food	2,720	302	3,022
Upper Commercial	425	47	472
Lower Commercial	5,029	9,501	14,530
Total	8,174	9,850	18,024
% Harvest	78.8%	57.7%	65.7%
Test Fishery Catch	822	1,118	1,940
Inriver Run	23,923	33,464	57,386
U.S. Harvest			
106-41&42	801	1,911	2,712
106-30	114	1,075	1,189
108	1,280	4,239	5,519
Total	2,195	7,225	9,420
% Harvest	21.2%	42.3%	34.3%
Test Fishery Catch	112	324	436
Total Run	26,230	41,013	67,242
Escapement Goal			
Minimum	20,000	20,000	40,000
Maximum	40,000	40,000	80,000
Total Allowable Catch			
Minimum	0	1,013	0
Maximum	6,230	21,013	27,242
Actual Catch	11,303	18,517	29,820

## **TAKU RIVER**

Taku River salmon are harvested in the U.S. gill net fishery in Alaskan District 111, in northern Southeast Alaska seine and troll fisheries, and in the Juneau area sport fishery and inriver personal use fishery (Figure 6). Canadian fisheries for Taku River salmon include a commercial gill net fishery located in the river near the U.S./Canada border, a sport fishery, and an Indian food fishery.

### ***Harvest Regulations***

The 1988 to 1992 harvest and management of Taku River salmon stocks is governed by Annex IV, Chapter 1, of the Pacific Salmon Treaty as negotiated at the February 1988 meeting of the Pacific Salmon Commission. The annex allows Canada to harvest 18% of the TAC of Taku sockeye salmon, 3,000 coho salmon, and incidental catches of other species. This regime is conditional on the Parties proceeding with a cooperative sockeye enhancement program which began in 1990.

Prior to the 1990 fishing season, the Transboundary Technical Committee met to exchange management plans for the Taku River. The results from this exchange are documented in: "Salmon Management Plan for the Transboundary Rivers", Pacific Salmon Commission Transboundary Technical Committee Report TCTR (90)-2, April 1990.

### ***U.S. Fisheries***

Catches in the District 111 drift gill net fishery in 1990 totaled 3,480 chinook, 126,884 sockeye, 67,310 coho, 153,036 pink, and 145,530 chum salmon (Appendix C.1). Catches of sockeye and coho salmon were comprised primarily of mixed wild stocks from the Taku River, Port Snettisham, and other drainages. Catches of chinook, pink, and chum salmon were comprised of both wild and local hatchery stocks. Catches of sockeye and coho salmon were the highest ever recorded in the District 111 gill net fishery (Figure 7 and Appendix D.1). The 1990 sockeye and coho catches were 78% and 81%, respectively, above the 1980 to 1989 averages. The chinook harvest was 67% above the 1980 to 1989 average, a reflection of the presence of a large number of small, immature chinook salmon during the early weeks of the fishery. Pink salmon catches were about average for even years, while chum harvests varied according to the major stocks fished. The summer chum salmon catch (prior to August 19, statistical week 34) was exceptional. The record catch of 112,260 fish was three times the 1980 to 1989 average and is believed to have been primarily comprised of Alaskan coastal wild and hatchery stocks. On the other hand, wild fall chum salmon from Port Snettisham and the Taku River contributed 33,270 fish to the District 111 gill net catch, 65% of the 1980 to 1989 average.

The majority of the sockeye salmon harvest in District 111 (an estimated 86% or 108,499 fish) was of Taku River origin and 14% (18,385 fish) was of Port Snettisham origin, based on scale pattern analysis (Appendices C.3 and C.4). By

stock, the catches were 42,676 (33.6%) Mainstem, 36,332 (28.6%) Tatsamenie, 24,952 (19.7%) Trapper, 14,242 (11.2%) Crescent, 4,539 (3.6%) Kuthai, and 4,143 (3.3%) Speel sockeye salmon. The estimated combined marine commercial and inriver personal use catch of 110,059 Taku sockeye salmon was 72% to 76% of the TAC, approximately 8,278 to 15,658 fish less than the level allowed for in the Annex.

As a result of above average sockeye salmon catches in the District 111 drift gill net fishery and subsequent above average sockeye CPUE recorded at the Canyon Island fish wheels, the weekly fishing time was maintained at three days for the duration of the summer season. An additional 24 hours of fishing was allowed during statistical week 30 (July 22-28), because district catches were high as were fish wheel catches and inriver run size estimates generated by the mark-recapture program. In order to reduce the harvest of immature chinook salmon, the District 111 gill net fishery was closed from 10 pm to 4 am from July 8 to July 18. In addition, portions of Stephens Passage were closed from July 8 to August 1, to provide chum salmon brood stock for the Snettisham Hatchery. This closure also protected Port Snettisham sockeye salmon and was primarily responsible for the minor contribution of these stocks to the District 111 sockeye salmon catch. Despite the closure and the lack of additional fishing time allowed to harvest fish, the summer chum catch was triple the 1980 to 1989 average. Fall management was initiated on August 19 (statistical week 34), when the District 111 gill net fishery was opened for three days. By this time it became clear that the Taku River and Port Snettisham coho runs were above average, but wild chum runs were below average. Consequently, beginning August 26 (statistical week 35), fishing time and area were increasingly reduced to provide protection for the weak chum stocks. The 24-hour extension during the last week of the fishery was in response to extremely poor weather conditions. Because Taku Inlet was closed in the protected waters above Greeley to Cooper points, very little fishing occurred during the initial 24-hour opening.

Several fisheries, other than the commercial fisheries, harvest salmon including transboundary river stocks in District 111. The U.S. personal use fishery located in U.S. portions of the Taku River harvested approximately 52 chinook, 1,560 sockeye, 206 coho, 130 pink, and 92 chum salmon. A small test fishery was again operated in Port Snettisham for one day each week during the month of July and the first week of August. Catches totaled 21 chinook, 57 sockeye, 0 coho, 38 pink, and 217 chum salmon and are believed to be of Port Snettisham origin. The ADF&G Division of Sport Fish estimated that the spring sport fishery near the mouth of the Taku River, open from mid-April to mid-June, caught approximately 700 large mature chinook salmon; although estimates are not made for that area specifically. Several stocks are thought to contribute to the sport fishery, including Taku, Chilkat, King Salmon, and Unuk River stocks and local hatchery stocks, but the majority are believed to be of Taku River origin.

### ***Canadian Fisheries***

The Taku River commercial fishery catch was 1,258 large chinook, 128 jack chinook (fish less than 2.27 kg), 21,100 sockeye, 3,207 coho, 378 pink, and 12 chum salmon and 22 steelhead trout (Appendix C.5). Catches of chinook and sockeye were above the 1980 to 1989 averages of 422 and 15,406 fish, respectively, while

catches of the remaining species were below average (Figure 7, Appendix D.5). The fishery was open for 28 days, near the 1980 to 1989 average. The seasonal fishing effort was 295 boat-days in 1990 compared to the 1980 to 1989 average of 250 boat-days.

In addition to the commercial catches, an Indian food fishery existed in the river in 1990 which took 15 chinook, 74 sockeye, and 74 coho salmon. The inriver test fishery catch was 48 chinook, 285 sockeye, and 472 coho salmon and 20 steelhead trout.

The commercial fishery commenced at noon on Monday, June 25 (statistical week 26). The CPUE for the first two weeks (combined) was more than 40% above average; the CPUE for the first opening was a record. The CPUE values dropped to near average values after these first two weeks; however, the CPUE value recorded for the week of August 6 was the lowest on record for that week. Unusually high water conditions persisted throughout the fishing season. The fishery was closed for the season August 21, when the Treaty limit of 3,000 coho salmon was attained.

Forecasts of the total sockeye return were made on a regular basis using data collected from the Canada/U.S. tagging program and catch statistics reported from U.S. District 111 and Canadian gill net fisheries. The forecasts were used in conjunction with historical timing information to develop both seasonal and weekly cumulative catch guidelines for the Canadian fishery (Table 3); weekly fishing times were adjusted according to these guidelines. The first in-season run forecast was made in week 27 at which time a total run of 183,000 to 281,000 sockeye salmon was predicted. A wide range is typical for the initial weeks of the season due to uncertainty over run timing; the range narrows as the season progresses. The run projections increased from week 27 to a maximum forecast of 255,000 to 309,000 fish in weeks 31 and 32 and, thereafter, decreased to a final in-season estimate of 229,000 in week 34. The forecasts used in weeks 33 and 34 were the lower numbers in the ranges since it was obvious by this time that the run timing was earlier than normal. The predicted season allowable catch for the Canadian fishery ranged from 23,000 fish predicted in week 28 to approximately 36,000 fish in weeks 30 through 32. By the end of the season, the TAC had dropped to about 27,000 sockeye salmon.

Table 3. Canadian in-season forecasts of total run size, TAC, and Canadian TAC of Taku sockeye salmon, 1990.

Stat. Week	Run Forecast			Total TAC	Canada TAC	Escapement
	Lower	Upper	Used			
27	183,000	281,000	232,000	152,000	27,000	80,000
28	170,000	245,000	208,000	128,000	23,000	80,000
29	238,000	306,000	272,000	192,000	35,000	80,000
30	253,000	307,000	280,000	200,000	36,000	80,000
31	255,000	309,000	282,000	202,000	36,000	80,000
32	255,000	309,000	282,000	202,000	36,000	80,000
33	244,000	274,000	244,000	164,000	30,000	80,000
34	229,000	257,000	229,000	149,000	27,000	80,000

The final Canadian in-season estimate of TAC was approximately 149,000 to 154,000 sockeye salmon excluding any allowance for District 112 seine interceptions. Canadian fishermen caught 21,174 sockeye salmon (commercial plus IFF catch), or roughly 14% of the aforementioned estimates of the sockeye TAC, which was 4,802 to 6,422 fish less than allowed under the Annex.

The combined commercial and Indian food fishery catch of coho salmon totaled 3,281 fish which slightly exceeded the Annex provision of 3,000 fish.

As in recent years, both set and drift gillnetting techniques were utilized with the majority of the commercial catch taken in drift gill nets. Mesh sizes were restricted to less than 146 mm through July 15 to minimize the incidental catch of chinook salmon.

### **Escapement**

#### **Sockeye**

Total spawning escapement in the above-border is estimated from the joint U.S./Canada mark-recapture program. The estimated escapement of 92,795 fish was 6% above the 1985 to 1989 average of 87,390 fish (Figure 8 and Appendix D.8) and was over the upper limit of the escapement goal range of 71,000 to 80,000 sockeye salmon.

Escapement counts are made at several weirs throughout the Taku drainage. The escapement of 9,443 fish through the Little Trapper Lake weir was below the 1985 to 1989 average of 12,180 sockeye salmon and the escapement through Little Tatsamenie Lake weir of 5,706 fish was slightly below the 1985 to 1989 average of 6,456 sockeye salmon. A weir was also operated at the Nahlin River in 1990 and a total of 2,515 sockeye salmon was counted. Helicopter surveys of the mainstem Taku River were made during the fall of 1990 and good spawning demislies of fish were observed at several spawning locations. The escapements of Port Snettisham stocks were mixed. A record total of 18,064 sockeye salmon was counted through the Speel Lake weir, 48% higher than that observed in the next highest year (1989), and over twice the 1985 to 1989 average of 7,089 fish. The sockeye count at the Crescent Lake weir was 1,262 fish, below the 1985 to 1989 average of 4,162 fish. However, the actual escapement to Crescent Lake in 1990 is unknown because the weir was underwater for extended periods of time after several heavy rainstorms allowing fish to pass uncounted.

#### **Chinook**

Above average escapements were observed in most of the Taku chinook tributaries surveyed in 1990. The total chinook escapement estimates of 21,278 (U.S.) and 24,498 (Canada) fish were generated from aerial survey counts expanded to account for the entire drainage escapement. The U.S. estimate is made by expanding the combined Nahlin and Nakina counts by a factor of 1/0.45 and the Canadian estimate is made by expanding the combined Nahlin, Nakina, Kowatua, Tatsatua, Tseta, and Dudidontu counts by a factor of two. These estimates were the largest observed since the aerial survey indices were standardized in 1974, but were still below

escapement goals of 25,600 (U.S.) and 30,000 (Canada). Escapement estimates for 1979 to 1990 are shown in Figure 9.

### Coho

Water conditions at Canyon Island in the Taku River in late summer and fall remained suitable for fish wheel operation, allowing a substantial but unknown portion of the coho run to be tagged. Mark-recapture and test fishery information indicated that the interim above-border escapement goal of 27,500 to 35,000 fish was exceeded and that the overall coho escapement was strong.

The mark-recapture estimate of run size through the end of the inriver commercial fishery (statistical week 34, August 23) was 22,454 fish. This is similar to run size estimates for comparable time periods from 1987 to 1989. Tag-recovery after the end of the commercial fishery was limited to the test fishery catches; few tags were recovered and the precision of the resulting run size estimates for this time period was poor. The mark-recapture estimate of inriver run size through the end of the test fishery (September 29) was 75,036 fish. A second method of estimating the above-border run size was made by expanding the inriver estimate through week 34 by the proportion of the cumulative test fishery CPUE that occurred after this time; the estimate was 85,053 fish. A total of 3,753 coho salmon were harvested from the above-border run.

Only limited, comparable, index escapement data exists for Taku coho salmon. A total of 907 coho salmon was counted through the Yehring Creek weir. The weir was inundated by high water on several occasions which presumably allowed fish to pass uncounted. A mark-recapture estimate of the total coho escapement to this index system was 2,522 fish. The escapement count of coho salmon at the Little Tatsamenie Lake was 529 fish counted through the weir and 140 fish counted holding below the weir when it was removed. The aerial counts of coho salmon in Flannigan Slough were 414 fish, 28% of the 1986 to 1989 average of 1,475 fish; however, surveyors felt that the count occurred late in the run and was not an accurate reflection of run strength. Survey counts for the Dudidontu River and upper portions of the Nahlin River were 25 and 256 fish, respectively. Both counts were below the respective 1986 to 1989 averages, an indication that early run coho stocks may not have been as strong as the rest of the Taku River coho run.

### Pink

Mark-recapture techniques were not used in 1990 to estimate the escapement of pink salmon to the Taku River because the magnitude of the even-year run is typically very small. Therefore, no estimate of system-wide escapement is available. Catches in the lower river ADF&G/DFO fish wheels totaled 13,358 fish, over twice the recent (1986 and 1988) even-year average of 5,628 fish; however, it is not known how accurately these catches reflect true abundance.



## Chum

A system-wide escapement estimate for chum salmon is not available. Limited aerial survey observations of the principal known spawning areas revealed that below-average numbers of fish were present. If one assumes equal catchability of coho and chum salmon in the test fishery nets (unproven assumption), the relative magnitude of the chum salmon run was approximately 40% of the coho run.

## Sockeye Run Reconstruction

The estimated total Taku sockeye salmon run was 224,313 fish (Table 4). This represents the largest run since total run statistics have been tabulated (1984) and is 42% above the 1985 to 1989 average of 158,279 fish. The total catch of Taku sockeye salmon in the U.S. District 111 and U.S. and Canadian inriver fisheries was 131,518 fish and the escapement was 92,795 fish. The escapement was above the upper level of the escapement goal range of 71,000 to 80,000 sockeye salmon. The U.S. District 111 harvest and inriver personal use harvest of 110,059 fish was 83.9% of the total harvest and the Canadian commercial and food fishery harvest of 21,174 fish was 16.1%. The Canadian test fishery catch of 285 sockeye salmon is not included in these calculations. Based on the escapement goal range, the TAC was 144,313 to 153,313 sockeye salmon. The U.S. harvested 71.8% to 76.3% of the TAC and Canada harvested 13.8% to 14.7% of the TAC. In addition, an estimated total of 18,385 Port Snettisham sockeye salmon were harvested in District 111, while at least 19,326 fish escaped into Crescent and Speel Lakes.

Table 4. Taku sockeye salmon run reconstruction, 1990. Run reconstructions is for Taku sockeye stocks that spawn above the border as they enter District 111 off the mouth of the Taku River.

	Taku	Snettisham
Escapement	92,795	19,326 a/
Canadian Harvest		
Commercial	21,100	
Food Fishery	74	
Total	21,174	
% Harvest	16.1%	
Test Fishery Catch	285	
Above Border Run	114,254	
U.S. Harvest		
District 111	108,499	18,385
Personal Use	1,560	
Total	110,059	
% Harvest	83.9%	
Test Fishery Catch	none	85
Total Run	224,313	37,796
Taku Harvest Plan	Minimum	Maximum
Escapement Goal	71,000	80,000
TAC	153,313	144,313
Canadian Portion	0.138	0.147
U.S. Portion	0.718	0.763

a/ Count incomplete due to water over weir.

## **ALSEK RIVER**

Alsek River salmon stocks contribute to the U.S. commercial gill net fisheries located in Dry Bay, at the mouth of the Alsek River (Figure 10). Some salmon of Alsek origin may also be taken in U.S. commercial gill net and troll fisheries in the Yakutat area. No commercial fishery exists in the Canadian portions of the Alsek River drainage, although Indian food and sport fisheries occur in the Tatshenshini River and some of its headwater tributaries (Figure 10).

### ***Harvest Regulations***

Although catch sharing of Alsek salmon stocks between Canada and the U.S. has not been specified, Annex IV does call for a cooperative attempt to rebuild depressed chinook and early-run sockeye stocks. Interim escapement goals for Alsek chinook, sockeye, and coho salmon have been set by the Transboundary Technical Committee at 7,200 to 12,500 chinook, 33,000 to 58,000 sockeye, and 5,400 to 25,000 coho salmon.

### ***U.S. Fisheries***

#### **Catch and Effort**

The U.S. Dry Bay set gill net fishery catch was 78 chinook, 17,013 sockeye, 1,437 coho, 0 pink, and 495 chum salmon (Appendix E.1). Catches of all species were below the 1980 to 1989 averages in this fishery (Figure 11, Appendix E.4).

The Dry Bay commercial gill net fishery opened for the season on June 18 and closed on September 20. Fishing effort was slightly above average through mid-July but fell below average through late August and returned to average levels late in the season. In 1990 the entire catch was made inriver; no catch was made in the surf fishery at the mouth of the Alsek River.

The preseason forecast indicated poor runs of chinook, early-run sockeye, and coho salmon in 1990, but an average run of late-run sockeye salmon. The fishing season opening in Dry Bay was delayed two weeks relative to historical patterns because of the expectations of poor early runs. The fishing season opened on June 18 with normal effort levels and was limited to a one-day opening in order to conserve chinook and early sockeye stocks. Fishing success was better than expected; consequently, the fishing periods for the next two weeks were increased to two days per week. Because above average CPUE levels and initial predictions generated by two ADF&G sockeye salmon management models indicated an above average run of sockeye salmon, weekly fishing periods were increased to three days per week for the remainder of the season. The total harvest of 17,013 sockeye salmon was slightly less than the 1980 to 1989 average (Figure 11), but better than in the last three years.

The U.S. Dry Bay gill net fishery typically catches few Alsek chinook salmon (Figure 13). With the delayed opening of the fishery in recent years, most of

the chinook run passes through the fishery prior to the opening date. In addition, a 6-inch maximum mesh size restriction through early July has been in effect since 1987, effectively eliminating the use of chinook gear. The total catch of 78 chinook salmon was the second lowest catch since 1964.

Fishing success for coho salmon in the fall was poor. As a result, the fishing season was terminated on September 20. The total coho catch of 1,437 fish was the second lowest catch since 1964.

A total of 495 chum salmon was taken in the fishery, 55% of the 1980 to 1989 average. No pink salmon were caught in 1990.

### Sockeye Management Model

ADF&G managers have used a model for managing the sockeye harvest since 1984. This model worked well in predicting the total season catch and escapement during the years 1984 through 1988. It did not work well in 1989, but a postseason review indicated that the model had not been correctly updated. Two management models, an updated original harvest rate model and a multiple regression model, produced highly accurate predictions of the Alsek River sockeye salmon run in 1990 (Table 5) and proved valuable in managing the fishery.

Table 5. In-season U.S. forecasts of the total 1990 Alsek River catch, Klukshu River escapement, and total (Alsek River catch + Klukshu escapement) using two predictive models.

Stat. Week	Start Date	Harvest Rate Model			Multiple Regression Model		
		Total Catch	Klukshu Escapement	Total	Total Catch	Klukshu Escapement	Total
27	01-Jul	17,653	24,198	41,851	13,326	25,985	39,311
28	08-Jul	22,786	31,700	54,486	14,494	37,633	52,127
29	15-Jul	21,169	27,765	48,934	15,253	27,885	43,138
30	22-Jul	19,829	26,199	46,028	17,107	28,248	45,355
31	29-Jul	17,813	22,525	40,338	16,784	26,627	43,411
Actual		16,852	25,995	42,847	16,852	25,995	42,847

### Canadian Fisheries

The center of Indian food fishing activity in the Alsek drainage occurs at the Champagne/Aishihik Indian village of Klukshu, on the Haines Road, approximately 60km south of Haines Junction, Yukon Territory. Fish are harvested by means of gaff and traditional fish traps as the fish migrate up the Klukshu River into Klukshu Lake. As in 1989, the Indian fish trap fishery remained closed until mid-July at which time, and until August 15, only trapping by elders was permitted for one day each week. A catch ceiling of 10% to 15% of the weir count was in effect during this period; however, it was not needed since effort was minimal. The early season restrictions were implemented to conserve chinook and

early run sockeye salmon. After August 15, fishing with traps was allowed four days per week. The gaff fishery was managed as follows:

Prior to August 15, only elders were allowed to fish with a gaff in the Klukshu River system. Other designated tributaries, such as Village Creek and the Blanchard River, were open for gaffing to other band members for three days each week.

After August 15, gaffing was permitted by all band members for four days per week in all systems.

After September 20 the fishery was opened for unlimited time.

The Indian food fishery catch was 173 chinook and 2,012 sockeye salmon. The food fishery catch data was summarized weekly from daily catch statistics gathered during the fishing periods.

The majority of the sport fishing effort on the drainage occurs on the Tatshenshini River, at and just downstream of the mouth of the Klukshu River in the vicinity of the abandoned settlement of Dalton Post. The retention of sockeye salmon in the recreational fishery was prohibited prior to August 15 to protect early runs. The daily salmon catch limit was two fish and only one could be a chinook salmon. The possession limit was twice the daily unit. Sport fishing in the area where effort traditionally concentrates, i.e. Dalton Post, was open from 6:00 am Saturday to 12:00 noon Tuesday each week. After September 20, the sport fishery was open 7 days per week.

The sport fishery catch was approximately 555 chinook, 392 sockeye, and 75 coho salmon. These catches represent a 96% increase in the chinook catch and 15% and 27% decreases, respectively, in the sockeye and coho catches from the 1980 to 1989 averages. The increase in the chinook catch may be attributable to the above normal contribution of Takhanne bound chinook salmon to the fishery. The catch data was derived from a creel census program conducted in the Dalton Post area by the Klukshu weir personnel. Additional catch data was collected in other areas/tributaries by a DFO patrol officer.

### ***Escapement***

It is currently not possible to accurately assess whether Alsek escapement goals are being met because total drainage enumeration programs are not established. A large, but unknown and presumably variable proportion of the escapement of each species is enumerated at the weir on the Klukshu River. Current escapement monitoring programs including the Klukshu weir and aerial surveys do, however, allow annual comparisons of escapement indices. The most reliable comparative escapement index for Alsek drainage salmon stocks is the Klukshu River weir count.

## **Sockeye**

A total of 25,995 sockeye salmon was counted through the Klukshu weir in 1990 (Figure 12), consisting of 1,316 early run (prior to August 16) and 24,679 late run sockeye salmon. The early run component was below the 1985 to 1989 average of 1,642 fish, while the late run component was well above the average of 15,730 fish. For the second consecutive year, an excellent run of sockeye salmon was recorded in Village Creek, where 7,500 fish passed through an electronic counter (Appendix E.8). Aerial surveys of tributaries on the U.S. side of the border (Appendix E.8) gave mixed results but the Tanis River count of 3,500 was more than twice the 1985 to 1989 average for this system.

## **Chinook**

A total of 1,915 chinook salmon was counted through the Klukshu weir in 1990 (Figure 13). This count was close to the 1984 to 1989 average of 2,039 fish (Appendix E.7). The escapement through the upstream food fishery was 1,742 chinook salmon. Estimates of the escapement to the entire Alsek River drainage have been generated by expanding the Klukshu weir count by a factor of 1/0.64 (U.S.) and by a factor of 2.0 (Canada) and subtracting the upriver Canadian catches. These expansion factors represent professional judgement; their accuracy is poorly understood and they are currently under review by the Transboundary Technical Committee. For 1990, these expansions yield estimates of escapement to the entire drainage of 2,264 (U.S.) and 3,102 (Canada) fish. The escapement goal range is from 7,200 (U.S.) to 12,500 (Canada) fish. Aerial surveys were again conducted in 1990 for several other index streams. The count of 325 fish in the Takhanne River exceeded the 1984 to 1989 average of 220 fish, while the count of 32 chinook salmon in Goat Creek was less than the average count of 69 fish.

## **Coho**

The coho run to the Alsek River was poor. A total of 315 coho salmon was counted through Klukshu River weir (Figure 14). The count was below the 1986 to 1989 average of 1,317 fish (Appendix E.7); however, this is not a total count since the weir is removed prior to the end of the coho migration. Results of aerial surveys conducted on U.S. coho index streams were above average.

## **Run Reconstruction**

Expectations for the sockeye run in 1990 were for a poor early-run and average late-run. The run developed as expected with a total sockeye harvest near average but an excellent escapement of 25,995 fish through the Klukshu weir (Table 6). The early portion of the escapement through the Klukshu weir was below average.

Estimates of the Klukshu contribution to the total sockeye run to the Alsek drainage vary from 37%, as estimated from an ADF&G mark-recapture study in 1983, to 60%, based on Canadian fishery managers' professional judgement. Total

escapement to the Alsek River is estimated by dividing the Klukshu weir count by the estimated Klukshu percent contribution and then subtracting the sport and Indian food fishery catches. The estimated escapement added to the U.S. commercial and subsistence catches yields an estimate of the entire Alsek run. Using the 37% to 60% contribution range, the estimated sockeye escapement in the Alsek River was on the order of 41,000 to 68,000 fish and the estimated total Alsek sockeye run was on the order of 58,000 to 85,000 sockeye salmon. The interim escapement goal for the Alsek River is from 33,000 (U.S.) to 58,000 (Canada) fish.

Table 6. Catch and Klukshu index escapement data for Alsek sockeye, chinook, and coho salmon for 1990.

	Sockeye	Chinook	Coho
Escapement Index <sup>a/</sup>			
Klukshu Weir Count	25,995	1,915	315
Klukshu Escapement <sup>b/</sup>	24,607	1,742	
Harvest			
U.S. Commercial	17,013	78	1,437
U.S. Subsistence	144	85	12
Canadian Sport	392	555	75
Canadian Indian Food	2,012	173	0
Total	19,561	891	1,524

a/ Klukshu River salmon stocks represent an assumed large and variable portion of the total Alsek River salmon escapement.

b/ Some of the Canadian Indian food fishery occurs above Klukshu weir, so these catches are subtracted from weir counts to represent the spawning escapement.

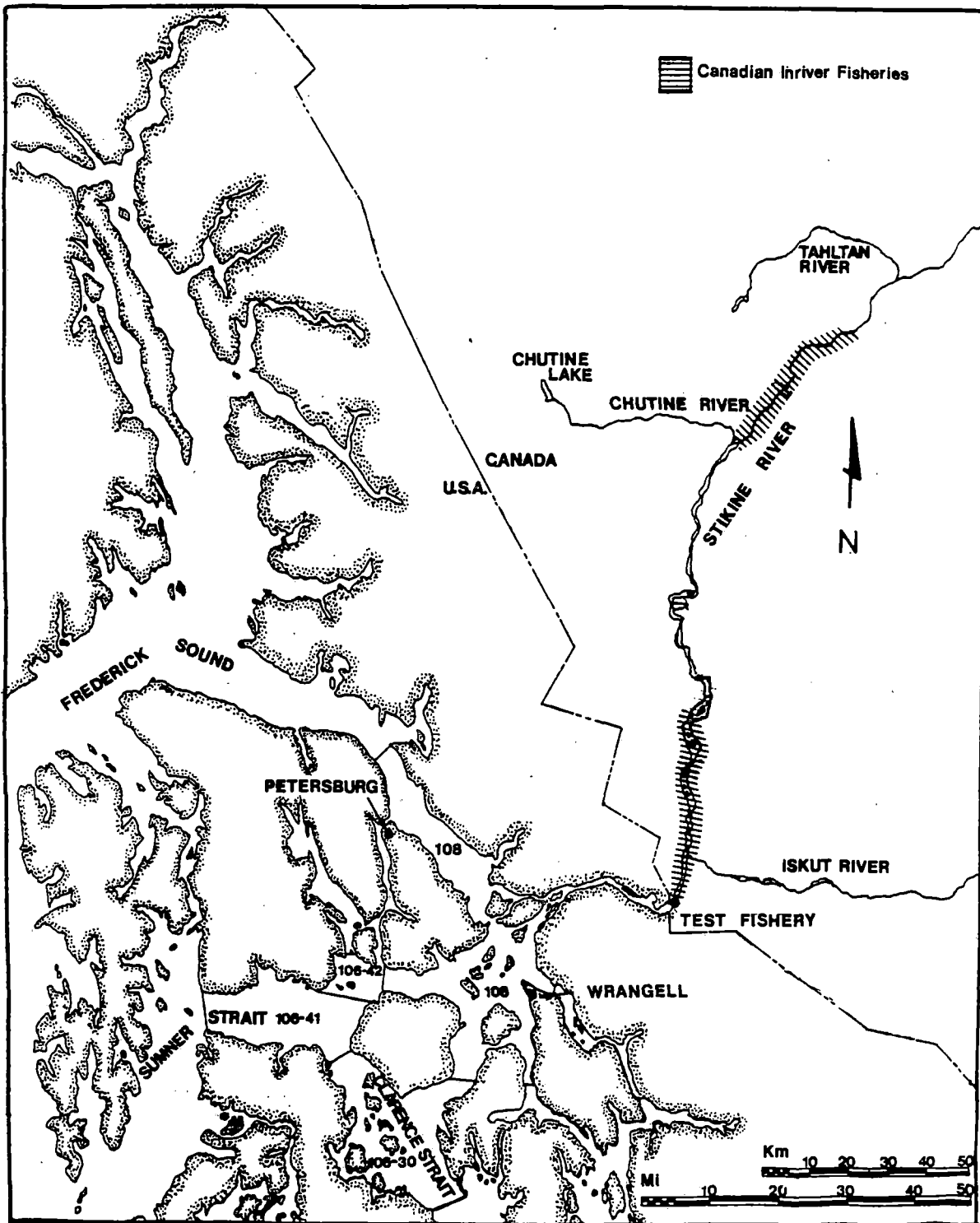


Figure 1. The Stikine River and principal U.S. and Canadian fishing areas.

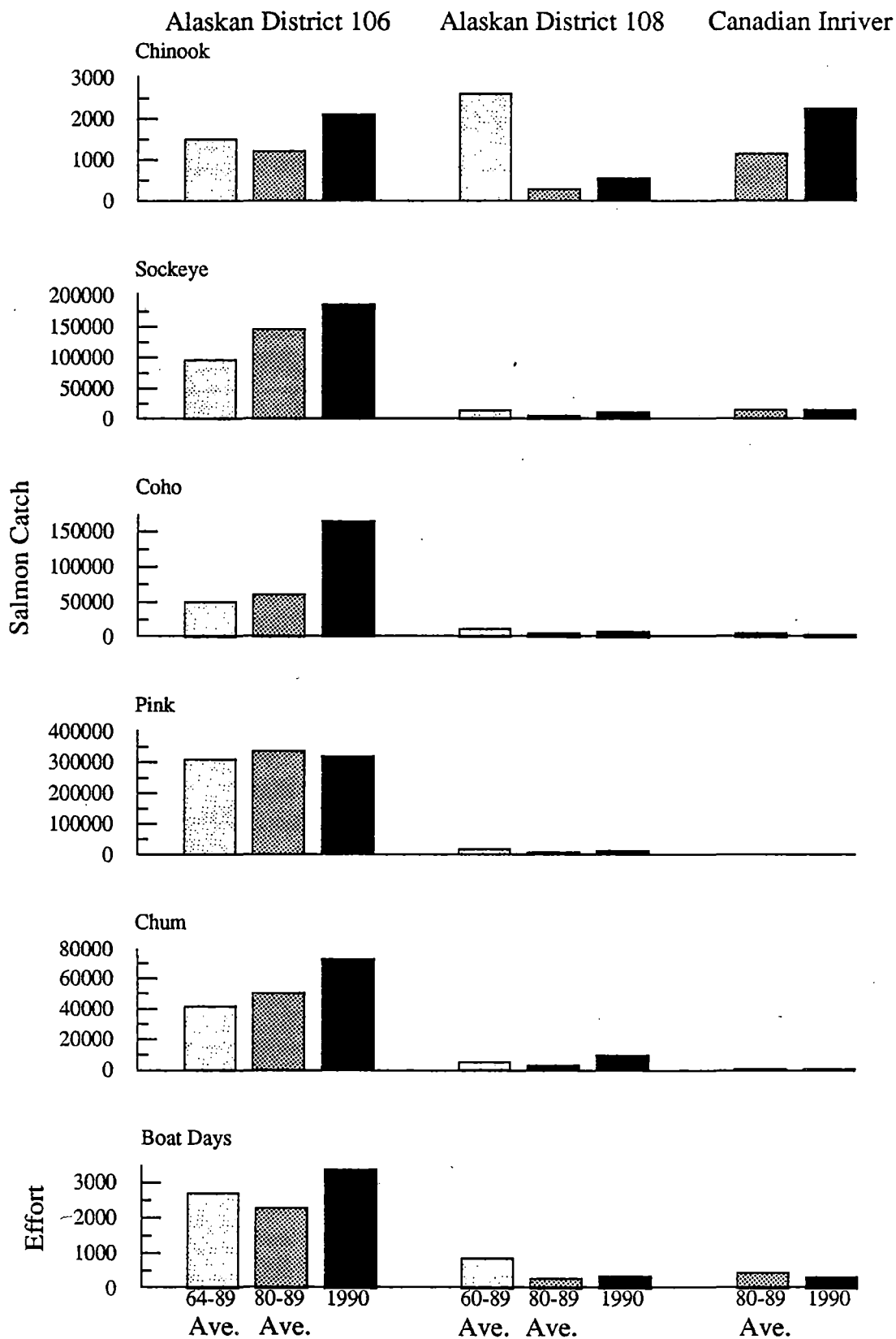


Figure 2. Average catches and fishing efforts compared with 1990 values for the Alaskan Districts 106 and 108 and for the Canadian commercial fisheries in the Stikine River.



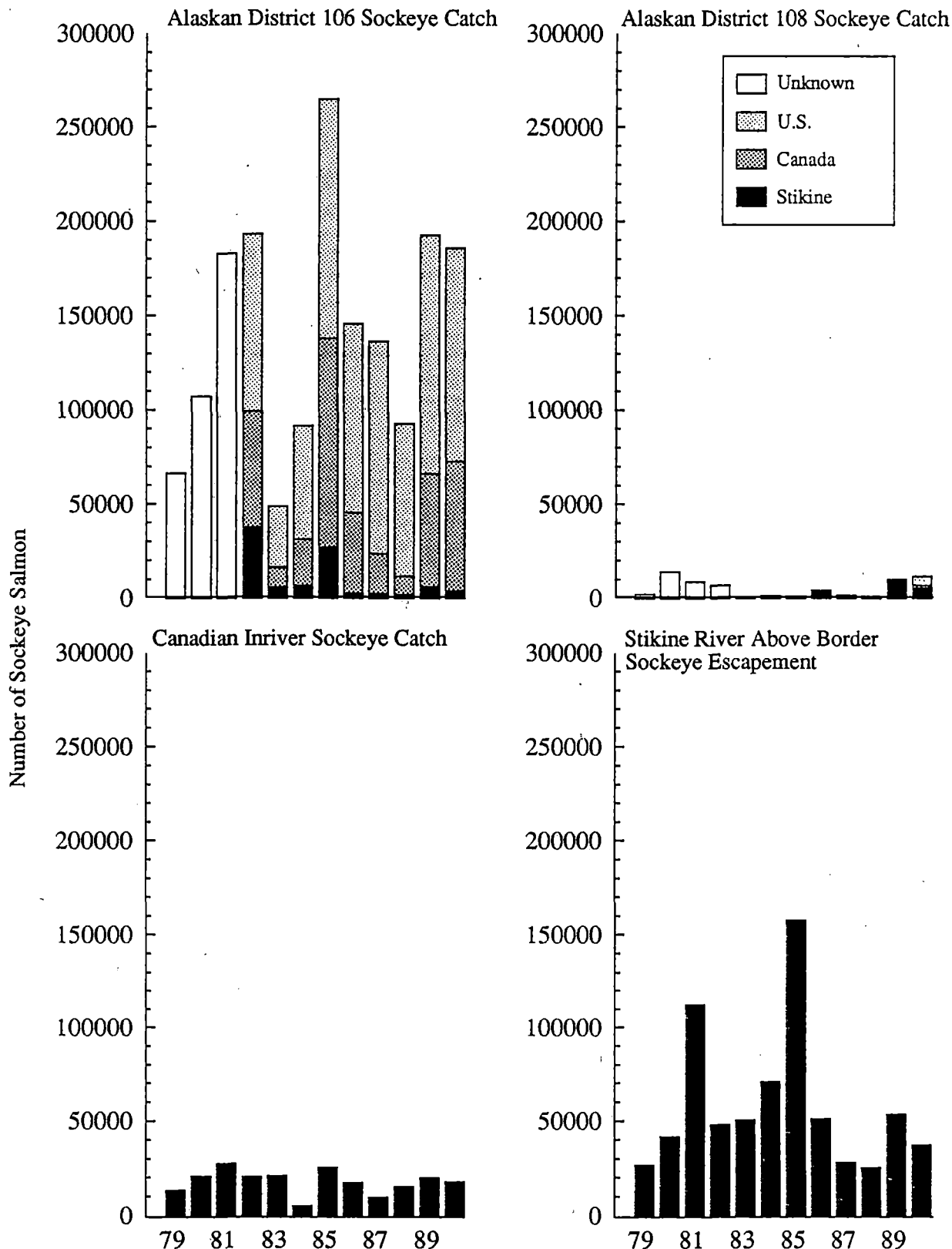


Figure 3. Sockeye catches for the Alaskan Districts 106 and 108 and the combined Canadian fisheries in the Stikine River and Stikine sockeye escapements, 1979-1990. Effort is for commercial fisheries only.

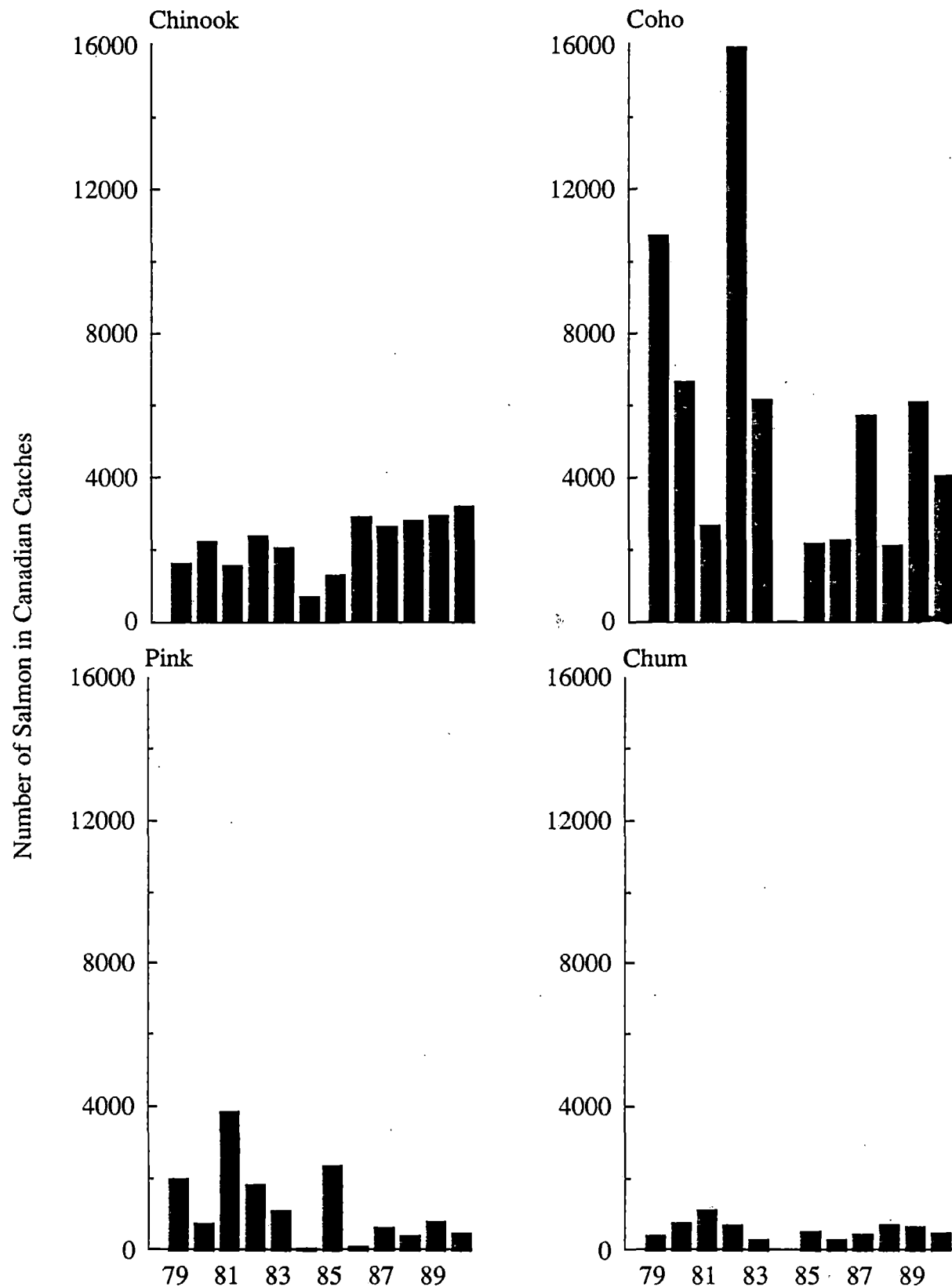


Figure 4. Catches of chinook, coho, pink, and chum salmon in the combined Canadian fisheries in the Stikine River, 1979-1990.

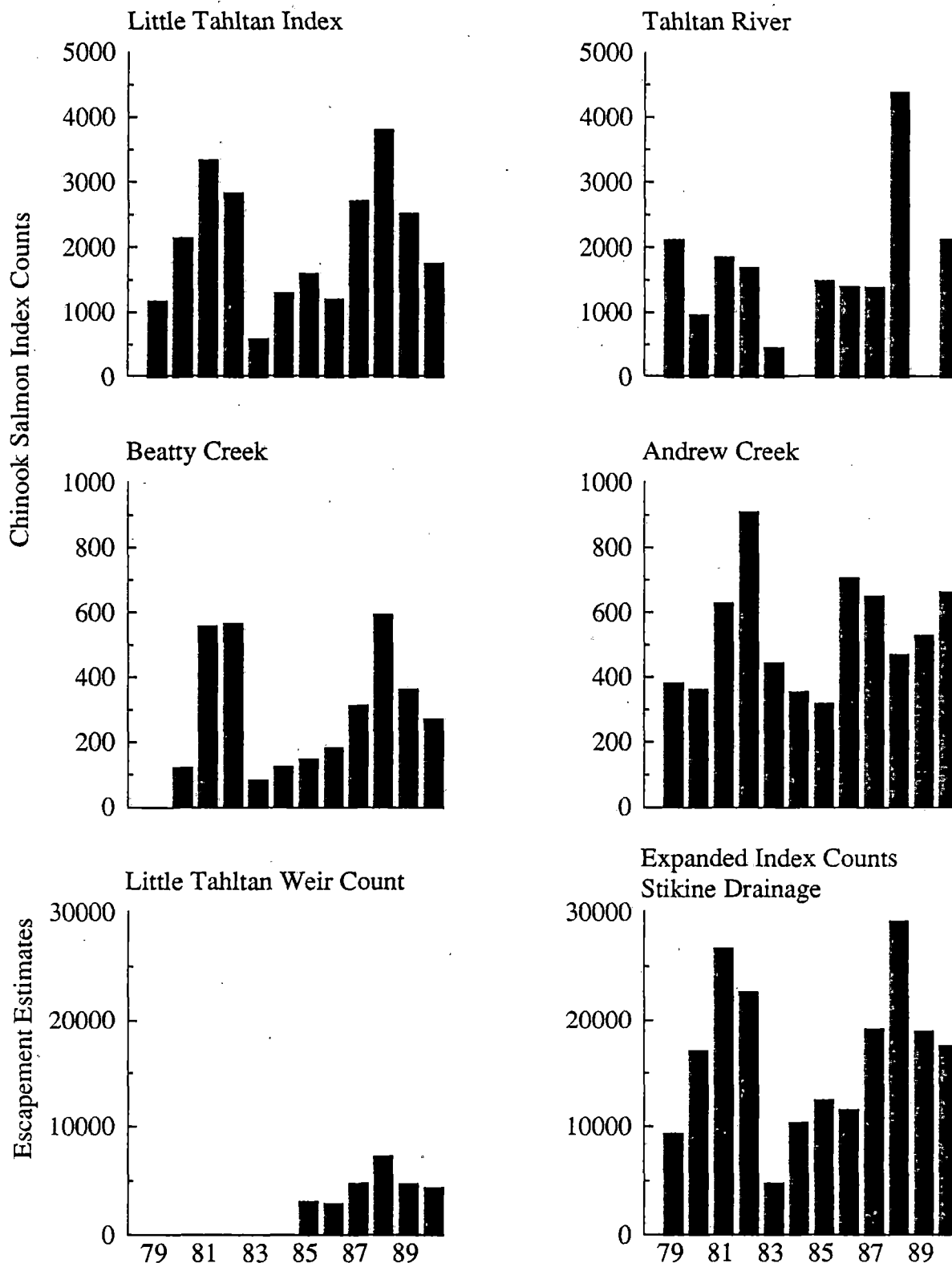


Figure 5. Chinook salmon weir counts and index escapement estimates for major spawning areas and for the entire Stikine River, 1979-1990.

