



Executive Secretary's Summary of Decisions  
January 2014 Post-Season Meeting of the Pacific Salmon Commission

The Pacific Salmon Commission held its 2014 Post-Season Meeting from January 13-16, 2014 in Portland, Oregon at the Embassy Suites Downtown, and discussed a number of topics (see attached agenda).

The Commission AGREED:

1. The Secretariat staff will develop a proposal for discussion in February 2014 that would allow the Commission to decide if holding a virtual meeting in October 2014 would be effective and technically feasible.
2. There would not be an approved work plan for the Habitat and Restoration Technical Committee in 2013 or 2014. Canada will receive U.S. reports in the near term regarding habitat issues under Attachment E to the 1999 Agreement between the Parties, and a bilateral discussion about how to proceed regarding habitat would be held in February 2014.
3. The Canadian section will draft written instructions to the Joint Technical Committee (JTC) co-chairs regarding the issues raised in the co-chairs' memo of January 10, 2014. The U.S. Section will review the draft and a bilateral assignment will be conveyed to the JTC co-chairs when appropriate.
4. The hydroacoustic programs at Mission and Qualark should continue to operate as usual in 2014 and the Commission encourages the Panel, the PSC Secretariat, and Fisheries and Oceans Canada to exchange information about both programs during the 2014 season.

ATTENDANCE  
PACIFIC SALMON COMMISSION  
POST-SEASON MEETING  
JANUARY 13-16, 2014  
DOWNTOWN EMBASSY SUITES, PORTLAND, OREGON

PRESENT:

COMMISSIONERS

UNITED STATES

B. Turner (Chair)  
W.R. Allen  
P. Anderson  
W. Auger  
D. Bedford  
M. Clark  
R. Elicker  
M. Oatman

CANADA

S. Farlinger (Vice-Chair)  
B. Assu  
J. McCulloch  
M. Ned  
B. Riddell  
B. Rezansoff  
P. Sprout

PACIFIC SALMON COMMISSION  
POST-SEASON MEETING  
JANUARY 13-16, 2014  
DOWNTOWN EMBASSY SUITES, PORTLAND, OREGON

ATTENDANT DOCUMENTS

1. Draft Agenda
2. NOAA West Coast Region Organization Chart
3. Diplomatic Note
4. U.S. 2013 Post-Season Report
5. Canadian 2013 Post-Season Report
6. Bilateral Coded Wire Tag Implementation Team Progress Report
7. Coded Wire Tag Implementation Team Revised Figure 4.2
8. Sentinel Stocks Committee Table
9. Sentinel Stocks Committee Report
10. Memorandum from Joint Technical Committee Co-Chairs
11. Fraser River Hydro-Acoustics Strategic Review – Instructions to Fraser River Panel



## **Draft Agenda**

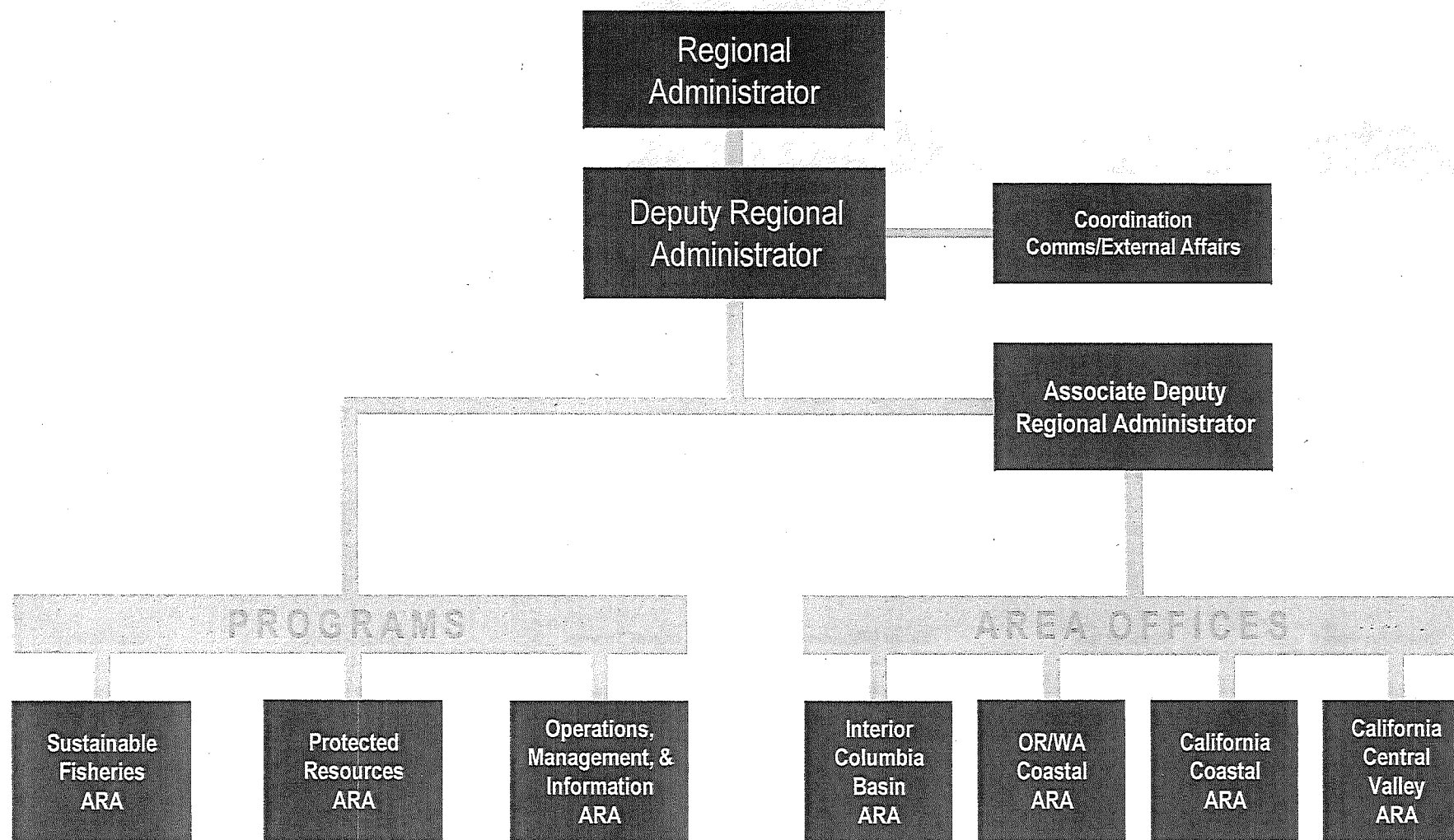
### **Pacific Salmon Commission Post-Season Meeting**

**January 13-16, 2014  
Embassy Suites Downtown  
Portland, Oregon**

- 1. Adoption of Agenda**
- 2. Executive Secretary's report**
- 3. Approval of Minutes**
  - a. October 22-24, 2013
- 4. Action Items Pending**
  - a. Provisional application of Annex IV, Chapter 4 – update from Parties
  - b. Update on bylaws review (from Executive Secretary)
  - c. Post-Season Reports
- 5. Reports from Panels and Committees**
  - a. Coded Wire Tag Implementation Team Interim report (as agreed in February 2013)
  - b. National Sections budget approach for the 2013/2014 meeting cycle
  - c. Interim Advisory Committee, as needed
  - d. Sentinel Stocks Committee report
  - e. Letter from JTC co-chairs to Commissioners
  - f. Fraser Strategic Review Committee, as needed
  - g. Habitat and Restoration Technical Committee – status of work plan
  - h. Standing Committee on Finance and Administration, as needed
  - i. Progress Reports on Work Plans – Panels and Technical Committees – as needed
- 6. Other Business**

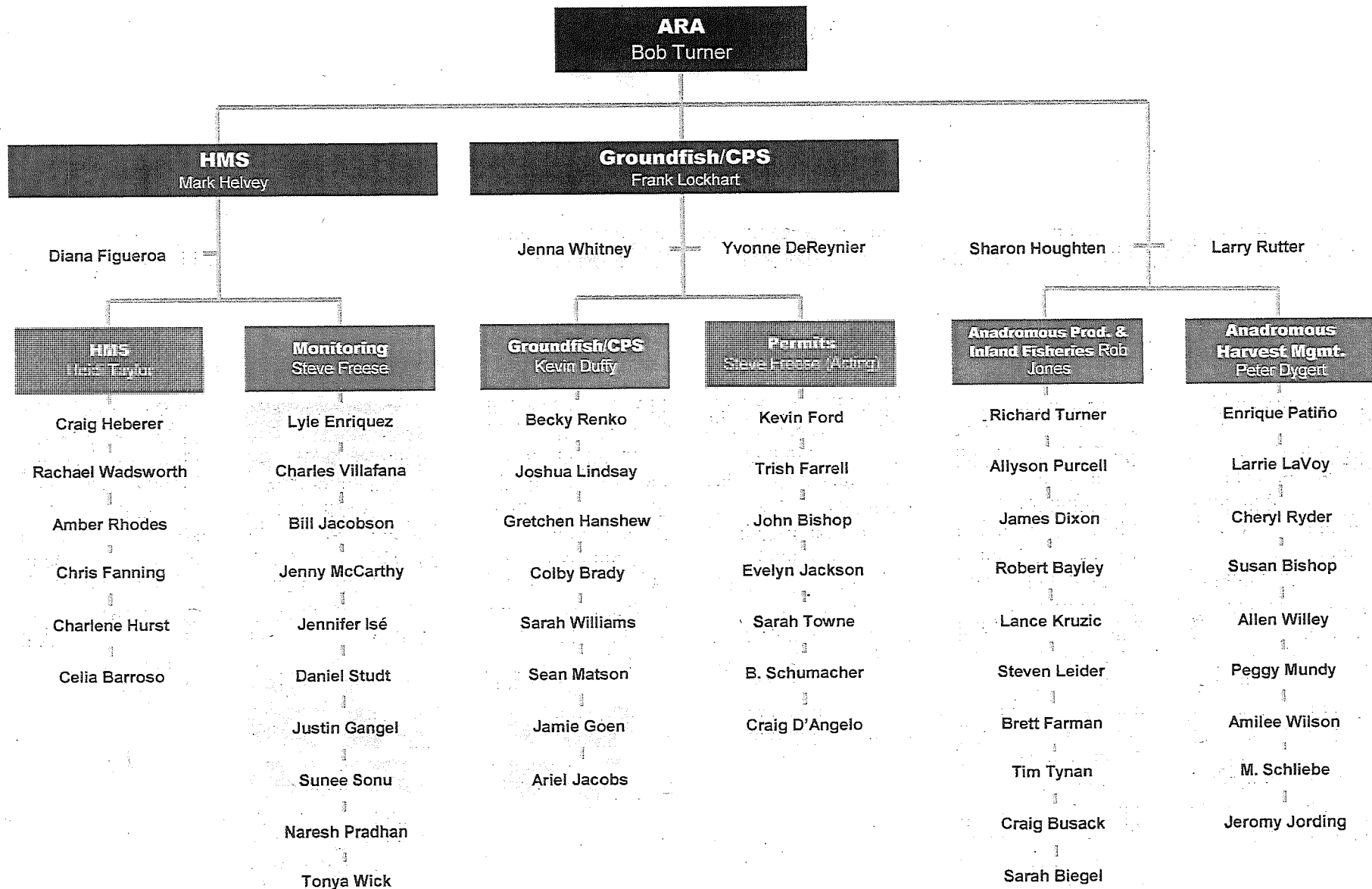
# West Coast Region

HQ approved August 5, 2013



NOAA FISHERIES

# Sustainable Fisheries



DEPARTMENT OF STATE

WASHINGTON

December 23, 2013

Excellency:

I have the honor to acknowledge receipt of your diplomatic note No. WSHDC-717, dated December 13, 2013, which reads as follows:

Note: WSHDC-717

The Honourable John F. Kerry  
Secretary of State  
Washington, D.C.