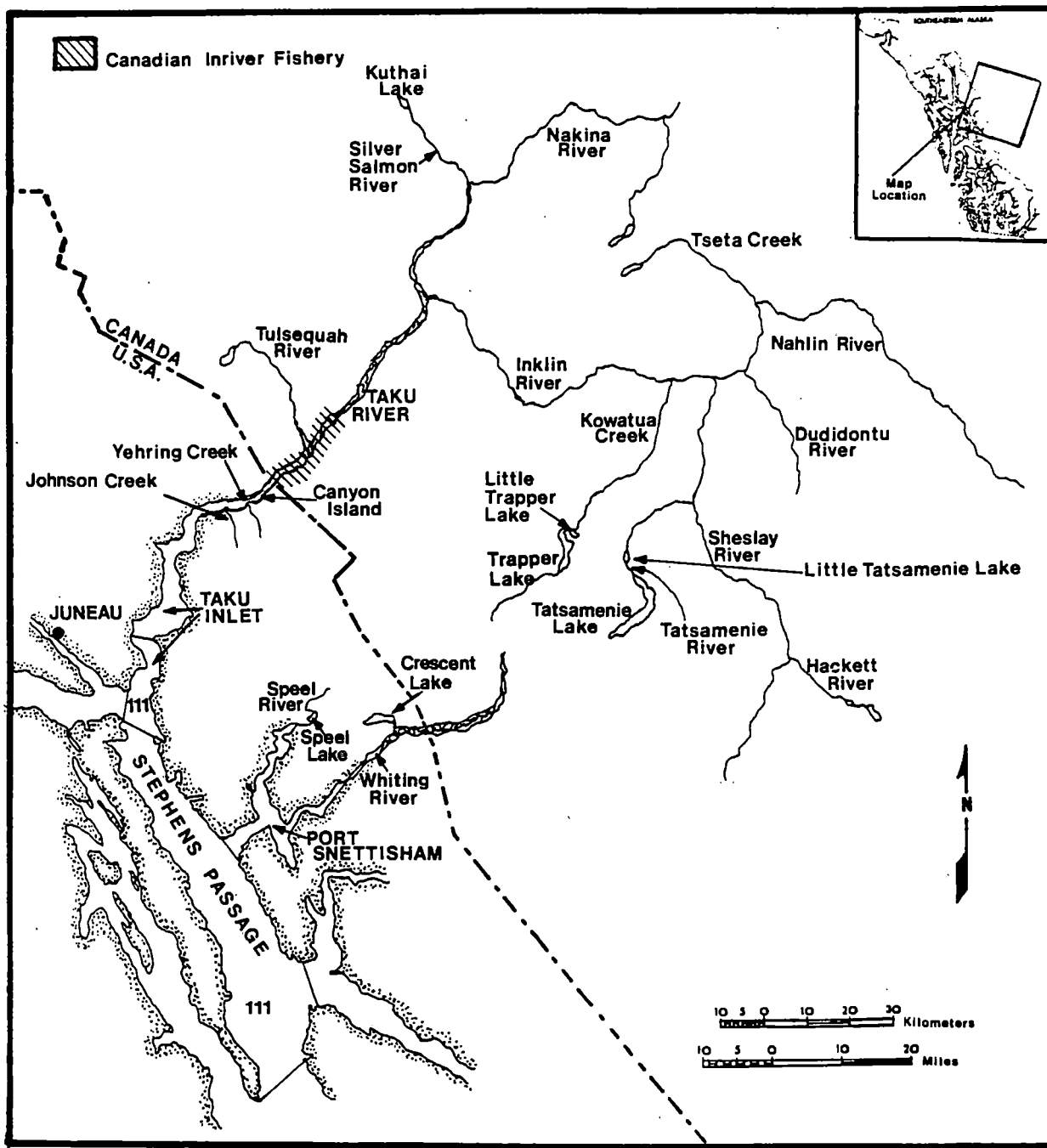


Figure 6. The Taku River and principal U.S. and Canadian fishing areas.

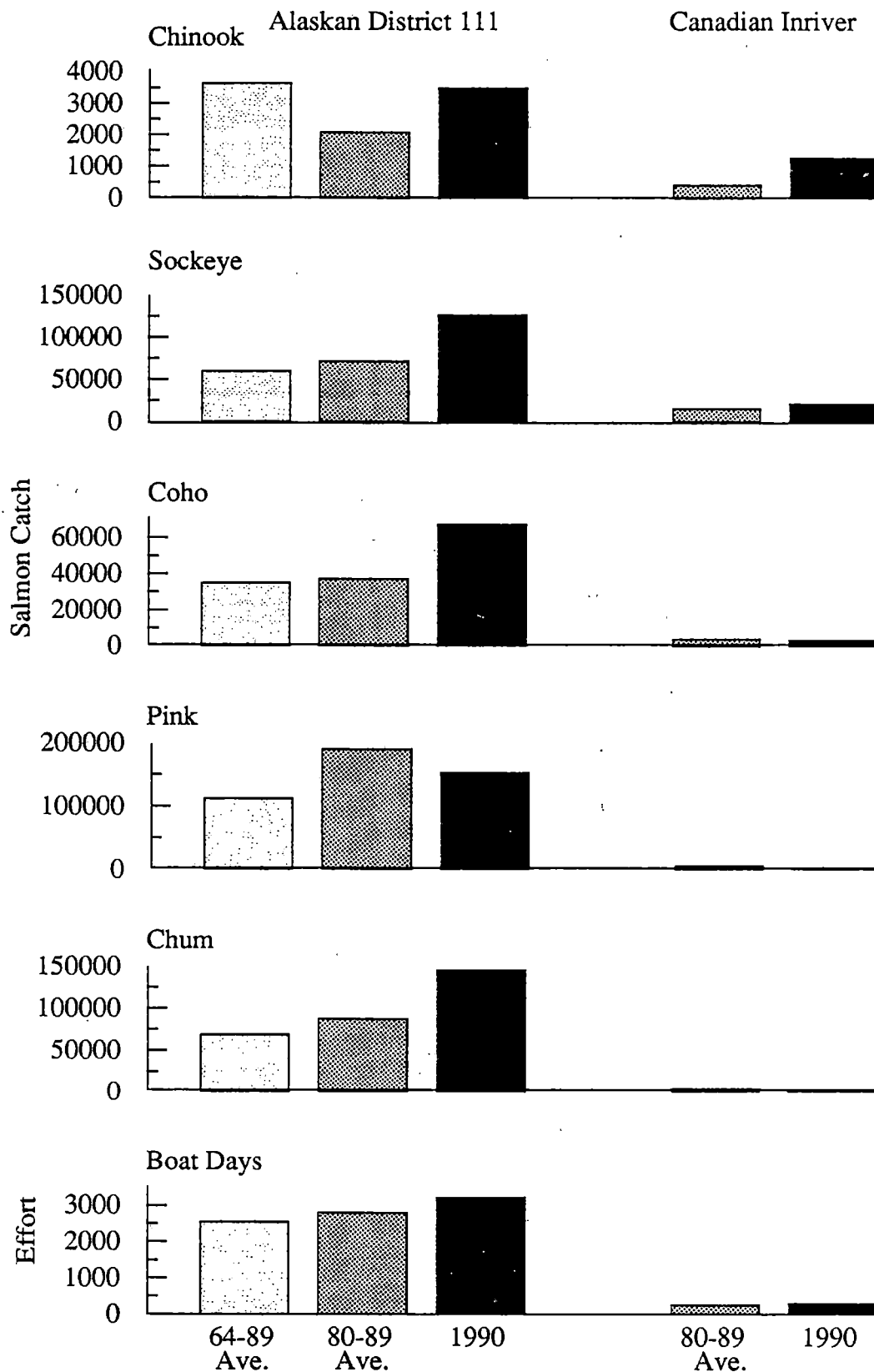


Figure 7. Average catches and fishing efforts compared with 1990 values for the Alaskan District 111 commercial fishery and the Canadian commercial fishery in the Taku River.

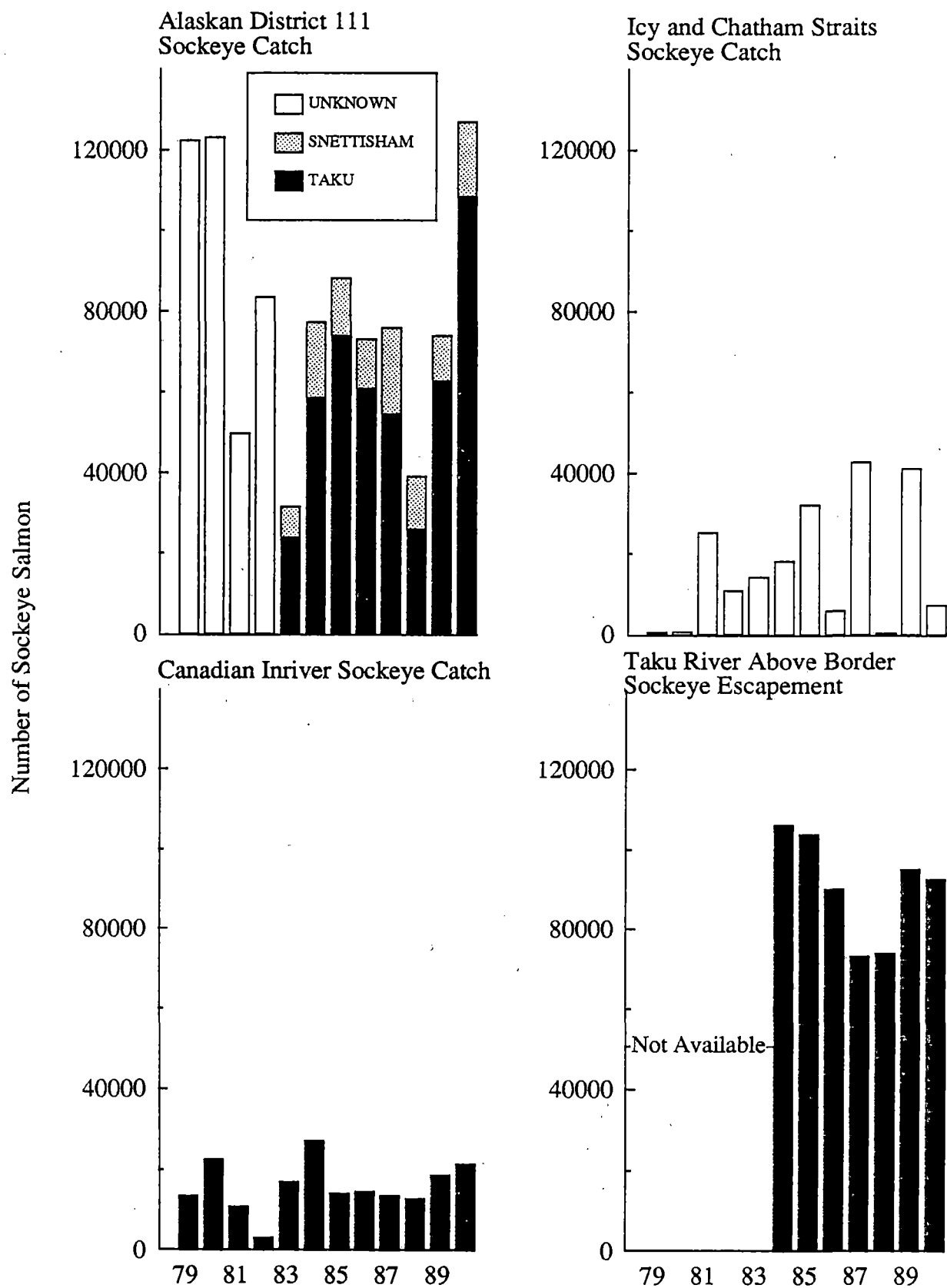


Figure 8. Sockeye catches for the Alaskan District 111, the Icy and Chatham Straits, and the combined Canadian fisheries in the Taku River and Taku sockeye escapements, 1979-1990.

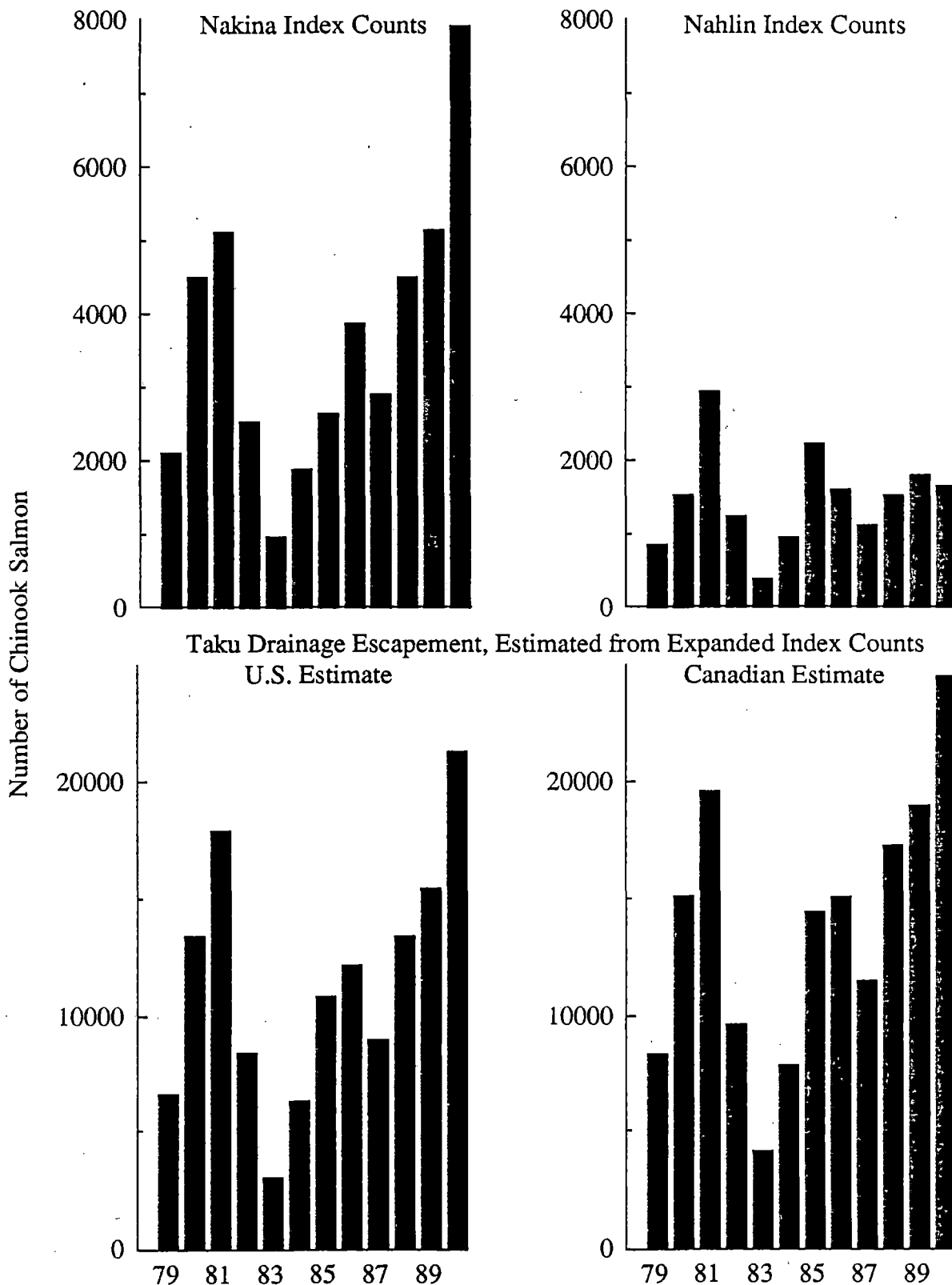


Figure 9. Chinook index escapement estimates for major spawning areas and for the entire Taku River, 1979-1990.

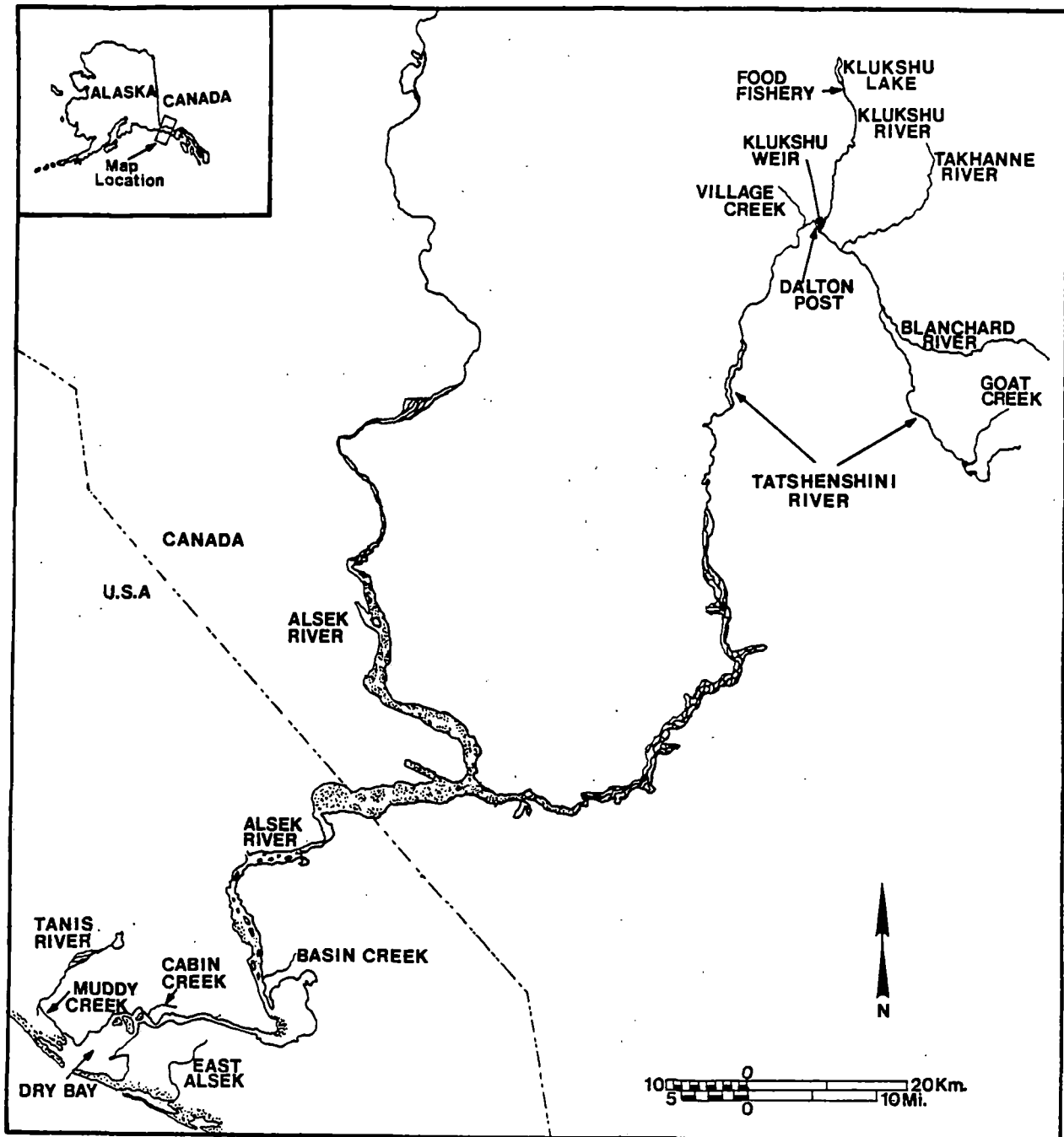


Figure 10. The Alsek River and principal U.S. and Canadian fishing areas.



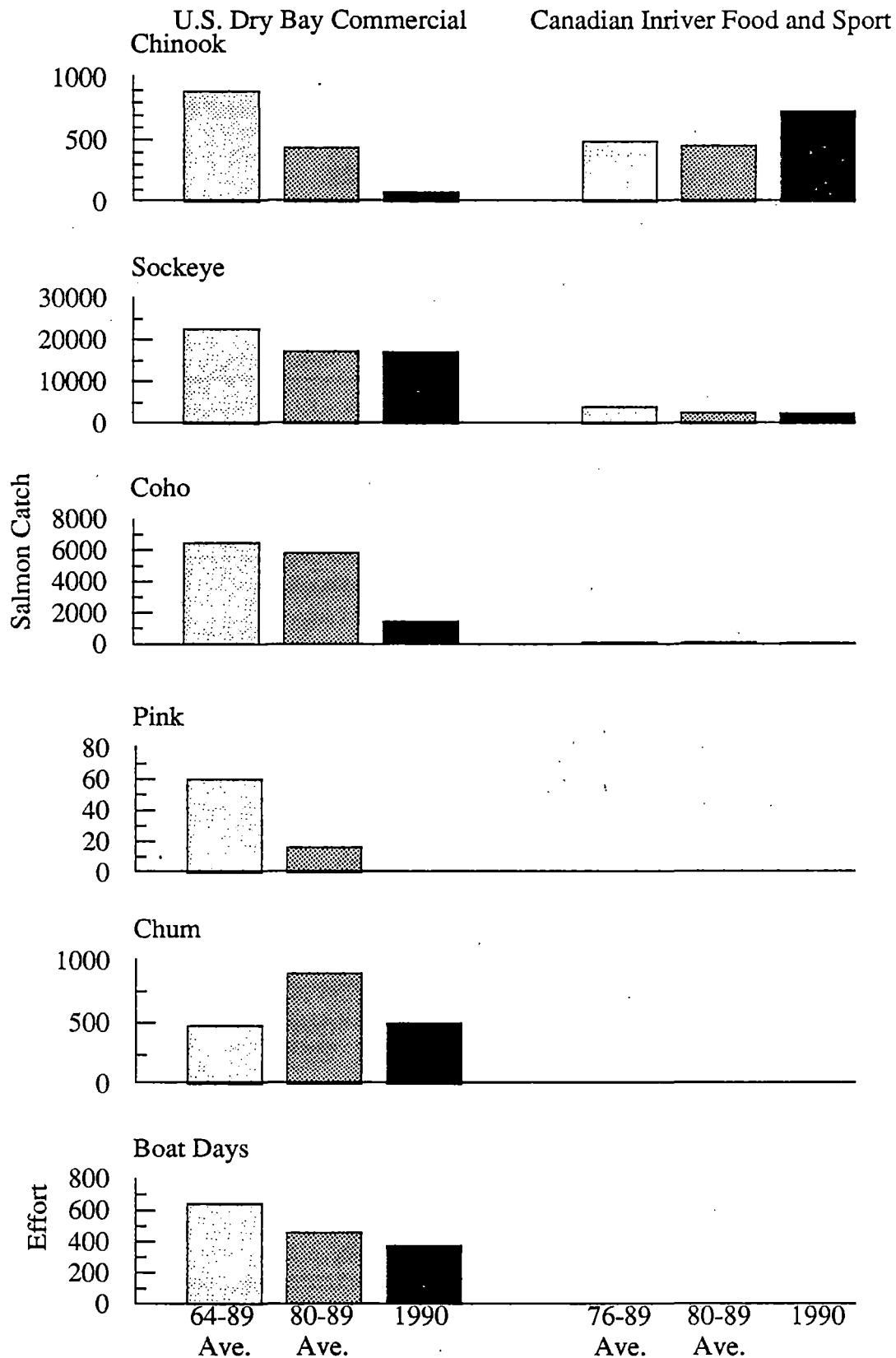


Figure 11. Average catches and fishing efforts compared with 1990 values for the Alaskan Dry Bay commercial fishery and the Canadian combined food and recreational fisheries in the Alsek River.

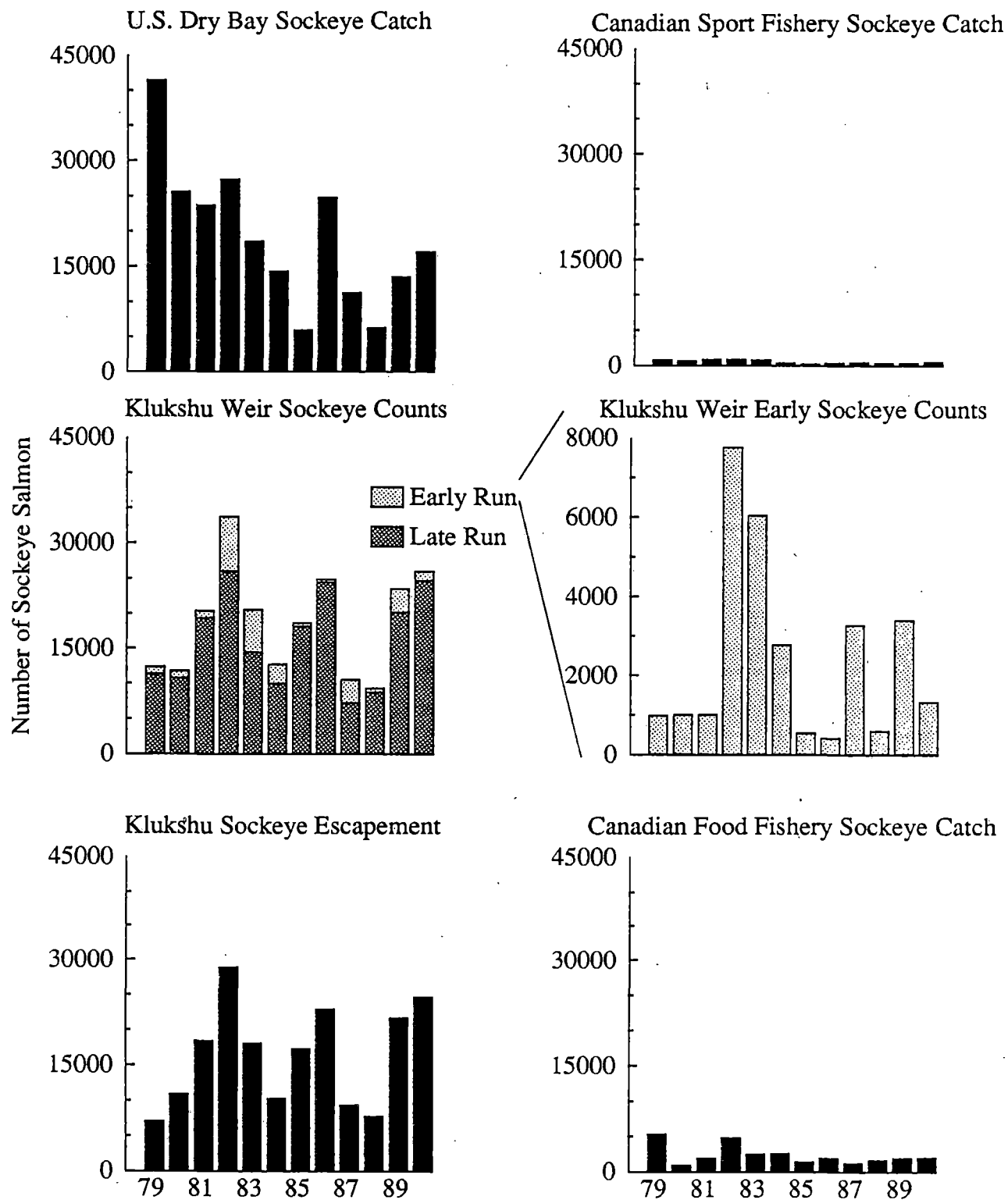


Figure 12. Alsek sockeye catches and weir counts, 1979-1990.

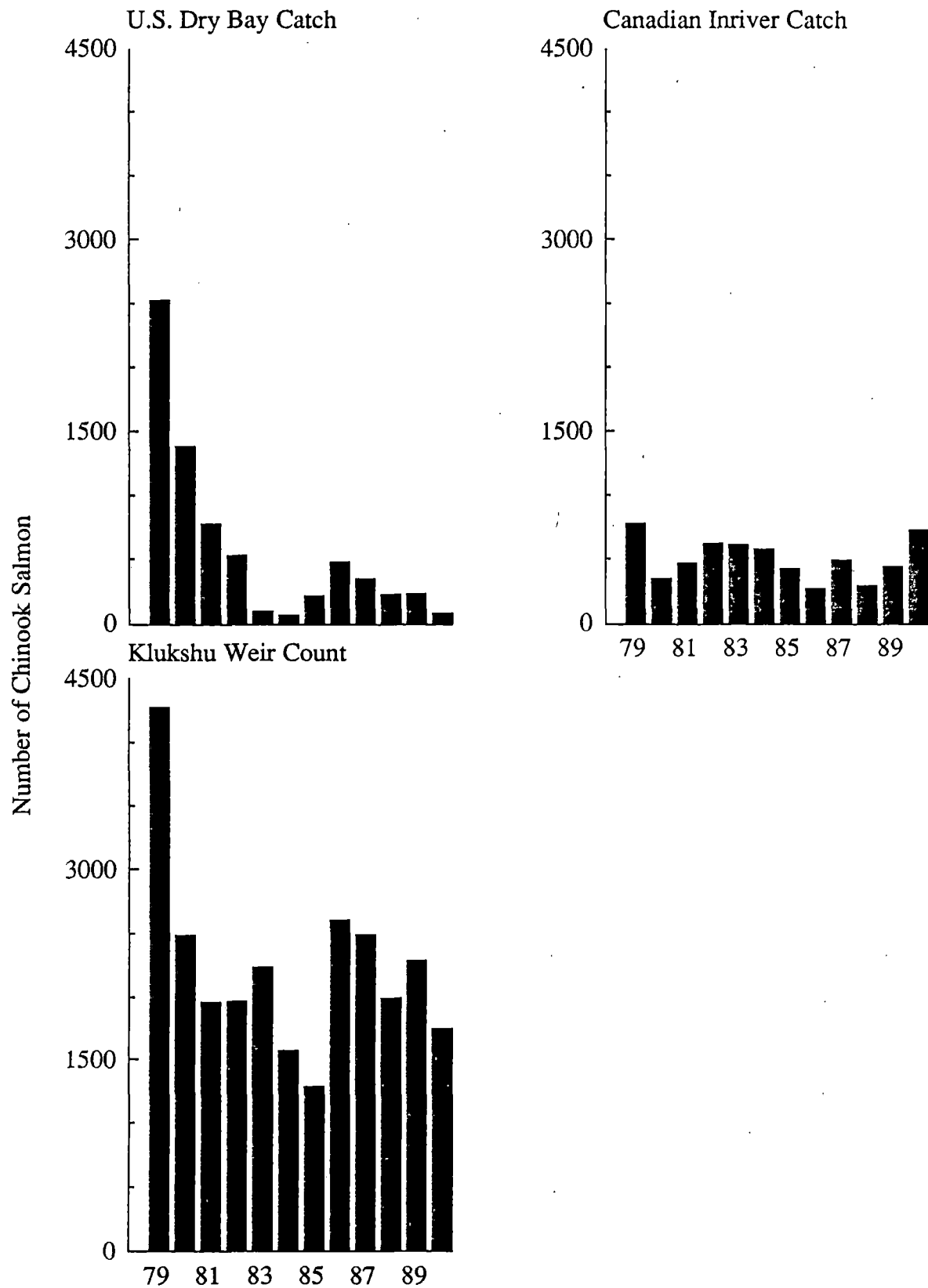


Figure 13. Alsek chinook catches and weir counts, 1979-1990.

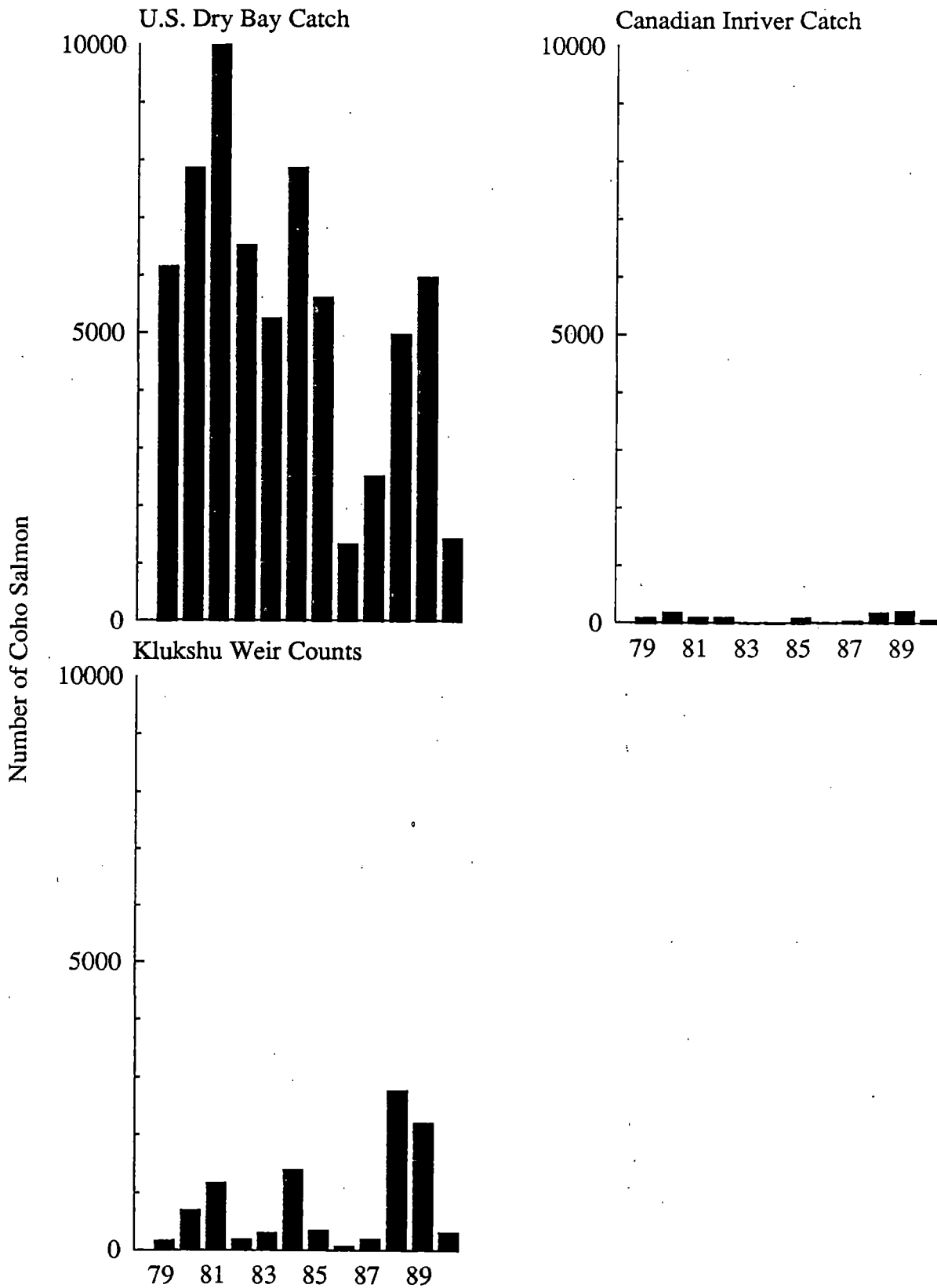


Figure 14. Alsek coho catches and weir counts, 1979-1990. The weir count for coho is incomplete since the weir is dismantled before the entire coho run has passed.

## APPENDICES

Appendix A.1. Weekly salmon catch and effort in the Alaskan Subdistrict 106-41 and -42 (Sumner Strait) commercial drift gill net fishery, 1990.

Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Permits	Days	Permit Days
25	17-Jun	215	3,151	559	317	563	54	2	108
26	24-Jun	122	4,567	1,550	260	1,194	68	2	136
27	01-Jul	92	9,691	2,134	647	4,600	62	2	124
28	08-Jul	80	19,262	2,906	2,147	7,732	76	3	228
29	15-Jul	30	18,113	3,491	3,022	5,504	78	2	156
30	22-Jul	51	30,256	4,913	6,865	6,858	57	3	171
31	29-Jul	26	10,197	6,580	7,251	2,837	65	2	130
32	05-Aug	14	4,240	6,232	9,946	1,656	47	2	94
33	12-Aug	17	2,573	5,218	20,434	1,754	42	2	84
34	19-Aug	22	2,072	18,342	25,975	3,101	55	3	165
35	26-Aug	30	696	20,002	6,392	4,424	55	3	165
36	02-Sep	38	99	13,745	1,243	1,359	50	3	150
37	09-Sep	22	5	6,592	43	605	26	2	52
38	16-Sep	0	0	1,870	1	244	29	2	58
39	23-Sep	0	0	368	0	43	6	1	6
Total		759	104,922	94,502	84,543	42,474	770	34	1,827

Appendix A.2. Weekly stock proportions of sockeye salmon harvested in the Alaskan Subdistrict 106-41 and -42 (Sumner Strait) commercial drift gill net fishery, 1990. Data based on scale pattern analysis (SPA).

Week	Stikine					Total
	Alaska	Canada	Tahltan	non-Tahltan		
25	0.516	0.411	0.018	0.055		0.073
26	0.409	0.544	0.026	0.022		0.048
27	0.444	0.511	0.025	0.020		0.045
28	0.536	0.430	0.012	0.022		0.034
29	0.653	0.334	0.008	0.005		0.013
30	0.608	0.383	0.001	0.008		0.009
31	0.625	0.336	0.000	0.039		0.039
32	0.642	0.308	0.000	0.049		0.049
33	0.658	0.338	0.000	0.004		0.004
34	0.581	0.403	0.000	0.016		0.016
35	0.581	0.403	0.000	0.016		0.016
36	0.581	0.403	0.000	0.016		0.016
37	0.581	0.403	0.000	0.016		0.016
Total		0.579	0.395	0.008	0.018	0.026

Appendix A.3. Weekly stock-specific catch of sockeye salmon in the Alaskan Subdistrict 106-41 and -42 (Sumner Strait) commercial drift gill net fishery, 1990. Data based on SPA.

Week	Stikine					Total
	Alaska	Canada	Tahltan	non-Tahltan		
25	1,625	1,296	58	172		230
26	1,866	2,484	117	100		217
27	4,303	4,951	239	198		437
28	10,318	8,288	225	431		656
29	11,824	6,055	142	92		234
30	18,403	11,581	20	252		272
31	6,371	3,426	0	400		400
32	2,724	1,307	0	209		209
33	1,692	870	0	11		11
34	1,204	835	0	33		33
35	404	280	0	11		11
36	58	40	0	2		2
37	3	2	0	0		0
Total		60,795	41,415	801	1,911	2,712

Appendix A.4. Weekly salmon catch and effort in the Alaskan Subdistrict 106-30 (Clarence Strait) commercial drift gill net fishery, 1990.

Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Permits	Days	Permit Days
25	17-Jun	194	1,886	233	109	187	30	2	60
26	24-Jun	40	1,727	532	1,367	579	42	2	84
27	01-Jul	41	3,031	584	1,465	1,310	32	2	64
28	08-Jul	60	6,284	881	1,392	1,532	37	3	111
29	15-Jul	54	8,920	1,148	2,009	2,434	44	2	88
30	22-Jul	403	20,625	2,924	8,110	5,781	59	3	177
31	29-Jul	94	16,992	6,707	15,005	3,707	78	2	156
32	05-Aug	98	10,262	6,236	31,160	5,389	58	2	116
33	12-Aug	29	6,785	5,797	62,896	2,171	78	2	156
34	19-Aug	87	2,637	6,028	57,026	1,887	63	3	189
35	26-Aug	73	1,458	12,673	40,745	2,152	54	3	162
36	02-Sep	50	233	12,834	12,271	2,108	54	3	162
37	09-Sep	99	36	9,186	1,041	864	37	2	74
38	16-Sep	16	7	3,736	47	552	36	2	72
39	23-Sep	10	0	210	0	105	5	1	5
Total		1,348	80,883	69,709	234,643	30,758	707	34	1,676

Appendix A.5. Weekly stock proportions of sockeye salmon harvested in the Alaskan Subdistrict 106-30 (Clarence Strait) commercial drift gill net fishery, 1990. Data based on SPA.

Week	Alaska	Canada	Stikine		Total
			Tahltan	non-Tahltan	
25	0.698	0.286	0.015	0.000	0.015
26	0.642	0.280	0.008	0.071	0.079
27	0.435	0.539	0.000	0.026	0.026
28	0.434	0.544	0.007	0.015	0.022
29	0.583	0.414	0.003	0.000	0.003
30	0.666	0.334	0.000	0.000	0.000
31	0.667	0.308	0.000	0.025	0.025
32	0.724	0.254	0.000	0.022	0.022
33	0.767	0.231	0.000	0.002	0.002
34	0.640	0.334	0.000	0.025	0.025
35	0.640	0.334	0.000	0.025	0.025
36	0.640	0.334	0.000	0.025	0.025
37	0.640	0.334	0.000	0.025	0.025
38	0.640	0.334	0.000	0.025	0.025
Total		0.645	0.340	0.001	0.013

Appendix A.6. Weekly stock-specific catch of sockeye salmon in the Alaskan Subdistrict 106-30 (Clarence Strait) commercial drift gill net fishery, 1990. Data based on SPA.

Week	Alaska	Canada	Stikine		Total
			Tahltan	non-Tahltan	
25	1,317	540	29	0	29
26	1,108	483	14	122	136
27	1,318	1,635	0	78	78
28	2,726	3,419	45	94	139
29	5,203	3,691	26	0	26
30	13,743	6,882	0	0	0
31	11,335	5,226	0	431	431
32	7,434	2,602	0	226	226
33	5,205	1,566	0	14	14
34	1,689	882	0	66	66
35	934	488	0	37	37
36	149	78	0	6	6
37	23	12	0	1	1
38	4	2	0	0	0
Total		52,188	27,506	114	1,075

Appendix A.7. Weekly salmon catch in the Alaskan District 106 commercial drift gill net fisheries, 1990. Catches do not include Blind Slough terminal area harvests. Effort may be less than the sum of effort from 106-41 & -42 and 106-30 since some boats fished in more than one subdistrict.

Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Permits	Days	Permit Days
25	17-Jun	409	5,037	792	426	750	84	2	168
26	24-Jun	162	6,294	2,082	1,627	1,773	110	2	220
27	01-Jul	133	12,722	2,718	2,112	5,910	94	2	188
28	08-Jul	140	25,546	3,787	3,539	9,264	113	3	339
29	15-Jul	84	27,033	4,639	5,031	7,938	122	2	244
30	22-Jul	454	50,881	7,837	14,975	12,639	116	3	348
31	29-Jul	120	27,189	13,287	22,256	6,544	143	2	286
32	05-Aug	112	14,502	12,468	41,106	7,045	105	2	210
33	12-Aug	46	9,358	11,015	83,330	3,925	120	2	240
34	19-Aug	109	4,709	24,370	83,001	4,988	118	3	354
35	26-Aug	103	2,154	32,675	47,137	6,576	109	3	327
36	02-Sep	88	332	26,579	13,514	3,467	104	3	312
37	09-Sep	121	41	15,778	1,084	1,469	63	2	126
38	16-Sep	16	7	5,606	48	796	65	1	65
39	23-Sep	10	0	578	0	148	11	1	11
Total		2,107	185,805	164,211	319,186	73,232	1,477	33	3,438

Appendix A.8. Weekly stock proportions of sockeye salmon harvested in the Alaskan District 106 commercial drift gill net fisheries, 1990. Data based on SPA.

Week	Alaska	Canada	Stikine		Total
			Tahltan	non-Tahltan	
25	0.584	0.365	0.017	0.034	0.051
26	0.473	0.471	0.021	0.035	0.056
27	0.442	0.518	0.019	0.022	0.040
28	0.511	0.458	0.011	0.021	0.031
29	0.630	0.361	0.006	0.003	0.010
30	0.632	0.363	0.000	0.005	0.005
31	0.651	0.318	0.000	0.031	0.031
32	0.700	0.270	0.000	0.030	0.030
33	0.737	0.260	0.000	0.003	0.003
34	0.614	0.365	0.000	0.021	0.021
35	0.621	0.357	0.000	0.022	0.022
36	0.623	0.355	0.000	0.022	0.022
37	0.633	0.343	0.000	0.024	0.024
38	0.640	0.334	0.000	0.025	0.025
Total		0.608	0.371	0.005	0.021

Appendix A.9. Weekly stock-specific catch of sockeye salmon in the Alaskan District 106 commercial drift gill net fisheries, 1990. Catches do not include Blind Slough terminal area harvests. Data based on SPA.

Stikine						
	Week	Alaska	Canada	Tahltan	non-Tahltan	Total
	25	2,942	1,836	87	172	259
	26	2,974	2,967	131	222	353
	27	5,621	6,586	239	276	515
	28	13,044	11,707	270	525	795
	29	17,027	9,746	168	92	260
	30	32,146	18,463	20	252	272
	31	17,706	8,652	0	831	831
	32	10,158	3,909	0	435	435
	33	6,897	2,436	0	25	25
	34	2,893	1,717	0	100	100
	35	1,338	768	0	48	48
	36	207	118	0	7	7
	37	26	14	0	1	1
	38	4	2	0	0	0
	Total	112,983	68,921	915	2,986	3,901



Appendix A.10. Weekly salmon catch and effort in the Alaskan District 108 commercial drift gill net fishery, 1990. Catches do not include Ohmer Creek terminal area harvests.

Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Permits	Days	Permit Days
25	17-Jun	373	369	4	1	26	14	2	28
26	24-Jun	38	467	4	0	106	7	2	14
27	01-Jul	34	1,573	49	25	619	20	2	40
28	08-Jul	31	2,823	220	387	1,440	20	3	60
29	15-Jul	15	2,068	41	687	2,353	14	2	28
30	22-Jul	20	2,816	73	6,115	2,915	12	3	36
31	29-Jul	6	906	216	2,029	741	6	2	12
32	05-Aug	21	306	593	2,117	533	7	2	14
33	12-Aug	0	172	293	1,402	116	a/	a/	a/
34	19-Aug	0	15	278	576	40	a/	a/	a/
35	26-Aug	7	39	1,692	374	109	8	3	24
36	02-Sep	3	18	2,576	67	164	11	3	33
37	09-Sep	6	2	1,258	36	74	10	2	20
38	16-Sep	1	0	579	6	63	12	2	24
39	23-Sep	2	0	342	0	83	8	1	8
Total		557	11,574	8,218	13,822	9,382	157	34	359

a/ Effort not recorded by week, effort for these weeks is included in the total.

Appendix A.11. Weekly stock proportions and stock-specific catch of sockeye salmon in the Alaskan District 108 commercial drift gill net fishery, 1990. Catches do not include Ohmer Creek terminal area harvests. Data based on SPA.

			Stikine			
	Week	Alaska	Canada	Tahltan	non-Tahltan	Total
Proportions						
	25	0.502	0.370	0.050	0.078	0.128
	26	0.502	0.370	0.050	0.078	0.128
	27	0.343	0.201	0.178	0.278	0.456
	28	0.540	0.121	0.085	0.254	0.339
	29	0.415	0.205	0.025	0.355	0.381
	30	0.272	0.007	0.004	0.717	0.721
	31	0.320	0.049	0.448	0.183	0.631
	32	0.320	0.049	0.448	0.183	0.631
	33	0.320	0.049	0.448	0.183	0.631
	34	0.320	0.049	0.448	0.183	0.631
	35	0.320	0.049	0.448	0.183	0.631
	36	0.320	0.049	0.448	0.183	0.631
	37	0.320	0.049	0.448	0.183	0.631
Total		0.395	0.128	0.111	0.366	0.477
Catch						
	25	185	136	19	29	47
	26	235	173	23	36	60
	27	540	316	280	437	717
	28	1,524	341	241	717	958
	29	858	423	52	735	787
	30	767	19	12	2,018	2,030
	31	290	44	406	166	572
	32	98	15	137	56	193
	33	55	8	77	31	109
	34	5	1	7	3	9
	35	12	2	17	7	25
	36	6	1	8	3	11
	37	1	0	1	0	1
Total		4,576	1,479	1,280	4,239	5,519

Appendix A.12. Weekly salmon catch and effort in the Alaskan Subdistrict 106-41 test fishery, 1990.

Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Boats	Hours	Boat Days
25	17-Jun	5	285	54	3	54	1	1.00	1.00
26	24-Jun	3	268	66	3	89	1	1.00	1.00
27	01-Jul	1	420	40	16	101	1	1.00	1.00
28	08-Jul	3	210	37	25	80	1	1.00	1.00
29	15-Jul	1	609	45	84	67	1	1.00	1.00
30	22-Jul	0	249	105	100	87	1	1.00	1.00
31	29-Jul	0	215	85	141	74	1	1.00	1.00
Total		13	2256	432	372	552	7	7	7

Appendix A.13. Weekly salmon catch and effort in the Alaskan District 108 test fishery, 1990.

Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Boats	Hours	Boat Days
25	17-Jun	7	52	0	2	5	1	1	0.04
26	24-Jun	8	124	0	3	56	1	1	0.04
27	01-Jul	3	159	0	9	26	1	1	0.04
28	08-Jul	0	153	0	53	163	1	1	0.04
29	15-Jul	1	167	2	274	238	1	1	0.04
30	22-Jul	0	147	5	446	108	1	1	0.04
31	29-Jul	0	64	38	155	47	1	1	0.04
Total		19	866	45	942	643	7	7.00	0.29

Appendix A.14. Stock compositions and stock-specific catch of sockeye salmon in the Alaskan District 106 and 108 test fisheries, 1990. Stock compositions from weekly commercial fishery catches were applied to weekly test fishery catches. Data based on SPA.

District	Stikine					Total
	Alaska	Canada	Tahltan	non-Tahltan		
Proportions						
Subdistrict 106-41	0.548	0.416	0.014	0.022		0.035
District 108	0.417	0.172	0.094	0.318		0.411
Catches						
Subdistrict 106-41	1,237	939	31	49		80
District 108	361	149	81	275		356
Total	1,598	1,088	112	324		436

Appendix A.15. Weekly salmon and steelhead trout catch and effort in the Canadian commercial fishery in the lower Stikine River, 1990.

Week	Start Date	Catch						Effort			
		Chinook		Sockeye	Coho	Pink	Chum	Steel-head	Licenses	Days	Boat Days
		Jacks	Large								
26	24-Jun	400	715	285	0	0	1	1	11.00	2.0	22.0
27	01-Jul	150	477	1,338	0	0	9	0	13.50	2.0	27.0
28	08-Jul	76	193	2,357	2	0	18	0	15.00	2.0	30.0
29	15-Jul	45	139	4,863	1	17	120	8	14.70	3.0	44.1
30	22-Jul	4	22	1,221	1	16	28	1	15.00	1.0	15.0
31	29-Jul	2	12	870	1	50	43	3	14.00	1.0	14.0
32	05-Aug	3	10	2,501	36	278	140	26	15.33	3.0	46.0
33	12-Aug	0	0	323	40	30	21	1	10.00	2.0	20.0
34	19-Aug	0	1	260	283	36	19	10	10.50	2.0	21.0
35	26-Aug	0	0	328	706	42	65	51	12.50	2.0	25.0
36	02-Sep	0	0	139	1,536	24	27	45	12.00	3.0	36.0
37	09-Sep	0	0	43	1,053	3	8	33	5.00	4.0	20.0
38	16-Sep	0	0	2	361	0	0	9	4.00	2.0	8.0
Total		680	1,569	14,530	4,020	496	499	188		29	328.1

Appendix A.16. Weekly sockeye salmon stock proportions and catch by stock in the Canadian commercial fishery in the lower Stikine River, 1990. Data based on egg diameter analysis.

Week	Proportion Tahltan	Catch		CPUE		Total
		Tahltan	non-Tahltan	Tahltan	non-Tahltan	
26	0.698	199	86	9.045	3.909	12.955
27	0.786	1,051	287	38.926	10.630	49.556
28	0.666	1,570	787	52.333	26.233	78.567
29	0.351	1,708	3,155	38.730	71.542	110.272
30	0.242	295	926	19.667	61.733	81.400
31	0.082	71	799	5.071	57.071	62.143
32	0.037	92	2,409	2.000	52.381	54.381
33	0.037	12	311	0.600	15.550	16.150
34	0.027	7	253	0.333	12.048	12.381
35	0.047	15	313	0.615	12.505	13.120
36	0.047	7	132	0.181	3.680	3.861
37	0.047	2	41	0.101	2.049	2.150
38	0.047	0	2	0.012	0.238	0.250
Total		5,029	9,501	167.615	329.570	497.185
Proportion		0.346	0.654			

Appendix A.17. Weekly salmon and steelhead trout catch and effort in the Canadian commercial fishery in the upper Stikine River, 1990. It is assumed that 90% of the sockeye catch is of Tahltan origin.

Week	Start Date	Catch						Effort			
		Chinook		Sockeye	Coho	Pink	Chum	Steel-head	Licenses	Days	Boat Days
		Jacks	Large								
26	24-Jun	2	12	0	0	0	0	0	1.0	1.0	1.0
27	01-Jul	4	11	0	0	0	0	0	2.0	1.0	2.0
28	08-Jul	7	13	12	0	0	0	0	2.0	1.0	2.0
29	15-Jul	4	2	154	0	0	0	0	2.0	1.0	2.0
30	22-Jul	2	6	178	0	0	0	0	4.0	1.0	4.0
31	29-Jul	0	4	84	0	0	0	0	2.0	1.0	2.0
32	05-Aug	1	0	44	0	0	0	0	2.0	1.0	2.0
Total		20	48	472	0	0	0	0	15	7	15

Appendix A.18. Weekly salmon and steelhead trout catch and effort in the Canadian Indian food fishery located at Telegraph Creek, on the Stikine River, 1990. It is assumed that 90% of the sockeye catch is of Tahltan origin.

Week	Start Date	Catch							Effort		
		Chinook Jacks	Large	Sockeye	Coho	Pink	Chum	Steel- head	Licenses	Days	Boat Days
24	10-Jun	0	7	0	0	0	0	0	1.0	4	4.0
25	17-Jun	3	49	1	0	0	0	0	2.0	6	12.0
26	24-Jun	52	90	8	0	0	0	0	2.3	7	16.1
27	01-Jul	79	167	13	0	0	0	0	3.6	7	25.2
28	08-Jul	75	137	414	0	0	0	0	6.9	7	48.3
29	15-Jul	32	75	1,390	0	0	0	0	13.1	7	91.7
30	22-Jul	12	74	622	0	0	0	0	8.9	7	62.3
31	29-Jul	6	25	413	5	0	0	0	6.4	7	44.8
32	05-Aug	0	6	110	1	0	0	0	2.3	7	16.1
33	12-Aug	0	3	36	3	0	0	1	0.4	4	1.6
34	19-Aug	0	0	0	0	0	0	0	0.0	0	0
35	26-Aug	0	0	14	6	0	0	6	0.6	5	3.0
36	02-Sep	0	0	1	2	0	0	4	0.4	3	1.2
Total		259	633	3,022	17	0	0	11	47.9	71	326.3

Appendix A.19. Weekly salmon and steelhead trout catch and effort in the Canadian test fishery in the Stikine River, 1990.

Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Steel- head	# Drifts/ Set Hours
Drift gill net								
25	17-Jun	49	2	0	0	0	0	60
26	24-Jun	61	19	0	0	4	0	50
27	01-Jul	39	64	0	0	0	0	50
28	08-Jul	16	109	0	0	2	0	50
29	15-Jul	1	68	1	0	2	0	40
30	22-Jul	1	106	0	0	4	0	60
31	29-Jul	0	54	1	0	0	1	60
32	05-Aug	0	16	0	0	2	0	23
33	12-Aug							0
34	19-Aug	0	9	19	3	12	1	50
35	26-Aug	0	0	34	1	3	1	50
36	02-Sep	0	0	36	1	0	1	40
37	09-Sep	0	0	17	0	0	0	20
38	16-Sep	0	0	18	0	0	1	50
39	23-Sep	0	0	8	0	0	1	70
Total		167	447	134	5	29	6	673
Set gill net								
25	17-Jun	23	14	0	0	0	0	168
26	24-Jun	28	184	0	0	1	0	120
27	01-Jul	8	260	0	0	1	0	120
28	08-Jul	5	264	0	0	8	1	120
29	15-Jul	0	163	0	0	2	0	96
30	22-Jul	0	308	0	1	9	0	144
31	29-Jul	0	218	6	0	4	2	144
32	05-Aug	0	43	3	4	4	0	36
33	12-Aug							0
34	19-Aug	0	32	112	29	8	10	120
35	26-Aug	0	7	132	3	11	5	120
36	02-Sep	0	0	18	5	0	0	24
Total		64	1,493	271	42	48	18	1,212

a/ The test fishery was not conducted during week 33.

Appendix A.20. Weekly sockeye salmon stock proportions in the Stikine River test fishery, 1990. Data based on egg diameter analysis.

Week	Sample Size	Tahltan	non-Tahltan
25	12	0.563	0.437
26	96	0.906	0.094
27	151	0.821	0.179
28	175	0.625	0.375
29	106	0.407	0.593
30	217	0.143	0.857
31	144	0.103	0.897
32	31	0.119	0.881
33a	0	0.080	0.920
34	27	0.024	0.976
35	1	0.000	1.000
960			

a/ Data for week 33 is interpolated from weeks 32 and 34.

Appendix A.21. Weekly catch, CPUE, and migratory timing of Tahltan and non-Tahltan sockeye stocks in the Stikine River test fishery, 1990. Data based on egg diameter analysis. Data for week 33 interpolated from 32 and 34.

Week	Catch		CPUE			Migratory Timing	
	Tahltan	non-Tahltan	Tahltan	non-Tahltan	Total	Tahltan	non-Tahltan
Drift gill net							
25	1	1	0.019	0.015	0.033	0.002	0.002
26	17	2	0.344	0.036	0.380	0.037	0.004
27	53	11	1.051	0.229	1.280	0.112	0.024
28	68	41	1.363	0.818	2.180	0.145	0.087
29	28	40	0.692	1.008	1.700	0.073	0.107
30	15	91	0.253	1.514	1.767	0.027	0.161
31	6	48	0.093	0.807	0.900	0.010	0.086
32	2	14	0.083	0.613	0.696	0.009	0.065
33a	0	0	0.009	0.290	0.299	0.003	0.029
34	0	9	0.004	0.176	0.180	0.000	0.019
Total	190	257	3.910	5.505	9.415		
Proportion	0.424	0.576	Proportion of run			0.417	0.583
Set gill net							
25	8	6	0.047	0.036	0.083	0.003	0.003
26	167	17	1.389	0.144	1.533	0.101	0.011
27	213	47	1.779	0.388	2.167	0.130	0.028
28	165	99	1.375	0.825	2.200	0.100	0.060
29	66	97	0.691	1.007	1.698	0.050	0.073
30	44	264	0.306	1.833	2.139	0.022	0.134
31	22	196	0.156	1.358	1.514	0.011	0.099
32	5	38	0.142	1.052	1.194	0.010	0.077
33a/	0	0	0.025	0.823	0.849	0.005	0.057
34	1	31	0.006	0.260	0.267	0.000	0.019
35	0	7	0.000	0.058	0.058	0.000	0.004
Total	692	801	5.916	7.785	13.702	0.435	0.565
Proportion	0.463	0.537					

a/ CPUEs for week 33 were calculated from the regression of the commercial CPUE vs the drift or set test CPUE for weeks 26-32,34,35, stock composition is from the commercial catch.

Appendix A.22. Daily counts of adult sockeye salmon passing through Tahltan weir, 1990. The weir was installed on July 6, but no fish passed through prior to July 15.

Date	Count	Cumulative		Date	Count	Cumulative	
		Count	Percent			Count	Percent
15-Jul	1	1	0.0	09-Aug	114	14,373	96.3
16-Jul	0	1	0.0	10-Aug	14	14,387	96.4
17-Jul	0	1	0.0	11-Aug	24	14,411	96.5
18-Jul	0	1	0.0	12-Aug	2	14,413	96.6
19-Jul	0	1	0.0	13-Aug	51	14,464	96.9
20-Jul	1	2	0.0	14-Aug	34	14,498	97.1
21-Jul	27	29	0.2	15-Aug	2	14,500	97.1
22-Jul	829	858	5.7	16-Aug	41	14,541	97.4
23-Jul	3076	3,934	26.4	17-Aug	28	14,569	97.6
24-Jul	1723	5,657	37.9	18-Aug	7	14,576	97.6
25-Jul	1743	7,400	49.6	19-Aug	7	14,583	97.7
26-Jul	1673	9,073	60.8	20-Aug	5	14,588	97.7
27-Jul	792	9,865	66.1	21-Aug	1	14,589	97.7
28-Jul	1074	10,939	73.3	22-Aug	0	14,589	97.7
29-Jul	763	11,702	78.4	23-Aug	91	14,680	98.3
30-Jul	670	12,372	82.9	24-Aug	201	14,881	99.7
31-Jul	401	12,773	85.6	25-Aug	38	14,919	99.9
01-Aug	322	13,095	87.7	26-Aug	1	14,920	100.0
02-Aug	286	13,381	89.6	27-Aug	4	14,924	100.0
03-Aug	188	13,569	90.9	28-Aug	3	14,927	100.0
04-Aug	20	13,589	91.0	29-Aug	0	14,927	100.0
05-Aug	20	13,609	91.2	30-Aug	0	14,927	100.0
06-Aug	80	13,689	91.7	31-Aug	0	14,927	100.0
07-Aug	194	13,883	93.0	01-Sep	0	14,927	100.0
08-Aug	376	14,259	95.5				
Total Counted					14927		
Adjustments					-3302 a/		
Total Spawners					11625		

a/ A total of 1615 females and 1687 males were taken for broodstock.

Appendix A.23. Daily counts of sockeye salmon smolt migrating through Tahltan Lake smolt weir, 1990.

Date	Count	Cumulative		Date	Count	Cumulative	
		Count	Percent			Count	Percent
05-May	weir in			26-May	542	295,383	48.6
06-May	0	0	0.0	27-May	1,778	297,161	48.9
07-May	0	0	0.0	28-May	4,816	301,977	49.7
08-May	0	0	0.0	29-May	6,226	308,203	50.7
09-May	0	0	0.0	30-May	13,815	322,018	53.0
10-May	0	0	0.0	31-May	6,777	328,795	54.1
11-May	0	0	0.0	01-Jun	11529	340,324	56.0
12-May	0	0	0.0	02-Jun	196252	536,576	88.3
13-May	0	0	0.0	03-Jun	935	537,511	88.5
14-May	0	0	0.0	04-Jun	1,001	538,512	88.6
15-May	153	153	0.0	05-Jun	12,831	551,343	90.7
16-May	1,113	1,266	0.2	06-Jun	1,158	552,501	90.9
17-May	63,184	64,450	10.6	07-Jun	4,169	556,670	91.6
18-May	5,311	69,761	11.5	08-Jun	7,396	564,066	92.8
19-May	9,671	79,432	13.1	09-Jun	3,567	567,633	93.4
20-May	39,799	119,231	19.6	10-Jun	2,022	569,655	93.7
21-May	5,267	124,498	20.5	11-Jun	294	569,949	93.8
22-May	3,877	128,375	21.1	12-Jun	91	570,040	93.8
23-May	4,326	132,701	21.8	13-Jun	23,710	593,750	97.7
24-May	151,907	284,608	46.8	14-Jun	1,397	595,147	97.9
25-May	10,233	294,841	48.5	Total a/		607,645	100.0

a/ Based on historical migratory timing, 97.9% of the smolt outmigration has occurred by June 14. The estimated total smolt run in 1990 was 607,645 fish.

Appendix A.24. Daily counts of adult chinook salmon passing through Little Tahltan weir, 1990.

	Large Chinook			Chinook Jacks		
		Cumulative			Cumulative	
Date	Count	Count	Percent	Count	Count	Percent
22-Jun		-----weir installed-----				
23-Jun	0	0	0.00	0	0	0.00
24-Jun	0	0	0.00	0	0	0.00
25-Jun	0	0	0.00	0	0	0.00
26-Jun	0	0	0.00	0	0	0.00
27-Jun	0	0	0.00	0	0	0.00
28-Jun	0	0	0.00	0	0	0.00
29-Jun	4	4	0.09	0	0	0.00
30-Jun	11	15	0.34	0	0	0.00
01-Jul	2	17	0.39	0	0	0.00
02-Jul	0	17	0.39	0	0	0.00
03-Jul	0	17	0.39	0	0	0.00
04-Jul	0	17	0.39	0	0	0.00
05-Jul	22	39	0.89	3	3	0.72
06-Jul	0	39	0.89	0	3	0.72
07-Jul	61	100	2.28	6	9	2.16
08-Jul	6	106	2.41	1	10	2.40
09-Jul	11	117	2.66	1	11	2.64
10-Jul	3	120	2.73	1	12	2.88
11-Jul	66	186	4.23	16	28	6.71
12-Jul	104	290	6.60	4	32	7.67
13-Jul	11	301	6.85	0	32	7.67
14-Jul	90	391	8.90	2	34	8.15
15-Jul	135	526	11.98	6	40	9.59
16-Jul	268	794	18.08	7	47	11.27
17-Jul	82	876	19.95	38	85	20.38
18-Jul	127	1,003	22.84	8	93	22.30
19-Jul	362	1,365	31.08	33	126	30.22
20-Jul	62	1,427	32.49	15	141	33.81
21-Jul	102	1,529	34.81	33	174	41.73
22-Jul	224	1,753	39.91	42	216	51.80
23-Jul	499	2,252	51.28	49	265	63.55
24-Jul	352	2,604	59.29	66	331	79.38
25-Jul	225	2,829	64.41	8	339	81.29
26-Jul	143	2,972	67.67	6	345	82.73
27-Jul	170	3,142	71.54	9	354	84.89
28-Jul	25	3,167	72.11	6	360	86.33
29-Jul	146	3,313	75.43	9	369	88.49
30-Jul	201	3,514	80.01	10	379	90.89
31-Jul	304	3,818	86.93	7	386	92.57
01-Aug	26	3,844	87.52	3	389	93.29
02-Aug	70	3,914	89.12	3	392	94.00
03-Aug	40	3,954	90.03	1	393	94.24
04-Aug	155	4,109	93.56	5	398	95.44
05-Aug	20	4,129	94.01	2	400	95.92
06-Aug	66	4,195	95.51	5	405	97.12
07-Aug	75	4,270	97.22	2	407	97.60
08-Aug	20	4,290	97.68	3	410	98.32
09-Aug	2	4,292	97.72	1	411	98.56
10-Aug	40	4,332	98.63	3	414	99.28
11-Aug	16	4,348	99.00	2	416	99.76
12-Aug	5	4,353	99.11	1	417	100.00
13-Aug	0	4,353	99.11	0	417	100.00
14-Aug	20	4,373	99.57	0	417	100.00
15-Aug	0	4,373	99.57	0	417	100.00
16-Aug	17	4,390	99.95	0	417	100.00
17-Aug	2	4,392	100.00	0	417	100.00
18-Aug	0	4,392	100.00	0	417	100.00
19-Aug	0	4,392	100.00	0	417	100.00

## Appendix B.1. Salmon catch and effort in the Alaskan Subdistrict 106-41 and -42 (Sumner Strait) commercial drift gill net fishery, 1964-1990.

Year	Catch					Effort	
	Chinook	Sockeye	Coho	Pink	Chum	Permit Days	Days Open
1964	316	52,943	27,338	183,402	22,913	2,344	49
1965	679	58,736	30,570	162,271	15,763	1,658	51
1966	690	65,721	30,792	96,287	24,235	2,080	74
1967	668	60,148	10,573	52,284	19,626	1,463	27
1968	1,010	50,212	46,111	82,012	39,001	2,997	52
1969	747	46,282	6,557	92,102	6,395	1,147	31
1970	420	26,812	15,153	29,102	18,092	905	41
1971	671	33,991	24,727	283,739	19,329	1,619	50
1972	1,747	74,745	60,827	40,644	46,511	2,152	41
1973	1,540	55,254	24,921	160,297	62,486	2,253	26
1974	1,342	46,760	28,889	57,296	38,045	1,579	28
1975	467	19,319	4,650	29,340	7,762	515	17
1976	237	9,319	10,367	20,251	2,301	366	19
1977	202	47,408	1,819	51,038	4,240	447	17
1978	274	1,422	26,762	9,546	3,142	389	27
1979	458	34,807	12,087	176,395	16,816	952	25
1980	205	48,430	10,826	16,966	15,162	596	16
1981	598	132,359	13,158	218,359	25,994	1,732	25
1982	648	121,220	21,387	10,343	11,896	1,083	22
1983	268	28,153	41,196	74,347	13,001	875	32
1984	136	27,372	19,124	99,807	28,461	587	32
1985	549	172,088	50,655	319,379	45,566	1,726	38
1986	421	85,247	104,328	105,347	48,471	1,896	32
1987	441	79,165	17,776	117,059	25,877	978	20
1988	452	57,337	6,349	10,894	42,210	815	18
1989	581	107,886	55,671	418,044	40,156	1,716	34
Averages							
64-89	606	59,351	27,024	112,175	24,748	1,341	32
80-89	430	85,926	34,047	139,055	29,679	1,200	27
1990	759	104,922	94,502	84,543	42,474	1,827	34

## Appendix B.2. Stock proportions and catches of sockeye salmon in the Alaskan Subdistrict 106-41 and -42 (Sumner Strait) commercial drift gill net fishery, 1985-1990. Data based on SPA.

Year	Stikine				
	Alaska	Canada	Tahltan	non-Tahltan	Total
Proportions					
1985	0.480	0.401	0.109	0.010	0.119
1986	0.662	0.308	0.024	0.006	0.030
1987	0.816	0.166	0.015	0.003	0.018
1988	0.868	0.112	0.019	0.001	0.020
1989	0.653	0.303	0.009	0.036	0.044
1990	0.579	0.395	0.008	0.018	0.026
Catches					
1985	82,563	68,962	18,801	1,762	20,563
1986	56,462	26,214	2,070	501	2,571
1987	64,582	13,170	1,155	258	1,413
1988	49,776	6,426	1,071	64	1,135
1989	70,436	32,663	957	3,830	4,787
1990	60,795	41,415	801	1,911	2,712



## Appendix B.3. Salmon catch and effort in the Alaskan Subdistrict 106-30 (Clarence Strait) commercial drift gill net fishery, 1964-1990.

Year	Catch					Effort	
	Chinook	Sockeye	Coho	Pink	Chum	Permit Days	Days Open
1964	1,766	23,598	37,316	259,684	21,305	3,039	49.00
1965	1,123	29,013	45,158	463,577	11,895	2,849	50.75
1966	975	24,126	32,031	304,645	16,521	2,898	74.25
1967	650	26,237	7,097	39,325	6,744	1,048	27.00
1968	306	14,459	21,040	87,095	22,365	1,968	52.00
1969	289	24,061	4,191	104,998	4,511	1,026	31.00
1970	365	15,966	20,317	65,790	14,139	1,025	41.00
1971	665	19,211	23,358	244,236	18,351	1,517	50.00
1972	826	26,593	32,600	48,823	25,871	1,276	41.00
1973	391	16,741	13,526	143,324	25,243	1,303	26.00
1974	696	10,482	16,825	47,041	12,258	712	28.00
1975	2,120	12,732	26,312	173,675	16,206	1,159	8.50
1976	147	6,162	8,759	119,188	4,567	527	21.00
1977	469	19,615	6,582	368,069	9,060	940	21.00
1978	2,408	40,152	28,816	215,169	13,403	1,148	16.00
1979	2,262	31,566	15,996	471,817	18,691	1,848	25.00
1980	375	58,988	5,754	28,594	11,107	749	25.00
1981	967	50,546	9,453	216,909	8,577	1,321	26.00
1982	1,000	72,140	10,284	15,141	6,719	647	21.00
1983	299	20,789	21,234	133,820	7,143	589	37.00
1984	756	64,281	22,235	243,448	41,797	1,236	24.00
1985	1,141	92,899	40,565	265,567	24,095	1,372	36.00
1986	1,283	60,462	90,584	203,137	33,818	1,664	31.00
1987	395	57,262	16,758	126,423	16,148	799	20.00
1988	652	35,192	6,754	58,605	27,410	682	19.00
1989	963	84,848	36,715	683,150	27,195	1,583	34.00
Averages							
64-89	896	36,082	23,087	197,356	17,121	1,343	32.10
80-89	783	59,741	26,034	197,479	20,401	1,064	27.30
1990	1,348	80,883	69,709	234,643	30,758	1,676	34.00

## Appendix B.4. Stock proportions and catches of sockeye salmon in the Alaskan Subdistrict 106-30 (Clarence Strait) commercial drift gill net fishery, 1985-1990. Data based on SPA. Data for 1990 is preliminary.

Year	Stikine				
	Alaska	Canada	Tahltan	non-Tahltan	Total
Proportions					
1985	0.477	0.453	0.056	0.013	0.070
1986	0.726	0.272	0.000	0.002	0.002
1987	0.844	0.140	0.004	0.012	0.016
1988	0.883	0.095	0.021	0.000	0.021
1989	0.662	0.322	0.002	0.015	0.016
1990	0.645	0.340	0.001	0.013	0.015
Catch					
1985	44,351	42,053	5,244	1,251	6,495
1986	43,875	16,471	11	105	116
1987	48,311	8,020	221	710	931
1988	31,092	3,358	742	0	742
1989	56,167	27,296	154	1,231	1,385
1990	52,188	27,506	114	1,075	1,189

Appendix B.5. Salmon catch and effort in the Alaskan District 106 commercial drift gill net fisheries, 1964-1990. Catches do not include Blind Slough terminal area harvests.

Year	Catch					Effort	
	Chinook	Sockeye	Coho	Pink	Chum	Permit Days	Days Open
1964	2,082	76,541	64,654	443,086	44,218	5,383	49.00
1965	1,802	87,749	75,728	625,848	27,658	4,507	50.75
1966	1,665	89,847	62,823	400,932	40,756	4,978	74.25
1967	1,318	86,385	17,670	91,609	26,370	2,511	27.00
1968	1,316	64,671	67,151	169,107	61,366	4,965	52.00
1969	1,036	70,343	10,748	197,100	10,906	2,173	31.00
1970	785	42,778	35,470	94,892	32,231	1,930	41.00
1971	1,336	53,202	48,085	527,975	37,680	3,136	50.00
1972	2,573	101,338	93,427	89,467	72,382	3,428	41.00
1973	1,931	71,995	38,447	303,621	87,729	3,556	26.00
1974	2,038	57,242	45,714	104,337	50,303	2,291	28.00
1975	2,587	32,051	30,962	203,015	23,968	1,674	17.00
1976	384	15,481	19,126	139,439	6,868	893	21.00
1977	671	67,023	8,401	419,107	13,300	1,387	21.00
1978	2,682	41,574	55,578	224,715	16,545	1,537	26.50
1979	2,720	66,373	28,083	648,212	35,507	2,800	25.00
1980	580	107,418	16,580	45,560	26,269	1,345	25.00
1981	1,565	182,905	22,611	435,268	34,571	3,053	26.00
1982	1,648	193,360	31,671	25,484	18,615	1,730	22.00
1983	567	48,942	62,430	208,167	20,144	1,464	37.00
1984	892	91,653	41,359	343,255	70,258	1,823	32.00
1985	1,690	264,987	91,220	584,946	69,661	3,098	38.00
1986	1,704	145,709	194,912	308,484	82,289	3,560	32.00
1987	836	136,427	34,534	243,482	42,025	1,777	20.00
1988	1,104	92,529	13,103	69,499	69,620	1,497	19.00
1989	1,544	192,734	92,386	110,194	67,351	3,299	34.00
Averages							
64-89	1,502	95,433	50,111	309,531	41,869	2,684	33.29
80-89	1,213	145,666	60,081	336,534	50,080	2,265	28.50
1990	2,107	185,805	164,211	319,186	73,232	3,503	34.00

Appendix B.6. Stock proportions and catches of sockeye salmon in the Alaskan District 106 commercial drift gill net fisheries, 1982-1990. Catches do not include Blind Slough terminal area harvests. Data based on SPA.

Year	Stikine				
	Alaska	Canada	Tahltan	non-Tahltan	Total
Proportions					
1982	0.486	0.319			0.194
1983	0.668	0.217	0.103	0.013	0.116
1984	0.658	0.269	0.029	0.044	0.074
1985	0.479	0.419	0.091	0.011	0.102
1986	0.689	0.293	0.014	0.004	0.018
1987	0.827	0.155	0.010	0.007	0.017
1988	0.874	0.106	0.020	0.001	0.020
1989	0.657	0.311	0.006	0.026	0.032
Averages					
1983-1989	0.693	0.253	0.039	0.015	0.054
1990	0.608	0.371	0.005	0.016	0.021
Catches					
1982	94,061	61,714			37,585
1983	32,670	10,611	5,030	632	5,662
1984	60,278	24,624	2,673	4,078	6,751
1985	126,914	111,015	24,045	3,013	27,058
1986	100,337	42,685	2,081	606	2,687
1987	112,893	21,190	1,376	968	2,344
1988	80,868	9,784	1,813	64	1,877
1989	126,603	59,959	1,111	5,061	6,172
Averages					
1983-1989	91,509	39,981	5,447	2,060	7,507
1990	112,983	68,921	915	2,986	3,901

Appendix B.7. Salmon catch and effort in the Alaskan District 108 commercial drift gill net fishery, 1964-1990. Catches do not include Ohmer Creek terminal area harvests.

Year	Catch					Effort	
	Chinook	Sockeye	Coho	Pink	Chum	Permit Days	Days Open
1964	2,911	20,299	29,388	114,555	10,771	3,416	62
1965	3,106	21,419	8,301	4,729	2,480	960	48
1966	4,516	36,710	16,493	61,908	17,730	1,841	62
1967	6,372	29,226	6,747	4,713	5,955	1,193	40
1968	4,604	14,594	36,407	91,028	14,537	3,114	61
1969	5,023	19,210	5,823	11,884	2,312	858	37
1970	3,207	15,120	18,403	20,523	12,305	1,180	41
1971	3,717	18,143	14,876	21,806	4,665	892	42
1972	9,332	51,734	38,520	17,153	17,363	1,922	49
1973	9,254	21,387	5,837	6,585	6,680	1,042	21
1974	8,199	2,428	16,021	4,188	2,107	550	16
1975	1,534	0	0	0	1		8
1976	1,123	18	6,056	722	124	130	10
1977	1,443	48,374	14,405	16,253	4,233	740	19
1978	531	56	32,650	1,157	1,001	608	12
1979	91	2,158	234	13,478	1,064	100	5
1980	631	14,053	2,946	7,224	6,910	327	22
1981	283	8,833	1,403	1,466	3,594	177	9
1982	1,033	6,886	19,971	16,988	741	508	21
1983	47	178	15,484	4,171	675	266	17
1984	14	1,290	5,141	4,960	1,892	34	5
1985	20	1,060	1,926	5,325	1,892	50	14
1986	102	4,185	7,439	4,901	5,928	216	25
1987	149	1,620	1,015	3,331	949	81	13
1988	206	1,246	12	144	3,109	60	8
1989	310	10,083	4,261	27,640	3,375	223	29
Averages							
64-89	2,606	13,473	11,914	17,955	5,092	820	27
80-89	280	4,943	5,960	7,615	2,907	194	16
1990	557	11,574	8,218	13,822	9,382	359	34

Appendix B.8. Stock proportions and catches of sockeye salmon in the Alaskan District 108 commercial drift gill net fishery, 1985-1990. Catches do not include Ohmer Creek terminal area harvests. Data based on SPA.

Year	Stikine				
	Alaska	Canada	Tahltan	non-Tahltan	Total
Proportions					
1985	0.064	0.000	0.292	0.644	0.936
1986	0.206	0.017	0.094	0.683	0.777
1987a	0.125	0.000	0.438	0.437	0.875
1988	0.213	0.039	0.178	0.571	0.749
1989	0.117	0.054	0.034	0.795	0.829
Averages					
1985-1989	0.145	0.022	0.207	0.626	0.833
1990	0.395	0.128	0.111	0.366	0.477
Catch					
1985	68	0	310	683	992
1986	862	71	393	2,858	3,252
1987	203	0	710	708	1,418
1988	265	48	222	711	933
1989	1,180	545	341	8,017	8,358
Averages					
1985-1989	515	133	395	2,595	2,990
1990	4,576	1,479	1,280	4,239	5,519

a/ There was no data available to determine the ratio of Tahltan to non-Tahltan Stikine stocks; a 1:1 ratio was assumed.

Appendix B.9. Salmon catch in the Alaskan Subdistrict 106-41 (Sumner Strait) test fishery, 1984-1990.

Year	Catch					Boat Hours
	Chinook	Sockeye	Coho	Pink	Chum	
1984	13	1,370	101	975	793	142.51
1985	16	4,345	301	3,230	746	156.31
1986	23	982	177	60	248	99.45
1987	24	2,659	799	4,117	741	508.10
1988	11	1,020	89	137	772	121.00
1989	11	2,043	275	6,069	856	60.20
1990	13	2,256	432	372	552	7.00

Appendix B.10. Stock proportions and catches of sockeye salmon in the Alaskan Subdistrict 106-41 and -42 (Sumner Strait) test fishery, 1984-1990. Data based on SPA.

			Stikine		
Year	Alaska	Canada	Tahltan	non-Tahltan	Total
Proportions					
1984	0.658	0.269	0.029	0.044	0.074
1985	0.480	0.401	0.109	0.010	0.119
1986	0.834	0.149	0.008	0.009	0.017
1987	0.816	0.166	0.015	0.003	0.018
1988	0.868	0.098	0.034	0.000	0.034
1989	0.561	0.430	0.000	0.008	0.008
1990	0.548	0.416	0.014	0.022	0.035
Catch					
1984	901	368	40	61	101
1985	2,085	1,741	475	44	519
1986	819	146	8	9	17
1987	2,169	442	39	9	47
1988	886	100	35	0	35
1989	1,147	879	0	17	17
1990	1,237	939	31	49	80

Appendix B.11. Salmon catch and effort in the Alaskan Subdistrict 106-30 (Clarence Strait) test fishery, 1986-1990.

Year	Catch					Boat Hours
	Chinook	Sockeye	Coho	Pink	Chum	
1986	24	363	95	80	58	23.25
1987	1	899	589	1,705	467	384.00
1988	10	16	412	112	598	119.70
1989	4	37	464	431	329	
1990	No Test Fishery					

Appendix B.12. Stock proportions and catches of sockeye salmon in the Alaskan Subdistrict 106-30 (Clarence Strait) test fishery, 1986-1990. Data based on SPA.

	Year	Alaska	Canada	Stikine		
				Tahltan	non-Tahltan	Total
Proportions						
	1986	0.726	0.272	0.000	0.002	0.002
	1987	0.844	0.140	0.004	0.012	0.016
	1988	0.746	0.254	0.000	0.000	0.000
	1989	0.514	0.486	0.000	0.000	0.000
	1990	No Test	Fishery			
Catches						
	1986	263	99	0	1	1
	1987	758	126	3	11	15
	1988	12	4	0	0	0
	1989	19	18	0	0	0
	1990	No Test	Fishery			

Appendix B.13. Salmon catch and effort in the Alaskan District 106 test fisheries 1984-1990.

Year	Catch					Boat Hours
	Chinook	Sockeye	Coho	Pink	Chum	
1984	13	1,370	101	975	793	142.51
1985	16	4,345	301	3,230	746	156.31
1986	47	1,345	272	140	306	122.70
1987	25	3,558	1,388	5,822	1,208	892.10
1988	21	1,036	501	249	1,370	240.70
1989	15	2,080	739	6,500	1,185	60.20
1990	13	2,256	432	372	552	7.00

Appendix B.14. Stock proportions and catches of sockeye salmon in the Alaskan District 106 test fisheries, 1984-1990. Data based on SPA.

			Stikine		
Year	Alaska	Canada	Tahltan	non-Tahltan	Total
Proportions					
1984	0.658	0.269	0.029	0.044	0.074
1985	0.480	0.401	0.109	0.010	0.119
1986	0.805	0.182	0.006	0.007	0.013
1987	0.823	0.160	0.012	0.006	0.017
1988	0.867	0.100	0.033	0.000	0.033
1989	0.561	0.431	0.000	0.008	0.008
1990	0.548	0.416	0.014	0.022	0.035
Catch					
1984	901	368	40	61	101
1985	2,085	1,741	475	44	519
1986	1,082	245	8	9	17
1987	2,928	568	42	20	62
1988	898	104	35	0	35
1989	1,166	897	0	17	17
1990	1,237	939	31	49	80

Appendix B.15. Salmon catch and effort in the Alaskan District 108 test fishery 1984-1990.

Year	Catch					Boat Hours
	Chinook	Sockeye	Coho	Pink	Chum	
1984	37	641	11	822	813	
1985	33	1,258	11	465	381	71.67
1986	79	564	3	36	315	72.15
1987	30	290	13	1,957	488	76.87
1988	65	451	9	1,091	1,009	126.83
1989	15	1,038	45	2,459	283	63.47
1990	19	866	45	942	643	7.00

Appendix B.16. Stock proportions and catches of sockeye salmon in the Alaskan District 108 test fishery, 1985-1990. Data based on SPA.

				Stikine		
	Year	Alaska	Canada	Tahltan	non-Tahltan	Total
Proportions						
	1985	0.064	0.000	0.292	0.644	0.936
	1986	0.134	0.044	0.486	0.336	0.822
	1987	0.125	0.000	0.438	0.437	0.875
	1988	0.205	0.049	0.132	0.614	0.746
	1989	0.136	0.105	0.100	0.659	0.759
	1990	0.417	0.172	0.094	0.318	0.411
Catch						
	1985	81	0	367	810	1,177
	1986	76	25	274	190	464
	1987	36	0	127	127	254
	1988	93	22	59	277	336
	1989	141	109	104	684	788
	1990	361	149	81	275	356

Appendix B.17. Salmon and steelhead trout catch and effort in the Canadian commercial fishery in the lower Stikine River, 1979-1990.

Year	Catch						Effort		
	Chinook Jacks	Large	Sockeye	Coho	Pink	Chum	Steelhead	Boat Days	Days
1979a/	63	712	10,534	10,720	1,994	424	264	b/	42.0
1980		1,488	18,119	6,629	736	771	362	701.0	41.0
1981		664	21,551	2,667	3,713	1,128	280	522.0	32.0
1982		1,693	15,397	15,904	1,782	722	828	1,093.0	71.0
1983	430	492	15,857	6,170	1,043	274	667	458.0	54.0
1984c/									
1985	91	256	17,093	2,172	2,321	532	231	145.5	22.5
1986	365	806	12,411	2,278	107	295	192	239.0	13.5
1987	242	909	6,138	5,728	646	432	217	287.0	20.0
1988	201	1,007	12,766	2,112	418	730	258	320.0	26.5
1989	157	1,537	17,179	6,092	825	674	127	325.0	23.0
Averages d/ 80-89		1,149	15,168	5,528	1,288	618	351	454.5	33.7
1990	680	1,569	14,530	4,020	496	499	188	328.1	29.0

- a/ The lower river commercial catch in 1979 includes the upper river commercial catch.  
b/ Effort data not available  
c/ There was no commercial fishery in 1984.  
d/ Chinook average is for jacks and large fish combined.

Appendix B.18. Sockeye salmon stock proportions and catch by stock in the Canadian commercial fishery in the lower Stikine River, 1979-1990. Stock compositions based on: scale circuli counts 1979-1983, SPA in 1985; average of SPA and GPA 1986; SPA in 1987 and 1988; and egg diameter in 1989 and 1990.

Year	Proportions		Catch	
	Tahltan	non-Tahltan	Tahltan	non-Tahltan
1979	0.433	0.567	4,561	5,973
1980	0.309	0.691	5,599	12,520
1981	0.476	0.524	10,258	11,293
1982	0.624	0.376	9,608	5,789
1983	0.422	0.578	6,692	9,165
1984a/				
1985	0.623	0.377	10,649	6,444
1986	0.489	0.511	6,069	6,342
1987	0.225	0.775	1,380	4,758
1988	0.161	0.839	2,062	10,704
1989	0.164	0.836	2,813	14,366
Averages 80-89	0.388	0.612	6,125	9,042
1990	0.346	0.654	5,029	9,501

a/ There was no commercial fishery in 1984.

Appendix B.19. Salmon and steelhead trout catch and effort in the Canadian commercial fishery in the upper Stikine River, 1975-1990.

Year	Catch						Effort	
	Chinook Jacks Large	Sockeye	Coho	Pink	Chum	Steelhead	Boat Days	Days
1975		178	270	45	0	0	0	
1976		236	733	13	0	0	0	
1977		62	1,975	0	0	0	0	
1978		100	1,500	0	0	0	0	
1979 a/								
1980		156	700	40	20	0	0	
1981		154	769	0	0	0	11	5.0
1982		76	195	0	0	0	8	4.0
1983		75	614	0	0	4	10	8.0
1984 b/								
1985		62	1,084	0	0	0	14	6.0
1986	41	104	815	0	0	0	19	7.0
1987	19	109	498	0	0	19	20	7.0
1988	46	185	348	0	0	0	4	6.5
1989	17	54	493	0	0	0	14	7.0
Averages c/ 75-89		120	769	8	2	2	0	
80-89		110	613	4	2	3	0	13 6.3
1990	20	48	472	0	0	0	0	15 7.0

a/ Catches in 1979 were included in the lower river commercial catches.

b/ There was no commercial fishery in 1984.

c/ Chinook averages are for jacks and large fish combined.

## Appendix B.20. Salmon and steelhead trout catch in the Canadian Indian food fishery located at Telegraph Creek, on the Stikine River, 1972-1990.

Year	Catch					
	Chinook Jacks	Large	Sockeye	Coho	Pink	Chum Steelhead
1972		0	230	0	0	0
1973		200	3,670	0	0	0
1974		0	3,500	0	0	0
1975		1,024	1,982	5	0	0
1976		924	2,911	0	0	0
1977		100	4,335	0	0	0
1978		400	3,500	0	0	0
1979		850	3,000	0	0	0
1980		587	2,100	0	0	0
1981		740	5,304	8	144	4
1982		618	4,948	40	60	0
1983		1,066	4,649	3	77	46
1984		702	5,327	1	62	2
1985	94	793	7,287	3	35	9
1986	569	1,026	4,208	2	0	2
1987	183	1,183	2,979	3	0	2
1988	197	1,178	2,177	5	0	3
1989	115	1,078	2,360	6	0	0
Averages a/						
72-89		757	3,582	4	21	4
80-89		1,013	4,134	7	38	7
1990	259	633	3,022	17	0	11

a/ Chinook averages are for jacks and large fish combined.

## Appendix B.21. Salmon and steelhead trout catch in the combined Canadian net fisheries in the Stikine River, 1972-1990.

Year	Chinook						Steel-head
	Jacks	Large	Sockeye	Coho	Pink	Chum	
1972	0	0	230	0	0	0	0
1973	0	200	3,670	0	0	0	0
1974	0	0	3,500	0	0	0	0
1975	0	1,202	2,252	50	0	0	0
1976	0	1,160	3,644	13	0	0	0
1977	0	162	6,310	0	0	0	0
1978	0	500	5,000	0	0	0	0
1979	63	1,562	13,534	10,720	1,994	424	264
1980	0	2,231	20,919	6,669	756	771	362
1981	0	1,558	27,624	2,675	3,857	1,128	284
1982	0	2,387	20,540	15,944	1,842	722	828
1983	430	1,633	21,120	6,173	1,120	304	714
1984a/	0	702	5,327	1	62	0	2
1985	185	1,111	25,464	2,175	2,356	536	240
1986	975	1,936	17,434	2,280	107	307	194
1987	444	2,201	9,615	5,731	646	459	219
1988	444	2,370	15,291	2,117	418	733	261
1989	289	2,669	20,032	6,098	825	674	127
Averages b/							
72-89		1,467	12,306	3,369	777	337	194
80-89		2,157	18,337	4,986	1,199	563	323
1990	959	2,250	18,024	4,037	496	499	199

a/ There was no commercial fishery in 1984.

b/ Chinook averages are for jacks and large fish combined.



Appendix B.22. Salmon and steelhead trout catches and effort in Canadian test fisheries in the Stikine River, 1985-1990.

Year	Fishery	Catch					Effort Drift=# Set=hr.
		Chinook	Sockeye	Coho	Pink	Chum Steelhead	
1985	C. Set		1,340				
1986	C. Drift	27	412	226	8	25	405
1987	J. Drift	128	385	162	111	61	845
	J. Set	61	1,283	620	587	193	109
1988	J. Drift	168	325	75	9	33	720
	J. Set	101	922	130	23	65	702
1989	C. Drift	116	364	242	41	46	5
	C. Set	101	1,243	502	249	103	1,392
1990	C. Drift	167	447	134	5	29	6
	C. Set	64	1,493	271	42	48	1,212

Appendix B.23. Sockeye salmon stock proportions and catch by stock in the test fishery in the lower Stikine River, 1985-1990. Stock compositions based on: SPA 1985; average of SPA and GPA 1986-1988; Egg diameter 1989 and 1990.