Excellency,

I have the honour to refer to the recent recommendations of the Pacific Salmon Commission relating to Chapter 4 of Annex IV of the *Treaty between the Government of Canada and the Government of the United States of America Concerning Pacific Salmon*, signed at Ottawa on 28 January 1985, as amended ("the Treaty"). That Chapter is scheduled to expire by its own terms on 31 December 2013. I therefore have the honour to propose an agreement between our two Governments, pursuant to Article XIII of the Treaty, to replace Annex IV, Chapter 4, in its entirety by the amended Annex IV, Chapter 4, comprised in the Appendix to this Note. I also propose that provisional application of Chapter 4 of Annex IV of the Treaty commence on 1 January 2014 and continue until the Chapter enters into force.

If the proposal set forth in this Note is acceptable to your Government, I have the honour to propose that this Note, which shall be equally authentic in the

English and French languages, and your affirmative reply shall constitute an Agreement between our Governments, which shall enter into force on the date of a second note that is part of a subsequent exchange of notes confirming the completion by each Party of all internal procedures necessary for its entry into force.

Please accept, Excellency, the assurances of my highest consideration.

Gary Doer  
Ambassador of Canada  
to the United States of America

Enclosure



## **APPENDIX**

### **“Chapter 4”**

#### **FRASER RIVER SOCKEYE AND PINK SALMON**

1. The provisions of this Chapter shall apply for the period 2014 through 2019.
2. The U.S. share of the annual Fraser River sockeye and pink salmon Total Allowable Catch (the “TAC”), as defined in paragraph 3, to be harvested in the waters of Washington State is as follows:
  - (a) for sockeye salmon, the U.S. catch in the Fraser Panel Area shall not exceed 16.5 percent of the TAC;
  - (b) for pink salmon, the U.S. catch in the Fraser Panel Area shall not exceed 25.7 percent of the TAC.
3. For the purpose of this Chapter, the TAC shall be defined as the portion of the annual aggregate of Fraser River sockeye and pink runs (excluding any catch of Fraser River sockeye identified in Alaskan waters) that remains after deducting the spawning escapement targets established, unless otherwise agreed, by application of Canada’s pre-season escapement plan (subject to any adjustments made pursuant to paragraph 3(b)), the Fraser River Aboriginal Fisheries Exemption (Fraser River AFE), and the catch in Fraser River Panel authorized test fisheries. The TAC shall be computed separately for Fraser River sockeye and pink salmon. The following definitions and procedures apply to TAC calculations:
  - (a) The annual U.S. share shall be computed based on the in-season run size estimates in effect at the time that the Fraser River Panel relinquishes control of the U.S. Fraser River Panel waters, using the escapement targets established by application of Canada’s pre-season escapement plan as may be adjusted pursuant to paragraph 3(b), and taking into account any adjustments as provided in paragraph 8.

- (b) For the purposes of in-season management by the Fraser River Panel, the spawning escapement objective is the target set by Canada, including any extra requirements that may be identified and agreed to by the Fraser River Panel, for natural, environmental, or stock assessment factors, to ensure the fish reach the spawning grounds at target levels. In the event that the Fraser River Panel does not agree to additional escapement amounts, the Commission staff will make a recommendation which shall become effective upon agreement by at least one national section of the Fraser River Panel. Any additional escapement amounts believed necessary by Canada above those determined pursuant to the foregoing will not affect the U.S. share.
- (c) The agreed Fraser River AFE is that number of sockeye which is subtracted from the total run size in determining the TAC upon which the U.S. shares specified in paragraph 2 are calculated. Any Canadian harvests in excess of these amounts count against the TAC, and do not affect the U.S. share. The agreed Fraser River AFE is the actual catch of Fraser River sockeye harvested in both the in-river and marine area Aboriginal Fisheries, up to 400,000 sockeye annually.
- (d) For computing TAC by stock management group, the Fraser River AFE shall be allocated to management groups as follows: The Early Stuart sockeye exemption shall be up to 20% of the Fraser River AFE, and the balance of the Fraser River AFE shall be based on the average proportional distribution for the most recent three cycles and modified annually as required to address concerns for Fraser River sockeye stocks and other species and as otherwise agreed by the Fraser River Panel. If either pre-season or in-season, there is insufficient harvestable surplus (defined as run size minus escapement goal, minus management adjustments made pursuant to paragraph 3(b), minus test fishing catches) in any stock management group to allow for the total Fraser River AFE distribution to that stock management group as described above, the Fraser River AFE for that stock management group will be the greater of: (i) the catch, (ii) the projected catch by aboriginal fisheries or (iii) the available harvestable surplus. The balance of Fraser River AFE not distributed to that stock management group shall be redistributed to the other stock management groups in the same proportions as specified in (i), (ii) and (iii), unless otherwise agreed by the Fraser River Panel. The Fraser River Panel shall develop agreed procedures for implementing potential Fraser River AFE redistributions as part of its pre-season planning process. The harvest distribution of Early Stuart sockeye is expected to remain similar to that of recent years.



- (e) Each Fraser River sockeye stock is assigned to one of four stock management groups. The stock management groups are: Early Stuart, Early Summer, Mid-Summer and Late Run. The annual U.S. share of sockeye available for harvest in the Fraser Panel Area is computed by applying the percentage share provided in paragraph 2(a) to the aggregate TAC, defined as the sum of the TACs computed for each of the four stock management groups. To the extent practicable, the Fraser River Panel shall develop and implement a fishing plan that provides the U.S. fishery with the opportunity to harvest its 16.5% aggregate share of the TAC of Fraser River sockeye. To accomplish this, the Fraser River Panel and to the extent practicable, shall strive to concentrate the U.S. sockeye fishery on the most abundant management group (or groups), i.e., those that provide the largest percentage of the available TAC. It is understood that, despite concentrating the U.S. harvest in this manner, the overlapping of management groups may result in greater than 16.5% of the TAC for one or more of the less abundant management groups being taken by the U.S. fishery. A small but acceptable rate of incidental harvest may occur on one or more overlapping management groups that have little or no TAC as defined in this Chapter.
- (f) Notwithstanding paragraph 3(e), in order to address specific conservation and harvest objectives in any given year the Panel may by agreement assign Fraser River sockeye stocks to five or more management groups. In the event that the Fraser River Panel adopts more than four Fraser River sockeye stock management groups, the TAC calculation, overlapping stock harvest approach, and incidental harvest provisions apply in a similar fashion as the four stock management groups as in paragraph 3(e). As part of the decision to adopt more than four stock management groups the Fraser River Panel shall agree on how the Fraser River AFE would be apportioned amongst the stock management groups.
- (g) To the extent practicable, the Fraser River Panel shall develop and implement a fishing plan that provides the U.S. fishery with the opportunity to harvest its 25.7% share of the Fraser River pink salmon TAC. To accomplish this, the Fraser River Panel shall take into consideration the availability of both the sockeye salmon TAC and pink salmon TAC through the entire fishing season while, to the extent practicable, minimizing the impacts on overlapping sockeye management groups with little or no TAC. The Parties understand that the overlapping of sockeye and pink salmon migrations may result in a small but acceptable rate of incidental harvest on one or more overlapping sockeye management groups that have little or no TAC as defined in this Chapter.

4. Pursuant to Article IV, paragraph 3, Canada shall annually establish the Fraser River sockeye and pink salmon spawning escapement targets for the purpose of calculating the annual TAC. For the purposes of pre-season planning, where possible, Canada shall provide forecasts of run size and spawning escapement requirements by stock management groups to the Fraser River Panel no later than the annual meeting of the Commission. Canada shall provide to the Fraser River Panel forecasts of migration patterns, gross escapement needs, and any in-season adjustments in escapement requirements as they become available in order to accommodate the management needs of the Fraser River Panel in a timely manner. In addition, on a timely basis, the United States shall provide to the Fraser River Panel run size forecasts of U.S. origin sockeye and pink salmon stocks affected by Fraser River Panel management.

5. The Fraser River Panel shall develop fishing plans and in-season decision rules as may be necessary to implement the intent of this Chapter. The Parties shall establish and maintain data sharing principles and processes which ensure that the Parties, the Commission, and the Fraser River Panel, are able to manage their fisheries in a timely manner consistent with this Chapter. With respect to management responsibilities, all activities of the Parties and the Fraser River Panel shall be consistent with the August 13, 1985, Memorandum of Understanding between the Parties.

6. Fraser River Panel pre-season planning meetings that do not occur simultaneously with Commission meetings shall be held alternately in Canada and the United States. Scheduled in-season management meetings shall be held at Richmond, B.C. unless the Fraser River Panel agrees otherwise. As agreed, Fraser River Panel meetings may be held by telephone conference call.

7. The Commission may recommend to the Parties that specific portions of the Fraser Panel Area be excluded from the regulations proposed by the Fraser River Panel in accordance with Article VI, paragraph 5 to simplify domestic fishery management and ensure adequate consideration of the effect on other stocks and species harvested in the Fraser Panel Area.

8. Annually, the U.S. share shall be adjusted for harvest overages and underages based on post-season catch estimates as follows:

- (a) The U.S. share shall be adjusted in the amount of any harvest overage or underage of the same species from the previous year or years as provided in paragraphs 8(b) and 8(c). In making such adjustment, the U.S. current year share shall not be reduced by more than 5 percent or increased by more than 15 percent because of the adjustment, unless otherwise agreed. The Fraser River Panel shall attempt to fully implement any adjustments to the U.S. share while this Chapter is still in effect. Any balance from the harvest overage or underage shall be incorporated in the subsequent year's allocation. Any residual overages or underages remaining in 2019 shall be carried forward into the next Chapter period.
- (b) The U.S. share shall be adjusted to account for management imprecision in U.S. fisheries subject to the limitations prescribed in paragraph 8(c). Additionally, the U.S. share shall be adjusted for underages which occur as a result of Canada directly impeding the U.S. from pursuing its in-season share of the TAC. This



latter circumstance shall be noted in-season by the Fraser River Panel including the effect Canada's catch had on impeding the U.S. pursuit of its in-season share, and shall be compensated for as an underage pursuant to paragraph 8(a).

- (c) The U.S. share shall not be adjusted:
  - (i) for underages which occur because the U.S. fishery failed to deploy sufficient effort;
  - (ii) for underages which occur because too few fish were available to the U.S. fishery due to migration patterns (e.g., diversion rates) or harvesting constraints for intermingled stocks or species;
  - (iii) for that portion of an underage resulting from an increase in the estimated TAC identified after the year's fishery has ended but which would not have been available due to harvest constraints for intermingled stocks or species;
  - (iv) for an overage resulting from TAC reductions after the scheduling of the last Fraser River Panel approved U.S. fishery of the season; or
  - (v) for any harvest of Fraser River sockeye that occurs in Alaska.
- (d) Fisheries that occur after the last U.S. Fraser River Panel approved fishery are expected to remain similar to those of recent years.

9. The Parties shall establish a Technical Committee of the Fraser River Panel with membership and functions as follows:

- (a) the members of the Technical Committee shall coordinate the technical aspects of Fraser River Panel activities with and between the Commission staff and the national sections of the Fraser River Panel, and shall report, unless otherwise agreed, to their respective National Sections of the Fraser River Panel. The Technical Committee may receive assignments of a technical nature from the Fraser River Panel and will report results directly to the Fraser River Panel;
- (b) membership of the Technical Committee shall consist of up to five such technical representatives as may be designated by each National Section of the Commission;
- (c) members of the Technical Committee shall analyze proposed management regimes, provide technical assistance in the development of proposals for management plans, explain technical reports and provide information and technical advice to their respective National Sections of the Fraser River Panel;
- (d) the Technical Committee shall work with the Commission staff during pre-season development of the fishery regime and management plan and during in-season consideration of regulatory options for the sockeye and pink salmon fisheries of

Fraser Panel Area waters and during post-season evaluations of the season to ensure that:

- (i) domestic allocation objectives of both Parties are given full consideration,
  - (ii) conservation requirements and management objectives of the Parties for species and stocks other than Fraser River sockeye and pink salmon in the Fraser Panel Area during periods of Fraser River Panel regulatory control are given full consideration, and
  - (iii) the Commission staff is informed in a timely manner of management actions being taken by the Parties in fisheries outside of the Fraser River Panel Area that may harvest sockeye and pink salmon of Fraser River origin;
- (e) the Commission staff shall consult regularly in-season with the Technical Committee to ensure that its members are fully informed in a timely manner on the status of Fraser River sockeye and pink salmon stocks, and the expectations of abundance, migration routes and proposed regulatory options, so the members of the Technical Committee can brief their respective National Sections prior to each in-season Fraser River Panel meeting.

10. The Parties agree that Fraser River Panel management actions should meet the following objectives, listed in order of priority:

- (a) obtain spawning escapement goals by stock or stock grouping;
- (b) meet treaty defined international allocation; and
- (c) achieve domestic objectives.

11. The Fraser River Panel shall manage its fisheries consistent with the provisions of the other chapters of Annex IV to ensure that the conservation needs and management requirements for other salmon species and other sockeye and pink salmon stocks are taken into account.

12. The Parties agree to develop regulations to give effect to the provisions of the preceding paragraphs. Upon approval of the pre-season plan and during the period of Fraser River Panel regulatory control, all sockeye and pink salmon fisheries under the Fraser River Panel's jurisdiction are closed unless opened for fishing by in-season order of the Fraser River Panel.

13. Pursuant to the Parties' obligations under Article VI, the Fraser River Panel shall use the following in-season decision process:

- (a) The mid-point forecast provided by Canada shall be used for management purposes until in-season updates of run size become available. Based upon advice from the Fraser River Panel Technical Committee and Commission staff, the Fraser River Panel may adopt a more precautionary or optimistic applications of the forecast information until in-season updates of run size are available.



Commission staff shall provide the Fraser River Panel with recommendations for in-season run size and other factors relevant to sound fisheries management decisions. Based on information such as, but not limited to, in-season estimates of run timing and diversion rate, the Commission staff shall make recommendations to the Fraser River Panel regarding in-season decision making.

- (b) Commission staff shall provide the Fraser River Panel with projected harvestable surpluses and status of harvest from fisheries under Panel management. These projections will incorporate any Fraser River Panel agreement on management adjustments that deal with environmental conditions during in-river migration that could significantly impact the Fraser River Panel's ability to achieve spawning escapement objectives and other considerations agreed to by the Fraser River Panel.
- (c) Any changes from Commission staff recommendations for paragraphs 13(a) and 13(b) shall be based on bilateral agreement between the National Sections of the Fraser River Panel. Acceptance of the Commission staff recommendation requires approval of at least one of the National Sections.
- (d) The respective National Sections of the Fraser River Panel shall develop proposed regulations for their domestic Fraser Panel Area fisheries consistent with recommendations and projections provided by the Commission staff as described in paragraphs 13(a) and 13(b) as may be modified pursuant to paragraph 13(c). Either National Section may ask Commission staff for advice in designing its fisheries proposals. Commission staff shall assess and provide advice as to whether proposed fishery regulations for Fraser Panel Area fisheries are consistent with recommendations and projections described in paragraphs 13(a) and 13(b) and Fraser Panel objectives. Subsequently, after full discussion of a Fraser River Panel Area fishery proposal, the following may occur: (i) the Fraser River Panel may adopt the proposal based on bilateral agreement or; (ii) the proposing National Section may modify and re-submit its proposal in response to advice from staff and/or concern(s) raised by the other National Section; or (iii) while acknowledging objection(s) of the other National Section, the Fraser River Panel may approve the fishery proposal. In the event that the Fraser River Panel approves a fishery under the provisions of the latter circumstance (paragraph 13(d)(iii)), prior to the commencement of the proposed fishery, the proposing National Section shall provide a written rationale for the fishery as submitted.
- (e) If post-season a Party believes that it has been adversely affected by a fishery that had been objected to but adopted pursuant to paragraph 13(d)(iii) or referred to in paragraph 13 (f), the Commission staff shall prepare an objective report on the circumstances of the fishery and its consequences for the January Commission meeting following the season in question. The Fraser River Panel shall review the staff report and determine what action is required. If the Fraser River Panel cannot come to agreement on the appropriate action, the issue shall be referred to the Commission for resolution during its February annual meeting.

- (f) Pursuant to Article VI, paragraph 7, the Parties shall communicate and consult with one another in a timely manner regarding their fishing plans for Fraser River sockeye outside of the Fraser River Panel's regulatory control. In the event that a Party has an objection to the other Party's fishing plans as they relate to achievement of Fraser River Panel objectives, the implementing Party shall provide the rationale for such plans.

14. The Parties agree that:

- (a) Fraser River sockeye are caught incidental to fisheries in Alaska District 104 directed at pink salmon;
- (b) Fraser River sockeye comprise a minor portion of the catch in that fishery and are not the target stock in that fishery;
- (c) the extent of these incidental catches of Fraser River sockeye is unpredictable from year to year; and
- (d) paragraph 8(c)(v) is premised along with other considerations between the Parties, on these circumstances continuing."

I am pleased to inform you that the Government of the United States of America accepts the proposal set forth in your diplomatic note. The Government of the United States of America further agrees that your diplomatic note, together with this reply, shall constitute an Agreement between the United States of America and Canada, which shall provisionally apply the Chapter 4 text in the attached appendix commencing January 1, 2014, and enter into force on the date of a second note that is part of a subsequent exchange of notes confirming the completion by each Party of all internal procedures necessary for its entry into force, and shall continue for a period of six years from January 1, 2014.



Accept, Excellency, the renewed assurances of my highest consideration.

For the Secretary of State:

*Kemi A. Jones.*

**2013 POST SEASON REPORT**  
**UNITED STATES SALMON FISHERIES**  
**Of RELEVANCE TO THE PACIFIC SALMON TREATY**

Report Submitted to the Pacific Salmon Commission  
By the United States Section

January, 2014

## TABLE OF CONTENTS

I.	Preliminary 2013 Southeast Alaska Fisheries.....	3
	a. Northern Boundary Area	
	b. Transboundary Area Fisheries	
	c. Chinook Fishery	
	d. Coho Fishery	
II.	Preliminary 2013 Chinook and Coho Salmon Catches in Washington and Oregon Fisheries.....	38
III.	Preliminary Review of 2013 Washington Chum Fisheries.....	55
IV.	Preliminary Review of 2013 U.S. Fraser River Sockeye And Pink Fisheries.....	58

# **POST SEASON REPORT**

## **PRELIMINARY 2013 SOUTHEAST ALASKA FISHERIES**

### **NORTHERN BOUNDARY AREA FISHERIES**

#### ***District 104 Purse Seine Fishery***

The 2009 Pacific Salmon Treaty (PST) Agreement calls for abundance based management of the District 104 purse seine fishery. The agreement allows the District 104 purse seine fishery to harvest 2.45 percent of the Annual Allowable Harvest (AAH) of Nass and Skeena sockeye salmon prior to Alaska Department of Fish and Game (ADFG) statistical week 31 (referred to as the treaty period). The AAH is calculated as the total run of Nass and Skeena sockeye salmon minus either the escapement requirement of 1.1 million (200,000 Nass and 900,000 Skeena) or the actual in-river escapement, whichever is less.

The District 104 purse seine fishery opens by regulation on the first Sunday in July. In 2013, the initial opening was July 7 (week 28). The pre-week 31 fishing plan for District 104 was based on the preseason Canadian Department of Fisheries and Oceans (DFO) forecast returns of approximately 1,152,000 Nass and Skeena sockeye salmon. In the 2013 Treaty period (Alaska statistical weeks 28-30), 13,102 sockeye were harvested during one 12-hour openings in Week 28; one 12-hour openings in Week 29, and one 12-hour and one 10-hour opening in week 30 (Table 1). A total of 36 purse seine vessels fished at some time in the district during the Treaty period. In past years 60% to 80% of Treaty-period sockeye salmon have been of Nass and Skeena origin, therefore we would anticipate between 7,900 and 10,500 Nass and Skeena sockeye may have been harvested in the District 104 purse seine fishery during the 2013 Treaty period. The final number of Nass and Skeena sockeye salmon harvested, and the actual catch by stock, will not be available until catch, escapement, and stock composition estimates are finalized for the year.

In 2013, a total of 10,863,894 pink salmon, 82,882 sockeye salmon, 84,330 chum salmon, 79,224 coho salmon, and 3,116 Chinook salmon were harvested in the District 104 purse seine fishery (Table 1). The number of days that the fishery was open was just above the treaty period (1985-2012) average (Figure 1) and the number of boats fishing was below average throughout the season (Figure 2). Chinook salmon catches in the District 104 purse seine fishery were near average following the purse seine non-retention period for Chinook salmon that lasted from the beginning of the season until week 32 (Figure 3). Sockeye salmon catches were well below average throughout the season (Figure 4) and the treaty period (week 28-30) catch of 13,102 was only 13% of the 1985–2012 average. The total sockeye salmon catch of 82,882 was also well below the long-term average. Catches of coho salmon were below average in most weeks (Figures 5) and the overall harvest was 67% of the long-term average. Pink salmon catches were above average most of the season (Figure 6), while chum salmon were below average in all weeks (Figure 7).

Since the Pacific Salmon Treaty was signed in 1985, the number of hours open, boats fishing and boat-days fished in the pre-Week 31 annex period in District 104 are down 55%, 61% and 84%

respectively compared to the averages in the pre-treaty 1980-1984 period (Table 2). The total pre-week 31 Treaty-period sockeye salmon harvest is also down 46%. The seine fleet moves freely between districts as various species are harvested, so seining opportunities elsewhere affect the effort and catch in District 104.

Table 1.—Catch and effort in the Alaska District 104 purse seine fishery, 2013.

Week/ Opening	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Hours
28	7/7	0	5,152	7,921	167,731	12,023	18	12
29	7/14	0	3,250	5,565	91,632	4,426	17	12
30	7/21	0	2,602	3,208	241,387	4,084	17	12
30B	7/24	0	2,098	1,584	183,946	2,982	10	10
31	7/28	0	8,011	3,445	1,211,657	6,973	27	39
31B	8/1	0	3,397	2,768	566,063	5,600	17	39
32	8/5	0	6,052	6,264	1,037,434	9,109	28	39
32B	8/9	729	9,943	5,800	1,266,419	7,991	34	39
33	8/13	1,169	19,206	9,624	2,254,693	10,851	50	39
33B	8/17	404	8,811	7,433	1,560,575	8,268	45	39
34	8/21	587	8,310	10,330	1,251,933	6,156	48	39
35	8/25	179	3,157	4,099	613,699	3,323	33	39
35B	8/29	30	2,045	4,247	296,264	1,365	17	39
36-36B <sup>a</sup>	9/2	18	848	6,936	120,461	1,179	15	78
Permits Fished								
Weeks 28-30		0	13,102	18,278	684,696	23,515	36	46
Weeks 31-36		3,116	69,780	60,946	10,179,198	60,815	83	429
Total		3,116	82,882	79,224	10,863,894	84,330	88	475

<sup>a</sup>Opening with fewer than three permits, confidential information so data combined in catch table.

Table 2.—Fishing opportunity, effort, and sockeye salmon harvest prior to week 31 in the District 104 purse seine fishery, 1980–2013.