Year	Catch Tahltan		Proportion Tahltan		Average Proportion a/ non-Tahltan	
	U.S.	Canada	U.S.	Canada	Tahltan	Tahltan
1985	560	439	0.418	0.328	0.372	0.628
1986	164	127	0.398	0.308	0.352	0.648
1987	513	397	0.308	0.238	0.273	0.727
1988	408	295	0.327	0.237	0.282	0.718
1989		414		0.258	0.258	0.742
1990		822		0.454	0.454	0.546

a/ Average proportions are from averages of weekly estimates.

Appendix B.24. Estimated proportion of inriver run comprised of Tahltan and non-Tahltan sockeye stocks, 1979-1990. Stock compositions based on: scale circuli counts 1979-1983, SPA in 1985; average of SPA and GPA 1986-1988; and egg diameter analysis in 1989 and 1990.

Year	Tahltan		Average a/ non-Tahltan	
	U.S.	Canada	Tahltan	Tahltan
1979	0.433		0.433	0.567
1980	0.305		0.305	0.695
1981	0.475		0.475	0.525
1982	0.618		0.618	0.382
1983	0.489	0.423	0.456	0.544
1984	0.635	0.394	0.493	0.507
1985	0.621	0.363	0.466	0.534
1986	0.398	0.500	0.449	0.551
1987	0.338	0.257	0.304	0.696
1988	0.209	0.122	0.172	0.828
1989		0.188	0.188	0.812
1990		0.417	0.417	0.583

a/ Average proportions are from averages of weekly stock composition and migratory timing (from drift test fishery) estimates.

Appendix B.25. Counts of adult sockeye salmon migrating through Tahltan Lake weir, 1959-1990.

	Weir Year Installed	Date of Arrival			No. Taken		
		First	50%	90%	Total for Count Broodstock	Natural Spawners	
1959	30-Jun	02-Aug	12-Aug	16-Aug	4,311		
1960	15-Jul	02-Aug	24-Aug	27-Aug	6,387		
1961	20-Jul	09-Aug	11-Aug	15-Aug	16,619		
1962a/	01-Aug	02-Aug	05-Aug	08-Aug	14,508		
1963b/	03-Aug				1,780		
1964	23-Jul	26-Jul	14-Aug	25-Aug	18,353		
1965c/	19-Jul	18-Jul	02-Sep	07-Sep	1,471		
1966	12-Jul	03-Aug	13-Aug	21-Aug	21,580		
1967	11-Jul	14-Jul	21-Jul	28-Jul	38,801		
1968	11-Jul	21-Jul	25-Jul	08-Aug	19,726		
1969	07-Jul	11-Jul	18-Jul	31-Jul	11,805		
1970	05-Jul	25-Jul	01-Aug	11-Aug	8,419		
1971	12-Jul	19-Jul	28-Jul	12-Aug	18,523		
1972	13-Jul	13-Jul	19-Jul	31-Aug	52,545		
1973	10-Jul	24-Jul	30-Jul	07-Aug	2,877		
1974	03-Jul	28-Jul	03-Aug	17-Aug	8,101		
1975	10-Jul	25-Jul	08-Aug	17-Aug	8,159		
1976	16-Jul	29-Jul	01-Aug	06-Aug	24,111		
1977	06-Jul	11-Jul	16-Jul	10-Aug	42,960		
1978	10-Jul	10-Jul	20-Jul	29-Jul	22,788		
1979	09-Jul	23-Jul	01-Aug	11-Aug	10,211		
1980	04-Jul	15-Jul	22-Jul	12-Aug	11,018		
1981	30-Jun	16-Jul	26-Jul	03-Aug	50,790		
1982	02-Jul	10-Jul	19-Jul	29-Jul	28,257		
1983	27-Jun	05-Jul	22-Jul	05-Aug	21,256		
1984	20-Jun	19-Jul	24-Jul	03-Aug	32,777		
1985	28-Jun	18-Jul	31-Jul	06-Aug	67,326		
1986	10-Jul	26-Jul	04-Aug	11-Aug	20,280		
1987	14-Jul	21-Jul	04-Aug	13-Aug	6,958		
1988	16-Jul	16-Jul	06-Aug	14-Aug	2,536		
1989	07-Jul	09-Jul	01-Aug	14-Aug	8,316	2,210	6,106
Averages							
59-89	10-Jul	20-Jul	31-Jul	11-Aug	19,469		
85-89	09-Jul	18-Jul	03-Aug	11-Aug	21,083		
1990	06-Jul	15-Jul	26-Jul	03-Aug	14,927	3,302	11,625

- a/ Question as to date weir installed.  
b/ Daily counts unavailable.  
c/ A slide occurred blocking the entrance for a while.

Appendix B.26. Aerial survey counts of non-Tahltan sockeye stocks in the Stikine River drainage, 1984-1990. The index represents the combined counts from eight spawning areas.

Year	Escapement Index
1984	2,329
1985	1,136
1986	571
1987	691
1988	376
1989	809
Averages	
84-89	986
85-89	718
1990	743

Appendix B.27. Count of sockeye salmon smolt migrating through Tahltan Lake smolt weir, 1984-1990.

Weir Year Installed	Date of Arrival				Total Count
	First	50%	90%		
1984	10-May	11-May	23-May	06-Jun	219,702
1985	25-Apr	23-May	31-May	28-May	613,531
1986	08-May	10-May	31-May	07-Jun	244,330
1987	07-May	15-May	23-May	24-May	810,432
1988	01-May	08-May	20-May	06-Jun	1,170,136
1989	05-May	08-May	22-May	06-Jun	580,574
Averages					
84-89	04-May	12-May	25-May	02-Jun	606,451
85-89	03-May	12-May	25-May	01-Jun	683,801
1990a	05-May	15-May	29-May	05-Jun	607,645 a/

a/ Actual count of 595,147 on June 14 expanded by average % of outmigration by date (97.9%) from historical data.

Appendix B.28. Weir counts of chinook salmon at Little Tahltan River, 1985-1990. Jacks are fish of less than 600 mm postorbital-hypural length.

Large Chinook						Jacks				Total All Chinook
Weir Year Installed	First Arrival	50% Arrival	90% Arrival	Total Count	First Arrival	50% Arrival	90% Arrival	Total Count		
1985	03-Jul	04-Jul	30-Jul	06-Aug	3,114	04-Jul	31-Jul	10-Aug	413	3,527
1986	28-Jun	29-Jun	21-Jul	05-Aug	2,891	03-Jul	25-Jul	06-Aug	572	3,463
1987	28-Jun	04-Jul	24-Jul	02-Aug	4,783	03-Jul	26-Jul	06-Aug	365	5,148
1988	26-Jun	27-Jun	18-Jul	03-Aug	7,292	27-Jun	17-Jul	02-Aug	327	7,619
1989	25-Jun	26-Jun	23-Jul	02-Aug	4,715	26-Jun	23-Jun	02-Aug	199	4,914
Averages 85-89	28-Jun	30-Jun	23-Jul	03-Aug	4,559	30-Jun	18-Jul	05-Aug	375	4,934
1990	22-Jun	29-Jun	23-Jul	04-Aug	4,392	05-Jul	22-Jun	30-Jul	417	4,809

Appendix B.29. Index counts of Stikine chinook escapements, 1979-1990. Counts do not include jacks. Total Stikine escapement estimated by Little Tahltan aerial counts \* 8 (1979-1984), since 1985 by Little Tahltan weir \* 4.

Year	Little Tahltan Weir	Little Tahltan (Aerial)	Tahltan (Aerial)	Beatty (Aerial)	a/ Andrew (Foot)	Total Stikine
1979		1,166	2,118		382	9,328
1980		2,137	960	122	362	17,096
1981		3,334	1,852	558	629	26,672
1982		2,830	1,690	567	910	22,640
1983		594	453	83	444	4,752
1984		1,294		126	355	10,352
1985	3,114	1,598	1,490	147	319	12,456
1986	2,891	1,201	1,400	183	707	11,564
1987	4,783	2,706	1,390	312	651	19,132
1988	7,292	3,796	4,384	593	470	29,168
1989	4,715	2,515	b/	362	530	18,860
Averages						
80-89		2,201	1,513	305	538	17,269
85-89	4,559	2,363	1,733	319	535	18,236
1990	4,392	1,755	2,134	271	664	17,568

a/ Andrew Creek counts in 1983 and 1984 are from a weir.

b/ Not surveyed due to poor visibility.

Appendix B.30. Index counts of Stikine coho salmon escapements, 1984, 1985, 1988, 1989, and 1990.

Index Area	Year and Survey Date				
	1990 10/30	1989 10/27	1988 10/28	1985 10/25	1984 10/30
Katete (south)	94	336	32	590	460
Katete (north)	548	896	227	1,217	
Craig	810	992	a/	735	0
Jekill	NS	a/	a/		0
Verret	494	848	175	39	15
Bronson Slough	NS	120		0	42
Scud Slough	664	707	97		
Porcupine	430	90	53		
Christina	NS	55	0		
Total	3,040	4,044	584	2,581	517

a/ Poor observation conditions  
b/ Surveys not completed for 1990.

Appendix B.31. Stikine River sockeye salmon run size, 1979-1990. Catches include test fishery catches.

Year	Inriver run size estimates			Inriver		Marine	Total
	Canada	U.S.	Average <sup>a</sup>	Catch	Escapement	Catch	Run
1979		40,353	40,353	13,534	26,819	8,299	48,652
1980		62,743	62,743	20,919	41,824	23,206	85,949
1981		140,029	140,029	27,624	112,405	27,538	167,567
1982		68,761	68,761	20,540	48,221	43,329	112,090
1983	77,260	66,838	71,683	21,120	50,563	5,810	77,493
1984	95,454	59,168	76,211	5,327	70,884	7,928	84,139
1985	237,261	138,498	184,747	26,804	157,943	29,747	214,494
1986			69,036	17,846	51,190	6,420	75,456
1987			39,264	11,283	27,981	4,077	43,342
1988			41,915	16,538	25,377	3,181	45,096
1989			75,054	21,639	53,415	15,335	90,389
Averages							
79-89			79,072	18,470	60,602	15,897	94,970
80-89			82,944	18,964	63,980	16,657	99,602
1990			57,386	19,964	37,422	9,856	67,242
Tahltan sockeye run size							
1979			17,472	7,261	10,211	5,076	22,548
1980			19,137	8,119	11,018	11,239	30,376
1981			66,514	15,724	50,790	16,189	82,703
1982			42,493	14,236	28,257	24,785	67,278
1983			32,684	11,428	21,256	5,104	37,788
1984			37,571	4,794	32,777	3,251	40,822
1985			86,008	18,682	67,326	25,197	111,205
1986			31,015	10,735	20,280	2,757	33,771
1987			11,923	4,965	6,958	2,255	14,178
1988			7,222	4,686	2,536	2,129	9,351
1989			14,110	5,794	8,316	1,556	15,666
Averages							
79-89			33,286	9,675	23,611	9,049	42,335
80-89			34,868	9,916	24,951	9,446	44,314
1990			23,923	8,996	14,927	2,307	26,230

a/ The average is an average of weekly run timing estimates as well as stock composition estimates and is not a simple average of total estimates for the season.

Appendix C.1. Weekly salmon catch and effort in the Alaskan District 111 commercial drift gill net fishery, 1990.

Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Boats	Days Open/	Boat Days
25	17-Jun	487	3,287	3	7	311	56	3.0	168
26	24-Jun	547	8,370	18	456	3,850	77	3.0	231
27	01-Jul	1,361	11,100	36	2,171	17,565	71	3.0	213
28	08-Jul	348	18,704	483	6,968	29,991	94	2.7	254
29	15-Jul	113	25,381	645	9,515	27,761	113	2.7	305
30	22-Jul	195	26,245	1,205	26,842	17,716	99	4.0	396
31	29-Jul	91	6,724	1,350	27,680	6,560	52	3.0	156
32	05-Aug	52	12,585	3,000	31,915	4,209	87	3.0	261
33	12-Aug	165	9,234	7,090	29,054	4,297	78	3.0	234
34	19-Aug	35	3,976	9,863	17,429	8,853	162	3.0	486
35	26-Aug	15	704	10,629	797	8,292	57	2.0	114
36	02-Sep	33	390	14,226	196	8,447	78	2.0	156
37	09-Sep	16	136	9,886	6	6,079	64	2.0	128
38	16-Sep	15	47	7,673	0	1,526	68	1.0	68
39	23-Sep	7	1	1,203	0	73	23	2.0	46
Total		3,480	126,884	67,310	153,036	145,530	1,179	39.4	3,216

a/ Night closures to minimize chinook catch were in effect during weeks 28 and 29.

Appendix C.2. Weekly salmon catch and effort in the Alaskan District 111 test gill net fishery, 1990. The test fishery was operated in Port Snettisham.

Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Boats	Days Open	Boat Days
27	01-Jul	6	3	0	1	28	1	0.362	0.36
28	08-Jul	5	9	0	2	52	1	0.130	0.13
29	15-Jul	5	17	0	11	104	1	0.336	0.34
30	22-Jul	2	10	0	10	20	1	0.518	0.52
31	29-Jul	3	18	0	14	13	1	0.197	0.20
Total a/		21	57	0	38	217	5	1.543	1.543

a/ Not all fish caught were sold, therefore, fish ticket catch totals are incorrect.

Appendix C.3. Weekly stock proportions of sockeye salmon harvested in the Alaskan District 111 commercial drift gill net fishery, 1990. Data based on scale pattern analysis (SPA).

	Week	Kuthai	Little Trapper	Mainstem	Little Tatsamenie	Total Taku	Crescent	Speel	Total Snettisham
	25	0.360	0.112	0.316	0.086	0.874	0.126	0.000	0.126
	26	0.148	0.295	0.290	0.203	0.935	0.065	0.000	0.065
	27	0.047	0.306	0.541	0.011	0.904	0.089	0.006	0.096
	28	0.050	0.285	0.215	0.223	0.773	0.218	0.009	0.227
	29	0.011	0.297	0.101	0.374	0.782	0.206	0.012	0.218
	30	0.013	0.163	0.226	0.462	0.863	0.101	0.036	0.137
	31	0.002	0.133	0.473	0.335	0.943	0.011	0.046	0.057
	32	0.001	0.049	0.687	0.202	0.939	0.006	0.055	0.061
	33	0.000	0.004	0.612	0.263	0.878	0.000	0.122	0.122
	34	0.000	0.011	0.615	0.236	0.862	0.037	0.102	0.138
	35	0.000	0.011	0.615	0.236	0.862	0.037	0.102	0.138
	36	0.000	0.011	0.615	0.236	0.862	0.037	0.102	0.138
	37	0.000	0.011	0.615	0.236	0.862	0.037	0.102	0.138
	38	0.000	0.011	0.615	0.236	0.862	0.037	0.102	0.138
	39	0.000	0.011	0.615	0.236	0.862	0.037	0.102	0.138
	Total	0.036	0.197	0.336	0.286	0.855	0.112	0.033	0.145

Appendix C.4. Weekly stock-specific catch of Taku sockeye salmon harvested in the Alaskan District 111 commercial drift gill net fishery, 1990. Data based on SPA.

Week	Kuthai	Little Trapper	Mainstem	Little Tatsamenie	Total Taku	Crescent	Speel	Total Snettisham
25	1,183	367	1,039	283	2,872	415	0	415
26	1,236	2,465	2,425	1,697	7,823	547	0	547
27	527	3,392	6,002	117	10,038	990	72	1,062
28	940	5,327	4,022	4,173	14,462	4,070	172	4,242
29	290	7,530	2,554	9,480	19,854	5,235	292	5,527
30	338	4,269	5,926	12,123	22,656	2,644	945	3,589
31	11	894	3,182	2,255	6,342	76	306	382
32	14	613	8,648	2,541	11,816	72	697	769
33	0	37	5,648	2,424	8,109	0	1,125	1,125
34	0	44	2,444	938	3,426	146	404	550
35	0	8	433	166	607	26	72	97
36	0	4	240	92	336	14	40	54
37	0	1	84	32	117	5	14	19
38	0	1	29	11	40	2	5	7
39	0	0	1	0	1	0	0	0
Total	4,539	24,952	42,676	36,332	108,499	14,242	4,143	18,385

Appendix C.5. Weekly salmon and steelhead trout catch and effort in the Canadian commercial fishery in the Taku River, 1990.

Week	Start Date	Catch						Effort		
		Chinook Jacks	Large	Sockeye	Coho	Pink	Chum	Steel-head	Average Licenses	Days Open
26	24-Jun	69	735	2,217	0	1	0	1	11.0	2.3
27	01-Jul	29	230	1,508	2	4	0	2	10.0	2.0
28	08-Jul	24	153	3,709	10	95	1	0	13.0	4.0
29	15-Jul	4	86	2,922	57	89	1	0	11.0	3.0
30	22-Jul	1	39	4,394	361	125	2	1	13.0	4.0
31	29-Jul	1	14	3,478	913	39	5	5	11.9	4.0
32	05-Aug	0	1	1,453	512	25	3	2	10.7	3.0
33	12-Aug	0	0	474	202	0	0	0	5.0	2.0
34	19-Aug	0	0	945	1,150	0	0	11	5.8	4.0
Total		128	1,258	21,100	3,207	378	12	22	91.4	28.3

Appendix C.6. Weekly stock proportions of sockeye salmon harvested the Canadian commercial fishery in the Taku River, 1990. Data based on SPA.

Week	Kuthai	Little Trapper	Mainstem	Little Tatsamenie
26	0.459	0.278	0.188	0.074
27	0.197	0.666	0.052	0.085
28	0.135	0.478	0.387	0.000
29	0.054	0.466	0.429	0.052
30	0.059	0.519	0.165	0.257
31	0.034	0.244	0.376	0.347
32	0.003	0.106	0.653	0.238
33	0.002	0.063	0.738	0.196
34	0.002	0.123	0.652	0.223
35	0.002	0.123	0.652	0.223
36	0.002	0.123	0.652	0.223
37	0.002	0.123	0.652	0.223
38	0.002	0.123	0.652	0.223
Total	0.112	0.388	0.338	0.163

Appendix C.7. Weekly stock-specific catch of sockeye salmon in the Canadian commercial fishery in the Taku River, 1990. Data based on SPA.

Week	Kuthai	Little Trapper	Mainstem	Little Tatsamenie
26	1,018	617	417	165
27	297	1,004	79	128
28	499	1,772	1,437	1
29	157	1,361	1,253	151
30	258	2,282	724	1,130
31	119	847	1,306	1,206
32	4	154	949	346
33	1	30	350	93
34	2	116	616	211
Total	2,355	8,183	7,131	3,431

Appendix C.8. Weekly salmon and steelhead trout catch in the Canadian test fishery in the Taku River, 1990.

Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Steelhead
25	17-Jun	19	16	0	0	0	0
26	24-Jun	22	51	0	0	0	0
27	01-Jul	6	53	1	0	0	0
28	08-Jul	1	25	0	0	0	0
29	15-Jul	0	17	0	0	0	0
30	22-Jul	0	21	4	0	0	0
31	29-Jul	0	9	2	0	0	0
32	05-Aug	0	13	6	0	0	0
33	12-Aug	0	6	6	0	0	0
34	19-Aug	0	7	23	0	0	0
35	26-Aug	0	40	131	0	0	1
36	02-Sep	0	23	132	0	0	3
37	09-Sep	0	4	93	0	0	12
38	16-Sep	0	0	71	0	0	4
39	23-Sep	0	0	3	0	0	0
Total		48	285	472	0	0	20

Appendix C.9. Weekly stock specific-catch of sockeye salmon in the Canadian test fishery in the Taku River, 1990. Data based on SPA, weekly stock proportions assumed the same as the commercial catch.

Week	Kuthai	Little Trapper	Mainstem	Little Tatsamenie
25	7	4	3	1
26	23	14	10	4
27	10	35	3	4
28	3	12	10	0
29	1	8	7	1
30	1	11	3	5
31	0	2	3	3
32	0	1	8	3
33	0	0	4	1
34	0	1	5	2
35	0	5	26	9
36	0	3	15	5
37	0	0	3	1
Total	47	98	100	40

Appendix C.10. Mark-recapture estimate of above border run of sockeye and coho salmon in the Taku River, 1990.

Recovery Week	Start Date	Above Border Run	Canadian Harvests		Above Border b/	
			Commercial	Test	Fooda/Escapement	
Sockeye						
25	17-Jun	283		16	267	
26	24-Jun	19,643	2,217	51	17,375	
27	01-Jul	14,756	1,508	53	13,195	
28	08-Jul	18,857	3,709	25	15,123	
29	15-Jul	16,223	2,922	17	13,284	
30	22-Jul	16,907	4,394	21	12,492	
31	29-Jul	9,163	3,478	9	5,676	
32	05-Aug	3,182	1,453	13	1,716	
33	12-Aug	5,402	474	6	4,922	
34	19-Aug	7,324	945	7	6,372	
35	26-Aug	1,353	0	40	1,313	
36	02-Sep	1,161	0	23	1,138	
Total c/		114,254	21,100	285	74	92795
Coho						
27-28	01-Jul	52	12	1	39	
29	15-Jul	314	57	0	257	
30	22-Jul	852	361	4	487	
31	29-Jul	2,429	913	2	1,514	
32	05-Aug	1,685	512	6	1,167	
33	12-Aug	1,070	202	6	862	
34	19-Aug	16,053	1,150	23	14,880	
35	26-Aug	9,768	0	131	9,637	
36	02-Sep	18,760	0	132	18,628	
37-39	09-Sep	24,054	0	167	23,887	
Total		75,037	3,207	472	74	71,284 d/

a/ Food fishery catch by week not available.

b/ Total above border escapement equals the sum of the period escapements minus the food fishery catch and test fishery catch after week 36.

c/ Test fishery total includes fish caught after week 36.

d/ A second method of estimating the above-border run size by expanding the test fishery CPUE indicated an above-border run of 85,053 coho salmon.



Appendix C.11. Daily counts of salmon passing through Nahlin River weir, 1990.

Date	Jack a/ Chinook Count	Large Chinook			Sockeye		
		Count	Cum.	Percent	Count	Cum.	Percent
18-Jun							
19-Jun	0	1	1	0.1	0	0	0.0
20-Jun	0	0	1	0.1	0	0	0.0
21-Jun	0	1	2	0.1	0	0	0.0
22-Jun	0	0	2	0.1	0	0	0.0
23-Jun	0	1	3	0.2	0	0	0.0
24-Jun	0	2	5	0.3	0	0	0.0
25-Jun	0	4	9	0.5	0	0	0.0
26-Jun	0	1	10	0.5	0	0	0.0
27-Jun	0	0	10	0.5	0	0	0.0
28-Jun	0	1	11	0.6	0	0	0.0
29-Jun	2	7	18	0.9	3	3	0.1
30-Jun	3	6	24	1.3	2	5	0.2
01-Jul	3	42	66	3.5	23	28	1.1
02-Jul	0	14	80	4.2	92	120	4.8
03-Jul	0	0	80	4.2	200	320	12.7
04-Jul	6	14	94	4.9	417	737	29.3
05-Jul	6	27	121	6.3	207	944	37.5
06-Jul	11	29	150	7.8	139	1,083	43.1
07-Jul	14	31	181	9.5	90	1,173	46.6
08-Jul	11	30	211	11.0	74	1,247	49.6
09-Jul	8	17	228	11.9	61	1,308	52.0
10-Jul	14	29	257	13.4	84	1,392	55.3
11-Jul	12	32	289	15.1	27	1,419	56.4
12-Jul	6	32	321	16.8	20	1,439	57.2
13-Jul	2	25	346	18.1	21	1,460	58.1
14-Jul	8	14	360	18.8	15	1,475	58.6
15-Jul	14	141	501	26.2	20	1,495	59.4
16-Jul	23	105	606	31.7	19	1,514	60.2
17-Jul	18	119	725	37.9	37	1,551	61.7
18-Jul	22	145	870	45.5	44	1,595	63.4
19-Jul	22	193	1,063	55.6	30	1,625	64.6
20-Jul	13	83	1,146	60.0	57	1,682	66.9
21-Jul	17	57	1,203	63.0	63	1,745	69.4
22-Jul	18	88	1,291	67.6	82	1,827	72.6
23-Jul	8	31	1,322	69.2	133	1,960	77.9
24-Jul	10	80	1,402	73.4	141	2,101	83.5
25-Jul	11	77	1,479	77.4	89	2,190	87.1
26-Jul	2	6	1,485	77.7	78	2,268	90.2
27-Jul	1	75	1,560	81.6	66	2,334	92.8
28-Jul	5	130	1,690	88.4	56	2,390	95.0
29-Jul	7	83	1,773	92.8	44	2,434	96.8
30-Jul	3	45	1,818	95.1	33	2,467	98.1
31-Jul	6	34	1,852	96.9	29	2,496	99.2
01-Aug	2	17	1,869	97.8	8	2,504	99.6
02-Aug	0	10	1,879	98.3	10	2,514	100.0
03-Aug	5	21	1,900	99.4	1	2,515	100.0
04-Aug	0	11	1,911	100.0	0	2,515	100.0
	313	1,911			2,515		

a/ Jack chinook are defined as fish of less than 660 MEF length.

Appendix C.12. Daily counts of salmon passing through Little Tatsamenie weir, 1990.

Date	Jack Chinook Count	Large Chinook			Sockeye			Coho		
		Count	Cum.	Percent	Count	Cum.	Percent	Count	Cum.	Percent
29-Jul										
30-Jul	1	0	0	0.0	1	1	0.0	0	0	0.0
31-Jul	14	12	12	2.8	1	2	0.0	0	0	0.0
01-Aug	5	13	25	5.8	1	3	0.1	0	0	0.0
02-Aug	4	6	31	7.1	4	7	0.1	0	0	0.0
03-Aug	3	0	31	7.1	0	7	0.1	0	0	0.0
04-Aug	0	6	37	8.5	0	7	0.1	0	0	0.0
05-Aug	8	3	40	9.2	3	10	0.2	0	0	0.0
06-Aug	6	6	46	10.6	4	14	0.2	0	0	0.0
07-Aug	5	19	65	15.0	5	19	0.3	0	0	0.0
08-Aug	7	13	78	18.0	4	23	0.4	0	0	0.0
09-Aug	4	5	83	19.1	6	29	0.5	0	0	0.0
10-Aug	0	4	87	20.0	3	32	0.6	0	0	0.0
11-Aug	1	3	90	20.7	2	34	0.6	0	0	0.0
12-Aug	26	22	112	25.8	47	81	1.4	0	0	0.0
13-Aug	30	38	150	34.6	31	112	2.0	0	0	0.0
14-Aug	18	49	199	45.9	33	145	2.5	0	0	0.0
15-Aug	8	22	221	50.9	15	160	2.8	0	0	0.0
16-Aug	3	21	242	55.8	6	166	2.9	0	0	0.0
17-Aug	0	21	263	60.6	7	173	3.0	0	0	0.0
18-Aug	0	4	267	61.5	4	177	3.1	0	0	0.0
19-Aug	1	25	292	67.3	6	183	3.2	0	0	0.0
20-Aug	1	14	306	70.5	3	186	3.3	0	0	0.0
21-Aug	4	14	320	73.7	16	202	3.5	0	0	0.0
22-Aug	5	11	331	76.3	35	237	4.2	0	0	0.0
23-Aug	3	5	336	77.4	30	267	4.7	0	0	0.0
24-Aug	5	22	358	82.5	44	311	5.5	0	0	0.0
25-Aug	0	24	382	88.0	32	343	6.0	0	0	0.0
26-Aug	7	6	388	89.4	94	437	7.7	0	0	0.0
27-Aug	2	11	399	91.9	172	609	10.7	0	0	0.0
28-Aug	1	10	409	94.2	198	807	14.1	0	0	0.0
29-Aug	2	6	415	95.6	249	1,056	18.5	0	0	0.0
30-Aug	2	7	422	97.2	275	1,331	23.3	0	0	0.0
31-Aug	3	5	427	98.4	172	1,503	26.3	2	2	0.4
01-Sep	0	1	428	98.6	135	1,638	28.7	0	2	0.4
02-Sep	1	1	429	98.8	191	1,829	32.1	1	3	0.6
03-Sep	1	2	431	99.3	357	2,186	38.3	1	4	0.8
04-Sep	0	1	432	99.5	517	2,703	47.4	1	5	0.9
05-Sep	0	1	433	99.8	307	3,010	52.8	1	6	1.1
06-Sep	0	0	433	99.8	520	3,530	61.9	3	9	1.7
07-Sep	0	1	434	100.0	267	3,797	66.5	1	10	1.9
08-Sep	0	0	434	100.0	61	3,858	67.6	0	10	1.9
09-Sep	0	0	434	100.0	75	3,933	68.9	3	13	2.5
10-Sep	0	0	434	100.0	141	4,074	71.4	1	14	2.6
11-Sep	0	0	434	100.0	50	4,124	72.3	0	14	2.6
12-Sep	0	0	434	100.0	191	4,315	75.6	2	16	3.0
13-Sep	0	0	434	100.0	203	4,518	79.2	8	24	4.5
14-Sep	0	0	434	100.0	109	4,627	81.1	4	28	5.3
15-Sep	0	0	434	100.0	132	4,759	83.4	5	33	6.2
16-Sep	0	0	434	100.0	122	4,881	85.5	7	40	7.6
17-Sep	0	0	434	100.0	97	4,978	87.2	0	40	7.6
18-Sep	0	0	434	100.0	116	5,094	89.3	1	41	7.8
19-Sep	0	0	434	100.0	107	5,201	91.1	8	49	9.3
20-Sep	0	0	434	100.0	40	5,241	91.9	3	52	9.8
21-Sep	0	0	434	100.0	72	5,313	93.1	8	60	11.3
22-Sep	0	0	434	100.0	95	5,408	94.8	16	76	14.4
23-Sep	0	0	434	100.0	52	5,460	95.7	16	92	17.4
24-Sep	0	0	434	100.0	50	5,510	96.6	12	104	19.7
25-Sep	0	0	434	100.0	29	5,539	97.1	5	109	20.6
26-Sep	0	0	434	100.0	31	5,570	97.6	24	133	25.1
27-Sep	0	0	434	100.0	8	5,578	97.8	8	141	26.7
28-Sep	0	0	434	100.0	9	5,587	97.9	15	156	29.5
29-Sep	0	0	434	100.0	3	5,590	98.0	9	165	31.2
30-Sep	0	0	434	100.0	3	5,593	98.0	11	176	33.3
01-Oct	0	0	434	100.0	5	5,598	98.1	13	189	35.7
02-Oct	0	0	434	100.0	6	5,604	98.2	18	207	39.1
03-Oct	0	0	434	100.0	1	5,605	98.2	2	209	39.5
04-Oct	0	0	434	100.0	9	5,614	98.4	32	241	45.6
05-Oct	0	0	434	100.0	0	5,614	98.4	0	241	45.6
06-Oct	0	0	434	100.0	8	5,622	98.5	14	255	48.2
07-Oct	0	0	434	100.0	4	5,626	98.6	12	267	50.5
08-Oct	0	0	434	100.0	8	5,634	98.7	18	285	53.9
09-Oct	0	0	434	100.0	5	5,639	98.8	17	302	57.1
10-Oct	0	0	434	100.0	11	5,650	99.0	25	327	61.8
11-Oct	0	0	434	100.0	3	5,653	99.1	5	332	62.8
12-Oct	0	0	434	100.0	4	5,657	99.1	5	337	63.7
13-Oct	0	0	434	100.0	2	5,659	99.2	7	344	65.0
14-Oct	0	0	434	100.0	2	5,661	99.2	11	355	67.1
15-Oct	0	0	434	100.0	4	5,665	99.3	5	360	68.1
16-Oct	0	0	434	100.0	4	5,669	99.4	5	365	69.0
17-Oct	0	0	434	100.0	2	5,671	99.4	1	366	69.2
18-Oct	0	0	434	100.0	3	5,674	99.4	8	374	70.7
19-Oct	0	0	434	100.0	2	5,676	99.5	3	377	71.3

--Continued--

Appendix C.12. (Page 2 of 2.)

Date	Jack Chinook Count	Large Chinook			Sockeye			Coho		
		Count	Cum.	Percent	Count	Cum.	Percent	Count	Cum.	Percent
20-Oct					3	5,679	99.5	9	386	73.0
21-Oct					4	5,683	99.6	8	394	74.5
22-Oct					6	5,689	99.7	11	405	76.6
23-Oct					3	5,692	99.8	41	446	84.3
24-Oct					11	5,703	99.9	4	450	85.1
25-Oct					0	5,703	99.9	21	471	89.0
26-Oct					0	5,703	99.9	23	494	93.4
27-Oct					2	5,705	100.0	9	503	95.1
28-Oct					1	5,706	100.0	13	516	97.5
29-Oct					0	5,706	100.0	10	526	99.4
30-Oct	--- Weir Removed ---							3	529	100.0
Counts	181	434			5,706			529		
Adjustments					30 a/ -807 b/			140 a/		
Spawners	181	434			4,929			669		

a/ Totals of 30 sockeye and 140 coho salmon were holding below the weir when it was dismantled.  
b/ The adjustment for broodstock (-807 fish) includes 280 female and 280 male sockeye salmon spawned and 182 female and 65 male sockeye holding mortalities.

Appendix C.13. Daily counts of salmon passing through Little Trapper Lake weir, 1990.

Sockeye				
Date	Count	Cum.	Percent	
21-Jul	---	Weir Installed	---	
22-Jul	0	0	0.0	
23-Jul	0	0	0.0	
24-Jul	0	0	0.0	
25-Jul	69	69	0.7	
26-Jul	450	519	5.5	
27-Jul	557	1,076	11.4	
28-Jul	375	1,451	15.4	
29-Jul	530	1,981	21.0	
30-Jul	586	2,567	27.2	
31-Jul	389	2,956	31.3	
01-Aug	178	3,134	33.2	
02-Aug	295	3,429	36.3	
03-Aug	198	3,627	38.4	
04-Aug	581	4,208	44.6	
05-Aug	324	4,532	48.0	
06-Aug	312	4,844	51.3	
07-Aug	336	5,180	54.9	
08-Aug	294	5,474	58.0	
09-Aug	530	6,004	63.6	
10-Aug	706	6,710	71.1	
11-Aug	565	7,275	77.0	
12-Aug	561	7,836	83.0	
13-Aug	293	8,129	86.1	
14-Aug	208	8,337	88.3	
15-Aug	206	8,543	90.5	
16-Aug	60	8,603	91.1	
17-Aug	52	8,655	91.7	
18-Aug	91	8,746	92.6	
19-Aug	93	8,839	93.6	
20-Aug	48	8,887	94.1	
21-Aug	15	8,902	94.3	
22-Aug	41	8,943	94.7	
23-Aug	46	8,989	95.2	
24-Aug	56	9,045	95.8	
25-Aug	33	9,078	96.1	
26-Aug	20	9,098	96.3	
27-Aug	22	9,120	96.6	
28-Aug	9	9,129	96.7	
29-Aug	22	9,151	96.9	
30-Aug	34	9,185	97.3	
31-Aug	29	9,214	97.6	
01-Sep	11	9,225	97.7	
02-Sep	20	9,245	97.9	
03-Sep	11	9,256	98.0	
04-Sep	21	9,277	98.2	
05-Sep	7	9,284	98.3	
06-Sep	7	9,291	98.4	
07-Sep	12	9,303	98.5	
08-Sep	47	9,350	99.0	
09-Sep	11	9,361	99.1	
10-Sep	13	9,374	99.3	
11-Sep	14	9,388	99.4	
12-Sep	13	9,401	99.6	
13-Sep	34	9,435	99.9	
14-Sep	8	9,443	100.0	
15-Sep	0	9,443	100.0	
16-Sep	Weir Dismantled			
Counted	9,443			
Adjust.a/	-1,666			
Spawners	7,777			

a/ The adjustment for broodstock includes 761 female and 761 male sockeye salmon which were spawned and 65 female and 79 male sockeye holding mortalities.

Appendix C.14. Daily counts of salmon passing through Nakina River weir, 1990. These counts represent only a portion of the run above the Nakina River weir because the weir is installed after an unknown portion of the escapement has already passed.

Date	Jack a/ Chinook Count	Large Chinook			Sockeye			Pink		
		Count	Cum.	Percent	Count	Cum.	Percent	Count	Cum.	Percent
28-Jul		58	58	6.0	0	0	0.0	3	3	2.8
29-Jul		72	130	13.4	0	0	0.0	3	6	5.6
30-Jul		49	179	18.5	0	0	0.0	6	12	11.1
31-Jul		95	274	28.3	0	0	0.0	7	19	17.6
01-Aug		6	280	28.9	0	0	0.0	2	21	19.4
02-Aug		81	361	37.3	0	0	0.0	8	29	26.9
03-Aug		86	447	46.2	2	2	0.3	0	29	26.9
04-Aug		126	573	59.2	2	4	0.5	4	33	30.6
05-Aug		78	651	67.3	1	5	0.6	20	53	49.1
06-Aug		48	699	72.2	9	14	1.8	6	59	54.6
07-Aug		63	762	78.7	1	15	1.9	10	69	63.9
08-Aug		62	824	85.1	8	23	3.0	5	74	68.5
09-Aug		38	862	89.0	8	31	4.0	5	79	73.1
10-Aug		34	896	92.6	8	39	5.0	5	84	77.8
11-Aug		21	917	94.7	13	52	6.7	7	91	84.3
12-Aug		29	946	97.7	59	111	14.3	7	98	90.7
13-Aug		12	958	99.0	86	197	25.3	6	104	96.3
14-Aug		0	958	99.0	83	280	36.0	1	105	97.2
15-Aug		0	958	99.0	43	323	41.5	0	105	97.2
16-Aug		5	963	99.5	63	386	49.6	2	107	99.1
17-Aug		1	964	99.6	53	439	56.4	1	108	100.0
18-Aug		4	968	100.0	62	501	64.4	0	108	100.0
19-Aug		0	968	100.0	93	594	76.3	0	108	100.0
20-Aug		0	968	100.0	75	669	86.0	0	108	100.0
21-Aug		0	968	100.0	69	738	94.9	0	108	100.0
22-Aug		0	968	100.0	0	738	94.9	0	108	100.0
23-Aug		0	968	100.0	27	765	98.3	0	108	100.0
24-Aug		0	968	100.0	0	765	98.3	0	108	100.0
25-Aug		0	968	100.0	13	778	100.0	0	108	100.0
26-Aug		0	968	100.0	0	778	100.0	0	108	100.0
Totals		968			778			108		

a/ Jack chinook are defined as fish of less than 650 MEF length.

Appendix C.15. Daily counts of salmon passing through Speel Lake weir, 1990.

Date	Sockeye		
	Count	Cum.	Percent
12-Jul	Weir Installed		
13-Jul	0	0	0.00
14-Jul	0	0	0.00
15-Jul	3	3	0.02
16-Jul	10	13	0.07
17-Jul	9	22	0.12
18-Jul	24	46	0.25
19-Jul	40	86	0.48
20-Jul	19	105	0.58
21-Jul	15	120	0.66
22-Jul	21	141	0.78
23-Jul	36	177	0.98
24-Jul	46	223	1.23
25-Jul	55	278	1.54
26-Jul	39	317	1.75
27-Jul	580	897	4.97
28-Jul	140	1,037	5.74
29-Jul	524	1,561	8.64
30-Jul	3,331	4,892	27.08
31-Jul	94	4,986	27.60
01-Aug	93	5,079	28.12
02-Aug	123	5,202	28.80
03-Aug	101	5,303	29.36
04-Aug	2,912	8,215	45.48
05-Aug	37	8,252	45.68
06-Aug	65	8,317	46.04
07-Aug	53	8,370	46.34
08-Aug	56	8,426	46.65
09-Aug	2,239	10,665	59.04
10-Aug	23	10,688	59.17
11-Aug	522	11,210	62.06
12-Aug	305	11,515	63.75
13-Aug	56	11,571	64.06
14-Aug	1,042	12,613	69.82
15-Aug	415	13,028	72.12
16-Aug	825	13,853	76.69
17-Aug	176	14,029	77.66
18-Aug	208	14,237	78.81
19-Aug	818	15,055	83.34
20-Aug	677	15,732	87.09
21-Aug	93	15,825	87.61
22-Aug	170	15,995	88.55
23-Aug	476	16,471	91.18
24-Aug	488	16,959	93.88
25-Aug	162	17,121	94.78
26-Aug	139	17,260	95.55
27-Aug	91	17,351	96.05
28-Aug	713	18,064	100.00
Total a/ 18,064			

a/ The total is not a complete count since an unknown but assumed small number of fish passed uncounted.

Appendix C.16. Daily counts of salmon passing through Crescent Lake weir, 1990. The actual escapements are unknown because a number of fish passed uncounted during high water.

Date	Sockeye			Coho			Chum		
	Count	Cum.	Percent	Count	Cum.	Percent	Count	Cum.	Percent
11-Jul	Weir Installed								
12-Jul	0	0	0.0	0	0	0.0	0	0	0.0
13-Jul	0	0	0.0	0	0	0.0	0	0	0.0
14-Jul	0	0	0.0	0	0	0.0	0	0	0.0
15-Jul	2	2	0.2	0	0	0.0	0	0	0.0
16-Jul	0	2	0.2	0	0	0.0	0	0	0.0
17-Jul	0	2	0.2	0	0	0.0	0	0	0.0
18-Jul	0	2	0.2	0	0	0.0	0	0	0.0
19-Jul	0	2	0.2	0	0	0.0	0	0	0.0
20-Jul	23	25	2.0	0	0	0.0	2	2	0.3
21-Jul	143	168	13.3	0	0	0.0	0	2	0.3
22-Jul	64	232	18.4	0	0	0.0	1	3	0.4
23-Jul	85	317	25.1	0	0	0.0	3	6	0.9
24-Jul	45	362	28.7	0	0	0.0	3	9	1.3
25-Jul	52	414	32.8	0	0	0.0	8	17	2.5
26-Jul	49	463	36.7	0	0	0.0	2	19	2.8
27-Jul	17	480	38.0	0	0	0.0	13	32	4.7
28-Jul	8	488	38.7	0	0	0.0	3	35	5.1
29-Jul	32	520	41.2	0	0	0.0	5	40	5.9
30-Jul	97	617	48.9	0	0	0.0	1	41	6.0
31-Jul	11	628	49.8	0	0	0.0	6	47	6.9
01-Aug	14	642	50.9	0	0	0.0	0	47	6.9
02-Aug	5	647	51.3	0	0	0.0	8	55	8.1
03-Aug	9	656	52.0	0	0	0.0	2	57	8.4
04-Aug	144	800	63.4	0	0	0.0	9	66	9.7
05-Aug	56	856	67.8	0	0	0.0	8	74	10.9
06-Aug	15	871	69.0	0	0	0.0	0	74	10.9
07-Aug	7	878	69.6	0	0	0.0	0	74	10.9
08-Aug	38	916	72.6	0	0	0.0	0	74	10.9
09-Aug	48	964	76.4	0	0	0.0	0	74	10.9
10-Aug	0	964	76.4	0	0	0.0	0	74	10.9
11-Aug	0	964	76.4	0	0	0.0	0	74	10.9
12-Aug	0	964	76.4	0	0	0.0	0	74	10.9
13-Aug	0	964	76.4	0	0	0.0	0	74	10.9
14-Aug	0	964	76.4	0	0	0.0	0	74	10.9
15-Aug	2	966	76.5	0	0	0.0	1	75	11.0
16-Aug	15	981	77.7	0	0	0.0	9	84	12.4
17-Aug	36	1,017	80.6	0	0	0.0	44	128	18.8
18-Aug	68	1,085	86.0	1	1	4.3	39	167	24.6
19-Aug	7	1,092	86.5	0	1	4.3	8	175	25.7
20-Aug	0	1,092	86.5	3	4	17.4	0	175	25.7
21-Aug	0	1,092	86.5	0	4	17.4	0	175	25.7
22-Aug	3	1,095	86.8	0	4	17.4	0	175	25.7
23-Aug	36	1,131	89.6	4	8	34.8	70	245	36.0
24-Aug	37	1,168	92.6	2	10	43.5	100	345	50.7
25-Aug	39	1,207	95.6	2	12	52.2	76	421	61.9
26-Aug	27	1,234	97.8	3	15	65.2	109	530	77.9
27-Aug	19	1,253	99.3	8	23	100.0	107	637	93.7
28-Aug	9	1,262	100.0		23	100.0	43	680	100.0
Totals	1,262			23			680		

a/ The weir was not fishing during August 10 through August 14 and August 21 and 22 due to high water.

Appendix D.1. Salmon catches and effort in the Alaskan District 111 commercial drift gill net fishery, 1964-1990.

Year	Catch					Effort	
	Chinook	Sockeye	Coho	Pink	Chum	Boat Days	Days Open
1964	2,509	34,140	29,315	26,593	12,853	1,752	56.00
1965	4,170	27,569	32,667	2,768	11,533	1,461	63.00
1966	4,829	33,925	26,065	23,833	35,133	1,708	64.00
1967	5,417	17,735	40,391	12,372	22,834	1,792	53.00
1968	4,904	19,501	39,103	67,365	21,890	2,686	60.00
1969	6,986	41,169	10,802	73,927	15,049	1,552	41.50
1970	3,357	50,922	44,960	197,017	110,390	3,214	53.00
1971	6,958	66,181	41,830	31,484	91,145	3,004	55.00
1972	10,955	80,404	49,780	144,339	147,957	3,831	50.00
1973	9,799	85,317	35,453	58,186	109,245	3,532	38.00
1974	2,905	38,676	38,661	57,732	86,687	2,710	27.50
1975	2,182	32,513	1,185	9,567	2,678	1,240	15.50
1976	1,757	61,749	41,729	14,962	81,803	2,152	25.00
1977	1,068	70,097	54,917	88,578	61,102	2,603	27.00
1978	1,926	55,398	31,944	51,385	36,254	2,406	24.00
1979	3,702	122,376	16,192	152,410	61,200	2,493	28.83
1980	2,422	123,117	41,515	295,553	192,750	4,451	30.92
1981	1,720	49,765	26,803	255,029	76,092	2,862	30.00
1982	3,057	83,479	29,072	109,385	37,310	2,639	35.50
1983	888	31,627	21,443	66,080	15,188	1,411	34.00
1984	1,773	77,233	33,836	145,949	86,741	3,139	66.50
1985	2,651	88,192	55,597	311,248	106,720	3,888	48.00
1986	2,606	73,061	30,512	16,568	58,792	2,164	32.50
1987	2,105	74,457	35,173	355,725	121,862	3,009	35.75
1988	1,778	39,168	45,179	157,424	139,704	2,322	31.00
1989	1,811	74,019	51,812	180,597	36,977	2,121	36.00
Averages							
64-89	3,624	59,684	34,844	111,772	68,457	2,544	40.83
80-89	2,081	71,412	37,094	189,356	87,214	2,801	38.02
1990	3,480	126,884	67,310	153,036	145,530	3,216	39.40

Appendix D.2. Stock proportions and catches of sockeye salmon in the Alaskan District 111 commercial drift gill net fishery, 1983-1990. Data based on SPA.