Year	Hours Fished	Boats Fishing	Fraction Days Fished (1d=15hrs)	Boat-Days Fished (Fraction Boats and Fraction Days)	Sockeye Harvest	Sockeye Catch per Boat-Day
1980	207	244	13.8	2,877	266,273	93
1981	132	212	8.8	1,108	185,188	167
1982	117	255	7.8	1,435	213,150	149
1983	108	241	7.2	1,211	170,306	141
1984	132	174	8.8	805	103,319	128
1985	84	141	5.6	502	100,590	200
1986	108	194	7.2	968	91,320	94
1987	90	134	6	457	72,385	158
1988	108	210	7.2	994	248,789	250
1989	84	135	5.6	438	157,566	360
1990	42	171	2.8	276	169,943	615
1991	41	134	2.7	243	98,583	406
1992	29	108	1.9	142	79,643	561
1993	45	171	3	343	163,189	476
1994	55	84	3.7	202	158,524	783
1995	58	109	3.9	218	71,376	328
1996	31	113	2.1	128	215,144	1,684
1997	56	159	3.7	409	572,942	1,402
1998	32	78	2.1	89	17,394	196
1999	30	38	2	44	7,664	174
2000	81	66	5.4	192	48,969	255
2001	50	95	3.3	182	203,090	1,115
2002	72	44	4.8	124	26,554	215
2003	52	40	3.5	97	84,742	875
2004	107	24	7.1	102	30,758	302
2005	68	38	4.5	93	35,690	382
2006	95	39	6.3	117	89,615	766
2007	50	68	3.3	136	112,135	824
2008	33	17	2.2	22	6,262	281
2009	72	38	4.8	95	15,971	168
2010	55	21	3.7	39	4,617	118
2011	84	29	5.6	77	25,280	329
2012	75	30	5.0	93	18,300	196
2013	46	36	3.1	59	13,102	222
Avg. 80–84	139	225	9	1,487	187,647	136
Avg. 85–12	63	88	4	237	101,384	474
% Change	-55%	-61%	-55%	-84%	-46%	249%

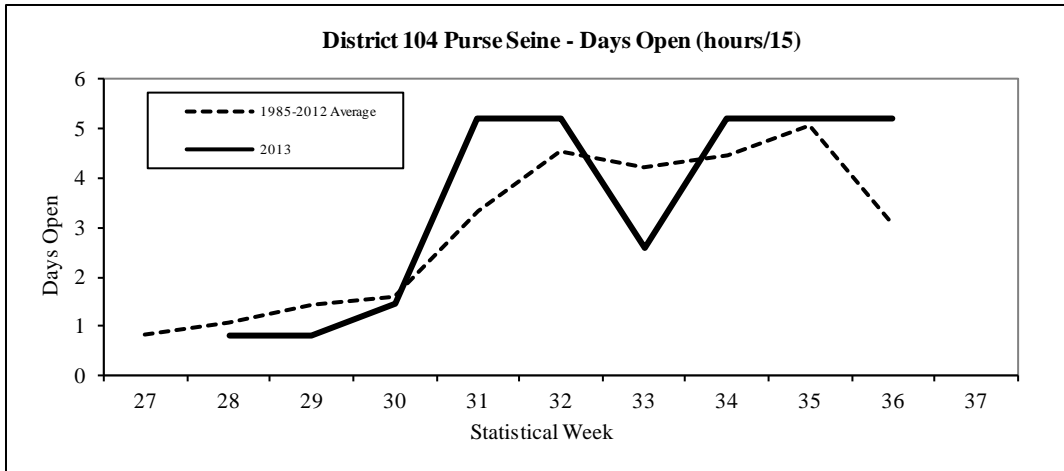


Figure 1.—Days open by week in the District 104 purse seine fishery, 2013.

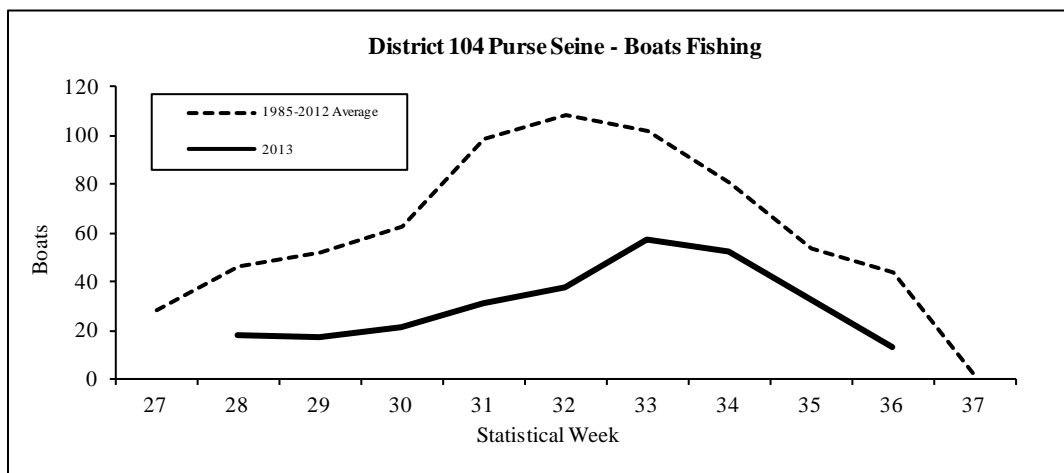


Figure 2.—Number of boats fishing by week in the District 104 purse seine fishery, 2013.

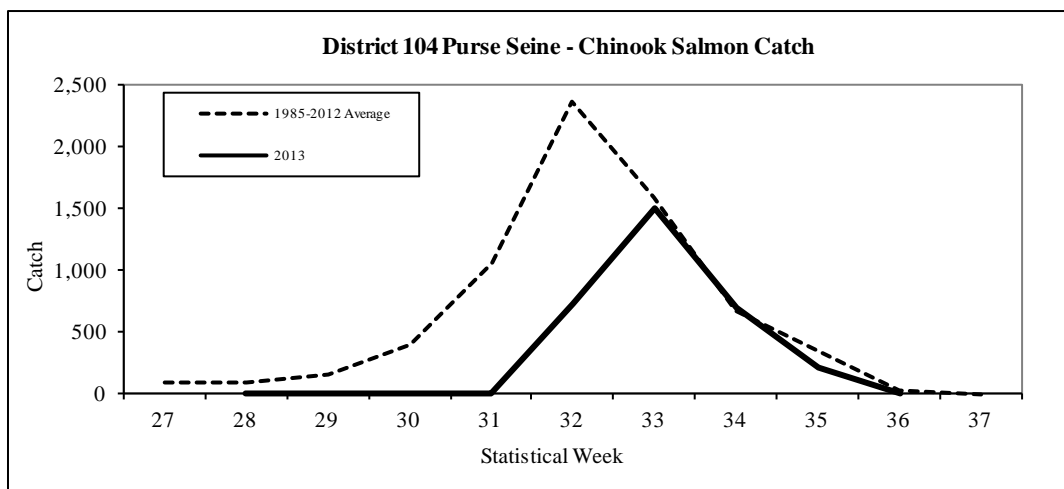


Figure 3.—Chinook salmon catch by week in the District 104 purse seine fishery, 2013.

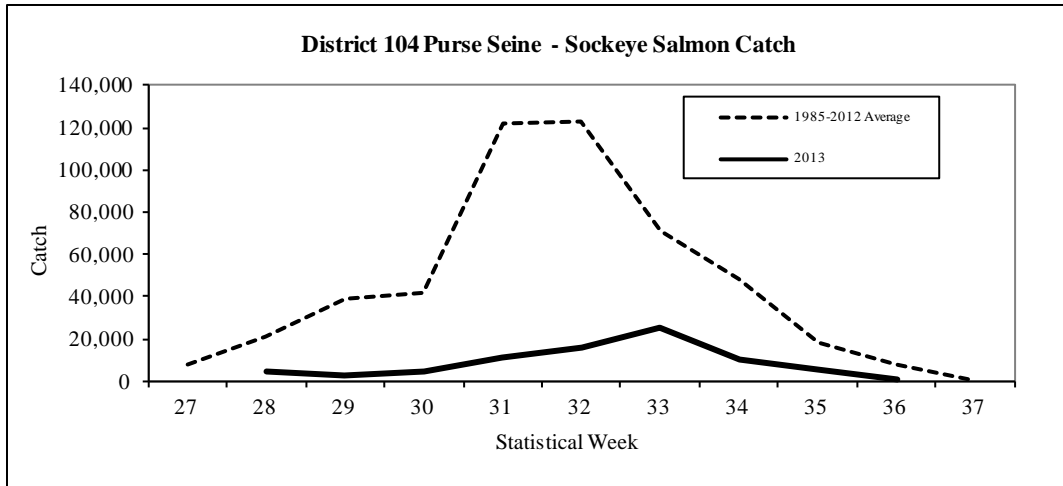


Figure 4.—Sockeye salmon catch by week in the District 104 purse seine fishery, 2013.

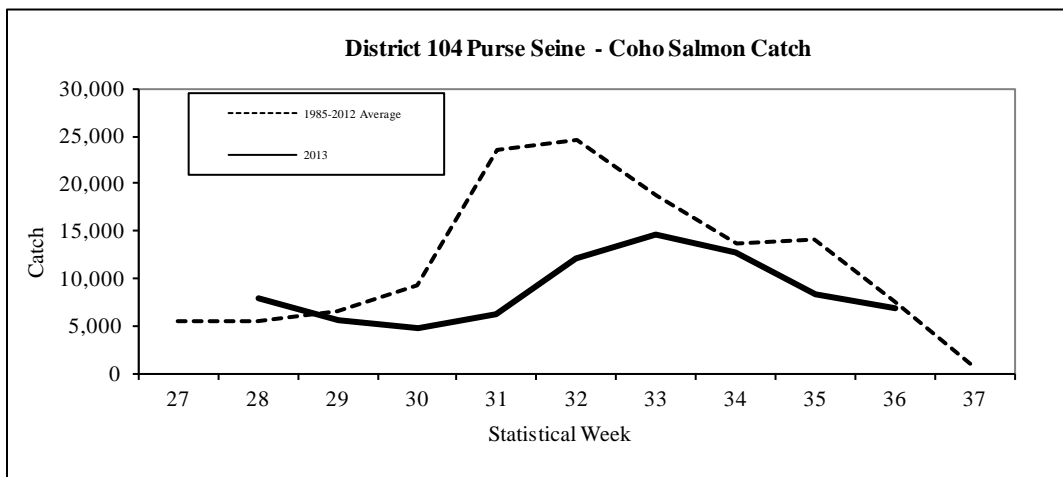


Figure 5.—Coho salmon catch by week in the District 104 purse seine fishery, 2013.

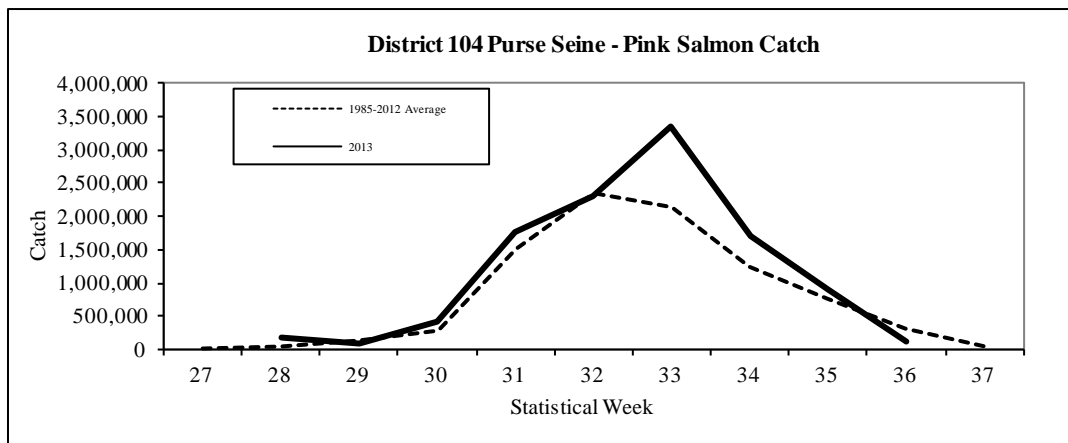


Figure 6.—Pink salmon catch by week in the District 104 purse seine fishery, 2013.