Year	Little Kuthai	Little Trapper	Mainstem	Little Tatsamenie	Total Taku	Crescent	Total Speel	Total Snettisham
Proportions								
1983					0.755			0.245
1984					0.758			0.242
1985					0.838			0.162
1986	0.061	0.266	0.303	0.204	0.834	0.090	0.076	0.166
1987	0.078	0.234	0.376	0.031	0.720	0.157	0.123	0.280
1988	0.118	0.158	0.305	0.082	0.663	0.266	0.071	0.337
1989	0.077	0.616	0.000	0.156	0.848	0.051	0.100	0.152
Averages	0.084	0.318	0.246	0.118	0.774	0.141	0.092	0.234
1990	0.036	0.197	0.336	0.286	0.855	0.112	0.033	0.145
Catches								
1983					23,878			7,749
1984					58,543			18,690
1985					73,905			14,287
1986	4,489	19,441	22,104	14,900	60,934	6,610	5,516	12,127
1987	5,834	17,418	28,002	2,328	53,581	11,695	9,181	20,876
1988	4,627	6,192	11,940	3,214	25,973	10,430	2,765	13,195
1989	5,696	45,573	a/	11,536	62,805	3,789	7,425	11,214
Averages b/	4,983	14,350	20,682	6,814	49,469	9,579	5,821	15,399
1990	4,539	24,952	42,676	36,332	108,499	14,242	4,143	18,385

a/ The Trapper and Mainstem groups were combined in the 1989 analysis.  
b/ Averages do not include 1989.



Appendix D.3. Proportion of Taku River sockeye salmon in the Alaskan District 111 commercial drift gill net catch, 1983-1990. Data based on SPA.

Week	1983	1984	1985	1986	1987	1988	1989	1990
25		0.970	0.999	0.938			0.943	0.874
26	0.996	0.956	0.986	0.953	0.982	0.964	0.989	0.935
27	0.842	0.843	0.928	0.873	0.901	0.886	0.979	0.904
28	0.819	0.670	0.974	0.880	0.884	0.889	0.852	0.773
29	0.663	0.588	0.868	0.852	0.948	0.510	0.835	0.782
30	0.527	0.712	0.706	0.777	0.414	0.643	0.641	0.863
31	0.836	0.728	0.737	0.851	0.619	0.677	0.681	0.943
32	0.534	0.809	0.826	0.757	0.689	0.528	0.919	0.939
33	0.719	0.726	0.801	0.893	0.841	0.478	0.676	0.878
34	0.759			0.739	0.731	0.346		0.862
Total	0.755	0.758	0.838	0.834	0.718	0.663	0.848	0.855

Appendix D.4. Salmon catch in the U.S. subsistence and personal use fisheries in the Taku River (1967-1990). The subsistence fishery was open 1967 to 1976 and 1985 and the personal use fishery was open 1989 and 1990. Data for 1990 is expanded from a 50% return rate for permits.

Year	Catch				
	Chinook	Sockeye	Coho	Pink	Chum
1967	0	103	221	9	25
1968	3	41	196	19	10
1969	0	122	8	11	0
1970	0	304	0	20	8
1971	0	512	0	42	0
1972	0	554	0	103	7
1973	0	1,227	0	64	14
1974	0	1,431	0	118	5
1975	0	170	0	3	0
1976	0	351	4	22	0
1985	0	924	35	19	1
1989	33	749	73	765	25
1990	52	1,560	206	130	92

Appendix D.5. Salmon and steelhead trout catch and effort in the Canadian commercial fishery in the Taku River, 1979-1990.

Year	Catch							Effort	
	Chinook		Sockeye	Coho	Pink	Chum	Steelhead	Boat Days	Days Open
	Jacks	Large							
1979		97	13,578	6,006	13,661	15,474	254	599.0	50.00
1980		225	22,602	6,405	26,821	18,516	457	479.0	39.00
1981		159	10,922	3,607	10,771	5,591	108	243.0	31.25
1982		54	3,144	51	202	3	1	38.0	13.00
1983	400	156	17,056	8,390	1,874	1,760	213	390.0	64.00
1984	221	294	27,242	5,357	6,964	2,492	367	288.0	30.00
1985	24	326	14,244	1,770	3,373	136	32	178.0	16.00
1986	77	275	14,739	1,783	58	110	48	148.0	17.00
1987	106	127	13,554	5,599	6,250	2,270	223	281.0	26.00
1988	186	555	12,014	3,123	1,030	733	86	185.4	14.70
1989	139	895	18,545	2,876	695	42	24	270.6	25.30
Averages a/									
79-89		392	15,240	4,088	6,518	4,284	165	281.8	29.66
80-89		422	15,406	3,896	5,804	3,165	156	250.1	27.63
1990	128	1,258	21,100	3,207	378	12	22	295.2	28.30

a/ Chinook averages are for large fish and jacks combined.

Appendix D.6. Sockeye salmon stock proportions and catch by stock in the Canadian commercial fishery on the Taku River, 1986-1990. Data based on SPA.

Year	Kuthai	Little Trapper	Mainstem	Little Tatsamenie
Proportions				
1986	0.111	0.397	0.350	0.143
1987	0.062	0.201	0.649	0.088
1988	0.143	0.417	0.343	0.098
1989 a/	0.053	0.744		0.203
Averages				
86-88 b/	0.092	0.440	0.335	0.133
1990	0.112	0.388	0.338	0.163
Catch				
1986	1,629	5,855	5,152	2,103
1987	834	2,728	8,793	1,199
1988	1,715	5,005	4,122	1,172
1989 a/	990	13,792		3,763
Averages				
86-88 b/	1,292	6,845	4,517	2,059
1990	2,355	8,183	7,131	3,431

a/ The Trapper and Mainstem groups were combined in the 1989 analysis.  
b/ Averages do not include 1989.

Appendix D.7. Salmon and steelhead trout catch in the Canadian test fishery in the Taku River, 1987-1990.

Year	Catch					
	Chinook	Sockeye	Coho	Pink	Chum	Steelhead
1987		237	807			
1988	72	708	422	52	222	14
1989	31	207	1,011	0	13	26
1990	48	285	472	0	0	20

Appendix D.8. Sockeye salmon escapement counts of Taku River and Port Snettisham stocks, 1983-1990.

	Taku Above Border		a/Little		Little	Hackett	Crescent	Speel
	Run	Escapement	Trapper	Tatsamenie	Weir			
1983			7,402	b/			19,422	10,484
1984	133,414	106,172	13,084				6,707	9,764
1985	118,160	103,916	14,889	b/13,015	2,308		7,249	7,073
1986	105,109	90,370	13,820	11,368	1,004		3,414	5,857
1987	87,130	73,339	12,007	b/ 2,794	910		7,839	9,319
1988	87,028	74,061	10,629	2,063	516		1,199	969
1989	114,068	95,263	9,556	3,039			1,109	c/12,229
Averages								
83-89	107,485	90,520	11,627	6,456	1,185		6,706	7,956
85-89	102,299	87,390	12,180	6,456			4,162	7,089
1990	114,254	92,795	9,443	d/ 5,706	d/		1,262	c/18,064 c/

a/ Tag-recovery estimates.  
b/ Weir count plus spawning ground survey.  
c/ Count may be low due to fish passage over weir during high water.  
d/ Totals of 761 male and 761 female sockeye salmon from Little Trapper Lake and 280 female and 280 male sockeye salmon from Little Tatsamenie Lake were taken for broodstock. Holding mortality at Little Tatsamenie Lake included 182 female and 65 male sockeye salmon. A total of 30 sockeye salmon was holding below Little Tatsamenie weir when the weir was removed.

Appendix D.9. Aerial survey index escapement counts of large (3-ocean and older) Taku River chinook salmon and estimated escapements of large chinook salmon to the entire Taku drainage, 1977-1990.

Year	Taku Drainage							
	Kowatua	Tatsamenie	Dudidontu	Tseta	Nakina	Nahlin	U.S. a/	Canada b/
1975	NS	NS	15	NS	1,800	274	4,609	4,178
1976	341	620	40	NS	3000	725	8,278	9,452
1977	580	573	18	NS	3,850	650	10,000	11,342
1978	490	550	0	21	1,620	624	4,987	6,610
1979	430	750	9	NS	2,110	857	6,593	8,312
1980	450	905	158	NS	4,500	1,531	13,402	15,088
1981	560	839	74	258	5,110	2,945	17,900	19,572
1982	289	387	130	228	2,533	1,246	8,398	9,626
1983	171	236	117	179	968	391	3,020	4,124
1984	279	616	NS	176 c/	1,887	951 d/	6,307	7,818
1985	699	848	475	303	2,647	2,236	10,851	14,416
1986	548	886	413	193	3,868	1,612	12,178	15,040
1987	570	678	287	180	2,906	1,122	8,951	11,486
1988	1,010	1,272	243	66	4,500	1,535	13,411	17,252
1989	601	1,228	204	494	5,141	1,812	15,451	18,960
Averages								
77-89					3,096	1,234	9,622	11,552
84-89	618	921	270	235	3,492	1,545	11,191	14,162
1990	614	1,068	820	172	7,917	1,658	21,278	24,498

- a/ U.S. estimate: combined Nakina and Nahlin aerial escapement counts, expanded by 1/.45.  
b/ Canadian estimate: combined survey counts of Nakina, Nahlin, Kowatua, Tatsamenie, Tseta, and Dudidontu Rivers, expanded by 2.0.  
c/ Partial survey  
d/ Extrapolated results.

Appendix D.10. Taku River (above border) coho salmon salmon run size, 1987-1990.

Year	Canadian Catch			Above Border		
	Commercial	Food	Test	Escapement	Run	
1987	5,599		807	55,570	61,976	a/
1988	3,123	98	422	39,450	43,093	b/
1989	2,876	146	1,011	56,808	60,841	c/
Averages						
87-89	3,866	122	747	50,609	55,303	
1990	3,207	74	472	71,284	75,037	d/

- a/ Mark-recapture estimate through 9/20 was 43,570, run through 10/05 estimated using inriver test fish CPUE.  
b/ Mark-recapture estimate through 9/18.  
c/ Mark-recapture estimate through 10/01.  
d/ A second method of estimating the above border run by expanding test fishery CPUE yielded an estimate of 85,053 coho salmon.

Appendix D.11. Escapement counts of Taku River coho salmon, 1984-1990. Counts are for age-.1 fish and do not include jacks.

Year	Yehring Creek Weir	Flannigan Slough (Aerial)	Tatsamenie River Weir a/	Hackett River Weir	Dudidontu River (Aerial)	Upper Nahlin River (Aerial)
1984		1,480				
1985		2,320	201b/	1,031		
1986	2,116a/	1,095	344b/	2,723	108	318
1987	1,627a/	2,100	173b/	1,715	276	165
1988	1,423	1,241c/	663a/	1,260	367	694d/
1989	1,570e/	1,464	712a/	e/	115	322
Averages						
84-89	1,804	1,617	419	1,346	217	375
86-89	1,804	1,475	473	1,425	217	375
1990	2,522e/	414c/	669a/	f/	25	256

- a/ Weir count combined with spawning ground count.  
b/ Incomplete count.  
c/ Count is an average of surveys by different observers. Flan 88,90  
d/ Weir count of 1,322. Nah 88  
e/ Includes markrecapture estimate.  
f/ Weir discontinued in 1988.

Appendix D.12. Taku River sockeye salmon run size, 1984-1990. Run estimate does not include spawning escapements below the U.S./Canada border.

Year	Canadian Catch			Escapement	Above Border Run	U.S. Catcha/	Total Run
	Commercial	Food	Test				
1984	27,242			106,172	133,414	58,543	191,957
1985	14,244			103,916	118,160	74,829	192,989
1986	14,739			90,370	105,109	60,934	166,043
1987	13,554		237	73,339	87,130	54,611	141,741
1988	12,014	245	708	74,061	87,028	25,973	113,001
1989	18,545	53	207	95,263	114,068	63,554	177,622
Averages							
84-89	16,723			90,520	107,485	56,407	163,892
85-89	14,619			87,390	102,299	55,980	158,279
1990	21,100	74	285	92,795	114,254	110,059	224,313

- a/ Includes subsistence and personel use catches in District 111 but does include catches of Taku River fish which may occur in other districts.  
b/ Includes test fishery catch of 1,030 Taku sockeye salmon in 1987.

Appendix E.1. Weekly salmon catch and effort in the U.S. commercial fishery in the Alsek River, 1990. There was no effort in the surf fishery in 1990.

Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Boats	Days Open	Boat Days
25	17-Jun	43	571	0	0	0	23	1	23
26	24-Jun	26	1,339	0	0	0	21	2	42
27	01-Jul	6	3,075	0	0	0	21	2	42
28	08-Jul	3	4,663	0	0	0	24	3	72
29	15-Jul	0	2,717	1	0	2	16	3	48
30	22-Jul	0	2,160	0	0	0	7	3	21
31	29-Jul	0	1,178	0	0	0	8	3	24
32	05-Aug	0	971	0	0	2	4	3	12
33	12-Aug	0	189	2	0	0	a/	3	a/
34	19-Aug	0	61	6	0	0	a/	3	a/
35	26-Aug	0	50	115	0	78	a/	3	a/
36	02-Sep	0	33	211	0	115	8	3	24
37	09-Sep	0	3	458	0	129	6	3	18
38	16-Sep	0	3	644	0	169	9	3	27
Total		78	17,013	1,437	0	495	154	38.0	374

a/ Effort not reported by week; effort for these weeks is included in the total.

Appendix E.2. Weekly salmon catch and effort in the Canadian food and sport fisheries in the Alsek River, 1990.

Week	Date	Chinook				Sockeye				Coho			
		Sport	Release	Food	Totala	Sport	Release	Food	Totala	Sport	Release	Food	Totala/
25	17-Jun	4	0	0	4	0	0	0	0	0	0	0	0
26	24-Jun	17	6	0	17	0	1	0	0	0	0	0	0
27	01-Jul	76	40	1	77	0	6	4	4	0	0	0	0
28	08-Jul	188	91	25	213	0	9	1	1	0	0	0	0
29	15-Jul	251	80	111	362	0	11	12	12	0	0	0	0
30	22-Jul	16	9	20	36	0	12	0	0	0	0	0	0
31	29-Jul	3	1	11	14	0	3	23	23	0	0	0	0
32	05-Aug	0	0	2	2	0	0	175	175	0	0	0	0
33	12-Aug	0	0	2	2	0	0	175	175	0	0	0	0
34	19-Aug	0	0	0	0	5	1	65	70	0	0	0	0
35	26-Aug	0	0	0	0	11	2	120	131	0	0	0	0
36	02-Sep	0	0	1	1	53	11	305	358	0	0	0	0
37	09-Sep	0	0	0	0	50	38	539	589	0	0	0	0
38	16-Sep	0	0	0	0	57	26	320	377	0	0	0	0
39	23-Sep	0	0	0	0	23	24	182	205	0	2	0	0
40	30-Sep	0	0	0	0	91	67	91	182	10	3	0	10
41	07-Oct	0	0	0	0	52	112	0	52	25	41	0	25
42	14-Oct	0	0	0	0	20	28	0	20	20	30	0	20
43	21-Oct	0	0	0	0	30	15	0	30	20	10	0	20
Totals		555	227	173	728	392	366	2,012	2,404	75	86	0	75

a/ Does not include released fish.

Appendix E.3. Daily counts of salmon passing through Klukshu River weir, 1990.

Date	Chinook a/			Sockeye			Coho		
	Daily	Cumulative		Daily	Cumulative		Daily	Cumulative	
		Daily	Prop.		Daily	Prop.		Daily	Prop.
05-Jun	1	1	0.001	0	0	0.000	0	0	0.000
06-Jun	0	1	0.001	0	0	0.000	0	0	0.000
07-Jun	0	1	0.001	0	0	0.000	0	0	0.000
08-Jun	0	1	0.001	0	0	0.000	0	0	0.000
09-Jun	0	1	0.001	0	0	0.000	0	0	0.000
10-Jun	0	1	0.001	0	0	0.000	0	0	0.000
11-Jun	0	1	0.001	0	0	0.000	0	0	0.000
12-Jun	0	1	0.001	0	0	0.000	0	0	0.000
13-Jun	0	1	0.001	0	0	0.000	0	0	0.000
14-Jun	0	1	0.001	0	0	0.000	0	0	0.000
15-Jun	0	1	0.001	0	0	0.000	0	0	0.000
16-Jun	0	1	0.001	0	0	0.000	0	0	0.000
17-Jun	0	1	0.001	0	0	0.000	0	0	0.000
18-Jun	0	1	0.001	0	0	0.000	0	0	0.000
19-Jun	0	1	0.001	0	0	0.000	0	0	0.000
20-Jun	0	1	0.001	0	0	0.000	0	0	0.000
21-Jun	0	1	0.001	0	0	0.000	0	0	0.000
22-Jun	0	1	0.001	0	0	0.000	0	0	0.000
23-Jun	0	1	0.001	0	0	0.000	0	0	0.000
24-Jun	0	1	0.001	1	1	0.000	0	0	0.000
25-Jun	0	1	0.001	0	1	0.000	0	0	0.000
26-Jun	2	3	0.002	0	1	0.000	0	0	0.000
27-Jun	4	7	0.004	0	1	0.000	0	0	0.000
28-Jun	1	8	0.004	0	1	0.000	0	0	0.000
29-Jun	6	14	0.007	4	5	0.000	0	0	0.000
30-Jun	6	20	0.010	1	6	0.000	0	0	0.000
01-Jul	7	27	0.014	1	7	0.000	0	0	0.000
02-Jul	11	38	0.020	2	9	0.000	0	0	0.000
03-Jul	15	53	0.028	3	12	0.000	0	0	0.000
04-Jul	10	63	0.033	11	23	0.001	0	0	0.000
05-Jul	19	82	0.043	0	23	0.001	0	0	0.000
06-Jul	265	347	0.181	26	49	0.002	0	0	0.000
07-Jul	14	361	0.189	19	68	0.003	0	0	0.000
08-Jul	43	404	0.211	1	69	0.003	0	0	0.000
09-Jul	195	599	0.313	5	74	0.003	0	0	0.000
10-Jul	51	650	0.339	5	79	0.003	0	0	0.000
11-Jul	38	688	0.359	0	79	0.003	0	0	0.000
12-Jul	68	756	0.395	7	86	0.003	0	0	0.000
13-Jul	50	806	0.421	15	101	0.004	0	0	0.000
14-Jul	740	1,546	0.807	71	172	0.007	0	0	0.000
15-Jul	17	1,563	0.816	0	172	0.007	0	0	0.000
16-Jul	125	1,688	0.881	4	176	0.007	0	0	0.000
17-Jul	20	1,708	0.892	2	178	0.007	0	0	0.000
18-Jul	20	1,728	0.902	1	179	0.007	0	0	0.000
19-Jul	12	1,740	0.909	0	179	0.007	0	0	0.000
20-Jul	8	1,748	0.913	1	180	0.007	0	0	0.000
21-Jul	1	1,749	0.913	1	181	0.007	0	0	0.000
22-Jul	3	1,752	0.915	1	182	0.007	0	0	0.000
23-Jul	9	1,761	0.920	2	184	0.007	0	0	0.000
24-Jul	6	1,767	0.923	2	186	0.007	0	0	0.000
25-Jul	4	1,771	0.925	5	191	0.007	0	0	0.000
26-Jul	4	1,775	0.927	0	191	0.007	0	0	0.000
27-Jul	1	1,776	0.927	0	191	0.007	0	0	0.000
28-Jul	1	1,777	0.928	0	191	0.007	0	0	0.000
29-Jul	1	1,778	0.928	0	191	0.007	0	0	0.000
30-Jul	3	1,781	0.930	1	192	0.007	0	0	0.000
31-Jul	25	1,806	0.943	43	235	0.009	0	0	0.000
01-Aug	6	1,812	0.946	0	235	0.009	0	0	0.000
02-Aug	9	1,821	0.951	1	236	0.009	0	0	0.000
03-Aug	4	1,825	0.953	1	237	0.009	0	0	0.000
04-Aug	7	1,832	0.957	41	278	0.011	0	0	0.000
05-Aug	4	1,836	0.959	1	279	0.011	0	0	0.000
06-Aug	9	1,845	0.963	8	287	0.011	0	0	0.000
07-Aug	5	1,850	0.966	6	293	0.011	0	0	0.000
08-Aug	2	1,852	0.967	20	313	0.012	0	0	0.000
09-Aug	4	1,856	0.969	17	330	0.013	0	0	0.000
10-Aug	18	1,874	0.979	637	967	0.037	0	0	0.000
11-Aug	4	1,878	0.981	19	986	0.038	0	0	0.000
12-Aug	4	1,882	0.983	9	995	0.038	0	0	0.000
13-Aug	5	1,887	0.985	110	1,105	0.043	0	0	0.000
14-Aug	7	1,894	0.989	205	1,310	0.050	0	0	0.000
15-Aug	2	1,896	0.990	6	1,316	0.051	0	0	0.000
16-Aug	4	1,900	0.992	211	1,527	0.059	0	0	0.000
17-Aug	3	1,903	0.994	0	1,527	0.059	0	0	0.000
18-Aug	1	1,904	0.994	51	1,578	0.061	0	0	0.000
19-Aug	0	1,904	0.994	9	1,587	0.061	0	0	0.000
20-Aug	0	1,904	0.994	115	1,702	0.065	0	0	0.000
21-Aug	2	1,906	0.995	4	1,706	0.066	0	0	0.000
22-Aug	0	1,906	0.995	8	1,714	0.066	0	0	0.000
23-Aug	1	1,907	0.996	19	1,733	0.067	0	0	0.000
24-Aug	3	1,910	0.997	15	1,748	0.067	0	0	0.000
25-Aug	3	1,913	0.999	215	1,963	0.076	0	0	0.000
26-Aug	1	1,914	0.999	11	1,974	0.076	0	0	0.000

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## Appendix E.3. (Page 2 of 2.)

Date	Chinook a/			Sockeye			Coho		
	Daily	Cumulative		Daily	Cumulative		Daily	Cumulative	
		Daily	Prop.		Daily	Prop.		Daily	Prop.
27-Aug	0	1,914	0.999	14	1,988	0.076	0	0	0.000
28-Aug	0	1,914	0.999	26	2,014	0.077	0	0	0.000
29-Aug	0	1,914	0.999	19	2,033	0.078	0	0	0.000
30-Aug	0	1,914	0.999	4	2,037	0.078	0	0	0.000
31-Aug	1	1,915	1.000	134	2,171	0.084	0	0	0.000
01-Sep	0	1,915	1.000	15	2,186	0.084	0	0	0.000
02-Sep	0	1,915	1.000	72	2,258	0.087	0	0	0.000
03-Sep	0	1,915	1.000	203	2,461	0.095	0	0	0.000
04-Sep	0	1,915	1.000	3,292	5,753	0.221	0	0	0.000
05-Sep	0	1,915	1.000	936	6,689	0.257	0	0	0.000
06-Sep	0	1,915	1.000	1,763	8,452	0.325	0	0	0.000
07-Sep	0	1,915	1.000	601	9,053	0.348	0	0	0.000
08-Sep	0	1,915	1.000	56	9,109	0.350	0	0	0.000
09-Sep	0	1,915	1.000	894	10,003	0.385	0	0	0.000
10-Sep	0	1,915	1.000	187	10,190	0.392	0	0	0.000
11-Sep	0	1,915	1.000	1,578	11,768	0.453	0	0	0.000
12-Sep	0	1,915	1.000	3,221	14,989	0.577	0	0	0.000
13-Sep	0	1,915	1.000	1,645	16,634	0.640	0	0	0.000
14-Sep	0	1,915	1.000	873	17,507	0.673	0	0	0.000
15-Sep	0	1,915	1.000	479	17,986	0.692	1	1	0.003
16-Sep	0	1,915	1.000	366	18,352	0.706	0	1	0.003
17-Sep	0	1,915	1.000	653	19,005	0.731	0	1	0.003
18-Sep	0	1,915	1.000	1,432	20,437	0.786	0	1	0.003
19-Sep	0	1,915	1.000	780	21,217	0.816	2	3	0.010
20-Sep	0	1,915	1.000	1,585	22,802	0.877	1	4	0.013
21-Sep	0	1,915	1.000	1,754	24,556	0.945	1	5	0.016
22-Sep	0	1,915	1.000	201	24,757	0.952	1	6	0.019
23-Sep	0	1,915	1.000	277	25,034	0.963	0	6	0.019
24-Sep	0	1,915	1.000	16	25,050	0.964	0	6	0.019
25-Sep	0	1,915	1.000	9	25,059	0.964	0	6	0.019
26-Sep	0	1,915	1.000	14	25,073	0.965	1	7	0.022
27-Sep	0	1,915	1.000	31	25,104	0.966	2	9	0.029
28-Sep	0	1,915	1.000	28	25,132	0.967	3	12	0.038
29-Sep	0	1,915	1.000	11	25,143	0.967	1	13	0.041
30-Sep	0	1,915	1.000	24	25,167	0.968	4	17	0.054
01-Oct	0	1,915	1.000	13	25,180	0.969	3	20	0.063
02-Oct	0	1,915	1.000	45	25,225	0.970	14	34	0.108
03-Oct	0	1,915	1.000	41	25,266	0.972	8	42	0.133
04-Oct	0	1,915	1.000	58	25,324	0.974	4	46	0.146
05-Oct	0	1,915	1.000	73	25,397	0.977	5	51	0.162
06-Oct	0	1,915	1.000	144	25,541	0.983	8	59	0.187
07-Oct	0	1,915	1.000	15	25,556	0.983	8	67	0.213
08-Oct	0	1,915	1.000	45	25,601	0.985	22	89	0.283
09-Oct	0	1,915	1.000	135	25,736	0.990	53	142	0.451
10-Oct	0	1,915	1.000	47	25,783	0.992	39	181	0.575
11-Oct	0	1,915	1.000	81	25,864	0.995	9	190	0.603
12-Oct	0	1,915	1.000	41	25,905	0.997	12	202	0.641
13-Oct	0	1,915	1.000	16	25,921	0.997	9	211	0.670
14-Oct	0	1,915	1.000	12	25,933	0.998	47	258	0.819
15-Oct	0	1,915	1.000	5	25,938	0.998	38	296	0.940
16-Oct	0	1,915	1.000	6	25,944	0.998	13	309	0.981
17-Oct	0	1,915	1.000	11	25,955	0.998	6	315	1.000
18-Oct	0	1,915	1.000	40	25,995	1.000	0	315	1.000
Totals	1,915			25,995			315		

a/ Jack chinook included in the counts.

Appendix E.4. Salmon catch and effort in the U.S. commercial fishery in the Alsek River, 1964-1990.

Year	Catch					Effort	
	Chinook	Sockeye	Coho	Pink	Chum	Boat Days	Days Open
1964	591	14,127	9,760	144	367	592	72.00
1965	719	28,487	9,638	10	72	1,016	72.00
1966	934	29,091	2,688	22	240	500	68.00
1967	225	11,108	10,090	107	30	600	68.00
1968	215	26,918	10,586	82	240	664	68.00
1969	685	29,259	2,493	38	61	807	61.00
1970	1,128	22,654	2,188	6	26	670	52.25
1971	1,222	25,314	4,730	3	120	764	60.50
1972	1,827	18,717	7,296	37	280	640	65.00
1973	1,757	26,523	4,395	26	283	894	52.00
1974	1,162	16,747	7,046	13	107	699	46.00
1975	1,379	13,842	2,230	16	261	738	58.00
1976	512	19,741	4,883	0	368	550	58.50
1977	1,402	40,780	11,817	689	483	893	57.00
1978	2,441	50,580	13,913	59	233	948	57.00
1979	2,525	41,449	6,158	142	263	1,146	51.00
1980	1,382	25,589	7,863	21	1,005	794	42.00
1981	779	23,697	10,096	65	816	500	41.00
1982	532	27,389	6,534	6	358	497	36.00
1983	94	18,546	5,253	20	432	466	38.00
1984	60	14,326	7,868	24	1,610	455	33.00
1985	213	5,940	5,622	3	427	271	33.00
1986	478	24,791	1,344	13	462	517	34.00
1987	347	11,281	2,517	0	1,924	388	40.50
1988	223	6,286	4,986	7	907	324	34.00
1989	228	13,513	5,972	2	1,031	355	35.50
Averages							
64-89	887	22,565	6,460	60	477	642	51.28
80-89	434	17,136	5,806	16	897	457	36.70
1990	78	17,013	1,437	0	495	374	38.00

Appendix E.5. Salmon catch in the U.S. subsistence fishery in the Alsek River, 1976-1990.

Year	Catch		
	Chinook	Sockeye	Coho
1976	13	51	5
1977	18	113	0
1978			
1979	80	35	70
1980	57	41	62
1981	32	50	74
1982	87	75	50
1983	31	25	50
1984			
1985	16	95	0
1986	22	241	45
1987	27	173	31
1988	13	148	9
1989	10	97	54
Averages			
76-89	34	95	38
80-89	33	105	42
1990	85	144	12



## Appendix E.6. Salmon catches in the Canadian Indian food and sport fisheries in the Alsek River, 1976-1990.

Year	Chinook			Sockeye			Coho		
	Food	Sport	Total	Food	Sport	Total	Food	Sport	Total
1976	125	200	325	3,750	600	4,350	0	100	100
1977	250	300	550	11,350	500	11,850	0	200	200
1978	300	300	600	7,850	500	8,350	0	200	200
1979	130	650	780	5,260	750	6,010	0	100	100
1980	150	200	350	900	600	1,500	0	200	200
1981	150	315	465	1,900	808	2,708	0	109	109
1982	400	224	624	4,800	755	5,555	0	109	109
1983	300	312	612	2,475	732	3,207	0	16	16
1984	100	475	575	2,500	289	2,789	0	20	20
1985	175	250	425	1,361	100	1,461	50	100	150
1986	102	165	267	1,914	307	2,221	0	9	9
1987	125	367	492	1,158	383	1,541	0	49	49
1988	43	249	292	1,604	322	1,926	0	192	192
1989	167	272	439	1,906	319	2,225	0	227	227
<hr/>									
Averages									
76-89	180	306	485	3,481	498	3,978	4	117	120
80-89	171	283	454	2,052	462	2,513	5	103	108
<hr/>									
1990	173	555	728	2,012	392	2,404	0	75	75

## Appendix E.7. Klukshu River weir counts of chinook, sockeye, and coho salmon, 1976-1990. The escapement count equals the weir count minus the Indian food fishery catch that occurred above the weir.

Year	Chinook a/		Sockeye				Coho Count c/
	Count	Escape.	Early b/	Late	Total	Escape.	
1976	1,278	1,153	181	11,510	11,691	7,941	1,572
1977	3,144	2,894	8,931	17,860	26,791	15,441	2,758
1978	2,976	2,676	2,508	24,359	26,867	19,017	30
1979	4,404	4,274	977	11,334	12,311	7,051	175
1980	2,637	2,487	1,008	10,742	11,750	10,850	704
1981	2,113	1,963	997	19,351	20,348	18,448	1,170
1982	2,369	1,969	7,758	25,941	33,699	28,899	189
1983	2,537	2,237	6,047	14,445	20,492	18,017	303
1984	1,672	1,572	2,769	9,958	12,727	10,227	1,402
1985	1,458	1,283	539	18,081	18,620	17,259	350
1986	2,709	2,607	416	24,434	24,850	22,936	71
1987	2,616	2,491	3,269	7,235	10,504	9,346	202
1988	2,037	1,994	585	8,756	9,341	7,737	2,774
1989	2,456	2,289	3,400	20,142	23,542	21,636	2,219
<hr/>							
Averages d/							
76-89	2,458	2,278	2,813	16,011	18,824	15,343	994
84-89	2,158	2,039					
85-89			1,642	15,730	17,371	15,783	
86-89							1,317
<hr/>							
1990	1,915	1,742	1,316	24,679	25,995	24,607 e/	315

a/ Counts include jack chinook salmon.

b/ Includes sockeye counts up to and including August 15.

c/ Weir was removed prior to the end of the coho run.

d/ Six-year averages are given for chinook five-year for sockeye, and four-year for coho salmon to best represent the life span of each species.

e/ The sockeye escapement into Klukshu Lake is calculated from the weir count - 1,388 fish which were harvested above the weir site. The remainder of the food fishery harvest occurred below the weir and at Village Creek.

Appendix E.8. Alsek River sockeye counts from U.S. and Canadian aerial surveys and from the electronic counter at Village Creek, 1985-1990.

Year	U.S. Aerial Surveys a/				Canadian Aerial Surveys b/		
	Basin Creek	Cabin Creek	Muddy Creek	Tanlis River	Tatshenshini River	Neskataheen Lake	Village Creek Counter
1985	2,600			2,200			
1986	100		300	2,700	536	750	1,490
1987	350	220		1,600			1,875
1988	500			750	433	456	433 c/
1989	320			680	1,689	1,700	9,569
1990	275	300		3,500			7,500

a/ Surveys not made every year at each tributary.  
b/ Included several streams from Lo-Fog to Goat Creek.  
c/ Incomplete count due to machine malfunction.

Appendix E.9. Aerial survey index counts of Alsek chinook salmon escapements, 1984-1990.

Year	Blanchard River	Takhanne River	Goat Creek
1984	304	158	28
1985	232	184	
1986	556	358	142
1987	624	295	85
1988	437	169	54
1989	a/	158	34
1990	a/	325	32

a/ Not surveyed due to poor visibility.

Appendix E.10. Aerial survey counts of coho salmon from U.S. lower Alsek River tributaries, 1984-1990.

Year	Combined U.S. Tributary Counts
1985	450
1986	1,100
1987	100
1988	1,900
1989	1,990
1990	1,600



Fisheries and Oceans / Pêches et Océans

Pacific Biological Station  
Nanaimo, B.C.  
V9R 5K6

TO: C.C. Graham  
Your file / Votre référence

Our file / Notre référence

003026 FEB 26 P1:44

February 25, 1992

FISHERIES & OCEANS  
FISHERIES PACIFIC

1110-P9

Janice Abramson  
Pacific Salmon Commission  
1155 Robson Street, Suite 600  
Vancouver, British Columbia  
V6E 1B9

Dear Ms. Abramson:

RE: P.S.C. Work Group on Catch Data Exchange.

Brian Kuhn is no longer with the Department of Fisheries and Oceans. We request that he be removed from the membership of the above group and that his name be removed from the Pacific Salmon Commission mailing list.

At this time, we do not wish to name a replacement member.

Sincerely,

M. Hamer  
Canadian Chair  
P.S.C. Data Sharing Committee

cc: C.C. Graham



## PACIFIC SALMON COMMISSION

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

600 - 1155 ROBSON STREET  
VANCOUVER, B.C. V6E 1B5  
TELEPHONE: (604) 684-8081  
FAX: (604) 666-8707

TO: *G. Faulkner*

Our File:

68001

009778

MAR -2 14:12

Your File:

FISHERIES & OCEANS  
FISHERIES PACIFIC

February 25, 1992

FILE: 1110-P9.

Mr. Wayne Saito  
Management Biologist  
Department of Fisheries & Oceans  
610 Derwent Way, Annacis Island  
New Westminster, B.C.  
V3M 5P8

Dear Wayne:

Enclosed are the results of the scale analysis for the 1991 Nechako River adult sockeye samples. The age composition of the 50 fish sampled is 98% 4<sub>2</sub>'s and 2% 5<sub>2</sub>'s. Please note the age composition is based on scale analysis, and due to resorption of scales and lack of otoliths to confirm the aging, the 5<sub>2</sub>'s may be underestimated. However, I am reasonably confident in the age composition because ten scales were sampled from each fish giving good double checks on age and the length frequency distributions do not suggest that many more 5<sub>2</sub>'s were present.

The mean freshwater circuli count without spring growth for 4<sub>2</sub>'s is 11.51 and including spring growth is 13.69. The spacing between circuli is average compared to other Fraser River stocks. The Nechako River sample is very similar in circulus counts and spacing to the 1991 Chilko River spawning ground sample. No other spawning population within the Nechako watershed showed strong similarities to the Nechako River sample. The mean circuli count for Stellako River is approximately 4.3 circuli greater without and with spring growth, and the spacing is closer than Nechako River. The mean circuli count for Late Nadina River is approximately 7.2 circuli greater without spring growth and 4.2 greater with spring growth, and the spacing is wider than Nechako River.

Finally, enclosed is the length, weight and scale analysis data of three smolts sampled in May, 1991 from the Nechako River. The circuli counts are a bit higher than the adults but may simply indicate interannual variation in growth.

Please contact me if you need additional information.

Yours truly,

PACIFIC SALMON COMMISSION

*J.C.W. for*  
Carol Arffman  
Senior Scale Analyst

Encl.

cc: Gail Faulkner, Project Biologist,  
Habitat Management Division,  
Department of Fisheries & Oceans

Updated 10-Jan-92

TITLE: NECHAKO RIVER 1991 ADULTS - SPECIAL DFO SAMPLE  
 FILENAME: 91ANECRA.PRN  
 ANALYST: JULLIE & CAROL  
 GEAR: DEAD RECOVERY  
 AREA: NECHAKO RIVER SPAWNING GROUNDS  
 DATE: SEPTEMBER 15, 16, 22  
 NOS FROM: 1 TO: 50

04:27 PM

4/2 CIRCULUS COUNTS  
 Without Spring Growth

Count	Smooth		Pct
	Freq	Freq	
5	0	0	0.00
6	0	0	0.00
7	0	0	0.00
8	0	1	0.51
9	1	16	8.16
10	14	41	20.92
11	12	49	25.00
12	11	39	19.90
13	5	26	13.27
14	5	15	7.65
15	0	6	3.06
16	1	2	1.02
17	0	1	0.51
18	0	0	0.00
19	0	0	0.00
20	0	0	0.00
21	0	0	0.00
22	0	0	0.00
23	0	0	0.00
24	0	0	0.00
25	0	0	0.00
26	0	0	0.00
27	0	0	0.00
28	0	0	0.00
29	0	0	0.00
30	0	0	0.00
31	0	0	0.00
32	0	0	0.00
33	0	0	0.00
34	0	0	0.00
35	0	0	0.00
36	0	0	0.00
37	0	0	0.00
38	0	0	0.00
39	0	0	0.00
40	0	0	0.00

TOTAL 49 196 100.00  
 MEAN 11.51 SD 1.64

4/2 CIRCULUS COUNTS  
 With Spring Growth

Count	Smooth		Pct
	Freq	Freq	
5	0	0	0.00
6	0	0	0.00
7	0	0	0.00
8	0	0	0.00
9	0	0	0.00
10	0	2	1.02
11	2	13	6.63
12	9	32	16.33
13	12	47	23.98
14	14	47	23.98
15	7	31	15.82
16	3	14	7.14
17	1	5	2.55
18	0	2	1.02
19	1	2	1.02
20	0	1	0.51
21	0	0	0.00
22	0	0	0.00
23	0	0	0.00
24	0	0	0.00
25	0	0	0.00
26	0	0	0.00
27	0	0	0.00
28	0	0	0.00
29	0	0	0.00
30	0	0	0.00
31	0	0	0.00
32	0	0	0.00
33	0	0	0.00
34	0	0	0.00
35	0	0	0.00
36	0	0	0.00
37	0	0	0.00
38	0	0	0.00
39	0	0	0.00
40	0	0	0.00

TOTAL 49 196 100.00  
 MEAN 13.69 SD 1.69

## AGED BY SCALES

Age	Freq	Pct
3/1	0	0.00
4/1	0	0.00
4/2	49	98.00
5/2	1	2.00
5/3	0	0.00
3/2	0	0.00
4/3	0	0.00
GRAND TOTAL 6/2	0	0.00
50 6/3	0	0.00
Subtotal	50	100.00

## SCALE SUMMARY

UNREADABLE		READABLE	
Condition	#	Condition	#
Regenerated	0	1	50
Missing	0	2	0
Unreadable	0	3	0
Not Sockeye	0	4	0
Lateral Line	0		
TOTAL UNREADABLE:	0	TOTAL READ:	50

## OTOLITH SUMMARY

Unreadable 0  
 Missing 0

TOTAL: 0

## BREAKDOWN OF INDIVIDUAL SCALES

AGE FIRST SECOND PLUS

Updated 10-Jan-92

TITLE: NECHAKO RIVER 1991 ADULTS - SPECIAL DFO SAMPLE  
 FILENAME: 91ANECRA.PRN  
 ANALYST: JULLIE & CAROL  
 GEAR: DEAD RECOVERY  
 AREA: NECHAKO RIVER SPAWNING GROUNDS  
 DATE: SEPTEMBER 15, 16, 22  
 NOS FROM: 1 TO: 50

04:27 PM

5/2 CIRCULUS COUNTS  
 Without Spring Growth

5/2 CIRCULUS COUNTS  
 With Spring Growth

Count	Freq	Smooth Freq	Pct
5	0	0	0.00
6	0	0	0.00
7	0	0	0.00
8	0	0	0.00
9	0	0	0.00
10	0	1	25.00
11	1	2	50.00
12	0	1	25.00
13	0	0	0.00
14	0	0	0.00
15	0	0	0.00
16	0	0	0.00
17	0	0	0.00
18	0	0	0.00
19	0	0	0.00
20	0	0	0.00
21	0	0	0.00
22	0	0	0.00
23	0	0	0.00
24	0	0	0.00
25	0	0	0.00
26	0	0	0.00
27	0	0	0.00
28	0	0	0.00
29	0	0	0.00
30	0	0	0.00
31	0	0	0.00
32	0	0	0.00
33	0	0	0.00
34	0	0	0.00
35	0	0	0.00
36	0	0	0.00
37	0	0	0.00
38	0	0	0.00
39	0	0	0.00
40	0	0	0.00

Count	Freq	Smooth Freq	Pct
5	0	0	0.00
6	0	0	0.00
7	0	0	0.00
8	0	0	0.00
9	0	0	0.00
10	0	0	0.00
11	0	0	0.00
12	0	0	0.00
13	0	0	0.00
14	0	1	25.00
15	1	2	50.00
16	0	1	25.00
17	0	0	0.00
18	0	0	0.00
19	0	0	0.00
20	0	0	0.00
21	0	0	0.00
22	0	0	0.00
23	0	0	0.00
24	0	0	0.00
25	0	0	0.00
26	0	0	0.00
27	0	0	0.00
28	0	0	0.00
29	0	0	0.00
30	0	0	0.00
31	0	0	0.00
32	0	0	0.00
33	0	0	0.00
34	0	0	0.00
35	0	0	0.00
36	0	0	0.00
37	0	0	0.00
38	0	0	0.00
39	0	0	0.00
40	0	0	0.00

TOTAL 1 4 100.00  
 MEAN 11.00 SD 0.82

TOTAL 1 4 100.00  
 MEAN 15.00 SD 0.82

Updated 10-Jan-92

TITLE: NECHAKO RIVER 1991 ADULTS - SPECIAL DFO SAMPLE  
FILENAME: 91ANECRA.PRN  
ANALYST: JULLIE & CAROL  
GEAR: DEAD RECOVERY  
AREA: NECHAKO RIVER SPAWNING GROUNDS  
DATE: SEPTEMBER 15, 16, 22  
NOS FROM: 1 TO: 50

04:27 PM

LENGTH FREQUENCY DIST'N Age 4/2 Males				LENGTH FREQUENCY DIST'N Age 4/2 Females			
POH Length	Smooth Freq	Smooth Freq	Pct	POH Length	Smooth Freq	Smooth Freq	Pct
35	0	0	0.00	35	0	0	0.00
36	0	0	0.00	36	0	0	0.00
37	0	0	0.00	37	0	0	0.00
38	0	0	0.00	38	0	0	0.00
39	0	0	0.00	39	0	0	0.00
40	0	0	0.00	40	0	5	3.91
41	0	1	1.47	41	5	13	10.16
42	1	4	5.88	42	3	14	10.94
43	2	7	10.29	43	3	15	11.72
44	2	10	14.71	44	6	20	15.63
45	4	13	19.12	45	5	22	17.19
46	3	15	22.06	46	6	18	14.06
47	5	13	19.12	47	1	11	8.59
48	0	5	7.35	48	3	7	5.47
49	0	0	0.00	49	0	3	2.34
50	0	0	0.00	50	0	0	0.00
51	0	0	0.00	51	0	0	0.00
52	0	0	0.00	52	0	0	0.00
53	0	0	0.00	53	0	0	0.00
54	0	0	0.00	54	0	0	0.00
55	0	0	0.00	55	0	0	0.00
56	0	0	0.00	56	0	0	0.00
57	0	0	0.00	57	0	0	0.00
58	0	0	0.00	58	0	0	0.00
59	0	0	0.00	59	0	0	0.00
60	0	0	0.00	60	0	0	0.00
61	0	0	0.00	61	0	0	0.00
62	0	0	0.00	62	0	0	0.00
63	0	0	0.00	63	0	0	0.00
64	0	0	0.00	64	0	0	0.00
65	0	0	0.00	65	0	0	0.00
66	0	0	0.00	66	0	0	0.00
67	0	0	0.00	67	0	0	0.00
68	0	0	0.00	68	0	0	0.00
69	0	0	0.00	69	0	0	0.00
70	0	0	0.00	70	0	0	0.00
71	0	0	0.00	71	0	0	0.00
72	0	0	0.00	72	0	0	0.00
73	0	0	0.00	73	0	0	0.00
74	0	0	0.00	74	0	0	0.00
75	0	0	0.00	75	0	0	0.00
TOTAL	17	68	100.00	TOTAL	32	128	100.00
MEANS: LN	45.24	WT	ERR	LN	44.25	WT	ERR
SD:	LN 1.55	WT	ERR	LN	2.12	WT	ERR