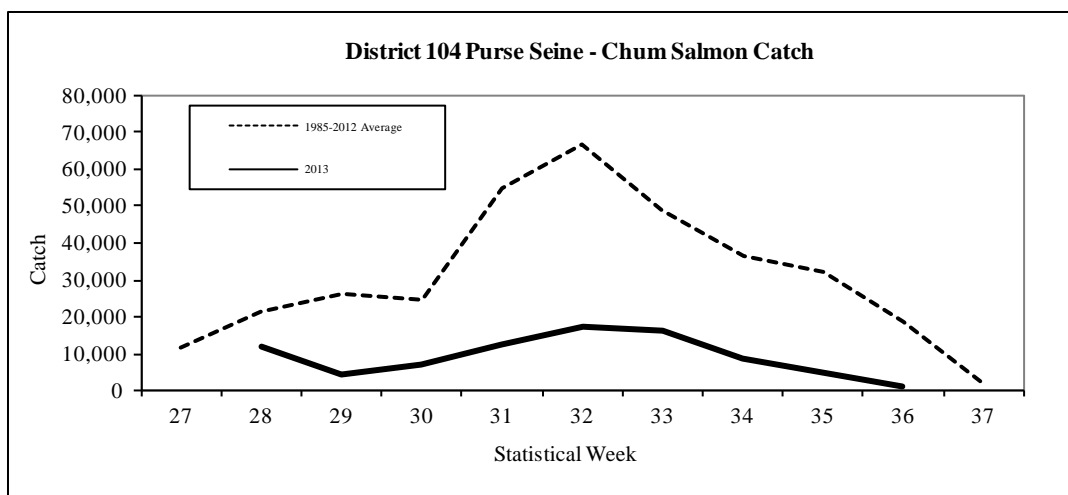


Figure 7.—Chum salmon catch by week in the District 104 purse seine fishery, 2013.

### ***District 101 Drift Gillnet Fishery***

The 2009 PST agreement calls for abundance based management of the District 101 (Tree Point) drift gillnet fishery. The agreement specifies a harvest of 13.8 percent of the AAH of the Nass River sockeye run. For the 2013 season, DFO forecast a total return of 452,000 Nass River sockeye salmon. The AAH is calculated as the total run of Nass sockeye salmon minus either the escapement requirement of 200,000 or the actual in-river escapement, whichever is less.

The District 101 drift gillnet fishery opens by regulation on the third Sunday in June, which was June 16 in 2013. During the early weeks of the fishery, management is based on the run strength of Alaska wild stock chum and sockeye salmon and on the run strength of Nass River sockeye salmon. Beginning in the third week of July, when pink salmon stocks begin to enter the fishery in large numbers, management emphasis shifts by regulation to that species. By regulation, the District 101 Pink Salmon Management Plan begins the third Sunday in July and sets gillnet fishing time in this district in relation to the District 101 purse seine fishing time. Beginning in Week 37 (September 8) management was based on the strength of wild stock fall chum and coho salmon.

The District 101 drift gillnet fishery opened Sunday June 16 (week 25) in 2013. The number of days the fishery was open was slightly above average all season (Figure 8). The number of boats fishing during weekly openings remained below average until late in the season (Figure 9). The total number of individual boats fishing during the season was 91, which was 81% of the 1985-2012 average of 113 boats. A total of 54,597 sockeye salmon were harvested, which was only 43% of the 1985-2012 average of 127,862 fish (Table 3). Catches of sockeye salmon were below treaty period averages throughout the entire season (Figure 10). The cumulative sockeye salmon harvest prior to the initiation of the PSMP in Week 29 was 34,000 fish, or about 62% of the season's total sockeye salmon harvest. The final number of Nass River sockeye harvested at Tree Point will not be available until catch, escapement, and stock composition estimates are finalized for the 2013 season. In past years approximately 70% of the District 101 gillnet sockeye harvest has been of Nass River origin, therefore we would anticipate that approximately 38,200 Nass River sockeye may have been harvested in the District 101 gillnet fishery in 2013.

Coho salmon catches were above average throughout the season, with particularly large catches in late August and September (weeks 35–39, Figure 11). Pink salmon catches were also well above average most of the season (Figure 12). Chum salmon catches were above average early in the season but fell below average beginning in mid-July (Figure 13). Chinook salmon catches were above average early in the season (Figure 14).

Table 3.—Weekly catch and effort in the Alaska District 101 commercial drift gillnet fishery, 2013.

Week	Start	Chinook	Sockeye	Coho	Pink	Chum	Boats	Hours
	Date							
25	6/16	530	9,082	723	160	9,585	57	96
26	6/23	567	12,186	1,862	4,156	26,223	70	96
27	6/30	416	7,267	2,889	32,093	34,018	60	96
28	7/7	246	5,508	2,402	72,654	53,180	68	96
29	7/14	147	6,577	2,969	67,299	31,351	65	96
30	7/21	71	5,790	4,830	82,577	14,512	57	120
31	7/28	45	5,130	3,875	133,969	14,579	55	120
32	8/4	19	1,684	3,787	100,903	7,446	51	120
33	8/11	7	662	2,625	100,143	4,066	38	120
34	8/18	2	477	6,015	61,079	7,672	41	120
35	8/25	0	154	9,296	30,218	10,855	43	120
36	9/1	4	55	12,495	5,381	6,423	45	120
37	9/8	1	16	20,380	2,612	5,802	48	96
38	9/15	2	8	17,980	196	3,804	43	96
39	9/22	2	1	9,154	1	1,593	30	96
40	9/29	3	0	4,349	0	1,045	18	96
Total		2,062	54,597	105,631	693,441	232,154	91	1,704
1985-2012 Avg.		1,490	127,862	46,437	507,607	306,636	113	1,340

Table 4.—Sockeye salmon harvest in the Alaska District 101 gillnet fishery, 1985 to 2013, and comparison of harvest and effort (boats, hours, and boat-hours) between weeks 26 and 35 when sockeye salmon are most abundant in this district.

Year	Total Sockeye Harvest	Catch and Effort between Weeks 26-35			
		Sockeye Harvest	Individual Permits Fished	Hours	Boat- Hours <sup>1</sup>
1985	173,100	159,021	153	1,032	106,209
1986	145,699	143,286	198	960	109,490
1987	107,503	106,638	170	615	64,104
1988	116,115	115,888	187	756	93,072
1989	144,936	130,024	176	1,023	117,465
1990	85,691	78,131	150	840	70,421
1991	131,492	123,508	130	984	80,064
1992	244,649	243,878	118	1,080	94,159
1993	394,098	390,299	148	1,032	102,814
1994	100,377	98,725	142	984	74,408
1995	164,294	151,131	128	1,008	82,512
1996	212,403	175,569	129	1,104	86,108
1997	169,474	152,662	128	1,008	81,672
1998	160,506	159,307	124	1,044	87,358
1999	160,028	158,268	118	1,032	80,424
2000	94,651	94,399	95	912	49,488
2001	80,041	62,129	73	1,020	46,874
2002	120,353	106,360	68	1,008	42,528
2003	105,263	96,921	68	1,104	44,008
2004	142,357	141,395	61	1,104	42,400
2005	79,725	75,875	69	1,104	40,864
2006	62,770	53,048	45	840	28,265
2007	66,822	50,642	54	1,032	33,713
2008	34,113	30,672	47	936	31,961
2009	69,859	69,325	62	1,080	43,432
2010	62,680	61,987	66	1,008	45,135
2011	88,618	87,744	84	840	47,627
2012	62,506	40,518	81	1,008	43,695
2013	54,575	45,413	91	1,104	59,437
Average 1985–2012	127,862	117,337	109	986	66,542

<sup>1</sup>Boat-hours equals the sum of all weekly estimates of boat-hours: boats fished multiplied by open hours. Boat-hours does not equal individual permits fished multiplied by total open hours.

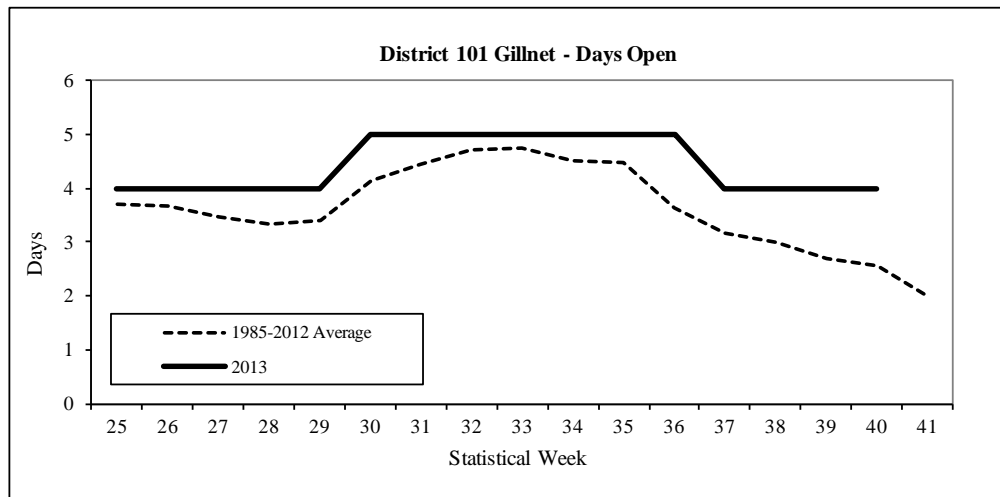


Figure 8.—Days open by week in the District 101 drift gillnet fishery, 2013.

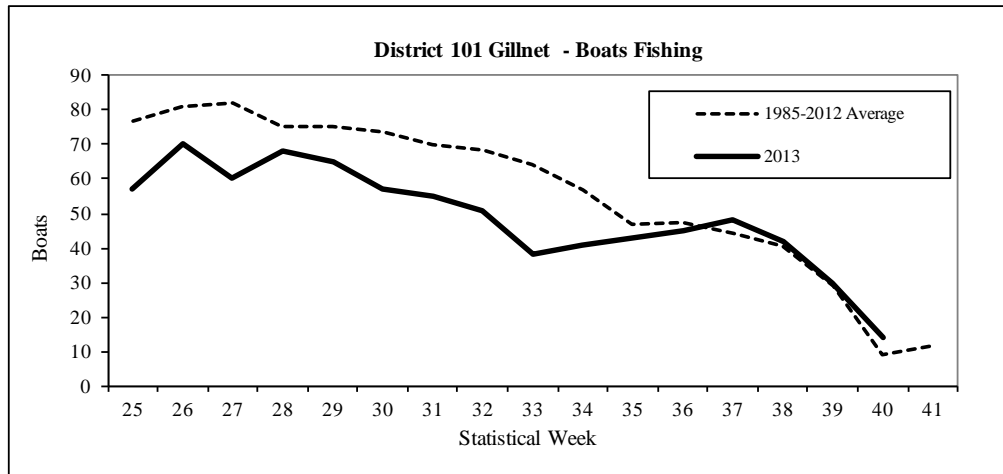


Figure 9.—Number of boats fishing by week in the District 101 drift gillnet fishery, 2013.

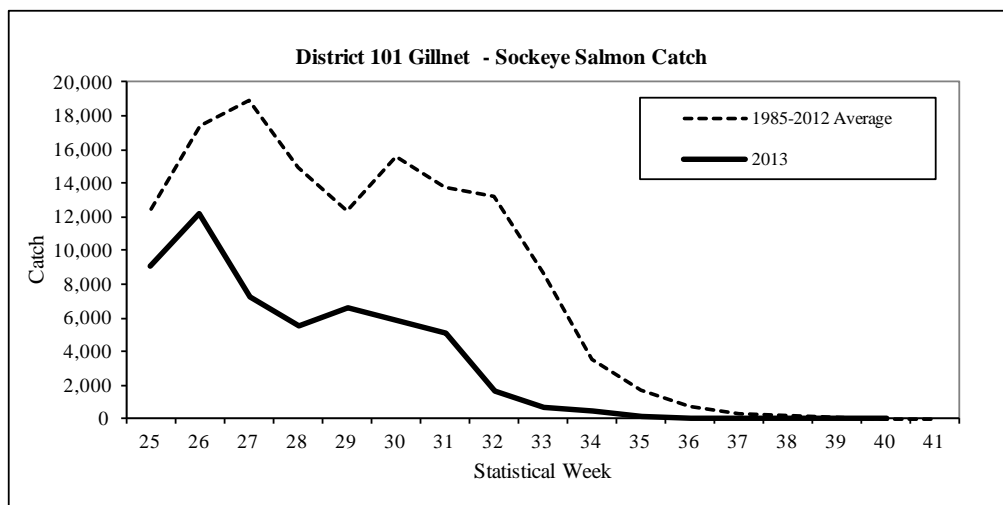


Figure 10.—Sockeye salmon catch by week in the District 101 drift gillnet fishery, 2013.