000115

TITLE: NECHAKO RIVER 1991 ADULTS - SPECIAL DFO SAMPLE  
 LENAME: 91ANECRA.FRN  
 ANALYST: JULLIE & CAROL  
 GEAR: DEAD RECOVERY  
 AREA: NECHAKO RIVER SPAWNING GROUNDS  
 DATE: SEPTEMBER 15, 16, 22  
 NOS FROM: 1 TO: 50

04:27 PM

LENGTH FREQUENCY DIST'N Age 5/2 Males				LENGTH FREQUENCY DIST'N Age 5/2 Females			
POH Length	Smooth Freq	Smooth Freq	Pct	POH Length	Smooth Freq	Smooth Freq	Pct
35	0	0	ERR	35	0	0	0.00
36	0	0	ERR	36	0	0	0.00
37	0	0	ERR	37	0	0	0.00
38	0	0	ERR	38	0	0	0.00
39	0	0	ERR	39	0	0	0.00
40	0	0	ERR	40	0	0	0.00
41	0	0	ERR	41	0	0	0.00
42	0	0	ERR	42	0	0	0.00
43	0	0	ERR	43	0	0	0.00
44	0	0	ERR	44	0	0	0.00
45	0	0	ERR	45	0	1	25.00
46	0	0	ERR	46	1	2	50.00
47	0	0	ERR	47	0	1	25.00
48	0	0	ERR	48	0	0	0.00
49	0	0	ERR	49	0	0	0.00
50	0	0	ERR	50	0	0	0.00
51	0	0	ERR	51	0	0	0.00
52	0	0	ERR	52	0	0	0.00
53	0	0	ERR	53	0	0	0.00
54	0	0	ERR	54	0	0	0.00
55	0	0	ERR	55	0	0	0.00
56	0	0	ERR	56	0	0	0.00
57	0	0	ERR	57	0	0	0.00
58	0	0	ERR	58	0	0	0.00
59	0	0	ERR	59	0	0	0.00
60	0	0	ERR	60	0	0	0.00
61	0	0	ERR	61	0	0	0.00
62	0	0	ERR	62	0	0	0.00
63	0	0	ERR	63	0	0	0.00
64	0	0	ERR	64	0	0	0.00
65	0	0	ERR	65	0	0	0.00
66	0	0	ERR	66	0	0	0.00
67	0	0	ERR	67	0	0	0.00
68	0	0	ERR	68	0	0	0.00
69	0	0	ERR	69	0	0	0.00
70	0	0	ERR	70	0	0	0.00
71	0	0	ERR	71	0	0	0.00
72	0	0	ERR	72	0	0	0.00
73	0	0	ERR	73	0	0	0.00
74	0	0	ERR	74	0	0	0.00
75	0	0	ERR	75	0	0	0.00
TOTAL	0	0	ERR	TOTAL	1	4	100.00
MEANS: LN	ERR	WT	ERR	LN 46.00	WT		ERR
SD: LN	ERR	WT	ERR	LN 0.00	WT		ERR



Page 1

Raw Scale Data

Updated 10-Jan-92

TITLE: NECHAKO RIVER 1991 ADULTS - SPECIAL DFO SAMPLE  
 FILENAME: 91ANECRA.PRN  
 ANALYST: JULLIE & CAROL  
 GEAR: DEAD RECOVERY  
 AREA: NECHAKO RIVER SPAWNING GROUNDS  
 DATE: SEPTEMBER 15, 16, 22  
 NOS FROM: 1 TO: 50

04:27 PM

SCALE NO.	COND	AGE SCL	OTO	LENGTH STD	POH	WEIGHT KGS	SEX	CIRCULUS FIRST	COUNT PLUS	COUNT SECOND	DIST ANNUL	DIST FIFTH	W
1	1	42	0	0.0	46.0	0	1	10	3	0	58	38	28
2	1	42	0	0.0	45.5	0	2	10	2	0	61	40	28
3	1	42	0	0.0	46.0	0	2	13	0	0	68	40	29
4	1	42	0	0.0	43.0	0	2	9	2	0	49	35	27
5	1	42	0	0.0	46.0	0	2	12	2	0	67	38	27
6	1	42	0	0.0	46.0	0	1	12	0	0	59	36	24
7	1	42	0	0.0	47.0	0	1	11	2	0	65	43	30
8	1	42	0	0.0	46.0	0	2	12	3	0	74	45	29
9	1	42	0	0.0	45.0	0	2	10	3	0	67	44	32
10	1	42	0	0.0	46.0	0	2	10	3	0	57	37	28
11	1	42	0	0.0	47.0	0	1	11	3	0	57	36	25
12	1	42	0	0.0	44.0	0	2	10	2	0	55	37	27
13	1	42	0	0.0	45.0	0	2	12	0	0	66	36	27
14	1	42	0	0.0	44.0	0	2	10	3	0	59	40	30
15	1	42	0	0.0	42.0	0	1	10	3	0	63	42	28
16	1	42	0	0.0	44.0	0	1	10	2	0	60	42	32
17	1	42	0	0.0	42.0	0	2	12	4	0	65	36	25
18	1	42	0	0.0	41.0	0	2	11	3	0	63	39	26
19	1	42	0	0.0	44.0	0	2	12	3	0	74	43	32
20	1	42	0	0.0	42.0	0	2	12	2	0	73	42	28
21	1	42	0	0.0	44.0	0	2	10	2	0	58	39	28
22	1	42	0	0.0	44.0	0	2	11	2	0	60	39	28
23	1	42	0	0.0	41.0	0	2	11	3	0	62	36	27
24	1	42	0	0.0	43.0	0	2	11	3	0	63	42	29
25	1	42	0	0.0	46.0	0	1	11	0	0	66	44	31
26	1	42	0	0.0	42.0	0	2	13	1	0	77	45	32
27	1	42	0	0.0	41.0	0	2	12	3	0	74	42	32
28	1	42	0	0.0	41.0	0	2	11	3	0	62	39	30
29	1	42	0	0.0	47.0	0	2	13	2	0	73	40	31
30	1	42	0	0.0	43.0	0	2	16	0	0	84	39	32
31	1	42	0	0.0	47.0	0	1	14	3	0	66	35	25
32	1	42	0	0.0	45.0	0	1	10	2	0	54	35	27
33	1	42	0	0.0	43.0	0	1	10	3	0	58	36	24
34	1	42	0	0.0	41.0	0	2	14	1	0	77	37	29
35	1	42	0	0.0	43.0	0	1	12	0	0	60	35	29
36	1	42	0	0.0	45.0	0	1	14	0	0	82	42	28
37	1	42	0	0.0	47.0	0	1	13	3	0	69	39	31
38	1	42	0	0.0	45.0	0	2	10	3	0	59	36	29
39	1	42	0	0.0	45.0	0	1	12	3	0	74	38	32
40	1	42	0	0.0	44.0	0	2	12	2	0	65	39	29
41	1	42	0	0.0	47.5	0	2	11	4	0	66	42	30
42	1	42	0	0.0	45.0	0	1	10	2	0	61	39	28
43	1	52	0	0.0	46.0	0	2	11	4	0	58	35	27
44	1	42	0	0.0	48.0	0	2	11	2	0	67	43	31
45	1	42	0	0.0	45.0	0	2	13	6	0	71	37	27
46	1	42	0	0.0	44.0	0	1	10	3	0	59	39	29
47	1	42	0	0.0	46.0	0	2	14	0	0	79	41	32
48	1	42	0	0.0	48.0	0	2	11	3	0	55	34	25
49	1	42	0	0.0	47.0	0	1	11	3	0	74	44	32
50	1	42	0	0.0	44.5	0	2	14	0	0	72	36	31

Updated 20-Feb-92

TITLE: NECHAKO RIVER 1991 SMOLTS  
FILENAME: 91SNECHR.PRN  
ANALYST: CAROL  
GEAR: PRESERVED SMOLT MIGRANTS  
AREA: NECHAKO RIVER  
DATE: MAY 21-22  
NOS FROM: 1 TO: 3

02:24 PM

1-YEAR OLD SMOLTS CIRCULUS COUNTS  
Without Spring Growth With Spring Growth

Smooth				Smooth			
Count	Freq	Freq	Pct	Count	Freq	Freq	Pct
5	0	0	0.00	5	0	0	0.00
6	0	0	0.00	6	0	0	0.00
7	0	0	0.00	7	0	0	0.00
8	0	0	0.00	8	0	0	0.00
9	0	0	0.00	9	0	0	0.00
10	0	0	0.00	10	0	0	0.00
11	0	0	0.00	11	0	0	0.00
12	0	1	8.33	12	0	0	0.00
13	1	2	16.67	13	0	0	0.00
14	0	2	16.67	14	0	0	0.00
15	1	3	25.00	15	0	0	0.00
16	1	3	25.00	16	0	0	0.00
17	0	1	8.33	17	0	1	8.33
18	0	0	0.00	18	1	3	25.00
19	0	0	0.00	19	1	3	25.00
20	0	0	0.00	20	0	2	16.67
21	0	0	0.00	21	1	2	16.67
22	0	0	0.00	22	0	1	8.33
23	0	0	0.00	23	0	0	0.00
24	0	0	0.00	24	0	0	0.00
25	0	0	0.00	25	0	0	0.00
26	0	0	0.00	26	0	0	0.00
27	0	0	0.00	27	0	0	0.00
28	0	0	0.00	28	0	0	0.00
29	0	0	0.00	29	0	0	0.00
30	0	0	0.00	30	0	0	0.00
31	0	0	0.00	31	0	0	0.00
32	0	0	0.00	32	0	0	0.00
33	0	0	0.00	33	0	0	0.00
34	0	0	0.00	34	0	0	0.00
35	0	0	0.00	35	0	0	0.00
36	0	0	0.00	36	0	0	0.00
37	0	0	0.00	37	0	0	0.00
38	0	0	0.00	38	0	0	0.00
39	0	0	0.00	39	0	0	0.00
40	0	0	0.00	40	0	0	0.00
TOTAL 3 12 100.00				TOTAL 3 12 100.00			
MEAN 14.67 SD 1.50				MEAN 19.33 SD 1.50			

AGED BY SCALES

Age	Freq	Pct
	0	0.00
	0	0.00
1-YR	3	100.00
	0	0.00
2-YR	0	0.00
	0	0.00
	0	0.00
GRAND TOTAL	0	0.00
3	0	0.00
Subtotal	3	100.00

SCALE SUMMARY

UNREADABLE		READABLE	
Condition	#	Condition	#
Regenerated	0	1	3
Missing	0	2	0
Unreadable	0	3	0
Not Sockeye	0	4	0
Lateral Line	0		
TOTAL UNREADABLE: 0 TOTAL READ: 3			

OTOLITH SUMMARY

Unreadable	0
Missing	0
TOTAL:	0

BREAKDOWN OF INDIVIDUAL SCALES

AGE FIRST SECOND PLUS

Updated 20-Feb-92

TITLE: NECHAKO RIVER 1991 SMOLTS  
 FILENAME: 91SNECHR.PRN  
 ANALYST: CAROL  
 GEAR: PRESERVED SMOLT MIGRANTS  
 AREA: NECHAKO RIVER  
 DATE: MAY 21-22  
 NOS FROM: 1 TO: 3

02:24 PM

LENGTH FREQUENCY DIST'N  
 1-YEAR OLD SMOLTS

Fork Length	Smooth Freq	Smooth Freq	Pct	Fork
60	0	0	0.00	0
62	0	0	0.00	0
64	0	0	0.00	0
66	0	0	0.00	0
68	0	0	0.00	0
70	0	0	0.00	0
72	0	0	0.00	0
74	0	0	0.00	0
76	0	0	0.00	0
78	0	0	0.00	0
80	0	1	8.33	0
82	1	2	16.67	0
84	0	1	8.33	0
86	0	0	0.00	0
88	0	0	0.00	0
90	0	1	8.33	0
92	1	2	16.67	0
94	0	1	8.33	0
96	0	0	0.00	0
98	0	0	0.00	0
100	0	1	8.33	0
102	1	2	16.67	0
104	0	1	8.33	0
106	0	0	0.00	0
108	0	0	0.00	0
110	0	0	0.00	0
112	0	0	0.00	0
114	0	0	0.00	0
116	0	0	0.00	0
118	0	0	0.00	0
120	0	0	0.00	0
122	0	0	0.00	0
124	0	0	0.00	0
126	0	0	0.00	0
128	0	0	0.00	0
130	0	0	0.00	0
132	0	0	0.00	0
134	0	0	0.00	0
136	0	0	0.00	0
138	0	0	0.00	0
140	0	0	0.00	0

TOTAL 3 12 100.00  
 MEANS: LN 92.00 WT 6.29  
 SD: LN 8.16 WT 0.45

000119

Page 1

Raw Scale Data

Updated 20-Feb-92

02:24 PM

TITLE: NECHAKO RIVER 1991 SMOLTS  
 FILENAME: 91SNECHR.PRN  
 ANALYST: CAROL  
 GEAR: PRESERVED SMOLT MIGRANTS  
 AREA: NECHAKO RIVER  
 DATE: MAY 21-22  
 NOS FROM: 1 TO: 3

SCALE	AGE	LENGTH	WEIGHT	CIRCULUS COUNT	DIST	DIST	
NO. COND	SCL	OTO	POF	FORK	GMS	FIRST	PLUS SECOND ANNUL FIFTH W
1	1	42	0	0.0	102.0	6.73	0 16 5 0 87 42 25
2	1	42	0	0.0	92.0	5.99	0 15 4 0 75 38 25
3	1	42	0	0.0	82.0	5.96	0 13 5 0 57 34 26

00001363



# PACIFIC SALMON COMMISSION

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

TO: *B. Graham*

600 - 1155 ROBSON STREET  
VANCOUVER, B.C. V6E 1B5  
TELEPHONE: (604) 684-8081  
FAX: (604) 666-8707

Our File: 75001

009779 MAR -2 14:13

FISHERIES & OCEANS  
FISHERIES PACIFIC  
FILE: *1110-P9.*

Your File:

February 25, 1992

## MEMORANDUM

TO: Southern Panel Area Coho Workshop Participants  
National Sections Correspondents

FROM: I. Todd, Executive Secretary

RE: Draft Summary Minutes - Southern Panel Coho Workshop

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Attached for your record and comment, if desired, is a draft summary of the discussions which took place during the February 16-18, 1992 Southern Panel Area Coho Workshop.

*I. Todd*  
I. Todd  
Executive Secretary



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1 <del>Martha Pawthorntwaite</del>	6 <del>Mark Saunders</del>	11
2 <del>K. Harrow</del>	7 <del>Mike Smith</del>	12
3 <del>SALLY MORTON CULTUS LAKE</del>	8 <del>SALLY RICH Don Noakes / PBS</del>	13
4 <del>Calin Levinge</del>	9 A. Lill - Stn # 422	14
5 <del>RJ Beagish PBS</del>	10	15

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AND THE UNITED STATES OF AMERICA  
MARCH 18, 1985

600 - 1155 ROBSON STREET  
VANCOUVER, B.C. V6E 1B5  
TELEPHONE: (604) 684-8081  
FAX: (604) 666-6707

TO: Pat Chamut

Our File: 72001

002967 FEB 24 P1:14

Your File:

*pg 2*

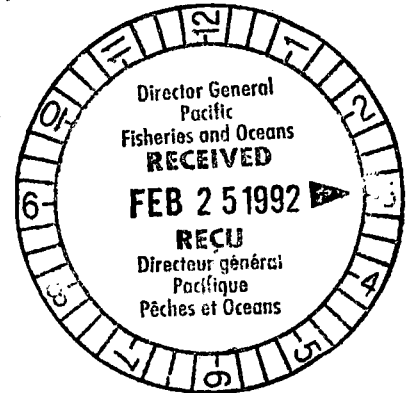
FISHERIES & OCEANS  
FISHERIES PACIFIC

1110-P9

February 20, 1992

## MEMORANDUM

TO: All members of the Pacific Salmon Commission  
FROM: J. Abramson, Secretary  
RE: Chinook Technical Report (92)-2



Please find enclosed the Chinook Technical Committee Report - Preliminary 1991 Catch and Escapement, (92)-2 dated February 13, 1992. Also, find enclosed "Canadian 1991 Catch and Sampling Report on Terminal Area Exclusions of Chinook Catches in Northern B.C.".

*J. Abramson*  
J. Abramson  
Secretary

Encl.

*Pat Chamut*  
26/2/92



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du Canada

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1 <del>Walter Churley,</del> <del>West Van Dist.</del>	6 <del>Pat Baglo</del> Pat Baglo	11 D. CAGGS 321
2 MIKE ROMANNE ITSD 555 W. HASTINGS.	7 <del>Grant Johnston</del> <del>Rosewall Creek</del>	12 Steele 422
3 Personnel #408	8 <del>PURCHASING</del> P.B.S. (MAUREEN FAHR)	13 D. Rappford P. Hubert
4 <del>Patricia Glover</del> <del>Comm.</del> <del>Stn. 412</del>	9 BROSS	14 Al Wood 317
5 Kelly Francis P.B.S.	10 N. Seigel Personnel Branch 555 W. Hastings Vancouver, B.C.	15

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16	17	18	19	20	21
22	23	24	25	26	27

## CANADIAN 1991 CATCH AND SAMPLING REPORT on TERMINAL AREA EXCLUSIONS of CHINOOK CATCHES in NORTHERN B.C.

February 6, 1991

### SUMMARY

In compliance with the 1991 Letter of Transmittal (Attachment 2), Canada is providing this brief report on catch estimates of chinook caught in the three areas described in TCCHINOOK (91)-2 and the recovery of coded-wire tags in these areas. Methods used in this report are the same as reviewed by the Chinook Technical Committee and reported in TCCHINOOK (91)-2. The sport catch survey used in the Kitimat terminal area was expanded and the area further sub-divided to improve resolution on tag recoveries and biological sampling data. Efforts were made to increase the sampling for tags and biological samples in each exclusion area.

Terminal exclusions are proposed for the Skeena and Bella Coola areas, 4,383 and 1,674 chinook respectively. No terminal exclusion exists in the Kitimat area since the estimated catch of chinook over 12 lb. in June and July does not exceed the base catch level. The estimated catch for Kitimat Area 6-1 was 2,305. However, the base catch level for each exclusion area (as specified in Attachment 2) has been included in the all-gear catch for North/Central B.C. Tag recoveries and biological sampling again demonstrated that all tagged chinook recovered in these terminal areas were from mature chinook returning to the local river. Spawning escapements to the Skeena, Kitimat, and Bella Coola rivers all exceeded their escapement goals. Escapements to the smaller natural populations in Kitimat and Bella Coola areas were more variable, but within each area the spawning escapements improved relative to 1990.

### REVIEWS BY TERMINAL AREA

#### Skeena River Area (River/Gap/Slough):

Procedures as outlined by Canada in the 1991 report to the Chinook Technical Committee were repeated, with the exception that samplers were placed aboard packers within the River/Gap/Slough (RGS) and proximal to this area. This sampling procedure was intended to increase the number of coded-wire tags recovered and to reduce possible contamination of RGS recoveries due to vessels reporting catch in this area that was caught elsewhere. The estimated RGS catch of chinook over 5 lb. was 7,283, resulting in a terminal exclusion of 4,383 (7,283 - 2,900) chinook (Table 1a). Of these, 1,883 were sampled (26% sampling rate) for adipose clips and 29 coded-wire tags were recovered. The mark rate (1.54%) in RGS was very similar to rates reported for 1989 and 1990, and all coded-wire tagged chinook over 5 lb. were from releases within the Skeena River (Table 1b).

Biological samples were collected from 635 chinook caught throughout Area 4. Most of these samples were collected in the RGS or in the adjacent fishing sub-area. Processing of these samples is incomplete but 86% of the chinook sampled in RGS exceeded 5.4 kilograms (Large Red chinook grade) and all chinook sampled in RGS were mature. Tag recoveries and biological sampling from all chinook recovered in Area 4 will be reported in June. A total of 93 coded-wire tags have been recovered throughout Area 4. Recoveries outside of the RGS were again from a wide variety of sources.

### Kitimat Sub-Area 6-1:

A creel survey similar to the 1990 survey described in the 1991 Canadian report was conducted between June 9 and August 9. The catch estimate was based on effort distribution and daily patterns, plus ramp interviews for catch and biological sampling data. Six sampling areas within Sub-area 6-1 were identified (Figure 1) and data were collected by 3 size categories (>12 lb., 5-12 lb., and <5 lb.). The estimated total catch of chinook over 12 lb. was only 2305 but effort was reduced by 37% relative to 1990 (Table 2a). This estimated catch is less than the 2,400 base catch level specified in Attachment 2 and a terminal exclusion does not exist.

Mark sampling examined 20% of the total catch but the vast majority of the sampling occurred at the head of Kitimat Arm (Sub-area A, Figure 1), and 3.8% of the chinook had adipose clips. Due to the voluntary return of heads in Canadian sport fisheries we do not know the origin of each marked chinook observed. However, all marks returned from Sub-areas A and B were from the Kitimat Hatchery. Heads voluntarily returned from throughout Statistical Area 6 continue to indicate that this inlet contains a mix of chinook stocks. However, biological samples collected throughout Area 6-1 (n = 341) indicated that all chinook 12 lb. or larger were sexually mature (Table 2b).

### Bella Coola Gillnet Area (BCGNA):

Procedures as outlined in the 1991 Canadian report were repeated in the BCGNA, except that the terminal exclusion has been calculated through the second week of July (Statistical week 7-2). This extension is proposed since the majority of the fishing and chinook catch occurred in the BCGNA and large mesh gill nets were still being used through this week. Following week 7-2, however, effort shifted to the outer portions of Area 8 and a substantial mix of chinook stocks is revealed by coded-wire tag recoveries. The estimated BCGNA catch of chinook over 5 lb. through week 7-2 was 4,624 (Table 3a), resulting in an exclusion of 1,674 (4,624 - 2,950) chinook. Sampling rates for mark incidence remained high (71%) as in previous years, and the mark incidence (2.2%) was similar to 1990. Seventy coded-wire tags were recovered from 3,242 samples (Table 3b). All but one tagged chinook was returning to the Snootli Hatchery in Bella Coola. All tagged fish were mature. One mature chinook from Kitimat Hatchery was recovered.

To protect natural chinook stocks in this Area, the upper portions of South Bentinck Arm and Dean Channel were closed to fishing. The two small chinook populations at the head of South Bentinck Arm are not well surveyed but the reported escapement (combined escapement of about 100) was similar to recent averages. The more important stock is the Dean River chinook at the head of Dean Channel. Escapement of Dean chinook increased compared to 1990 and late 1980 values (2400 vs. 2000, 1986-1990 average).

Note: Detailed lists of coded-wire tag recoveries will be provided in the June report but if desired the 1991 coded-wire tag data may be accessed directly via the Mark Recovery Database maintained at the Pacific Biological Station.

Starr D:\document\91TERMA4.WK1 Feb. 6, 1992

**Table 1a.** 1991 Chinook catch (>5lb.) in total Area 4 and the River/Gap/Slough exclusion area, and sampling rates for coded-wire tags in the R/G/S area.

Stat. Week	Fishing Dates	Hailed Catch		Reported Sales: Total Area 4	Prorated R/G/S	Sample Size in R/G/S	Sample Rate	CWT's Recovered
		Total Area 4	R/G/S					
71	July 1/2	1164	628	1219	658	395	60%	6
72	July 7/8,9,10	2825	1298	4009	1842	478	26%	2
73	July 14/15,16, 17,20/21	5006	3609	3183	2295	193	8%	0
74	July 22,23,24, 27/28	2193	1187	2027	1097	413	38%	5
75	July 29,30,31, Aug. 3/4	1646	732	1,458	648	190	29%	4
81	Aug. 5,6	321	279	383	333	79	24%	4
82	Aug. 11/12,13	125	77	172	106	97	92%	4
83	Aug. 18/19,20, 21	163	15	43	4	37	>100%	4
84	Aug. 25/26,27	20	0	36	0	1	>100%	0
Totals		13463	7825	12530	6983	1883	26%	29

Terminal Exclusion is estimated = 7283  
using the annual totals

**Table 1b.** 1991 Coded-wire tag recoveries in the RGS terminal exclusion area.

Stat. Week	Total age of Chinook caught				Total CWT's	No pins	Comments
	Age 3	Age 4	Age 5	Age 6			
71	1	2	1	0	4	2	All R/G/S recoveries were from Skeena River release sites:
72	0	0	1	1	2	0	
73	0	0	0	0	0	0	
74	0	1	3	0	4	1	
75	0	0	4	0	4	0	5 Terrace CDP
81	0	0	3	0	3	1	2 Fort Babine CDP
82	0	0	3	1	4	0	17 Toboggan Cr. CDP
83	0	0	2	1	3	1	
84	0	0	0	0	0	0	
Total	1	3	17	3	24	5	

Starr D:\Document\91termA6.wk1 Feb. 6, 1992

**Table 2a.** Estimated sport catch and effort in Kitimat Sub-area 6-1 based on the 1991 creel survey; plus the number of chinook sampled for mark incidence and the number of coded-wire tags observed.

Sub-Area	Parameters:	Numbers of Chinook by size			Totals by Sub-Area	
		>12 lb.	5-12 lb.	<5 lb.	Chinook Numbers	Boat Days Effort
A	Catch	1696	436	81	2213	5290
	Samples obs.	423	81	17	521	
	CWT's	14	4	1	19	
B	Catch	180	47	8	235	574
	Samples obs.	10	6	1	17	
	CWT's	1	0	0	1	
C	Catch	48	12	2	62	154
	Samples obs.	0	0	0	0	
	CWT's	0	0	0	0	
D	Catch	63	16	2	81	201
	Samples obs.	6	7	1	14	
	CWT's	0	0	0	0	
E	Catch	87	22	4	113	274
	Samples obs.	4	18	3	25	
	CWT's	1	0	0	1	
F	Catch	138	35	6	179	431
	Samples obs.	0	3	0	3	
	CWT's	0	0	0	0	
G	Catch	93	24	4	121	293
	Samples obs.	12	1	1	14	
	CWT's	2	0	0	2	
Totals	Catch	2305	592	107	3004	7217
	Samples obs.	455	116	23	594	
	CWT's	18	4	1	23	

**Table 2b.** Numbers of biological samples collected and distribution of samples by body size (weight) and maturity state of the samples.

Sub-Area	# of Biological Samples	Numbers of Samples by size			Maturity State	
		>12 lb.	5-12 lb.	<5 lb.	Mature	Immature
A	294	245	39	10	293	1
B	9	6	3	0	6	3
C	0	0	0	0	0	0
D	5	4	1	0	5	0
E	15	5	9	1	6	9
F	7	6	1	0	7	0
G	11	8	2	1	11	0
Total	341	274	55	12	328	13
% of Samples		80.4%	16.1%	3.5%	96.2%	3.8%

(Starr D:\document\91TERMA8.WK1 Feb. 6, 1992)

**Table 3a.** 1991 Chinook catch (>5lb.) in total Area 8 Gillnet and BCGNA, and sampling rates for coded-wire tag sampling.

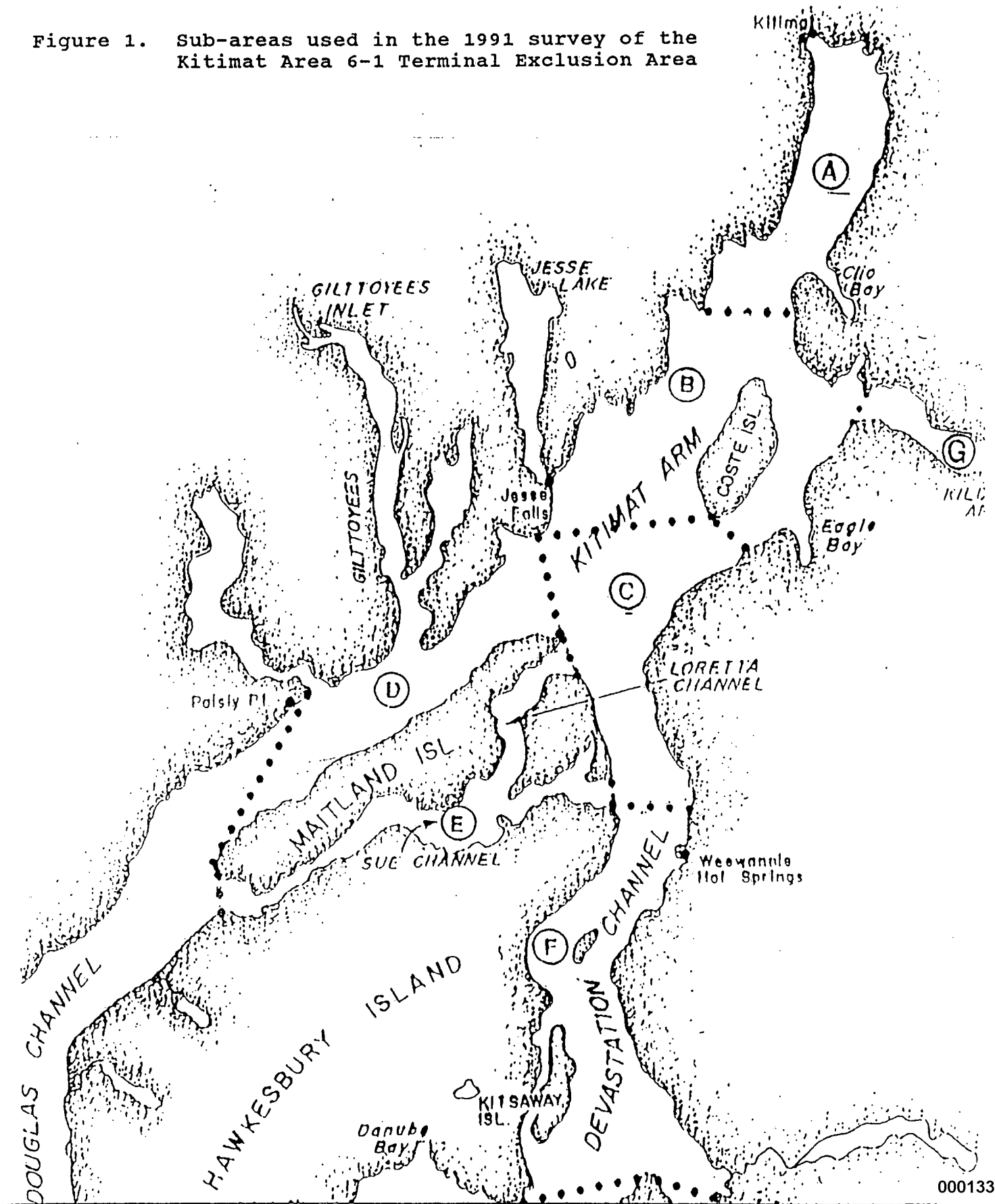
Stat. Week	Fishing Dates	Hailed Catch		Reported		% Large Mesh	Catch by large mesh	Sample Size	Sample Rate
		Total Area 8	BCGNA	Total Area 8	BCGNA				
062	June 11	524	524	588	588	100	588	396	67.3
063	June 18	1,000	1,000	1,143	1,143	100	1143	786	68.8
064	June 25	888	888	1,049	1,049	100	1049	865	82.5
071	July 01	741	601	896	727	67	487	702	96.6
072	July 8,9	1,277	1,005	1,422	1,119	25	280	493	44.1
Total to Week 072:		4,430	4,018	5,098	4,626		3,547	3,242	71.8
Terminal area exclusion =					4,624	estimated using totals			

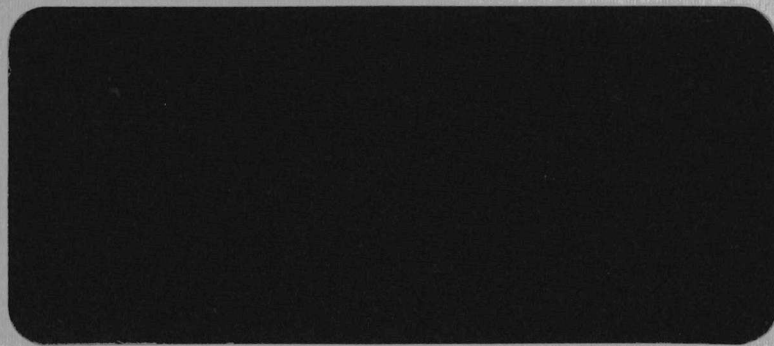
**Table 3b.** 1991 Coded-wire tag recoveries in Area 8 previous to Statistical week 072. All recoveries were from the Snootli Hatchery (Bella Coola) unless otherwise stated.

Stat. Week	Total age of Chinook recovered					Total CWT's	No pins	Comments
	Age 3	Age 4	Age 5	Age 6				
062	0	4	4	2	10	0		
063	0	10	11	0	21	1		(1 Age 5 Kitimat Chinook)
064	0	3	7	2	12	1		
071	1	7	7	1	16	0		
072	4	2	5	0	11	2		
Total by Age:	5	26	34	5	70	4		



Figure 1. Sub-areas used in the 1991 survey of the Kitimat Area 6-1 Terminal Exclusion Area





**PACIFIC SALMON COMMISSION  
CHINOOK TECHNICAL COMMITTEE**

**REPORT TCCHINOOK (92)-2**

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

**FEBRUARY 13, 1992**

## TABLE OF CONTENTS

1.0 1991 CHINOOK SALMON CATCHES IN FISHERIES WITH CEILINGS .....	1
2.0 CUMULATIVE DEVIATIONS FROM CATCH CEILINGS .....	1
3.0 REVIEW OF FISHERIES WITH CATCH CEILINGS .....	2
3.1 S.E. Alaska Fisheries .....	2
3.2 Canadian Fisheries .....	4
4.0 REVIEW OF OTHER FISHERIES .....	7
4.1 Canadian Fisheries .....	7
4.2 U.S. Fisheries .....	9
5.0 PRELIMINARY REVIEW OF 1991 ESCAPEMENTS .....	12
5.1 S.E. Alaska and Non-Annex Transboundary Rivers .....	12
5.2 Annex Transboundary Rivers .....	13
5.3 Northern B.C. (Areas 1, 3, and 4) .....	14
5.4 Central B.C. (Areas 6-10) .....	14
5.5 Southern B.C. (outside the Fraser River) .....	14
5.6 Fraser River .....	15
5.7 Puget Sound .....	15
5.8 Washington Coast .....	15
5.9 Columbia River .....	15
5.10 Oregon Coast .....	16
TABLE 1. Summary of the 1988-1991 Chinook catches in fisheries relevant to the U.S./Canada Pacific Salmon Treaty .....	17
TABLE 2. Summary of the 1987-1991 escapement of Pacific Salmon Commission Chinook Escapement Indicator Stocks. ....	18

## 1.0 1991 CHINOOK SALMON CATCHES IN FISHERIES WITH CEILINGS

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

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

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

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

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

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

## 2.0 CUMULATIVE DEVIATIONS FROM CATCH CEILINGS

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

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

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

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

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

c/ These overages exceed the 7.5% management range.

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

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

### **3.0 REVIEW OF FISHERIES WITH CATCH CEILINGS**

#### **3.1 S.E. Alaska Fisheries**

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

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

Preliminary data for 1991 indicate the following:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

### 3.2 Canadian Fisheries

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

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

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

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

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

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



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

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

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

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

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

#### **West Coast Vancouver Island (WCVI) Troll:**

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

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

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

#### **Strait of Georgia:**

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

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

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

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

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

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

#### 4.0 REVIEW OF OTHER FISHERIES

##### 4.1 Canadian Fisheries

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

##### Southern B.C. Commercial Net:

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

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

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

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

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

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

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

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

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

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

#### Indian Food Fisheries:

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

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

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

#### **4.2 U.S. Fisheries**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## 5.0 PRELIMINARY REVIEW OF 1991 ESCAPEMENTS

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

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

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



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

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

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

## **5.2 Annex Transboundary Rivers**

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

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

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

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

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

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

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

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

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

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

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

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

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

#### **5.6 Fraser River**

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

#### **5.7 Puget Sound**

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

#### **5.8 Washington Coast**

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

#### **5.9 Columbia River**

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

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

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

#### **5.10 Oregon Coast**

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

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

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

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

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

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

TABLE 2 continued.

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

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

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

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

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

# INTERIOR INDIAN FISHERIES COMMISSION

TO: *Fraser*

February 17, 1992

002948

FEB 21 12:59

Mr. Fred Fraser  
Chairman  
Fraser River Panel  
555 West Hastings Street  
Vancouver B.C.  
V6B 5G3

FISHERIES & OCEANS  
FISHERIES PACIFIC

1110-F24

cc 1110-518

cc 1110-pg

Re: Vacancy on the Fraser River Panel

Here is the copy of Peter Quaw's letter of resignation to the Fraser River Panel.

The IIFC will be having an assembly on the 24th of February, this vacancy will be dealt with at that meeting. I will be contacting you by February 26th with the name(s) of our respective nominees. I am hopeful that we can expedite the appointment process to fill this important position on the panel.

If you have any questions please contact me at 256-7523 or by fax at 256-7119.

Thank You

INTERIOR INDIAN FISHERIES COMMISSION

*[Signature]*  
GARRY JOHN  
COORDINATOR



s.19(1)



# Fort George Band

Phone 963-8451



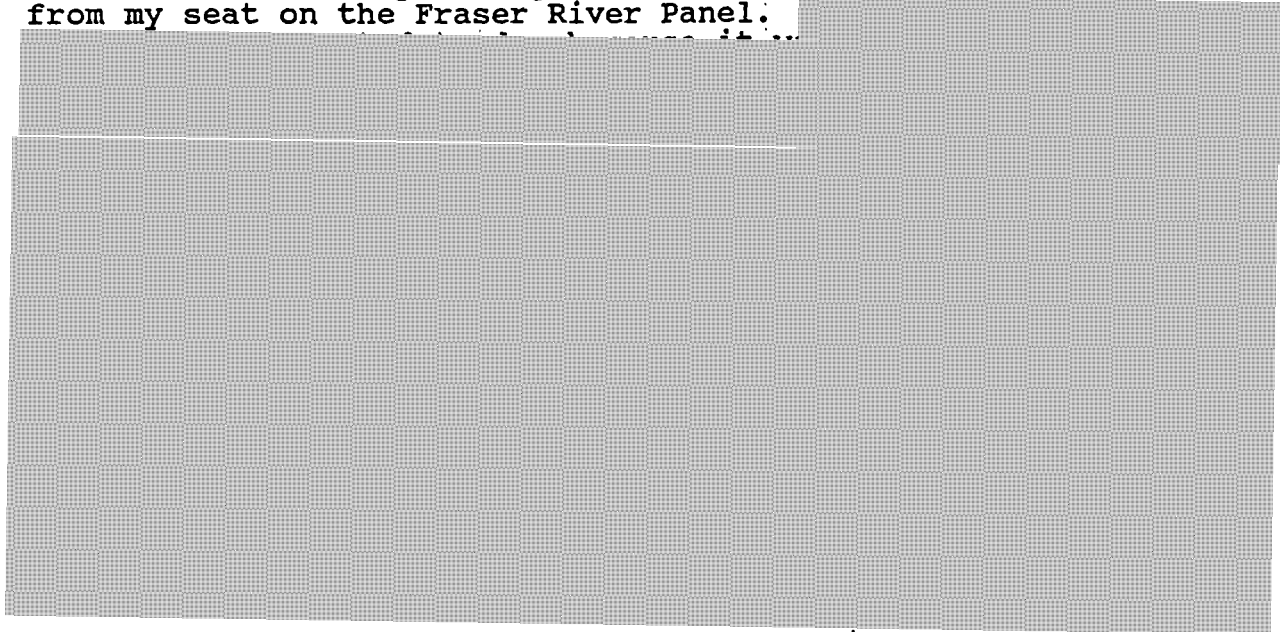
May 30, 1991

Mr. Ken Malloway  
Interior Indian Fisheries Commission  
Box 465  
Lillooet, BC  
V0K 1V0

Dear Mr. Malloway;

RE: "Resignation from the Pacific Salmon Commission"

It is with deepest regret that I tender my resignation  
from my seat on the Fraser River Panel.



Yours in Friendship,

FORT GEORGE BAND

Peter Quaw  
Chief

CC CSTC Chiefs  
Justa Monk Tribal Chief  
Gary John Co-ordinator IIFC

R.R. 1, SITE 27, COMP. 60, PRINCE GEORGE, B.C. V2N 2H8

000157



## PACIFIC SALMON COMMISSION

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

600 - 1155 ROBSON STREET  
VANCOUVER, B.C. V6E 1B5  
TELEPHONE (604) 684-8081  
FAX: (604) 666-8707

TO: G. Berezan  
Our File: 66001

JAN 30 1992

002734

FEB 10 1992  
Your File: 66001

January 30, 1992

FISHERIES & OCEANS  
MEMORANDUM  
FISHERIES PACIFIC  
1110-P9

TO: W. Saito, Sockeye and Pink Salmon Biologist, CDFO  
FROM: J. Woodey, Chief, Fisheries Management Division  
RE: 1991 Fraser River Pink Salmon Escapement Estimate

The 1991 pink salmon escapement estimate calculated from Duncan Bar (DB) tagging and spawning ground recovery data, presently indicated to be about 13.5 million fish, concerns the PSC staff for several reasons. First, if correct, this estimate indicates severe structural problems with our in-season total run-size and Georgia Strait escapement estimation models. These models must be based on valid assumptions and data. If the models are incorrect, they will have to be revised. Secondly, Cottonwood and Whonnock test fishing CPUE and Mission echo sounding target abundance are scaled to prior year data to obtain estimates of escapement. As such, those data must be correct for future in-season estimates to be within the bounds of the final escapement. I have undertaken the present analysis in order to ascertain whether problems exist within our respective escapement estimation programs.

After having reviewed the pink salmon tagging program results for 1991 with you and D. Hickey, I had P. Cheng tabulate tagging and recovery data for recent years searching for information which might direct your evaluation of the 1991 estimate. First, however, I will review the in-season estimates of escapement. Most of these estimates are indirect and depend upon the accuracy of past mark-recapture estimates of the pink salmon escapement. I will try to indicate the direction of the error that would occur if past escapement estimates are biased.

### In-season run-size estimates

PSC staff analyze biological data and the in-season catch and effort data to obtain run-size estimates for use by the Panel in setting the TAC and international and domestic allocations. In 1991, we used scale measurement, peak week CPUE and cumulative normal curve models to estimate the return of Fraser River pink salmon. The best fits suggested runs of 15 to 17 million fish. Subtracting the recorded catch of 9.4 million would give a range of 5.6 to 7.7 million pinks in the spawning escapement (Table 1). These estimates depend on the accuracy of past year escapement estimates since the data used in the models, i.e. total runs via Juan de Fuca and Johnstone Straits, include the spawning escapements observed in prior years. If these latter estimates were biased to the high side, as would be the case with most mark-recapture estimates when biases do occur, then our estimates of the 1991 run size would tend to be high. After subtraction of catch, we would be left with an overestimate of escapement, rather than the apparent underestimate of escapement if the tagging estimate for 1991 is correct.

.../2



W. Saito  
January 30, 1992  
Page 2.

Tempering these results were the conditions under which the run size estimates were obtained. First, to the large catches in Area 20 and Areas 12 and 13 purse seine fisheries in August and the low interest in pinks by the troll fleet, Canada did not want to have additional pink salmon harvest by the purse seines because of domestic allocation problems. Our data for Area 20 CPUE were, thus, from late August and may have been a bit low as these catches were made prior to the peak of the run. Secondly, purse seine test fishing data from Areas 20 and 12 constituted a major part of the data used for the cumulative normal model. However, test fishing CPUE and United States catches of southern approach pinks did not indicate extraordinary levels of escapement through these areas during closed periods. The scale measurement data were independent of catches and, essentially, gave the same results.

Fish size was not used for in-season run-size estimation; however, we were aware that pinks were quite small. The mean weight in Area 20 appears to be about 3.9 lb, the smallest on record, indicating a large run size.

#### In-river migration estimates

The PSC operated test fisheries at Cottonwood and Whonnock and echo sounding at Mission in 1991. The test fishing at Whonnock was conducted with the variable-mesh net. We have data on this drift with the VMN only in 1979 and, hence, there was an inadequate data base from which to make estimates with accuracy. The Cottonwood drift using the standard net gave a CPUE-based estimate (using average expansion of 5,650) of 8.7 million pink salmon escapement (Table 1). The small size of pinks in 1991 would be expected to give low net efficiency; i.e. regression of net efficiency on mean weight ( $r^2=0.378$ ) gave an expansion line of 8,300 and an escapement estimate of 12.8 million for 1991. However, above average water levels would have increased the net efficiency by forcing more fish toward the shore.

Echo sounding at Mission in past years has tended to underestimate the recorded pink salmon escapement. Various techniques have been tested to get around the apparent problem which has been attributed to the shoreline orientation of migrating pink salmon in the Fraser River. In 1991, we decided simply to correct for the apparent low bias. In order to obtain the daily estimates of pink salmon migration at Mission the total salmon abundance was apportioned to the five species using the unadjusted species composition data from test net catches at Cottonwood. The pink salmon estimate was then boosted by 1.69X to compensate for underestimates observed in the 1987 and 1989 programs using this procedure. The daily estimates total 7.4 million pink salmon. If past year spawning escapement estimates have been high, we would have overestimated the pink salmon escapement in 1991 due to the use of this factor, presuming the river distribution, etc. was not significantly different from previous years.

but the argument  
is that the pinks were  
much more shore oriented in  
'91; therefore, the echo sounding  
would be substantially lower  
than the 87-89 est.

Leif Neilson!  
Chris also report subst. of 54 in  
under-est

.../3



W. Saito  
January 30, 1992  
Page 3

P. Cheng has also calculated the pink salmon population without expansion but with an adjustment of species composition for the relative vulnerabilities of the five species to the test fishing nets. This analysis generated totally "independent" estimates of 5.1 and 5.4 million pink salmon and 1.3 and 1.4 million Adams and other late run sockeye. We think the pink salmon estimates are low due to shoreline orientation at Mission but this calculation gave late run sockeye escapement estimates only about 17% below recorded levels. If the pink salmon estimates were equally low, the total pink salmon escapement would have been in the order of 6.3 million fish.

We have also used the Duncan Bar beach seine catch per set as an indicator of abundance. The daily CPUE multiplied times an historically derived factor (mean = 1,400, range: 700 to 2600) gave a cumulative estimate of 14.5 million pink salmon escapement. The 41,000 total tags applied were approximately 50% above any previous year. High availability of small pink salmon migrating near shore may be the explanation for the high CPUE and large number of tags applied.

#### Hells Gate observations

Counts at Hells Gate during past pink salmon migrations have been compared to subsequent estimates of escapement above Hells Gate (Table 2). The cumulative daily estimates for 1971-1983, i.e. counts  $\div$  hours counted  $\times$  12 (approx.) hours of daylight were close to the total escapements observed (average factor = 1.21; range: 0.79 to 1.85). In 1987 and 1989, lights were installed to improve passage at Hells Gate during night hours and, thus, avoid the accumulation of fish below the fishways. Theoretically, the use of lights should cause the expansion factor to increase since a lower fraction of the fish would be counted during the day hours. The average expansion was 2.33 in these two years. In 1991, lights were again operated during night hours and the factor was 1.93 based on an escapement of 2,000,000 fish above Hells Gate. The factor for 1991 is within the bounds of past data and, hence, suggests that the counting was comparable to past years.

In addition to total count, the observer recorded the number of red Duncan Bar tags he saw on pink salmon. He counted 1,612 tags, the second largest number observed to date. These counts have been used in the past to estimate the Duncan Bar tag ratio and, hence, track the passage of fish through the lower river, i.e. number of fish tagged at Duncan Bar times the estimated tag ratio at HG = cumulative escapement past Duncan Bar. In 1991, these data gave a tag ratio estimate of 1:148 ( $594,431 \div 1,612 \div 2.5$ ), which when multiplied times the number of tags available for recovery (38,672) gave a total watershed population of 5.7 million pink salmon. The factor (2.5) is the historical (1971-1983) mean value for correction of observed ratio at Hells Gate to tag ratios obtained at spawning grounds above Hells Gate. Inclusion of 1987 and 1989 data increases the factor to 2.8 and reduces the population size to 5.1 million pinks.



W. Saito  
January 30, 1992  
Page 4

There are complicating factors, of course, which may compromise this analysis. First, the observer was new to the job and may have seen more or fewer tags than the average of past observers. He began counting sockeye in mid-August so he was not totally green at the job, but was not experienced with pink salmon counting. Second, we assume that the correction factor simply compensates for tags not seen due to the high turbidity of the river. However, the correction factor used may not simply measure the actual tagged:untagged ratio of fish at Hells Gate but may include the effects of tag loss/mortality upstream of Hells Gate. Since tag loss/mortality upstream should be random or, at least, similar from year to year, the calculation provides an estimate of the tag ratio which would be expected in the dead recovery upstream of Hells Gate.

Comparison of tag ratios at Hells Gate to dead recoveries above Hells Gate for the years of record shows 1991 to be an anomalous year (Table 1). The ratio of respective tag ratios (HG ratio + dead recovery ratio) averages 2.5 for 7 years (1971 - 1983). In 1991 the ratio was 0.92. The spawning ground dead recovery tagged:untagged ratio (1:400) was higher than the maximum at Hells Gate from the raw counts without correction (1:369). Assuming that counting was similar to past years, there appears to have been substantially greater tag loss/mortality above Hells Gate in 1991.

#### Duncan Bar tagging data

At least four sources of error can occur in mark-recapture (tagging) studies: (1) tagging mortality, (2) tag loss, (3) non-recognition of tagged fish and (4) non-random distribution of tagged fish in the population. The first three of these sources of error produce population estimates that are biased toward the high side. Due to the location of tagging vs. recovery areas and the method used to calculate the main Fraser population, non-random distribution is not considered to be a major concern. Also, since DFO personnel normally conduct a re-pitch of dead carcasses or cut each fish in half when pitching, non-recognition errors should also be minimal. We therefore concentrated on evidence for tagging mortality and tag loss.

Simpson (1984) tabulates mark-recovery experiment results for pink salmon where population size was known from weir counts, etc. Biases in the tagging studies were evident giving population estimates on average 43% higher than actual. J. Pella (pers. comm.) has found similar levels of bias in international marine tagging studies and has noted that some trunk stream tagging produced very high levels of bias. Source of bias (tag loss/mortality, etc.) was not evaluated in either study. Other studies of tag loss (shedding) suggest that the greater fraction of this overall bias is due to mortality, presumably from tagging injuries and stress. Pella does conclude from the available data that river tagging produced higher rates of mortality than tagging in the estuary.

Inevitably, some fish die immediately after tagging due to stress and injury. The procedure used for a number of years has been to accommodate these losses in a 5% tag loss/mortality factor. As large escapements in recent years have resulted in large catches at the Duncan Bar tagging site, we examined the recovery of tags in large sets to determine if there was evidence that holding fish for long periods contributed significantly to tagging mortality.

.../5



W. Saito  
January 30, 1992  
Page 5

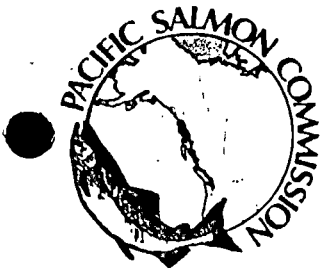
The tag numbers for each beach seine set at Duncan Bar in 1991 were divided into groups of 100 sequentially applied tags. Recoveries of tags within each group were tabulated and the percentage recovery calculated. The mean recovery rate for each 100 fish group, from the first 100 to the tenth 100 fish, averaged over all sets of 250 or more tagged fish showed no evidence of declining recovery rates up to approximately 800 fish in a set (Figure 1). Since only a few sets had more than 800 fish tagged, the bias associated with set size appears to be small. In fact, there appears to be an increase in recovery rate from the first 100 fish to the seventh 100 fish in the sets. The only explanation for this observation would be that the long holding time caused later tagged fish to be more docile, and, thus, less subject to injury from fighting the tagging. An estimate of minimum tagging mortality can be calculated from these data. The difference between the recovery of the first and second 100 tagged fish and the sixth and seventh 100 tagged fish is 21%. Although this may be an indication of tagging mortality, we have no way of assessing mortality that is random and independent of set size. In other words, even some of the later tagged fish may have died, thus, any of these calculations under-estimate the mortality.

Some tagged fish were recovered immediately downstream of the tagging site in test fishery catches and may indicate a degree of stress-related mortality. Drop-back is commonly observed in tagging programs. Tagging of sockeye in the Fraser River and at Lummi Island in the 1970's generally resulted in poor results, presumably from tagging mortality.

Tag loss can be estimated via double tagging programs but these were conducted only in 1989. Your data indicate a tag loss (shedding) rate of approximately 10.6% for fish tagged at Duncan Bar and from 4.7 to 15.3% tag loss in tributary tagging programs. Gathering more information on rate of tag loss and relating loss to distance travelled, etc. would be of great help in assessing tag loss.

In the Fraser River pink salmon enumeration program, tributary tagging programs capture Duncan Bar tagged fish along with untagged fish in the net or brail used to acquire fish for tagging at four streams (Seton, Thompson, Harrison, Chilliwack-Vedder). Tag numbers are recorded to ensure that these tags are Duncan Bar tags rather than recaptures of locally applied tags. The Duncan Bar tagged:untagged ratio from these local programs can be used to estimate of the overall watershed ratio. In 1991, the tributary dead recovery programs yielded Duncan Bar tagged to untagged ratios considerably different from the local tagging site capture ratios. The Seton Creek tagging site Duncan Bar tagged:untagged ratio was 1:217 while dead recovery recaptures were 1:364. At Thompson, the ratio changed from 1:156 to 1:577. Combining the Harrison and Chilliwack-Vedder data, the ratio changed from 1:120 to 1:255. If these changes were due to tag loss/mortality rather than selectivity for DB tagged fish in the local tagging catches, the amount of loss/mortality would be 40 to 73%, after the pink salmon had migrated into the tributary streams. The main Fraser tag ratio was 1:335, similar to the average for the rest of the watershed suggesting that tag loss/mortality was significant even there. The Coquihalla River system with a tag ratio in the dead recovery of 1:188 was similar to the tagging site ratio.

.../6



W. Saito  
January 30, 1992  
Page 6

We also examined recent past years of data on tag ratio changes (Table 3, Appendix 1). The change in tag ratio from tributary tagging site to dead recovery have varied considerably. All years show evidence of tag loss/mortality between sites. The 1979-89 average change was 36.3% (Range: 24.5% to 52.3%). The overall change indicated for 1991 was 55.0% which was higher than observed in any of the previous six years. The 1991 escapement would be approximately 6.4 million fish when this estimate of tag loss/mortality is used. Correction of the escapement estimate in 1991 by this method would not be reasonable unless all other years of escapement were similarly corrected. Two recent years where high tag loss/mortality was indicated in the data (1985 and 1989) were years when the mark-recapture population sizes were estimated to be larger than assessed in-season. This could be coincidence but could be the result of severe bias in the tagging estimate.

In the upriver spawning areas, Seton Creek and Thompson River, the local tagging program average DB tag ratios were similar (Seton Creek mean 1979-91 ratio=1:239, Thompson=1:242). However, in the dead recoveries the Thompson River ratios increased to a much greater extent than at Seton Creek. Overall average dead recovery ratios were 1:333 for Seton and 1:778 at Thompson River. From annual data, the average tag loss/mortality calculations were: Seton - 22.8% and Thompson - 62.4%. Pink salmon must travel farther from tagging site to spawning grounds in the Thompson than do Seton fish. More importantly, the elevation rise is much greater, making the migration more difficult. Tag loss/mortality may be occurring differentially in the two systems for these reasons. However, the evidence strongly suggests that substantial tag loss/mortality is occurring after the fish arrive in the tributary streams. Alternately, tagged fish may not be distributed randomly on the spawning grounds, and thus, could be under represented in the dead recovery.

#### Spawning ground dead recovery data

Dead recovery rates can also be compared between years (Table 4). Rate of dead recovery for tributary streams and the main Fraser depend upon the size of stream, crew size and escapement numbers. Rates are low (<15%) on the Thompson River, a large stream with limited access to carcasses, while the rate of recovery in Seton Creek frequently exceeds 20% of the estimated population. Large populations reduce recovery rates by saturation of the crew assigned to the dead pitch.

In 1991, the large population at Seton Creek appears to have reduced the recovery rate to 11.9% of the estimated population. Despite large populations in the Thompson and Harrison Rivers, recovery rates were at or above average. The Chilliwack-Vedder had a slightly below average recovery rate on a moderate population. The results indicate that these tributary populations had relatively normal tagging and recovery programs.

.../7



W. Saito  
January 30, 1992  
Page 7

At the main Fraser River spawning grounds the recovery rate based on a population of 10.5 million fish was 0.8%, well below the 5-year mean of 7.0% (range: 4.5 to 10.2%). Part of the lower recovery rate was due to the restriction of recovery to every fourth 100 ft. stretch of beach rather than recovery along the full length of the spawning area. I believe we would agree that, at most, three times the number of carcasses pitched and rate of recovery could have been achieved with full coverage. This would give approximately 2.5% recovery, still only about 1/2 the previous minimum rate of recovery. Again, we noted that 1985 and 1989 recoveries were calculated to be very low (4.6% and 4.5%, respectively). As indicated above, these two years showed the largest previous tag loss estimates and hence overestimates of escapement to the main Fraser population. My best estimate would be that the estimated recovery rate (2.5%) was about one-third that expected which would give a corrected rate of 7.5% and a population of 3.5 million for the main Fraser. Approximately 6.5 million pinks would be the estimate of the total watershed escapement.

#### Survival indicators

Egg to fry survival is measured annually for pink salmon via enumeration of adults and sampling of female fecundities to obtain potential egg deposition and estimation of fry numbers at Mission in the spring. Egg to fry survival averaged 13.7% (range: 9.2% to 18.7%) for 1961-77 brood years. Since 1979, larger escapements have produced larger numbers of fry but at apparent lower survival. The mean survival for 1979-89 broods was 9.0% (range: 4.3% to 12.3%). While some compensatory mortality would be expected, the two years of lowest estimated survival, i.e. 1985 and 1989, were years when the tag loss/mortality was apparently highest. This suggests that part of the low survival in 1985 and 1989 broods (4.3% and 5.0%) may have been the result of overestimates of the parental populations and, thus, egg deposition. Extenuating environmental circumstances in both these years have been blamed for the apparent low survivals. Even with correction for the estimated tag loss/mortality, the egg to fry survivals would still be low relative to other years.

Marine survival estimates have been above average in the past six returns (3.5%) compared to the previous eight returns (2.6%). If overestimates of spawner populations have occurred in recent years, the marine survivals would be overestimated by a small amount.

#### Racial estimates

Small differences in allelic frequencies appear to exist between the seven stocks (populations) of pink salmon spawners in the Fraser River watershed which have been screened by electrophoresis in the genetic stock identification (GSI) program. Lower river stocks (Main Fraser, Harrison, Vedder and Coquihalla) form a general grouping while upriver stocks (Seton, Thompson and Bridge) form a second group. B. White has tabulated the 1991 GSI classification data into these two groupings. He examined all commercial and test fishery samples (n=28) where Fraser stocks comprised about 80% or more (non-bias corrected) of the sample. On average, the upriver stocks formed 27% of the Fraser portion of the samples. Three of these samples were taken from Cottonwood test fishing catches at the peaks of the run. Upriver stocks were estimated at 23% of these three samples. Using an estimate of 2,000,000 fish escaping to upriver spawning grounds, at 27% the total escapement would have been 7.1 million.

.../8





W. Saito  
January 30, 1992  
Page 8

While the genetic differences between Fraser stocks is small, a mean value derived from 28 fishery samples gives some support to the use of these data. This analysis is independent of other years of escapement data but depends on the accuracy of 1991 upriver tributary escapement estimates.

### Recommendations

In summary, we can generate a number of escapement estimates from indirect or lower river estimates (Table 1). The range on these estimates was 5.1 to 14.5 million, with a mean of 8.4 million. No individual factor can be objectively (and confidently) substituted for the mark-recapture estimate (DB) unless you consider the Mission echo sounding or GSI data estimates to be valid.

PSC staff suggest you consider using, temporarily, the in-season corrected Mission escapement number (7.4 million) for 1991, rather than the tagging estimate. We justify this on the basis that the estimates centre around this number and because some level of bias higher than normally recognized (5%) is indicated from the data. Reanalysis of all the 1991 information may allow you to adjust the tag loss/mortality factor to compensate for this bias.

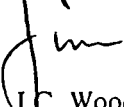
While the present analysis indicates that escapement estimates in other years may need a thorough review, before making changes we suggest collecting additional data in 1993. We would encourage DFO to consider modifications to the pink salmon tagging program in order to collect data to analyze objectively the extent of tag loss and tagging mortality. First, extensive double tagging with two Petersen disk tags would prove valuable in the assessment of tag loss. Double tagging experiments should be conducted at Duncan Bar and at tributary tagging sites. We further suggest that tagging on the main Fraser spawning grounds be conducted to estimate the main Fraser population (although some upriver pinks passing through the area would also be tagged). Corrections for loss of tags to tributary populations would be required, as at present, but may reduce the bias related to upstream tag loss. The comparison of tagging estimates obtained from spawning ground tagging and from Duncan Bar tagging (with double tagging estimates of tag loss) would yield an estimate of tagging mortality at Duncan Bar. These data would generate a new tag loss/mortality correction for use at Duncan Bar if the program is continued in the future and could be used to reassess prior-year estimates.

Also, DFO has used observations of tagged:untagged ratio at a location on the Thompson River upstream of the tagging site to ascertain the tag ratio. This technique may be of value in local area tagging programs. Alternatively, counting of tags into an area through a weir, such as at Seton Creek, would allow evaluation of tagging mortality and tag loss. Using different colour tags from Duncan Bar (and the main Fraser) and the local tagging would permit evaluation of the relative losses.



W. Saito  
January 30, 1992  
Page 9

PSC staff are available to discuss these recommendations and to advise DFO on the design of programs. We will also be considering changes to our programs where problems are indicated from this analysis. Any changes to past escapements will affect our models which would be need to be updated for 1993. Observations at Hells Gate should also be reviewed in light of the apparent need to obtain more precise data on tag ratios at this point in the migration.

  
J.C. Woodey

Encl.

## REFERENCES

- Simpson, K. 1984. The accuracy of mark-recapture estimates of escapements. Can. Tech. Rept. Fish. Aquat. Sci. 1326: 209-225.

Table 1. Summary of 1991 pink salmon escapement estimates from direct and indirect sources (chronologically ordered).

1. In-season run size less catch (9.4 M):

	EST.	RANGE
Scale measurements	7.7 M	4.7-11.3 M
Peak CPUE	5.6 M	1.6-10.6 M
Cum. Norm. Model	7.6 M	

2. Lower River migration estimates:

Cottonwood Test Fishing	8.7 M	6.3-11.1 M
W/fish size regression estimate	12.8 M	
Mission Echo Sounding	7.4 M	
W/O Scaling	5.1-5.4 M	
Duncan Bar CPUE	14.5 M	7.2-26.9 M

3. Hells Gate Observations:

Tagged:untagged ratio	5.7 M	4.8-6.8 M
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4. Duncan Bar tagging/dead recovery:

Standard tagging estimate	13.5 M	
Correction for local tagging		
site ratio to dead rec. ratio	6.4 M	
Dead recovery rates approx.	6.5 M	

5. GSI Data estimates:

7.4 M	6.6-8.3 M
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Average: 8.4 M

Table 2. Visual counts and daily estimates of pink salmon at Hells Gate and comparison with recorded escapements upstream.

Year	(A) Cum. Daily Counts.	(B) Cum. Daily Estimates.	(C) Net Esc. Above HG.	C/A	C/B	(D) Duncan Tags Counted At HG.	(E)=(A/D) Tag Ratio At HG.	(F) Tag Ratio Of Dead Above HG.	E/F
1971	425,328	503,607	571,759	1.34	1.14	1,026	415	163	2.54
1973	302,248	421,751	532,562	1.76	1.26	420	720	335	2.15
1975	409,254	632,300	761,411	1.86	1.20	646	634	221	2.87
1977	515,573	761,912	1,408,282	2.73	1.85	664	776	283	2.74
1979	809,193	1,254,537	1,607,479	1.99	1.28	1,833	441	286	1.54
1981	1,162,425	1,873,300	1,801,667	1.55	0.96	1,028	1,131	339	3.34
1983	839,216	1,286,461	1,021,293	1.22	0.79	1,025	819	334	2.45
1985	324,688	525,719	473,519	1.46	0.90			852	
1987	262,825	456,400	998,344	3.80	2.19	149	1,764	469	3.76
1989	366,672	550,008	1,357,421	3.70	2.47	244	1,503	376	4.00
1991	594,431	1,036,170	2,000,000	3.36	1.93	1,612	369	400	0.92
=====									
1971-83 Avg.				1.78	1.21				2.52
1971-89 Avg. (without 1985)				2.22	1.46				2.82

Table 3. Estimates of tributary Duncan Bar tagged:untagged ratios and calculated watershed tag loss.

YEAR	<u>SETON/THOMPSON</u>			<u>HARRISON/VEDDER</u>			<u>WATERSHED TOTAL</u>		
	<u>AT LOCAL</u> <u>TAGGING</u>	<u>AT DEAD</u> <u>RECOVERY</u>	<u>% CALC.</u> <u>LOSS</u>	<u>AT LOCAL</u> <u>TAGGING</u>	<u>AT DEAD</u> <u>RECOVERY</u>	<u>% CALC.</u> <u>LOSS</u>	<u>AT LOCAL</u> <u>TAGGING</u>	<u>AT DEAD</u> <u>RECOVERY</u>	<u>% CALC.</u> <u>LOSS</u>
1979	175	286	38.8%		298		195	274	28.8%
1981	157	339	53.7%		184		170	272	37.5%
1983	222	334	33.5%	240	326	26.4%	225	343	34.4%
1985	142	852	83.3%	134	266	49.6%	139	233	40.3%
1987	338	469	27.9%	188	212	11.3%	249	330	24.5%
1989	324	376	13.8%	102	212	51.9%	163	342	52.3%
1991	182	400	54.5%	120	255	52.9%	156	347	55.0%

Table 4. Dead recovery rates for major pink salmon spawning grounds.

YEAR		MAIN FRASER	SETON CR.	THOMP.R.	HARRISON	CHILL-VED
1979	Pop. Est.	1,521,856	498,574	885,402	271,925	132,930
	Dead Rec.	109,475	87,244	121,321	40,633	26,261
	% Rec.	7.2%	17.5%	13.7%	14.9%	19.8%
1981	Pop. Est.	2,252,368	519,393	1,166,348	314,519	68,601
	Dead Rec.	164,126	106,719	67,450	49,604	15,578
	% Rec.	7.3%	20.5%	5.8%	15.8%	22.7%
1983	Pop. Est.	3,307,834	408,628	512,398	146,014	99,646
	Dead Rec.	276,881	88,669	76,122	21,118	19,758
	% Rec.	8.4%	21.7%	14.9%	14.5%	19.8%
1985	Pop. Est.	5,248,742	169,957	193,448	438,022	95,556
	Dead Rec.	243,708	42,261	14,695	56,080	17,394
	% Rec.	4.6%	24.9%	7.6%	12.8%	18.2%
1987	Pop. Est.	1,065,710	627,966	253,109	1,028,892	106,410
	Dead Rec.	109,132	89,530	29,494	192,394	38,946
	% Rec.	10.2%	14.3%	11.7%	18.7%	36.6%
1989	Pop. Est.	4,780,703	872,460	281,640	681,572	328,020
	Dead Rec.	213,422	203,275	36,456	72,393	48,207
	% Rec.	4.5%	23.3%	12.9%	10.6%	14.7%
1991	Pop. Est.	10,500,000	921,000	715,000	788,000	228,000
	Dead Rec.	87,770	109,455	92,350	176,316	28,727
	% Rec.	0.8%	11.9%	12.9%	22.4%	12.6%
1979 - 89 Avg.		7.0%	20.4%	11.1%	14.6%	22.0%

# 1991 DUNCAN BAR TAGGING TAG AND RECOVERY ANALYSIS

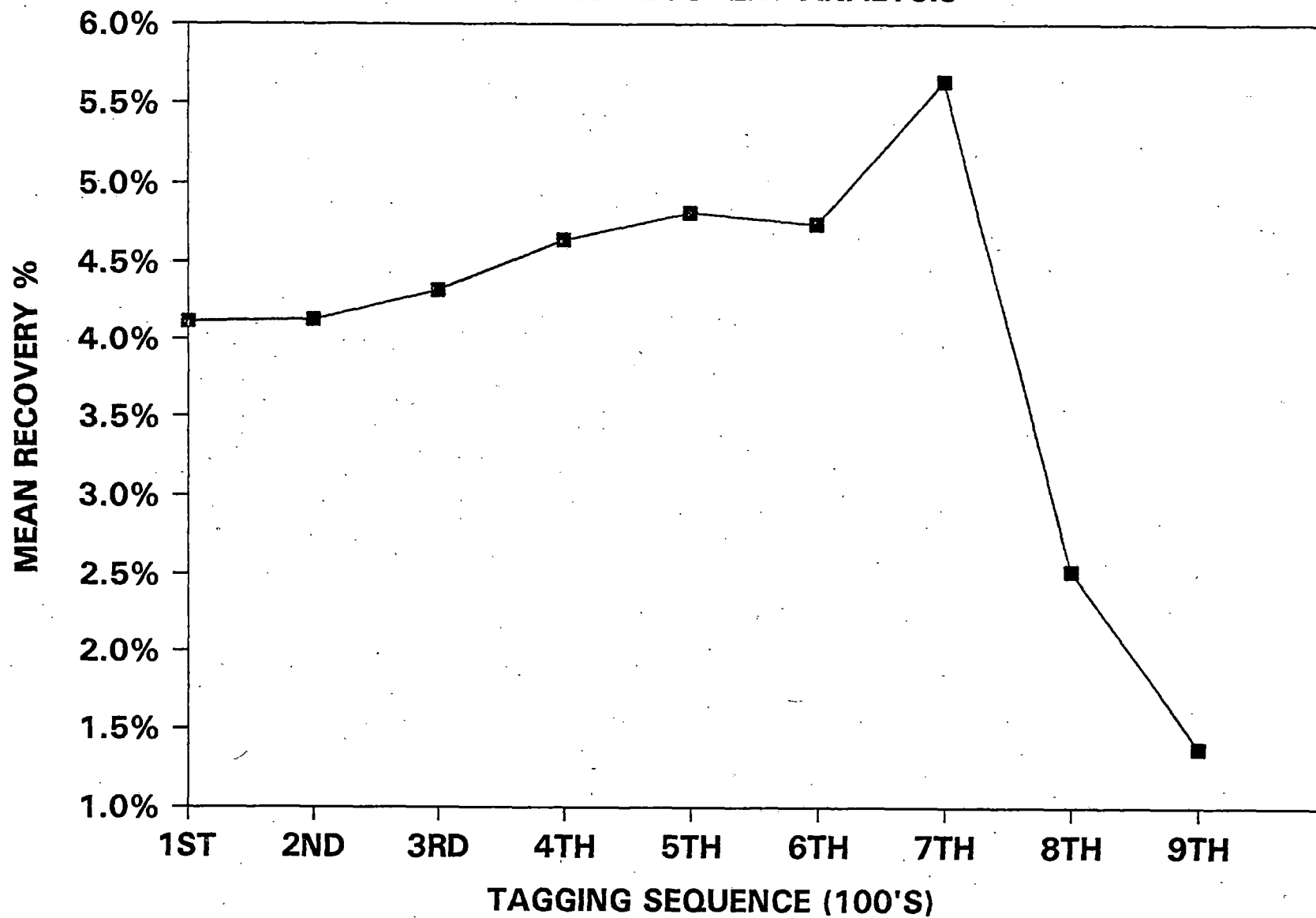


Figure 1. Rate of recovery of sequentially tagged lots of pink salmon in the 1991 Duncan Bar tagging program.



Appendix 1. Duncan Bar tag recaptures in local tagging programs and in dead recovery by stream.

AREA	1979			1979		
	LOCAL TAGS APPLIED	GV TAGS RECAP.	RATIO	DEAD PITCHED	GV TAGS RECOVERED	RATIO
HARRISON	1,559	5	312	40,633	109	373
CHILLIWACK - VEDDER	1,000	0		26,261	120	219
SETON - CREEK	3,537	15	236	87,244	326	268
- CHANNEL				44,448	222	200
THOMPSON	10,441	65	161	121,321	382	318
MAIN FRASER				109,475	435	252
AREA	1981			1981		
	LOCAL TAGS APPLIED	GV TAGS RECAP.	RATIO	DEAD PITCHED	GV TAGS RECOVERED	RATIO
HARRISON	1,799	2	900	49,604	256	194
CHILLIWACK - VEDDER	289	1	289	15,578	96	162
SETON - CREEK	5,994	50	120	106,719	476	224
- CHANNEL				44,248	165	268
THOMPSON	13,308	73	182	67,450	132	511
MAIN FRASER				164,126	633	259
AREA	1983			1983		
	LOCAL TAGS APPLIED	GV TAGS RECAP.	RATIO	DEAD PITCHED	GV TAGS RECOVERED	RATIO
HARRISON	1,797	4	449	21,118	41	515
CHILLIWACK - VEDDER	1,083	8	135	19,758	96	206
SETON - CREEK	4,090	12	341	88,669	323	275
- CHANNEL				40,736	130	313
THOMPSON	10,800	55	196	76,122	183	416
MAIN FRASER				276,881	782	354
AREA	1985			1985		
	LOCAL TAGS APPLIED	GV TAGS RECAP.	RATIO	DEAD PITCHED	GV TAGS RECOVERED	RATIO
HARRISON	1,990	11	181	56,080	179	313
CHILLIWACK - VEDDER	814	10	81	17,394	110	158
SETON - CREEK	2,701	26	104	42,261	80	528
- CHANNEL				38,366	74	518
THOMPSON	1,700	5	340	14,695	7	2,099
MAIN FRASER				243,708	1080	226
AREA	1987			1987		
	LOCAL TAGS APPLIED	GV TAGS RECAP.	RATIO	DEAD PITCHED	GV TAGS RECOVERED	RATIO
HARRISON	5,000	25	200	192,394	902	213
CHILLIWACK - VEDDER	1,200	8	150	38,946	191	204
SETON - CREEK	3,871	11	352	89,530	275	326
- CHANNEL				49,201	163	302
THOMPSON	3,899	12	325	29,494	37	797
MAIN FRASER				109,132	313	349
AREA	1989			1989		
	LOCAL TAGS APPLIED	GV TAGS RECAP.	RATIO	DEAD PITCHED	GV TAGS RECOVERED	RATIO
HARRISON	4,894	47	104	72,393	306	237
CHILLIWACK - VEDDER	2,639	27	98	48,207	279	173
SETON - CREEK	2,743	9	305	203,275	575	354
- CHANNEL				61,563	221	279
THOMPSON	6,342	19	334	36,456	50	729
MAIN FRASER				213,422	554	385
AREA	1991			1991		
	LOCAL TAGS APPLIED	GV TAGS RECAP.	RATIO	DEAD PITCHED	GV TAGS RECOVERED	RATIO
HARRISON	7,373	55	134	176,316	665	265
CHILLIWACK - VEDDER	1,155	16	72	28,727	101	284
SETON - CREEK	9,093	42	217	109,455	308	355
- CHANNEL				45,105	117	386
THOMPSON	8,598	55	156	92,350	160	577
MAIN FRASER				87,770	262	335



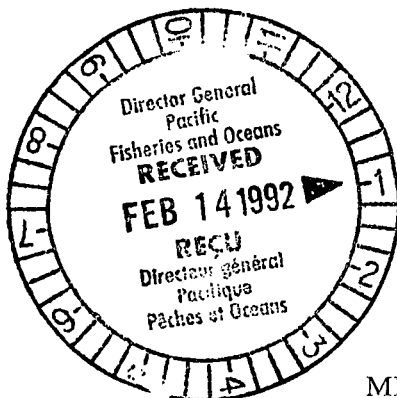
# PACIFIC SALMON COMMISSION

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

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009672 FEB 13 <sup>our</sup> ~~File~~: 25



FISHERIES & OCEANS February 10, 1992  
FISHERIES PACIFIC

FILE: 1110-Pg.

## MEMORANDUM

TO: Commissioners and Alternate Commissioners  
National Section Correspondents  
Fraser River Panel Members and Alternates  
Fraser River Panel Technical Committee

FROM: J. Abramson, Secretary

RE: Attachments to Fraser River Panel Minutes

cc 8400-F6.  
(Let only)

Enclosed for your files are the attachments which should be included with the signed minutes of the Fraser River Panel meetings dated June 10-12, 25, July 12, August 9, 16, 23, 30, and September 16 and 17.

J. Abramson  
Secretary

Encls.

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Gouvernement  
du Canada

**MESSENGER SERVICE  
ENVELOPE**

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2 George Krzyzowski	7 <del>BOB GRAHAM</del> #317	12 Purchasing #33
3 Steve Samis 555 WESTMANSING	8 K. Pontus #327	13 HAFEN STN. B13
4 <del>Mark Kaur</del> 317	9 <del>BOB</del>	14 Gus #428
5 Robin Harrison New West	10 Arthur Hengphars 426	15 Barb

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Attachments for Fraser River Panel minutes dated: June 10-12, 1991



**DRAFT**

**AGENDA**

**PACIFIC SALMON COMMISSION**

**FRASER RIVER PANEL**

**June 10 - 12, 1991**

**Hyatt Regency Hotel  
Bellevue, Washington**

1. Agenda
2. Minutes of February 5-8, 1991.
3. 1992 and 1993 Sampling programs. I. Todd
4. 1990 Alaska District 104 catch update. J. Woodey
5. 1987 & 1989 Pink salmon updates. J. Woodey
6. Current allocation status. J. Woodey
7. Responses to 1991 sampling requests. I. Todd
8. 1991 Management Plan development:
  - a) Canadian input F. Fraser
    - Domestic allocation goals
    - Concerns for other species/stocks
  - b) United States input L. Loomis
    - Domestic allocation
    - Concerns for other species/stocks
9. Draft Management Plan J. Woodey
10. In-season estimation of by-catch.
11. Other business
12. Next meeting

**FRP FILE: 71007**

## **LONG TERM COMMERCIAL SALMON ALLOCATION PLAN**

Based on the best advice of industry, the following is a complete set of objectives and principles for long term allocation and the commercial allocation plans for the next four years, 1991 to 1994.

### **OBJECTIVES**

**CONSERVATION IS PARAMOUNT.** It is vital to the fishery to ensure conservation of the salmon resource and to maintain the genetic integrity, diversity and viability of salmon stocks.

**FAIR AND EQUITABLE ALLOCATIONS.** It is important that the allocation process and decisions be fair and equitable. By definition this means that allocation decisions should be marked by impartiality and conform to some established rules and principles.

**MINIMIZE UNCERTAINTY AND CONFLICT.** Allocation is a fractious issue because it directly affects the catch, and therefore earnings, of fishermen. Having a long term allocation guideline in place can provide some certainty to fishermen in what has traditionally been a very uncertain environment.

**MINIMIZE IMPACT ON TRADITIONAL FISHING PATTERNS.** Allocations should, where possible, pose minimal disruption to historic and traditional fisheries.

**CONSISTENT WITH PACIFIC SALMON TREATY AND OBLIGATIONS WITH RESPECT TO INDIAN FOOD FISHERIES.** Allocations must be consistent with Canada's obligations with respect to the Pacific Salmon Treaty and the priority of Indian food fisheries.

**MANAGEABLE AND COST EFFECTIVE.** Allocations must be manageable and be implementable in a cost effective manner.

## PRINCIPLES

1. Allocations will continue to be expressed as shares of catch of fish (pieces) to each gear sector of each of the major salmon runs, or failing that by species and geographic area.
2. Allocations will cover all five species of salmon.
3. Allocations for the next 4 years (1991-1994) will be based on:
  - a) Minister's allocations from the cycle year for 1987-1990 for all species and runs other than Fraser sockeye.
  - b) In combination with: 1) the Minister's allocation from 1987-1990 on a base amount of catch for Fraser River sockeye and 2) a different sharing arrangement for Fraser River sockeye catches over and above the base.
4. Base catches of Fraser River sockeye were defined on the basis of the highest commercial catch in the first four years of the treaty or other recent years (ie. 1978-1988).
5. Specific allocations will be set for Fraser River catches over and above the base for the next 4 years with a review for 1993 and adjustments to those allocations considered in 1993 or subsequent years only if Canadian commercial catch expectations or fleet composition changes substantially. A substantial change which would require a review of the allocations is defined as a change which results in a change in any gear's share of CPUE in sockeye equivalents exceeding 0.5% in two consecutive years.
6. These allocations for "incremental fish" will apply to the number of Fraser sockeye caught over and above the base. Within the share of Fraser sockeye allocated to the troll sector, inside trollers will be allocated 14% of the troll "incremental fish" share based on their proportion of the total troll fleet.
7. Catch-up/make-up is important in principle. The trial catch-up/make-up on Fraser River sockeye should be continued for 1991 with CFIC giving further consideration to expansion of catch-up/make-up to other stocks in 1992 and beyond. Post season evaluation of the need for adjustments due to shortfalls or overages will be based on DFO catch data. Any further expansion of catch-up/make-up will be based on overages and underages for specific allocations on specific runs.
8. DFO will strive to manage commercial salmon fisheries to meet allocations by providing sufficient opportunities for each gear type to catch their allocations.
9. Allocations should stabilize the CPUE (catch per unit of effort) or catch per vessel shares by each gear type. This stabilization can be measured on the basis of Sockeye Equivalents per vessel. For the purpose of this allocation plan, sockeye equivalents are units of measurement which allow for comparison of the five different species of



salmon on an equivalent basis. They are based on the average 1985-1988 relative landed value of each of the species expressed in terms of their relationship to the average 1985-88 landed value of sockeye.

10. Sockeye equivalents are to be used only as an initial basis for measuring fairness in allocations, not as a driver or target which must be met in the allocations, nor for catch-up/make-up in 1991 through 1994.
11. DFO will provide CFIC with comprehensive information as available for a complete annual accounting of the outcome of allocations for the previous year.
12. CFIC will review the outcome of allocations on an annual basis.
13. The Minister of Fisheries and Oceans reserves the right to make alterations to allocations as required.

## LONG TERM SALMON ALLOCATION PLAN

YEAR	1991	1992	1993	1994
<u>NORTH COAST</u>				
PINKS	TROLL			
	Area 1	Fishery will be managed in accordance with the Pacific Salmon Treaty. The Area 1 Pink troll catch for the four year period 1990-1993 will be limited to a total of 5.125 million. The maximum harvest in Area 1 in any one year is 1.95 million, of which no more than 300,000 can be taken in the A-B line sub-areas.		
	Areas 2 - 10	Troll catch ceiling of 4% of the all gear catch in Areas 2-10, excluding Fraser River Pinks.		
	NET			
	Areas 1,3,4 & 5	GN 28% of net SN 72% of net	GN 22% of net SN 78% of net	GN 28% of net SN 72% of net
SOCKEYE	Areas 6 to 10	Maintain traditional fishing patterns with the primary objective to harvest available surpluses and ensure that escapement goals are met.		
	TROLL			
	Areas 1,3,4 & 5	Troll catch to remain incidental and not to exceed 5% of the total catch.		
	Areas 6 to 10	The troll fishery on sockeye in these areas should not escalate.		
	NET			
	Areas 1,3,4 & 5	GN 75% of net SN 25% of net	GN 75% of net SN 25% of net	GN 76% of net SN 24% of net
	Areas 6,7 & 8	Traditional fishing patterns to be maintained with an incidental catch of sockeye expected.		

	Areas 9 & 10	Net fishing restricted to gillnets only.
CHUM	TROLL	
	Areas 1 to 10	Troll fisheries on this species should not escalate.
	NET	
	Areas 1 to 10	Traditional fishing patterns to be continued.
CHINOOK	Areas 1 to 11	The commercial share of the Pacific Salmon treaty chinook ceiling (not including terminal exclusions) will be allocated 15.7% to net fisheries and 84.3% to troll (as in 1990).

		1991	1992	1993	1994
<u>SOUTH COAST</u>					
PINK	Southern Bound	GN 9% SN 58% OUTSIDE TR 29% INSIDE TR 4%	GN 9% SN 73% OUTSIDE TR 9% INSIDE TR 9%	GN 9% SN 58% OUTSIDE TR 29% INSIDE TR 4%	GN 9% SN 73% OUTSIDE TR 9% INSIDE TR 9%
SOCKEYE	AREA 23	GN 40% of net SN 60% of net	GN 40% of net SN 60% of net	GN 40% of net SN 60% of net	GN 40% of net SN 60% of net

SOCKEYE	FRASER BOUND	1991	1992	1993	1994
	Fraser bound sockeye are allocated by a two part formula with: 1) base catches allocated according to the Minister's allocations for the previous cycle; and 2) any incremental catch above that base allocated as shown below.*				
1	BASE CATCH OF:	3.2 MILLION	2.9 MILLION	8.3 MILLION	8.8 MILLION
	ALLOCATED	GN 35% SN 52% OUTSIDE TR 10.8% INSIDE TR 2.2%	GN 38.4% SN 52.8% OUTSIDE TR 4.8% INSIDE TR 4%	GN 33% SN 55% OUTSIDE TR 10% INSIDE TR 2%	GN 28% SN 45.5% OUTSIDE TR 22.7% INSIDE TR 3.8%
2	INCREMENTAL CATCH ALLOCATED	GN 31.5% SN 47% OUTSIDE TR 18.5% INSIDE TR 3%	GN 19% SN 66.5% OUTSIDE TR 12.5% INSIDE TR 2%	GN 23% SN 42% OUTSIDE TR 30% INSIDE TR 5%	GN 30% SN 44.5% OUTSIDE TR 22% INSIDE TR 3.5%

\* Allocations of catch incremental to the base will be reviewed after 1992 to ensure consistency with the principles of allocation outlined by the Minister.

The following are estimated combined allocations of Fraser sockeye using current catch expectations for the next four years. These predictions will be updated every January for that calendar year using up to date biological information and projected catches by other harvesters in Canada and the United States.

EST CATCH	8 MILLION	4 MILLION	12 MILLION	17 MILLION
ESTIMATED CATCH SHARES	GN 33% SN 49% OUTSIDE TR 15.4% INSIDE TR 2.6%	GN 33% SN 56.5% OUTSIDE TR 6.9% INSIDE TR 3.6%	GN 30% SN 51% OUTSIDE TR 16.2% INSIDE TR 2.8%	GN 29% SN 45% OUTSIDE TR 22.4% INSIDE TR 3.6%

		1991	1992	1993	1994
CHUM	TROLL OUTSIDE	The outside troll fishery on this species should not escalate.			
	INSIDE	The troll fishery for fall chums will be limited, with a catch ceiling not to exceed 1% of the total commercial catch of inside stocks after Sept 1.			
CHUM	NET INSIDE	GN 35% SN 65%	GN 35% SN 65%	GN 35% SN 65%	GN 35% SN 65%
	OUTSIDE	An initial early season allocation of 50% gillnet and 50% seine. The South Coast Advisory Committee will set the pre-cleanup catch ceiling in early fall to which the 50:50 catch split will apply. Fishing times on subsequent fisheries will be determined by the West Coast Sub-committee of the South Coast Advisory Committee in conjunction with DFO.			
CHINOOK	TROLL OUTSIDE	The outside troll fishery will be managed in accordance with the Pacific Salmon Treaty.			
	INSIDE	The inside troll allocation will continue to be subject to the Pacific Salmon Treaty and conservation requirements.			
COHO	TROLL	The outside troll fishery will be managed in accordance with the Pacific Salmon Treaty.			

Proposed U.S. Sockeye Catch Objectives  
for the 1991 Fraser Panel Fisheries

WEEK ENDING	TREATY 4B/5/6C	TREATY 6/7/7A	NON-TREATY
13-JULY	CLOSED	23,000	23,000
20-JULY	CLOSED	CLOSED	CLOSED
27-JULY	45,000	CLOSED	CLOSED
3-AUGUST		CLOSED	509,000
10-AUGUST			
17-AUGUST	44,000	340,000	
24-AUGUST		337,000	383,000
31-AUGUST			
7-SEPTEMBER	1,000		
14-SEPTEMBER	CLOSED		
TOTAL	90,000	700,000	915,000 (1,000,000) <sup>1</sup>

<sup>1</sup>The non-treaty catch objective is 1,000,000 sockeye, but the anticipated catch is 915,000. Some of the potential increase of 85,000 sockeye in the non-treaty fishery could be taken in the w/e 3-Aug. to w/e 24-Aug. period if the U.S. share of summer runs can accomodate the increased catch.

U.S. SECTION FRASER PANEL: June 10, 1991

Proposed U.S. Fishing Schedule  
for 1991 Fraser Panel Fisheries

WEEK ENDING	TREATY 4B/5/6C	6/7/7A SCHEDULE	TREATY 6/7/7A	NON-TREATY
13-JULY	CLOSED	1-1-0	Short Hours (7/7A only)	Short Hours (7/7A only)
20-JULY	CLOSED	CLOSED		
27-JULY	5 day opening	CLOSED		
3-AUGUST	Open as needed	0-1-0	CLOSED	GN=Short Hours PS=Short Hours
10-AUGUST	Open as needed	1-1-0	Short Hours	GN=Long Hours PS=Short Hours
17-AUGUST	Open as needed	1-1-0	Long Hours	GN=Long Hours PS=Short Hours
24-AUGUST	Open as needed	1-1-0	Long Hours	GN=Long Hours PS=CLOSED
31-AUGUST	Open as needed	1-1-1	Long Hours	Long Hours
7-SEPT.	Open as needed	2-1-1	Long Hours	Long Hours
14-SEPT.	CLOSED	2-1-1	Long Hours	Long Hours

U.S. Section Fraser Panel: June 10, 1991



Attachments for Fraser River Panel minutes dated: June 25, 1991





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AGENDA

PACIFIC SALMON COMMISSION

FRASER RIVER PANEL

June 25, 1991

La Conner, Washington

1. Agenda
2. Minutes of February 5-8 and June 11, 1991.
3. 1992 and 1993 Sampling programs. I. Todd
4. 1989 & 1990 Alaska District 104 Fraser sockeye catch estimates. J. Woodey
5. 1987 & 1989 Pink salmon updates. J. Woodey
6. Responses to 1991 sampling requests. I. Todd
7. 1991 Management Plan development.
8. Regulatory action. J. Woodey
9. In-season estimation of by-catch. J. Woodey
10. Other business
11. Next meeting

FRP FILE: 71007

Attachment 2

Table 1. PSC estimates of Fraser River sockeye salmon contributions to 1990 District 104

purse seine fisheries: Districts 104-10-20 and 104-30-40 separately estimated using all available age 4/2 fish.

PSC 104-10-20 analysis

Stat	Catch	Number Aged	Number digitized	Percent age-4/2	Number age-4/2	Percent age-4/2 FRASER	Number age-4/2 FRASER	Lower 90% C.L.	Upper 90% C.L.
27	17839	298	57	20.20%	3603	0.00%	0	-292	292
28	24077	333	65	20.12%	4844	0.00%	0	-601	601
29	24643	300	69	24.00%	5914	0.00%	0	-651	651
30	0	0	0	0.00%	0	0.00%	0	0	0
31	74302	205	84	43.90%	32619	29.30%	9557	3621	15494
32	103721	100	66	67.00%	69493	62.10%	43155	31202	55108
33	51626	176	123	78.98%	40774	61.80%	25198	19857	30540
34	21485	304	154	62.50%	13428	40.80%	5479	4002	6956
35	5044	98	68	72.45%	3654	74.10%	2708	2120	3296
total	322737	1814	686		174330	49.39%	86097	71605	100590

PSC 104-30-40 analysis

Stat	Catch	Number Aged	Number digitized	Percent age-4/2	Number age-4/2	Percent age-4/2 FRASER	Number age-4/2 FRASER	Lower 90% C.L.	Upper 90% C.L.
27	6646	298	57	20.20%	1342	0.00%	0	-109	109
28	17040	292	71	25.00%	4260	0.00%	0	-524	524
29	40152	288	104	38.54%	15475	0.00%	0	-1702	1702
30	39546	281	111	42.35%	16748	35.40%	5929	3149	8709
31	91699	312	137	46.15%	42319	27.60%	11680	5501	17859
32	64391	349	207	69.40%	44684	55.50%	24800	20376	29224
33	134174	268	185	73.51%	98631	79.20%	78116	67069	89163
34	71236	425	326	82.57%	58819	80.00%	47055	41761	52348
35	9161	98	78	79.59%	7291	95.60%	6970	5950	7991
total	474045	2611	1276		289569	60.28%	174550	159726	189374
TOTAL	796782	4425	1962		463900	56.19%	260647	239916	281379
Other ages*							9790		
Total Fraser							270437		

Models Used: Weeks 27-31 4-Way Fraser(N=200)/Skeena(N=200)/Nass(N=200)/Alaska(N=200)

(FW5,MEF,MRW,PGW,MR7,FWW,WMA,MR14,MR1) Mean Classification Accuracy = 68.13%

Weeks 32-33 3-Way Fraser(N=200)/Skeena(N=200)/Alaska(N=200)

(FW5,MEF,MRW,PGW,MR7,FWW,WMA,MR14,PGC) Mean Classification Accuracy = 78.67%

Weeks 34-35 2-Way Fraser(N=200)/Skeena(N=200)

(FW5,MEF,MRW,PGW,MR7,FWW,WMA,MR14,PGC) Mean Classification Accuracy = 81.75%

\* Other Ages Calculation = (Area 12/20 Fraser %other \* 260647)/(Area 12/20 Fraser %4/2)  
= (3.62%\*260647)/(96.38%)= 9790

Table 2. PSC estimates of age 4/2 Fraser River sockeye salmon contributions to 1990 District 104 purse seine fisheries. PSC version of ADF&G analysis, 104-10-40 combined, using the same age 4/2 fish.