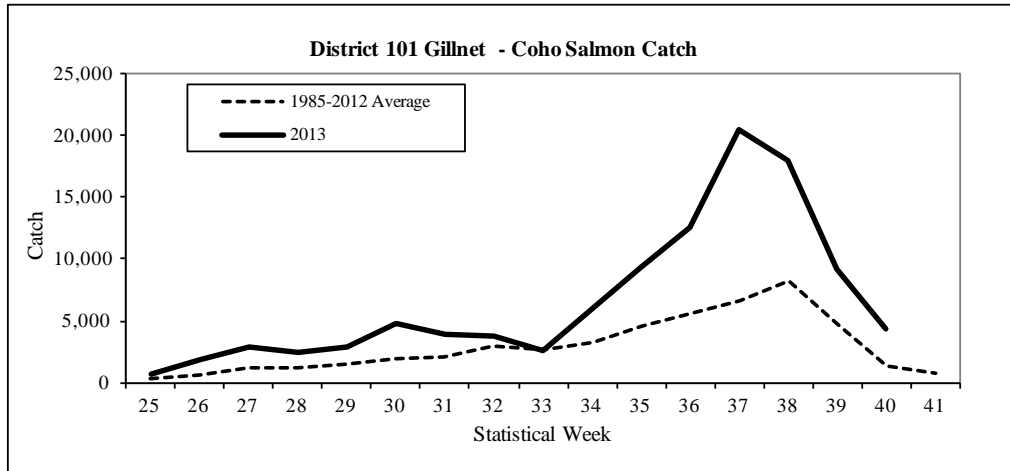


Figure 11.—Coho salmon catch by week in the District 101 drift gillnet fishery, 2013.

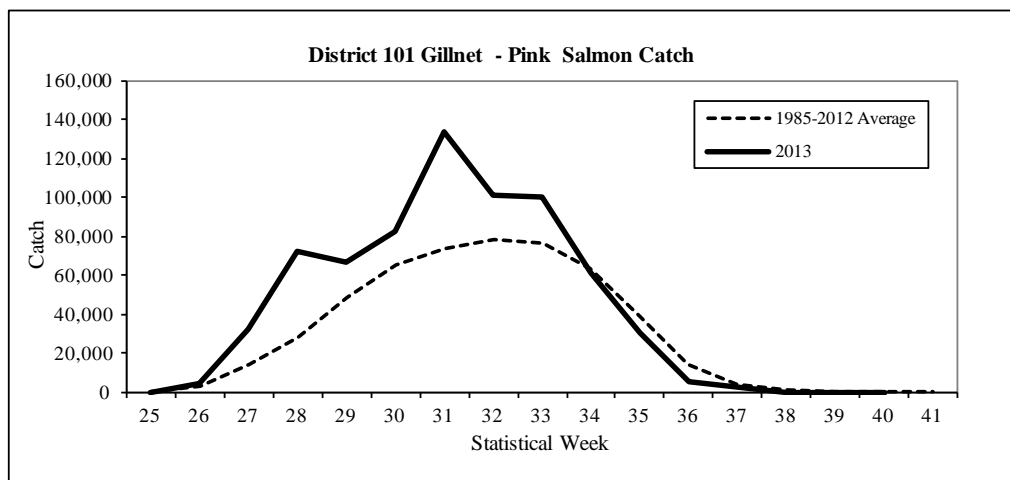


Figure 12.—Pink salmon catch by week in the District 101 drift gillnet fishery, 2013.

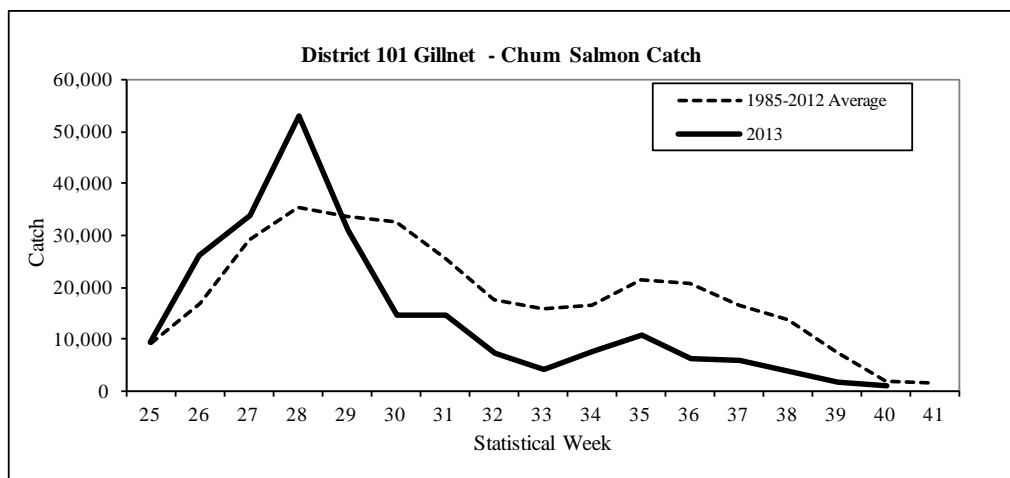


Figure 13.—Chum salmon catch by week in the District 101 drift gillnet fishery, 2013.

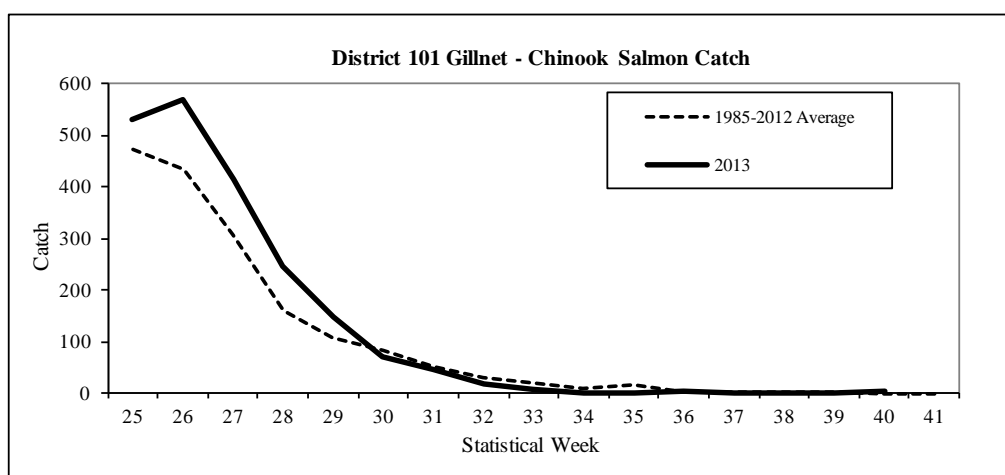


Figure 14.—Chinook salmon catch by week in the District 101 drift gillnet fishery, 2013.

### *Pink, Sockeye, and Chum Salmon Escapements*

Pink salmon returns were exceptionally strong throughout much of the region in 2013. The total 2013 Southeast Alaska pink salmon escapement index of 25.2 million index fish was the 2<sup>nd</sup> largest since 1960, and was close to doubling the recent 10-year average of 14.2 million. Biological escapement goals are in place for three subregions in Southeast Alaska and escapement goals were met or exceeded for all three subregions in 2013 (Table 5). On a finer scale, escapements met or exceeded management targets for all 15 districts in the region and for 45 of the 46 pink salmon stock groups in Southeast Alaska. The Southern Southeast Subregion includes all of the area from Sumner Strait south to Dixon Entrance (Districts 101–108). The escapement index value of 14.4 million was well above the escapement goal range of 3.0 to 8.0 million index fish and was the largest index value since 1960. The pink salmon harvest of 53.5 million in the Southern Southeast Subregion was the second highest since 1960 and the overall Southeast Alaska pink salmon harvest of 95 million fish was a new all-time record.

Table 5.—Southeast Alaska 2013 pink salmon escapement indices and biological escapement goals by subregion (in millions). The total is slightly more than the sum of all three subregions due to rounding of numbers.

Subregion	2013 Pink Salmon Index	Biological Escapement Goal	
		Lower Bound	Upper Bound
Southern Southeast	14.4	3.0	8.0
Northern Southeast Inside	5.4	2.5	6.0
Northern Southeast Outside	5.3	0.75	2.50
Total	25.2		

Sockeye salmon returns throughout Southeast Alaska were mixed in 2013, with most southern stocks performing poorly. Escapement targets were met for 8 of the 13 sockeye salmon systems in Southeast Alaska with formal escapement goals. The Hugh Smith Lake adult sockeye salmon

escapement was 5,950, which was below the optimal escapement goal range of 8,000 to 18,000 adult sockeye salmon. McDonald Lake sockeye salmon were recently de-listed as a “stock of management concern” at the 2012 Alaska Board of Fisheries meeting, based primarily on improved escapements since 2009. Escapements had been within the goal range from 2010 to 2012, but came in well below the lower bound of the sustainable escapement goal of 55,000 to 120,000 sockeye salmon in 2013. Based on the expanded peak foot survey count, the escapement of sockeye salmon into McDonald Lake was estimated to be 15,400 fish, which was the lowest escapement on record for that system.

For summer-run chum salmon, lower bound sustainable escapement goals were met for two of the three subregions in Southeast Alaska. In southern Southeast Alaska, runs are broken into summer and fall runs. The Southern Southeast chum salmon stock group is composed of an aggregate of 13 summer-run chum salmon streams on the inner islands and mainland of southern Southeast Alaska, from Sumner Strait south to Dixon entrance, with a sustainable escapement goal of 54,000 index spawners (based on the aggregate peak survey to all 13 streams). Summer chum salmon escapements were well below average at some of the smaller index streams in southern Southeast Alaska, but near average at most of the larger mainland systems. The index of 84,000 in 2013 was the third consecutive index value above goal, following a series of poor escapements from 2008 to 2010 (Figure 15).

Fall chum salmon runs in Cholmondeley Sound, Prince of Wales Island, were weak and the escapement goal was not met in 2013. Cholmondeley Sound is the only area in southern Southeast Alaska with a formal escapement goal for fall chum salmon. Fall chum salmon runs are monitored in Cholmondeley Sound through aerial surveys at Disappearance and Lagoon creeks. The escapement index of 13,000 was well below the lower bound of the sustainable escapement goal range of 30,000 to 48,000 index spawners (based on the aggregate peak survey to both streams; Figure 16).

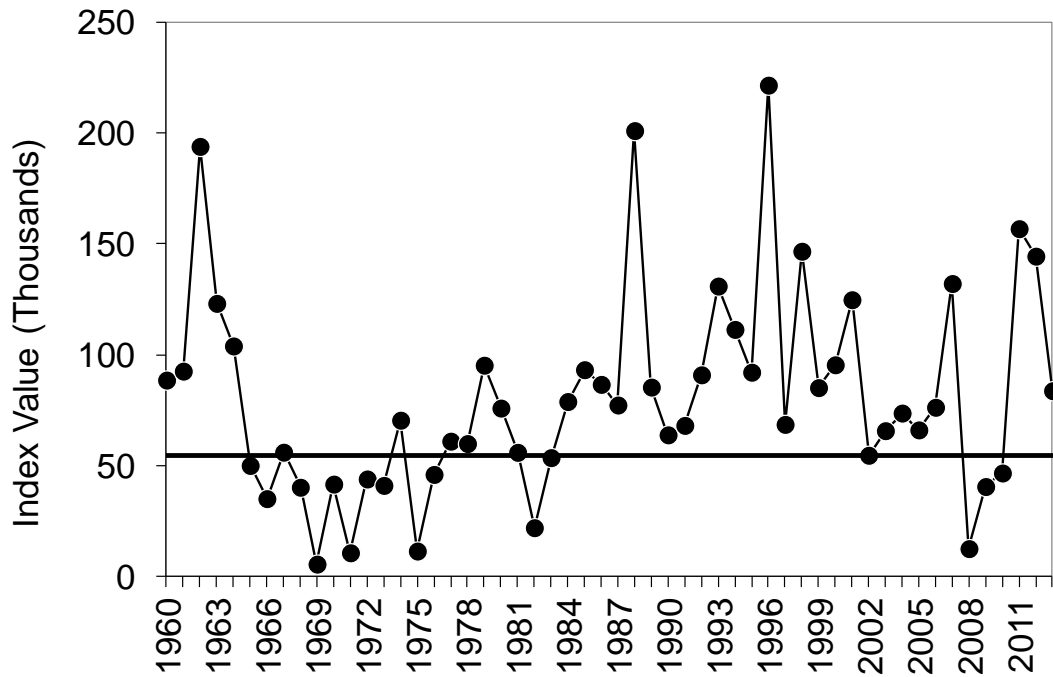


Figure 15.—Observed escapement index value by year (solid circles) and the sustainable escapement goal threshold of 54,000 index spawners (horizontal line) for wild summer-run chum salmon in the Southern Southeast Subregion, 1980–2013.

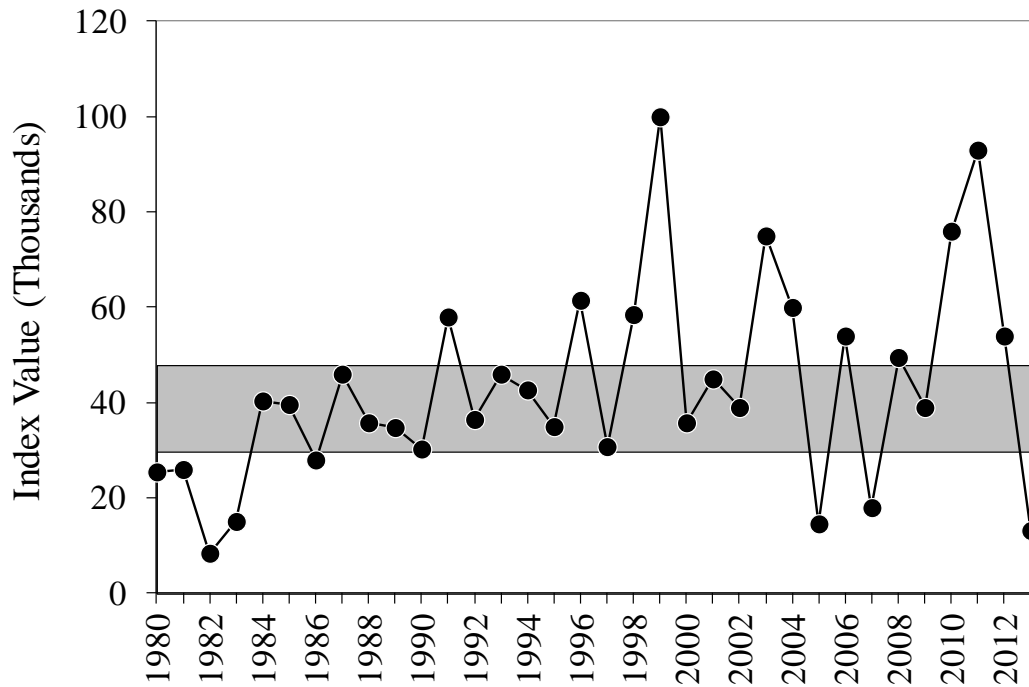


Figure 16.—Observed escapement index value by year (solid circles) and the sustainable escapement goal range of 30,000 to 48,000 index spawners (shaded area) for Cholmondeley Sound fall-run chum salmon, 1980–2013.



## TRANSBOUNDARY AREA FISHERIES

### *Stikine River Area Fisheries*

The initial preseason forecast for Chinook salmon returning to the Stikine River was approximately 22,400 fish, which was not large enough to allow for directed Chinook salmon fisheries in districts 106 and 108. Terminal run projections through mid-June ranged from 20,400 to 24,600 fish. As a result, directed commercial fisheries in districts 106 and 108 closed until the beginning of the traditional sockeye salmon fishing season on June 17, 2013.

The 2013 Stikine River sockeye salmon return was expected to be below the previous 10-year average. The preliminary forecast for total return to the Stikine River was 136,000 sockeye salmon. The 2013 forecast included approximately 60,600 Tahltan (45%), 28,400 enhanced Tuya (21%), and 46,800 wild mainstem (35%) sockeye salmon. Due to the near identical return timing of the Tahltan Lake and Tuya Lake stocks, any open fishing periods in District 108, and to a lesser extent in District 106, are determined by the inseason abundance estimate of the Tahltan Lake return. Typically, the Tahltan Lake and Tuya Lake sockeye salmon run timing peaks in statistical week 27 (June 30–July 6) through the districts 106 and 108 fisheries. During an average Tahltan Lake run significant numbers of sockeye salmon could be present as early as statistical week 24 (June 9–15) and as late as statistical week 31 (July 28–August 3). The 2013 returns of local area sockeye salmon stocks were expected to be average.

The District 106 and 108 drift gillnet fishery opened for an initial two-day opening on Monday, June 17 (week 25). Surveys of the gillnet fleet did not indicate an abundance of sockeye salmon significantly above the preseason forecast and no additional fishing time occurred. The updated assessment for Chinook salmon returning to the Stikine River was 23,000 large adults, and the escapement was expected to be within the goal range of 14,000 to 28,000 fish. The fisheries opened for two days on June 24 (week 26). Surveys of the fleet indicated above average harvest and below average effort, so a 24-hour extension occurred. The District 6 and 8 drift gillnet fisheries continued to open for at least three days weekly through late July (Figures 17 and 24). Management emphasis switched to pink salmon in late July and openings were generally four or five days weekly through August (Figures 17 and 24). In late August, management focus switched to coho salmon and the fisheries were open for 3–4 days weekly through the remainder of the fisheries. The number of boats participating in the fisheries was below average early in the season and near average from late July (week 30) through the end of the season (Figure 18 and 25).

During the 2013 season, 474,551 pink salmon, 49,223 sockeye salmon, 94,260 chum salmon, 160,659 coho salmon, and 2,202 Chinook salmon were harvested in the District 106 drift gillnet fishery (Table 6). Although there were no directed Chinook salmon fisheries early in the season, catches were generally above average from mid-June to early August (Figure 19). Sockeye salmon catches were well below average throughout the season (Figure 20) and the total sockeye salmon catch of 49,223 fish was only about half of the recent ten-year average. Catches of coho salmon were above average in most weeks, and the overall harvest exceeded the recent ten-year average of 134,000 fish (Figures 21). Pink salmon catches were also well above average

throughout the season (Figure 22), and the overall harvest was the largest since 1999. Chum salmon catches were below average in nearly all weeks (Figure 23).

In the District 108 drift gillnet fishery, 116,026 pink salmon, 20,609 sockeye salmon, 103,365 chum salmon, 43,669 coho salmon, and 10,817 Chinook salmon were harvested in 2013 (Table 7). Although there were no directed Chinook salmon fisheries early in the season, catches were above average from mid-June to early August (Figure 26). Sockeye salmon catches were well below average throughout the season (Figure 27) and the total sockeye salmon catch of 20,609 fish was only 37% of the recent ten-year average. Catches of coho salmon were well above average from late July to early September, and the overall harvest exceeded the recent ten-year average of 31,000 fish (Table 7, Figure 28). Pink salmon catches were also well above average most of the season and the overall harvest was more than double the recent ten-year average (Figure 29). Chum salmon catches were below average in nearly all weeks of the fishery (Figure 30).

Table 6.—Weekly salmon catch in the Alaskan District 106 commercial drift gillnet fisheries, 2013. Catches do not include Blind Slough terminal area harvests.

Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Days	Boat Days
25	16-Jun	515	4,211	2,711	1,044	3,369	36	2	72
26	23-Jun	180	6,013	3,611	3,923	4,160	41	3	123
27	30-Jun	433	9,173	8,014	20,961	17,091	35	4	140
28	7-Jul	283	8,514	8,155	13,990	11,856	45	3	135
29	14-Jul	366	9,360	8,616	29,540	18,751	51	3	153
30	21-Jul	148	5,186	6,596	28,349	10,324	63	3	189
31	28-Jul	152	3,876	9,825	80,114	14,773	63	4	252
32	4-Aug	54	1,432	8,335	66,402	3,911	69	4	276
33	11-Aug	16	808	11,379	94,250	4,120	60	5	300
34	18-Aug	4	408	11,962	89,598	1,989	63	5	315
35	25-Aug	13	159	14,060	32,882	1,788	59	5	295
36	1-Sep	6	50	17,004	11,363	749	70	4	280
37	8-Sep	10	21	27,911	1,997	703	86	4	344
38	15-Sep	17	9	16,849	133	457	61	4	244
39	22-Sep	5	1	4,232	5	124	32	4	128
40-41 <sup>a</sup>	29-Sep	0	2	1,399	0	95	11	5	31
Total		2,202	49,223	160,659	474,551	94,260	146	62	3,276
2003-2012 Average		1,991	97,452	134,036	272,101	192,618	155	48	2,746
2013 as % of Average		111%	51%	120%	174%	49%	94%	129%	119%

<sup>a</sup>Opening with fewer than three permits, confidential information so data combined in catch table.

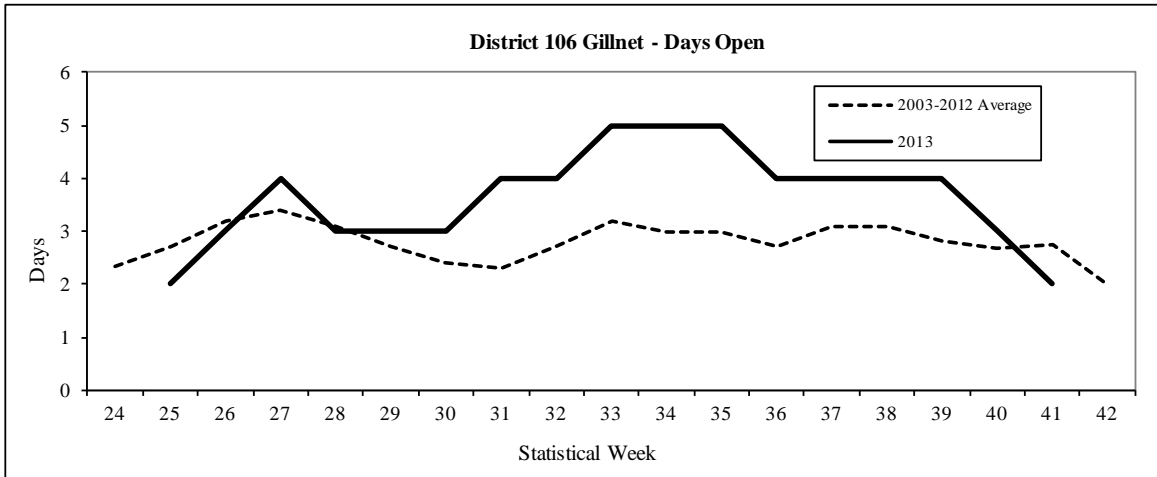


Figure 17.— Days open by week in the District 106 drift gillnet fishery, 2013.

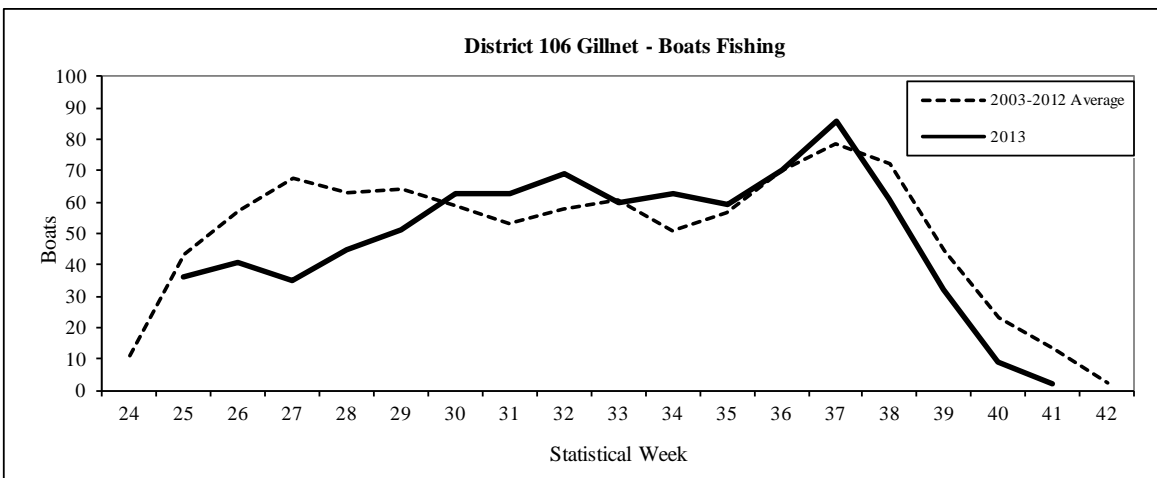


Figure 18.—Number of boats fishing by week in the District 106 drift gillnet fishery, 2013.