PSC 104-10-40 comparison analysis

Week	Catch	Number		Percent age-4/2	Number age-4/2	Percent age-4/2		Lower 90% C.L	Upper 90% C.L
		Aged	digitized			FRASER	FRASER		
27	24485	600	87	18.67%	4571	0.00%	0	-306	306
28	41117	643	100	20.84%	8569	0.00%	0	-908	908
29	64795	716	95	31.01%	20093	0.00%	0	-1828	1828
30	39546	691	97	42.11%	16653	17.00%	2831	150	5512
31	166001	629	91	46.58%	77323	41.40%	32012	20723	43301
32	168112	1446	94	66.87%	112416	49.50%	55646	39346	71947
33	185800	1226	98	72.84%	135337	71.20%	96360	77007	115713
34	92721	628	97	77.87%	72202	92.50%	66787	61372	72202
35	14205	644	95	78.57%	11161	85.00%	9487	7969	11005
total	796782	7223	854		458325	57.41%	263122	234775	291470

Models Used: Weeks 27,28,30: 4-Way Fraser(N=200)/Skeena(N=200)/Nass(N=200)/Alaska(N=200)  
(FW5,MEF,MRW,PGW,MR7,FWW,WMA,MR14,MR1) Mean Classification Accuracy = 68.13%

Weeks 29,31,32, and 33: 3-Way Fraser(N=200)/Skeena(N=200)/Alaska(N=200)  
(FW5,MEF,MRW,PGW,MR7,FWW,WMA,MR14,PGC) Mean Classification Accuracy = 78.67%

Weeks 34,35: 2-Way Fraser(N=200)/Skeena(N=200)  
(FW5,MEF,MRW,PGW,MR7,FWW,WMA,MR14,PGC) Mean Classification Accuracy = 81.75%

- 1) age composition is from ADF&G
- 2) Baseline standards and commercial samples are the same as used by ADF&G
- 3) differences in the number of scales digitized reflects the PSC's inability to read some of the scales read by ADF&G.

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Table 1. Estimated number of age-1.2 South-migrating sockeye salmon harvested in the 1990 District 104 purse seine fishery. (ADF&G, 6/5/91)

Week	Catch	Number Aged	Number Digitized	Percent Age-1.2	Number Age-1.2	Percent Age-1.2 S. Mig.	Number Age-1.2 S. Mig.	Lower 90% C.I.	Upper 90% C.I.
27	24,485	600	93	18.67%	4,571	2.67%	122	0	469
28	41,117	643	100	20.84%	8,569	6.87%	589	0	1,275
29	64,795	716	99	31.01%	20,093	11.69%	2,348	564	4,132
30	39,546	691	100	42.11%	16,653	19.63%	3,269	1,619	4,919
31	166,001	629	100	46.58%	77,323	42.79%	33,083	24,522	41,644
32	168,112	1,446	100	66.87%	112,416	52.84%	59,402	47,203	71,601
33	185,800	1,226	100	72.84%	135,337	70.42%	95,301	81,031	109,572
34	92,721	628	100	77.87%	72,202	80.85%	58,372	51,007	65,738
35	14,205	644	100	78.57%	11,161	87.03%	9,713	8,624	10,802
Total	796,782	7,223	892		458,325		262,199	240,115	284,282

#### Models Used

Weeks 27, 28, and 30:

4-Way Alaska (N=200), Nass (N=196), Skeena (N=198), South-migrating (N=200)  
9 Variables (5, 103, MEF-length, 12, 67, 79, 105, 95, 14)  
Mean Classification Accuracy = 75.93%

Weeks 29, 31, 32, and 33:

3-Way Alaska (N=200), Skeena (N=198), South-migrating (N=200)  
8 Variables (5, 103, 12, MEF-length, 79, 82, 66 67)  
Mean Classification Accuracy = 87.12%

Weeks 34 and 35:

2-Way Skeena (N=198), South-migrating (N=200)  
5 Variables (26, 4, MEF-length, 82, 103)  
Mean Classification Accuracy = 90.46%

Attachment 3

Comparison of scale-pattern based weekly stock composition proportions for Fraser River sockeye salmon harvested in the 1989 District 104 PS fishery.

				PSC RACIAL ANALYSIS			ADF&G RACIAL ANALYSIS		
Fraser River Standard				1989 Area 12+20 PS			1989 Area 12+20 PS		
Nass Standard				1989 Area 3 PS			1989 Nass River GNTF		
Skeena Standard				1989 Area 4 PS			1989 Skeena River GNTF		
Alaska Standard				1989 spawning ground			1989 spawning ground		
Variables Used In Model				1st FW zone circuli count plus growth circuli count POF length			dist. to fifth in 1st FW POF length, width of 1st MR relative widths in 1st FW relative widths in 1st MR plus growth circuli count		
Model Type				3-way (AL, SK+NA, FR)			4-way (AL,SK,NA,FR)		
Model Accuracy				67%			72.8%		
Samples analyzed				sub-district specific by week (104-10,20,30,40)			regional (all 104) by week		
Fraser 4/2 estimate	Week end	Stat wk.	all age catch	# scales analyzed	% Fraser 4/2	# Fraser 4/2	# scales analyzed	% Fraser 4/2	# Fraser 4/2
	Jul 8	27	8731	39	8.2%	716	67	0.0%	0
	Jul 15	28	48252	122	6.4%	3088	74	0.0%	0
	Jul 22	29	31346	113	5.2%	1630	85	0.0%	0
	Jul 29	30	68705	131	9.5%	6527	100	0.0%	0
	Aug 5	31	117238	137	21.0%	24620	88	11.1%	13014
	Aug 12	32	85331	223	37.2%	31743	100	22.4%	19136
	Aug 19	33	114948	85	74.0%	85062	34	69.3%	79602
	Aug 26	34	26683	151	66.7%	17798	69	59.8%	15957
	Sep 2	35	14835	122	51.8%	7685	66	39.0%	5790
Totals			516069	1123			683		
Total Fraser 4/2						178868			133499
Fraser other ages						9891 *			not est.

TOTAL FRASER CATCH (all ages) 188759

\* Calculation of Fraser other age catch

Area 12+20 weighted %4/2 = 94.76%

Area 12+20 weighted %other = 5.24%

PSC estimate of other age catch = (178868\*.0524)/.9476 = 9891

if applied to ADF&G estimate = (133498\*.0524)/.9476 = 7608

June 7/91

Attachment 5

ESTIMATES OF TOTAL FISHERY CATCHES OF FRASER RIVER PINK SALMON DURING 07-Jun-91  
THE 1989 FISHING SEASON - BY COUNTRY AND AREA

COMMERCIAL CATCH	No. of Fish	% of Run
<u>CANADA</u>		
Fraser River Panel Area:		
Areas 121-124 Troll	497000	2.99%
Area 20 Net	1429000	8.59%
Areas 17-18 and 29 Troll	94000	0.57%
Area 29 Net	201000	1.21%
Subtotal	2221000	13.35%
Non-Panel Area:		
Areas 1-10 Net and Troll	409000	2.46%
Areas 11-12, 124-127 Troll	1329000	7.99%
Areas 11-16 Net	2928000	17.61%
Areas 13-16 Troll	102000	0.61%
Subtotal	4768000	28.67%
CANADA TOTAL	6989000	42.02%
<u>UNITED STATES</u>		
Fraser River Panel Area:		
Areas 4B, 5, and 6C	37000	0.22%
Areas 6 and 7	1495000	8.99%
Area 7A	673000	4.05%
Subtotal	2205000	13.26%
Non-Panel Area:		
Calif/Ore/Wash. Troll	28000	0.17%
Alaska	0	0.00%
Subtotal	28000	0.17%
UNITED STATES TOTAL	2233000	13.43%
COMMERCIAL TOTAL	9222000	55.45%
 NON-COMMERCIAL CATCH:		
<u>CANADA</u>		
Areas 12-13, 18, 20, 123-124 Indian F.F.	0	0.00%
Areas 125-127, 111, 12 Test Fishing	8000	0.05%
Fraser River Indian Food Fishery	72000	0.43%
Recreational Fishery	99000	0.60%
Subtotal	179000	1.08%
<u>UNITED STATES</u>		
Recreational Fishery	Subtotal	* 0 0.00%
<u>COMMISSION</u>		
Areas 123-124, 20, 29 Test Fishing	36000	0.22%
Area 7 Test Fishing	5000	0.03%
Subtotal	41000	0.25%
NON-COMMERCIAL TOTAL	220000	1.32%
TOTAL CATCH	9442000	56.77%
 ESCAPEMENT:	7189000	43.23%

TOTAL RUN 16631000

\* estimates not yet available

000194

ESTIMATES FOR CANADIAN CATCHES OF FRASER RIVER PINK SALMON BY 07-Jun  
GEAR TYPE AND AREA DURING THE 1989 FISHING SEASON

Areas	Troll		Purse Seine		Gillnet		Total	
	Catch	%	Catch	%	Catch	%	Catch	%
1-10	385000	5.51%	22000	0.31%	1000	0.01%	408000	5.84%
11-16*	103000	1.47%	2747000	39.30%	181000	2.59%	3031000	43.37%
121-127**	1826000	26.13%	0	0.00%	0	0.00%	1826000	26.13%
20	0	0.00%	1354000	19.37%	75000	1.07%	1429000	20.45%
17,18,29	94000	1.34%	0	0.00%	201000	2.88%	295000	4.22%
TOTAL	2408000	34.45%	4123000	58.99%	458000	6.55%	6989000	100.00%

\*Includes Areas 13 to 16 troll only (inside troll).

\*\* Area 11 and 12 troll are added to Areas 121-127 troll.

ESTIMATES FOR UNITED STATES CATCHES OF FRASER RIVER PINK SALMON BY USER GROUP, 07-Jun  
GEAR TYPE AND AREA DURING THE 1989 FISHING SEASON

TREATY INDIAN										
Area	Gillnet		Purse Seine		Reef Net		Troll		Total	
	Catch	%	Catch	%	Catch	%	Catch	%	Catch	%
Areas 4B, 5, 6C	37000	3.10%	0	0.00%	0	0.00%	0	0.00%	37000	3.10%
Areas 6, 7	175000	14.64%	682000	57.07%	0	0.00%	0	0.00%	857000	71.72%
Area 7A	123000	10.29%	174000	14.56%	0	0.00%	0	0.00%	297000	24.85%
Calif/Ore/Wash	0	0.00%	0	0.00%	0	0.00%	4000	0.33%	4000	0.33%
TOTALS	335000	28.03%	856000	71.63%	0	0.00%	4000	0.33%	1195000	100.00%

NON-INDIAN										
Area	Gillnet		Purse Seine		Reef Net		Troll		Total	
	Catch	%	Catch	%	Catch	%	Catch	%	Catch	%
Areas 4B, 5, 6C	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Areas 6, 7	100000	9.63%	485000	46.72%	53000	5.11%	0	0.00%	638000	61.46%
Area 7A	60000	5.78%	316000	30.44%	0	0.00%	0	0.00%	376000	36.22%
Calif/Ore/Wash	0	0.00%	0	0.00%	0	0.00%	24000	2.31%	24000	2.31%
TOTAL	160000	15.41%	801000	77.17%	53000	5.11%	24000	2.31%	1038000	100.00%

GRAND TOTAL	495000	22.17%	1657000	74.21%	53000	2.37%	28000	1.25%	2233000	100.00%
-------------	--------	--------	---------	--------	-------	-------	-------	-------	---------	---------

ALASKA (DIST. 104) CATCH:

0

RECREATIONAL CATCH:

0

UNITED STATES TOTAL CATCH:

2233000





Fisheries  
and Oceans

Pêches  
et Océans

Attachment 6

Pacific Region  
Suite 400 - 555 West Hastings St.  
Vancouver, B.C.  
V6B 5G3

Région du Pacifique  
Pièce 400 - 555 rue Hastings ouest  
Vancouver (C.-B.)  
V6B 5G3

Your file    Votre référence

Our file    Notre référence

**RECEIVED**

MAY - 6 1991  
PACIFIC SALMON  
COMMISSION

002103

Mr. Joseph R. Blum  
Vice Chairman  
Pacific Salmon Commission  
600 - 1155 Robson Street  
Vancouver, British Columbia  
V6E 1B9

Dear Mr. Blum,

My staff and I have reviewed the Commission's requests for assistance in collecting 1991 data on Fraser river pink and sockeye salmon. I wish we could provide all that was requested but unfortunately budget restraints prohibit this.

#### TEST FISHING

1. Areas 125 to 127 troll test fishery.

As was the case for the last couple of years we are not able to provide assistance for this project.

2. Area 12 gillnet and seine test fishery.

We will provide similar assistance as in recent years. This does not include observer wages and expenses.

#### SOCKEYE SALMON COMMERCIAL CATCH SAMPLES

1. Catch sampling in northern British Columbia.

We will provide data which will be collected by J.O. Thomas and Associates. North coast terminal test fishing and spawning ground samples will be provided as in past years.

.../2

Canada



000197

- 2 -

2. Scale samples from Winter harbour.

As in recent years we will not be able to collect these samples.

**PINK SALMON COMMERCIAL CATCH SAMPLES**

1. South coast.

We will collect samples from purse seine fisheries in Areas 12, 13, and 16, but we cannot provide troll samples from Areas 125, 127 and 111.

2. North coast.

We are not able to do this sampling and hope that P.S.C. staff will be able to contract the services of J.O. Thomas & Associates.

**SOCKEYE SALMON INDIAN FISHERY SAMPLES**

Although we recognize the needs for increased sampling as this fishery grows we do not have additional resources. We will be able to sample two sites only and I suggest that P.S.C. staff consult with my Fraser River Division staff to determine sampling details.

**FORECAST OF TIMING AND MIGRATION ROUTES**

Dr. Blackbourne's services will be available again in 1991...

**SPAWNING GROUND SAMPLES**

1. Fraser River sockeye.

We will be able to provide these samples.

.../3

- 3 -

2. Pink salmon tissue samples.

Bella Coola and Skeena rivers - we will be able to provide these samples as in past years.

Fraser river - our assistance will be similar to past years in which we provided verbal information to P.S.C. staff on timing and availability of the fish, but we did not collect the samples.

If there are questions on any of the above items I suggest the Commission's staff deal directly with the appropriate people on my staff.

Yours truly,



P.S. Chamut  
Director-General  
Pacific Region  
Fisheries and Oceans

c.c. A.F. Lill  
N.J. Lemmen  
P. Sprout  
G. Jaltema  
R.J. Beamish  
I. Todd



# Northwest Indian Fisheries Commission

6730 Martin Way E., Olympia, WA 98506 Phone (206) 438-1180 FAX #456-3032 FTS #434-9476

**RECEIVED**

**DEC 13 1990**

**PACIFIC SALMON  
COMMISSION**

**01707**

December 7, 1990

Ian Todd, Executive Secretary  
Pacific Salmon Commission  
600 - 1155 Robson Street  
Vancouver, B.C. V6E 1R9

Dear Mr. Todd:

In response to your letter of November 29, 1990 we have discussed the request to sample the 1991 pink salmon catch of the Washington coastal troll fishery with the Washington Department of Fisheries (WDF).

The NWIFC will coordinate the sampling effort with WDF and the Tribes to assure that the tissue samples with sex and length data are provided as requested. Our staff will be in contact with your staff prior to the fishery to coordinate this sampling effort.

Sincerely,

**JIM ANDERSON**  
Executive Director

cc: Sockeye Tribes  
NWIFC Commissioners  
Joe Blum  
Lorraine Loomis  
Fred Fraser

IAN TODD.MG.1a:12690

68001

JOSEPH R. BLUM  
Director



STATE OF WASHINGTON  
DEPARTMENT OF FISHERIES

115 General Administration Building, M.S. AX-11 • Olympia, Washington 98504 • (206) 753-6600 • (SCAN) 234-6600

March 8, 1991

RECEIVED

MAR 13 1991

PACIFIC SALMON  
COMMISSION

01971

Dr. J. Woodey  
Pacific Salmon Commission  
1155 Robson St., Suite 600  
Vancouver, B.C. CANADA V6E1B9

Dear Jim:

This letter is simply to confirm that Washington Department of Fisheries will provide you with GSI samples from Washington's 1991 troll pink fisheries per your request. We plan to have GSI sampling staff in the outer Strait of Juan de Fuca during the July-August time frame, so it is simply a matter of Bruce White contacting Marc Miller to plan the specific collections.

I apologize for the delay in a direct written response to the Commission's request.

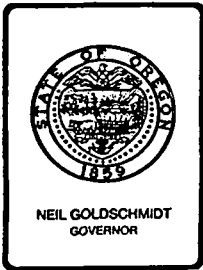
Sincerely,

A handwritten signature in cursive script, appearing to read "Rich".

Rich Lincoln  
Research Program Leader  
Research, Assessment, and Development  
Planning, Research, and Harvest Management

cc: D. Austin  
M. Miller  
B. Tweit

68001



## Department of Fish and Wildlife

2501 SW FIRST AVENUE, PO BOX 59, PORTLAND, OREGON 97207 PHONE (503) 229-5400

December 28, 1990

RECEIVED

JAN - 9 1991  
PACIFIC SALMON  
COMMISSION

001811

Mr. Ian Todd, Executive Secretary  
Pacific Salmon Commission  
600-1155 Robson Street  
Vancouver, BC V6E1B9

Dear Mr. Todd:

If the Commission determines that genetic stock samples of pink salmon in the Oregon troll fishery are needed we will attempt to collect them as we did in 1987 and 1989. However, I would like to point out some sampling difficulties in the Oregon troll fishery.

We do not have a pink salmon fishing season in Oregon. Troll seasons are established to target on chinook and coho with a small incidental pink catch occurring in the odd years. Only 4,000 pinks were landed in Oregon in 1989 and we were unable to obtain GSI samples. Even with an incidental catch of 18,000 pinks in 1987, only 50 samples were obtained.

We would have difficulty achieving the desired sample of 300 pinks given the magnitude of the incidental catch during recent years.

However, if you desire our assistance, our staff contact would be as follows:

Laimons Osis, Ocean Salmon Management  
Marine Region  
Marine Science Drive, Building #3  
Newport, OR 97365

Sincerely,

Burnie Bohn  
Harvest Manager

bbt

c Jack Donaldson, CBFWA  
Laimons Osis, ODFW

m123101t

*Handwritten note:*  
The woodley  
to discuss  
JF

Attachment 7

PROPOSED 1991 FISHING SCHEDULE

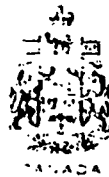
<u>W/E DATE</u>	<u>AREA 20</u>		<u>AREA 29</u>	<u>TREATY INDIAN</u>		<u>NON-INDIAN</u>
	<u>PS &amp; GN</u>	<u>GN ONLY</u>	<u>GN ONLY</u>	<u>AREAS 4B,5 6C</u>	<u>AREAS 6,7,7A</u>	<u>AREAS 7,7A</u>
June 29	Closed	Closed	Closed	Closed	Closed	Closed
July 06	Closed	Closed	1	Closed	Closed	Closed
July 13	Closed	Closed	Closed	Closed	1	1
July 20	Closed	Closed	1	Closed	Closed	Closed
July 27	Closed	Closed	1	3	Closed	Closed
August 03	Closed	2	1	2	Closed	1
August 10	1	3	1	2	1	1
August 17	3	1	1	2	1	1
August 24	3	1	1	2	1	1
August 31	1	3	Closed	2	1+1	1
September 07	Closed	Closed	Closed	4	2+1	1
September 14	Closed	Closed	Closed	Closed	2+1	1
September 21	Closed	Closed	Closed	Closed	Closed	Closed

**Pages 204 to / à 206  
are withheld pursuant to section  
sont retenues en vertu de l'article**

**20(1)(d)**

**of the Access to Information Act  
de la Loi sur l'accès à l'information**





PRIME MINISTER • PREMIER MINISTRE

Ottawa, K1A 0A2  
January 18, 1990

Dear Chief Erasmus:

Thank you for your letter regarding the South Island Tribal Council's efforts to negotiate the harvest of surplus chum salmon stock on the Goldstream River.

I understand that the Minister of Fisheries and Oceans, the Honourable Tom Siddon, and the Minister of State for Indian Affairs, the Honourable Kim Campbell, have issued a scientific permit to the Saanich Tribal Fishery for 1989. This authorized the harvesting of surplus chum stock while facilitating research that would improve future management of the fishery in the area. While this permit is a temporary measure, it provides some assistance to the Saanich Tribal Fishery.

In the longer term, the Minister of Fisheries and Oceans and the Minister of Indian Affairs and Northern Development are prepared to work with Indian representatives in developing a fishing agreement that would take into account any treaty fishing rights and the various interests involved in access to the fisheries stocks in the area.

Mr. Georges Erasmus,  
National Chief,  
Assembly of First Nations,  
Suite 300,  
47 Clarence Street,  
Ottawa, Ontario.  
K1N 9K1





Attachments for Fraser River Panel minutes dated: July 12, 1991

# AGENDA FRASER RIVER PANEL

JULY 12, 1991  
RICHMOND, B.C.

1. Agenda
2. MINUTES OF JUNE 10-11, 25, 1991.
3. FISHERY review.
4. TOTAL ALLOWABLE CATCH.
5. DEVELOPMENT OF REGULATIONS.
6. OTHER BUSINESS.
7. NEXT MEETING.

J. Woodey



Fisheries  
and Oceans

Pêches  
et Océans

Attachment 2

Pacific Region  
Suite 400 - 555 West Hastings St.  
Vancouver, B.C.  
V6B 5G3

Région du Pacifique  
Pièce 400 - 555 rue Hastings ouest  
Vancouver (C.-B.)  
V6B 5G3

Your file    Votre référence

Our file    Notre référence

1110-F24

11 July 1991

Ms. Lorraine Loomis  
Chair, Fraser Panel  
Fish Manager  
Swinomish Tribal Community  
P.O.Box 817  
950 Moorage Way  
La Conner, WA 98257  
U.S.A.

Dear Lorraine:

I am writing to provide you with Canada's intentions for the 1991 Fraser River sockeye and pink salmon seasons. Our preliminary expectations were provided informally to the U.S. in order for technical staff to develop fishing plans. There now has been some modification to that preliminary information because of the recent conclusion of consultations dealing with Native, commercial and sport allocations.

The Minister of Fisheries & Oceans announced on July 5, 1991 that the total Fraser sockeye run was expected to be 14.5 million and that the management plan would permit more than 3.4 million sockeye to spawn. Anticipated catches would be 800,000 for the Fraser River Indian Food Fishery (IFF), 125,000 for the Vancouver Island IFF, 8.2 million for the Canadian commercial industry and 40,000 for the sportfishery.

Since this announcement, the Panel approved a run size increase to the Early Stuart stock from 500,000 to 1,000,000 on July 8. As a consequence Canada increased the preliminary escapement goal for the Early Stuart based on the revised run size estimate. The net escapement goal was increased from 200,000 to 280,000 and the gross escapement goal was increased from 400,000 to 560,000.

Canada maintains the right to adjust escapement goals in-season as circumstances warrant. Canada will continue to notify the U.S. of any in-season adjustments to specific escapement goals. For informational purposes a more detailed description of specific escapement objectives for 1991 will be provided through the Technical Committee. These guidelines will be used by Canada to optimize escapement opportunities.

Based on the Minister's announcement and the Early Stuart run size update, the current sockeye and pink salmon forecasts and escapement goals for this year are as follows:

.../2

Canada

000211

## FRASER RIVER SOCKEYE AND PINK SALMON


### FORECAST AND ESCAPEMENT GOAL FOR 1991 (x Thousands)

Stock Grouping	Estimated Return	Net Escapement Goal	Gross Escapement Goal
<b>Fraser Sockeye</b>			
Early Stuart	1,000*	280.0	560
Early Summer	902	313.5	447
Summer	2,900	903.0	1,203
Late	10,148	1,993.5	2,080
Total Adult	14,950	3,490.0	4,290
Jacks	<u>50</u>	<u>25.0</u>	<u>25</u>
Total Return	<u>15,000</u>	<u>3,515.0</u>	<u>4,315</u>
<b>Fraser Pink</b>			
	<u>11,000</u>	<u>4,500.0</u>	<u>4,500</u>

\* July 8, 1991

It would be very much appreciated if you would provide any further information on your 1991 expectations and conservation or management concerns for other salmon species that might be impacted by Panel management measures. In particular I request details concerning your coho management plan for the Puget Sound/Juan de Fuca portion of Panel Waters for the 1991 season. A reply at your earliest convenience would be appreciated.

Yours very truly,

  
F.J. Fraser, Vice-Chair  
Fraser Panel

cc. Pacific Salmon Commissioners (Canadian Section)  
Fraser River Panel (Canadian Section)  
C.C.Graham - DFO  
G.Jaltema - DFO  
P.Sprout, Vice-Chair, Southern Panel  
W.Saito - DFO  
I.S.Todd - PSC  
J.C.Woodey - PSC  
C.W. Walters - NMFS



Attachments for Fraser River Panel minutes dated: August 9, 1991



**D R A F T**

**AGENDA**

**PACIFIC SALMON COMMISSION**

**FRASER RIVER PANEL**

**August 9, 1991  
10:00 a.m.**

**Richmond Inn  
Richmond, B.C.**

- |    |  |           |
|----|--|-----------|
| 1. | Agenda.  |           |
| 2. | Minutes of June 25 and 27, July 5, 8, 9-10, 12 and 15, 1991. |           |
| 3. | Fishery update.  | J. Woodey |
| 4. | Development of regulations.                                  | L. Loomis |
| 5. | News release.  | I. Todd   |
| 6. | Panel fall retreat.  | I. Todd   |
| 7. | Other business.  |           |
| 8. | Next meeting.  |           |





Attachments for Fraser River Panel minutes dated: August 16, 1991

Attachment 1



**AGENDA**  
**PACIFIC SALMON COMMISSION**  
**FRASER RIVER PANEL**

**August 16, 1991**  
**10:00 a.m.**

**Richmond Inn**  
**Richmond, B.C.**

1. Agenda.
2. Minutes of June 25 and 27, July 5, 8, 9-10, 12 and 15, 1991.
3. Spawning ground report.
4. Fishery review.
5. Development of regulations.
6. News release.
7. Other business.
8. Next meeting.

W. Saito

J. Woodey



Attachments for Fraser River Panel minutes dated: August 16, 1991



Attachment 1

**AGENDA**  
**PACIFIC SALMON COMMISSION**  
**FRASER RIVER PANEL**

**August 16, 1991**  
**10:00 a.m.**

**Richmond Inn**  
**Richmond, B.C.**

1. Agenda.
2. Minutes of June 25 and 27, July 5, 8, 9-10, 12 and 15, 1991.
3. Spawning ground report.
4. Fishery review.
5. Development of regulations.
6. News release.
7. Other business.
8. Next meeting.

W. Saito

J. Woodey



Attachments for Fraser River Panel minutes dated: August 23, 1991



Attachment 1

**D R A F T  
AGENDA**

**PACIFIC SALMON COMMISSION**

**FRASER RIVER PANEL**

**August 23, 1991  
9:30 a.m.**

**Richmond Inn  
Richmond, B.C.**

1. Agenda.
2. Minutes of June 25 and 27, July 5, 8, 9-10, 12 and 15, 1991.
3. Fishery review.
4. Development of regulations.
5. News release.
6. Other business.
7. Next meeting.

J. Woodey

I. Todd



Attachments for Fraser River Panel minutes dated: August 30, 1991

Attachment 1



**D R A F T  
AGENDA**

**PACIFIC SALMON COMMISSION**

**FRASER RIVER PANEL**

**August 30, 1991  
9:30 a.m.**

**Richmond Inn  
Richmond, B.C.**

1. Agenda.
2. Minutes of June 25 and 27, July 5, 8, 9-10, 12 and 15, 1991.
3. Fishery report.
4. Development of regulations.
5. Other business.
6. Next meeting.

**J. Woodey**



## Attachment 2

# 1991 FRASER RIVER SOCKEYE AND PINK SALMON IN-SEASON TAC CALCULATIONS

Using the forecasts, goals and estimates of run sizes, catches and escapements in effect at: 08:20 AM 30-Aug-91

		SOCKEYE				PINK
		Total	Early Stuart	Early Summer	Summer	Late
<b>TOTAL ALLOWABLE CATCH</b>						
Adult Run Size	12,050,000	550,000	1,300,000	4,700,000	5,500,000	13,000,000
Jack Run Size	50,000	0	0	0	50,000	0
Total Run Size	12,100,000	550,000	1,300,000	4,700,000	5,550,000	13,000,000
Canadian Add-on Benefit	1,239,000	0	125,000	207,000	907,000	n/a
Total Available to Share:	10,861,000	550,000	1,175,000	4,493,000	4,643,000	13,000,000
<u>Deductions</u>						
Adult Escapement	3,094,000	200,000	313,500	1,062,000	1,518,500	6,000,000
Jack Escapement	25,000	0	0	0	25,000	0
Fraser River IFF Exemption	400,000	82,000	62,000	212,000	44,000	0
Test Fishing	75,000	5,000	6,000	24,000	40,000	20,000
Total Deductions:	3,594,000	287,000	381,500	1,298,000	1,627,500	6,020,000
TAC:	7,267,000	263,000	793,500	3,195,000	3,015,500	6,980,000
<b>UNITED STATES (Washington)</b>						
Initial Allocation	1,800,000	65,000	197,000	791,000	747,000	1,795,000
Payback	n/a	n/a	n/a	n/a	n/a	259,000
SHARE:	1,800,000	65,000	197,000	791,000	747,000	2,054,000
% of TAC	24.8%					29.4%
<u>Treaty Indian Allocations</u>						
Areas 4B, 5 and 6C	90,000					
Areas 6, 7 and 7A	710,000					
Total	800,000					1,027,000
<u>Non-Indian Allocations</u>						
Purse Seine	500,000					
Gillnet	450,000					
Reefnet	50,000					
Total	1,000,000					1,027,000
<b>CANADA</b>						
TAC - United States Share	5,467,000	198,000	596,500	2,404,000	2,268,500	4,926,000
Canadian Add-on Benefit	1,239,000	0	125,000	207,000	907,000	n/a
SHARE:	6,706,000	198,000	721,500	2,611,000	3,175,500	4,926,000
<u>Planned Non-Commercial Shares</u>						
Fraser IFF Above Goal	400,000	118,000	72,000	128,000	82,000	100,000
Non-Fraser River IFF	125,000	0	4,000	54,000	67,000	0
Sport	40,000	0	0	0	40,000	68,000
Other (Charter, etc.)	0	0	0	0	0	0
Total	565,000	118,000	76,000	182,000	189,000	168,000
<u>Commercial Allocations</u>						
Inside Troll	177,000					190,000
Outside Troll	1,074,000					1,380,000
Purse Seine	3,048,000					2,760,000
Gillnet	1,842,000					428,000
Total	6,141,000					4,758,000

## Attachment 3

1991 FRASER RIVER SOCKEYE SALMON  
IN-SEASON CATCH AND ALLOCATION CALCULATIONS

08:20 AM

30-Aug-91

## CANADIAN CATCH

Areas	Inside Troll	Outside Troll	Purse Seine	Gillnet	Total
1-10	0	200,000	144,000	0	344,000
11-16	0	0	1,995,000	478,000	2,473,000
121-127	0	1,000,000	0	0	1,000,000
20	0	0	810,000	442,000	1,252,000
17, 18, 29	155,000	0	0	743,000	898,000
<b>TOTAL:</b>	155,000	1,200,000	2,949,000	1,663,000	5,967,000
<b>% of Catch</b>	2.6%	20.1%	49.4%	27.9%	100.0%
<b>ALLOCATION:</b>	177,000	1,074,000	3,048,000	1,842,000	6,141,000
<b>% of Catch</b>	2.9%	17.5%	49.6%	30.0%	100.0%
<b>BALANCE TO BE CAUGHT:</b>	22,000	(126,000)	99,000	179,000	174,000
	13,000	0	57,000	104,000	174,000

CANADA

## UNITED STATES CATCH

TREATY INDIAN					
Areas	Ceremonial	Purse Seine	Gillnet	Other	Total
4B, 5 and 6C TOTAL:	100	0	93,000	0	93,100
ALLOCATION:					90,000
BALANCE TO BE CAUGHT:					(3,100)
6, 7 and 7A TOTAL:	500	195,000	386,000	0	581,500
ALLOCATION:					710,000
BALANCE TO BE CAUGHT:					128,500

NON-INDIAN				
Areas	Purse Seine	Gillnet	Reefnet	Total
4B, 5 and 6C	0	6,000	0	6,000
6, 7 and 7A	462,000	377,000	47,000	886,000
TOTAL:	462,000	383,000	47,000	892,000
% of Catch	51.8%	42.9%	5.3%	100.0%
ALLOCATION:	500,000	450,000	50,000	1,000,000
% of Catch	50.0%	45.0%	5.0%	100.0%
BALANCE TO BE CAUGHT:	38,000	67,000	3,000	108,000

UNITED STATES TOTAL *					
	Treaty Indian	Non-Indian	Washington	Alaska	Total
TOTAL:	675,000	892,000	1,567,000	0	1,567,000
CATCH GOAL:	800,000	1,000,000	1,800,000		
BALANCE TO BE CAUGHT:	125,000	108,000	233,000		
	Early Stuart	Early Summer	Summer	Late	Total
TOTAL:	39,000	168,000	839,000	520,000	1,566,000
CATCH GOAL:	65,000	197,000	791,000	747,000	1,800,000
BALANCE TO BE CAUGHT:	26,000	29,000	(48,000)	227,000	234,000

T.I. 4B,5,6C

T.I. 6,7,7A

N.-I. WASH

U.S.

\* The total United States catch by user-group and area may not match the total catch by stock-group because of differences in when the analyses are available. The former estimate is usually the more accurate in-season.

Attachment 4

**1991 FRASER RIVER PINK SALMON  
IN-SEASON CATCH AND ALLOCATION CALCULATIONS**

08:20 AM

30-Aug-91

**CANADIAN CATCH**

Areas	Inside Troll	Outside Troll	Purse Seine	Gillnet	Total
1-10	0	361,000	50,000	200	411,200
11-16	90,000	0	1,936,000	132,000	2,158,000
121-127	0	555,000	0	0	555,000
20	0	0	813,000	48,000	861,000
17, 18, 29	77,000	0	0	22,000	99,000
<b>TOTAL:</b>	<b>167,000</b>	<b>916,000</b>	<b>2,799,000</b>	<b>202,200</b>	<b>4,084,200</b>
<b>% of Catch</b>	<b>4.1%</b>	<b>22.4%</b>	<b>68.5%</b>	<b>5.0%</b>	<b>100.0%</b>
<b>ALLOCATION:</b>	<b>190,000</b>	<b>1,380,000</b>	<b>2,760,000</b>	<b>428,000</b>	<b>4,758,000</b>
<b>% of Catch</b>	<b>4.0%</b>	<b>29.0%</b>	<b>58.0%</b>	<b>9.0%</b>	<b>100.0%</b>
<b>BALANCE TO BE CAUGHT:</b>	<b>23,000</b>	<b>464,000</b>	<b>(39,000)</b>	<b>226,000</b>	<b>674,000</b>

CANADA

**UNITED STATES CATCH**

TREATY INDIAN					
Areas	Ceremonial	Purse Seine	Gillnet	Other	Total
4B, 5 and 6C	0	0	11,000	0	11,000
6, 7 and 7A	0	31,000	21,000	0	52,000
<b>TOTAL:</b>	<b>0</b>	<b>31,000</b>	<b>32,000</b>	<b>0</b>	<b>63,000</b>
<b>% of Catch</b>	<b>0.0%</b>	<b>49.2%</b>	<b>50.8%</b>	<b>0.0%</b>	<b>100.0%</b>
<b>GOAL:</b>					<b>1,027,000</b>
<b>BALANCE TO BE CAUGHT:</b>					<b>964,000</b>

T.I. WASH.

NON-INDIAN					
Areas	Ocean Troll and Sport	Purse Seine	Gillnet	Reefnet	Total
3 and 4	31,000	0	0	0	31,000
4B, 5 and 6C	0	0	2,000	0	2,000
6, 7 and 7A	0	166,000	25,000	8,000	199,000
<b>TOTAL:</b>	<b>31,000</b>	<b>166,000</b>	<b>27,000</b>	<b>8,000</b>	<b>232,000</b>
<b>% of Catch</b>	<b>13.4%</b>	<b>71.6%</b>	<b>11.6%</b>	<b>3.4%</b>	<b>100.0%</b>
<b>GOAL:</b>					<b>1,027,000</b>
<b>BALANCE TO BE CAUGHT:</b>					<b>795,000</b>

N.-I. WASH

UNITED STATES TOTAL					
	Treaty Indian	Non-Indian	Washington	Alaska	Total
<b>TOTAL:</b>	<b>63,000</b>	<b>232,000</b>	<b>295,000</b>	<b>0</b>	<b>295,000</b>
<b>CATCH GOAL:</b>	<b>1,027,000</b>	<b>1,027,000</b>	<b>2,054,000</b>		
<b>BALANCE TO BE CAUGHT:</b>	<b>964,000</b>	<b>795,000</b>	<b>1,759,000</b>		

U.S.

Attachment 5

**1991 SOUTHERLY MIGRATING PINK SALMON  
IN-SEASON CATCH AND ALLOCATION CALCULATIONS**

08:27 AM  
30-Aug-91

**CANADIAN CATCH**

Areas	Inside Troll	Outside Troll	Purse Seine	Gillnet	Total
1-10	0	494,000	110,000	3,000	607,000
11-16	123,000	0	2,611,000	184,000	2,918,000
121-127	0	738,000	0	0	738,000
20	0	0	1,115,000	73,000	1,188,000
17, 18, 29	77,000	0	0	22,000	99,000
<b>TOTAL:</b>	<b>200,000</b>	<b>1,232,000</b>	<b>3,836,000</b>	<b>282,000</b>	<b>5,550,000</b>
% of Catch	3.6%	22.2%	69.1%	5.1%	100.0%
<b>ALLOCATION:</b>	<b>250,000</b>	<b>1,815,000</b>	<b>3,630,000</b>	<b>563,000</b>	<b>6,258,000</b>
% of Catch	4.0%	29.0%	58.0%	9.0%	100.0%
<b>BALANCE TO BE CAUGHT:</b>	<b>50,000</b>	<b>583,000</b>	<b>(206,000)</b>	<b>281,000</b>	<b>708,000</b>

CANADA



Attachments for Fraser River Panel minutes dated: September 16, 1991

## U.S. Commissioners

Joc Blum  
Don Collinsworth  
David Colson  
Guy McMinds

UNITED STATES SECTION  
of the  
PACIFIC SALMON COMMISSION

Office of the  
U.S. Section Coordinator  
7600 Sand Point Way N.E.  
Building 1, F/NWR-2  
Seattle, WA 98115

**RECEIVED**

SEP 16 1991  
PACIFIC SALMON  
COMMISSION

September 16, 1991

**U.S. STATEMENT ON 1991 FRASER PINK ALLOCATION STATUS**

The U.S. believes that Canada has allowed domestic management considerations to reduce the U.S. share of Fraser pinks in 1991. Canada has chosen to not conduct fisheries that are necessary to harvest the full Canadian share of the Fraser pink run. The effect of that choice will be to pass those unharvested fish to the spawning escapement. The February 1991 Panel agreement on escapement goals and TAC stipulates that TAC is calculated on the basis of actual escapement, and not the goal. Therefore, the U.S. members of the Fraser Panel have no choice but to schedule remaining U.S. pink fisheries based on projected escapements resulting from the lack of Canadian fisheries, and not on the escapement goal established by Canada. The U.S. strongly objects to this manipulation of the U.S. share, since international allocation takes precedence over domestic allocation considerations.

The U.S. members of the Fraser Panel intend to raise this issue during the next round of Commission meetings, along with Canada's decision to raise the pink escapement goal above the level defined in the treaty background documents, and above levels that were discussed with the U.S. preseason.

Lorraine Loomis  
U.S. Fraser Panel Chair

\*\*\*\*\*

Please include the above statement in the minutes of the  
Bilateral Fraser Panel teleconference which began at 11:10 on  
this date; Monday, September 16, 1991.



Attachments for Fraser River Panel minutes dated: September 17, 1991



Fisheries  
and Oceans

Pêches  
et Océans

Attachment 1

Pacific Region  
Suite 400 - 555 West Hastings St.  
Vancouver, B.C.  
V6B 5G3

Région du Pacifique  
Pièce 400 - 555 rue Hastings ouest  
Vancouver (C.-B.)  
V6B 5G3

**RECEIVED**

Your file Votre référence

Our file Notre référence

SEP 23 1991

**PACIFIC SALMON  
COMMISSION**

1110-F24

17 September 1991

**FRASER PANEL  
CANADIAN POSITION STATEMENT OF RECORD  
SEPTEMBER 17, 1991**

Canada accepts the Staff recommendation to maintain the Fraser River Pink Salmon run size estimate at 17.0 million. As a consequence, an overall TAC of 9.980 million exists on the basis of a 7.0 million spawner escapement goal.

On this basis a TAC of 9.812 million for commercial fisheries would be shared along the following lines:

U.S. Share	=	2.841 (incl. payback)
Cdn. Share	=	<u>6.971</u>
TOTAL COMMERCIAL TAC		<u>9.812</u> Million

On the basis of catches to-date the uncaught balances remaining for each country are approximately:

U.S.	=	0.078
Cdn.	=	<u>1.103</u>
TOTAL		<u>1.181</u> Million

In view of the concern expressed in the "US Statement on 1991 Fraser Pink Allocation Status" on September 16, 1991 about possible foregone opportunities because of the existence of the February 8, 1991 Bilateral Panel agreement entitled "The Establishment of Fraser Sockeye and Pink Escapement Goals for 1991 and 1992 For the Purpose of Computing the Total Allowable Catch", Canada is prepared, on a one time only basis, and without prejudice to future TAC calculations, to agree to U.S. fisheries to the extent necessary to catch 78,000 Fraser bound Pink salmon. The catch of these fish by U.S. fishermen would not be affected by the final determination of TAC and run size, and regardless of that outcome, payback would not be incurred as a result of this single management action to catch 78,000 Fraser River Pink salmon.

In the event that the actual pink run size is calculated to be below 17.0 million, then the catch balance adjustment procedure will be applied as has occurred in previous years in similar circumstances.

**Canada**

*Handwritten signature/initials*

*Handwritten signature*  
000230





# PACIFIC SALMON COMMISSION

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

600 - 1155 ROBSON STREET  
VANCOUVER, B.C. V6E 1B5  
TELEPHONE: (604) 684-8081  
FAX: (604) 666-8707

Our File: 11252  
x 72804

TO: *E. West*

Your File:

002614 JAN 29 12:07

January 28, 1992

MEMO  
FISHERIES & OCEANS  
FISHERIES PACIFIC

To: Transboundary Technical Committee  
Enhancement Subcommittee of the Transboundary T.C.

*1110-P9*

From: Vicki Beck

Re: Notice of Meeting and Agenda

This notice will remind you of a meeting of the Transboundary Technical Committee scheduled to start at 9:00 a.m. on February 26th and continue into February 27th at the offices of the Pacific Salmon Commission. Attached is the proposed agenda which Robin Harrison requested the Commission distribute.

Guest room reservations have been made at the Pacific Palisades Hotel, 1277 Robson Street, telephone (604) 688-0461, at the rate of \$69.00 per night plus taxes, as follows:

Canada	-	Robin Harrison	-	No Room Required
	-	Pat Milligan	-	Feb. 25, 26 & 27
	-	Pete Etherton	-	Feb. 25, 26 & 27
	-	Bruce Morley	-	Feb. 26
U.S.	-	Ken Leon	-	Feb. 25 & 26
	-	Norma Jean Sands	-	"
	-	John Eiler	-	"
	-	William Bergmann	-	"
	-	Andy McGregor	-	"
	-	Kathleen Jensen	-	"
	-	Keith Pahlke	-	"
	-	Jim Olsen	-	"
	-	Brian Lynch	-	"

Remember all rooms are on a 6:00 p.m. hold unless you notify me or the hotel of your personal credit card number to guarantee for late arrival. See you soon!

*Vicki*  
Vicki Beck  
Meeting Co-ordinator

## Transboundary Technical Committee Meeting

### Offices of the Pacific Salmon Commission

9:00 a.m.  
February 26-27, 1992

#### Proposed Agenda

1. Approval of October 1991 meeting minutes.
2. Alsek River 1992 Management Projects
  - Klukshu weir and sampling
  - aerial escapement surveys
  - U.S. fishery management model
3. Taku River 1992 Management Projects
  - Canyon Island tagging
  - escapement weirs
  - coho test fishery
  - fishery sampling
  - Tatsamie coho CWT
  - coho and chinook CWT on U.S. side of border
  - coho radio tagging
  - steelhead radio tagging
4. Stikine River 1992 Management Projects
  - test fishing
  - fishery sampling
  - Tahltan Lake weir (sockeye adults)
  - aerial escapement surveys
  - fishery models
  - Tahltan smolt enumeration
  - radio tagging feasibility work (1993)
5. Enhancement
  - egg takes
  - Snettisham Hatchery modifications and operation
  - enhancement evaluation - observations to date
  - proposed 1992 lake studies
  - thermal marking and otolith processing
  - Tuya Lake update