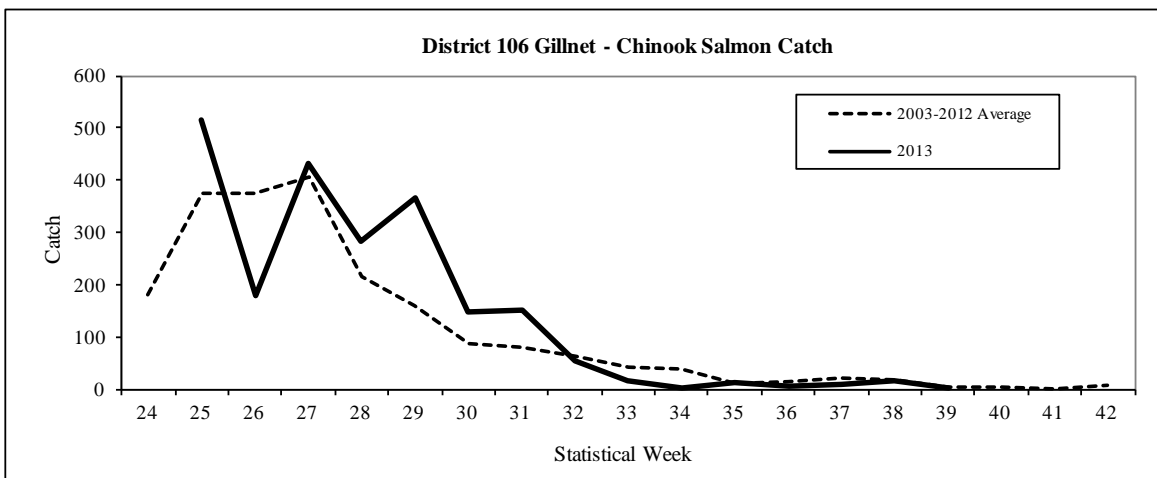


Figure 19.—Chinook salmon catch by week in the District 106 drift gillnet fishery, 2013.

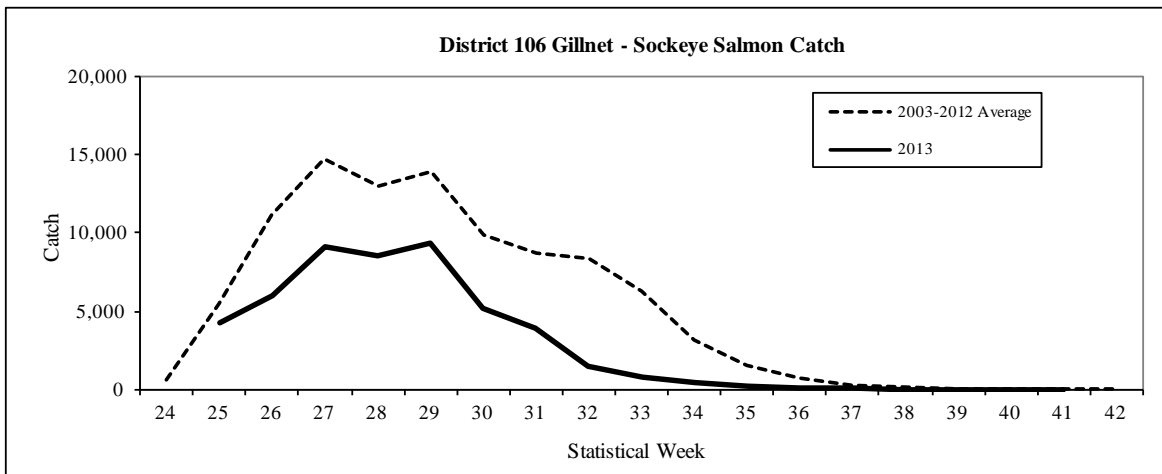


Figure 20.—Sockeye salmon catch by week in the District 106 drift gillnet fishery, 2013.

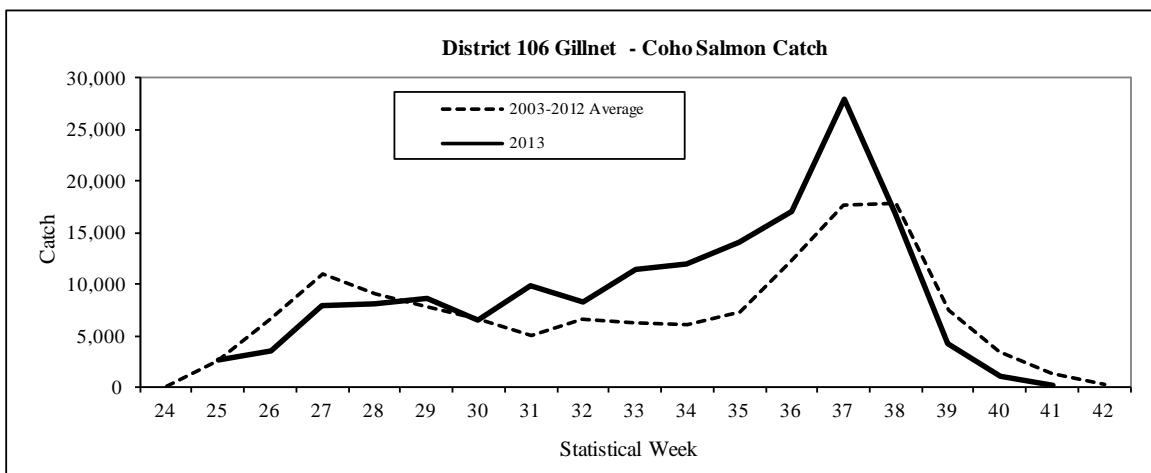


Figure 21.—Coho salmon catch by week in the District 106 drift gillnet fishery, 2013.

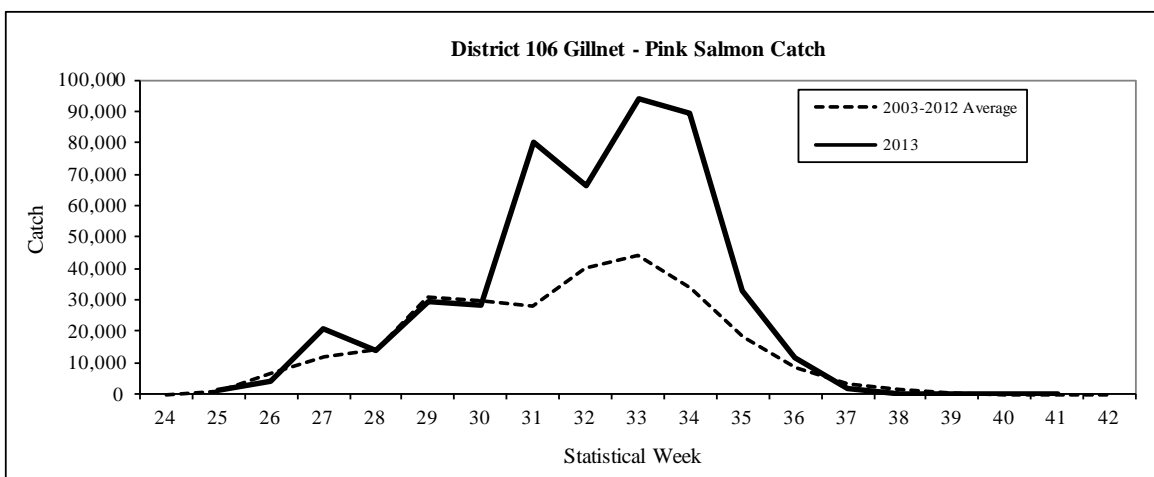


Figure 22.—Pink salmon catch by week in the District 106 drift gillnet fishery, 2013.

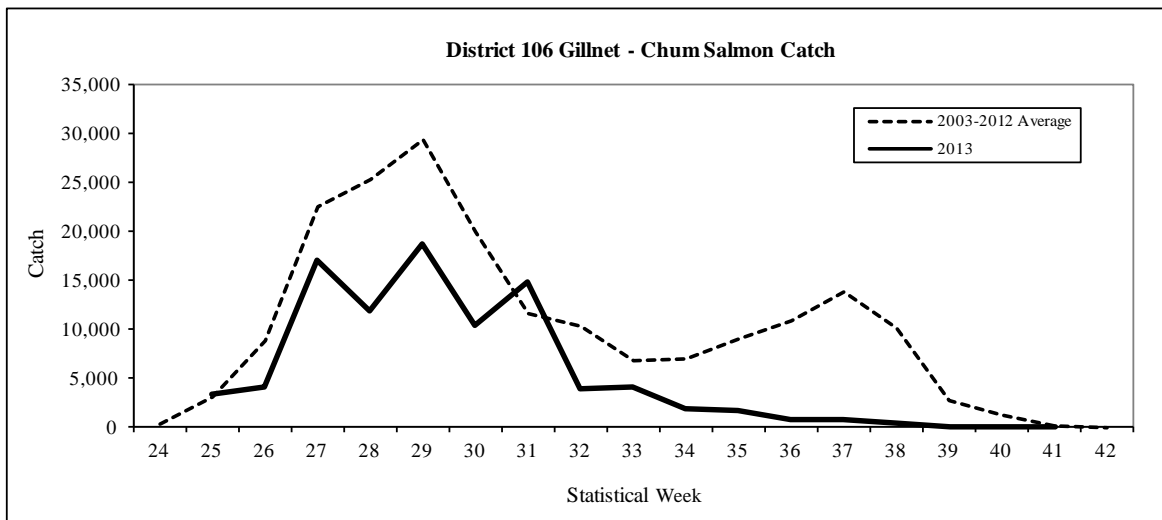


Figure 23.—Chum salmon catch by week in the District 106 drift gillnet fishery, 2013.

Table 7.—Weekly salmon catch and effort in the Alaskan District 108 directed sockeye salmon commercial drift gillnet fishery, 2013<sup>a</sup>.

Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Days	Boat Days
25	16-Jun	3,076	1,832	192	1	145	51	2	102
26	23-Jun	3793	5238	423	49	517	44	3	132
27	30-Jun	2,150	4,596	404	254	1,915	25	4	100
28	7-Jul	976	2,571	438	1,621	6,785	28	3	84
29	14-Jul	414	2,966	515	4,176	23,553	38	3	114
30	21-Jul	136	1,562	787	5,043	23,563	59	3	177
31	28-Jul	120	879	2,622	32,882	26,583	65	4	260
32	4-Aug	49	523	4,008	37,977	9,373	55	4	220
33	11-Aug	29	295	5,219	25,160	8,850	53	5	265
34	18-Aug	18	99	5,588	7,199	1,124	49	5	245
35	25-Aug	35	35	6,499	1,082	683	42	5	210
36	1-Sep	15	11	7,990	488	173	43	4	172
37	8-Sep	2	2	4,077	84	63	30	4	120
38	15-Sep	3	0	3,359	10	18	26	4	104
39	22-Sep	0	0	412	0	1	5	4	20
40	29-Sep	1	0	1,136	0	19	3	3	9
Total		10,817	20,609	43,669	116,026	103,365	127	60	2,334
2003-2012 Average		11,532	55,543	31,062	48,476	147,233	144	54	2,523
2013 as % of Average		94%	37%	141%	239%	70%	88%	111%	92%

<sup>a</sup> The 2013 District 108 drift gillnet catch and effort, as well as the 2003-2012 averages, are for the directed sockeye salmon portion of the fishery only. There was no directed Chinook salmon fishery in 2013.

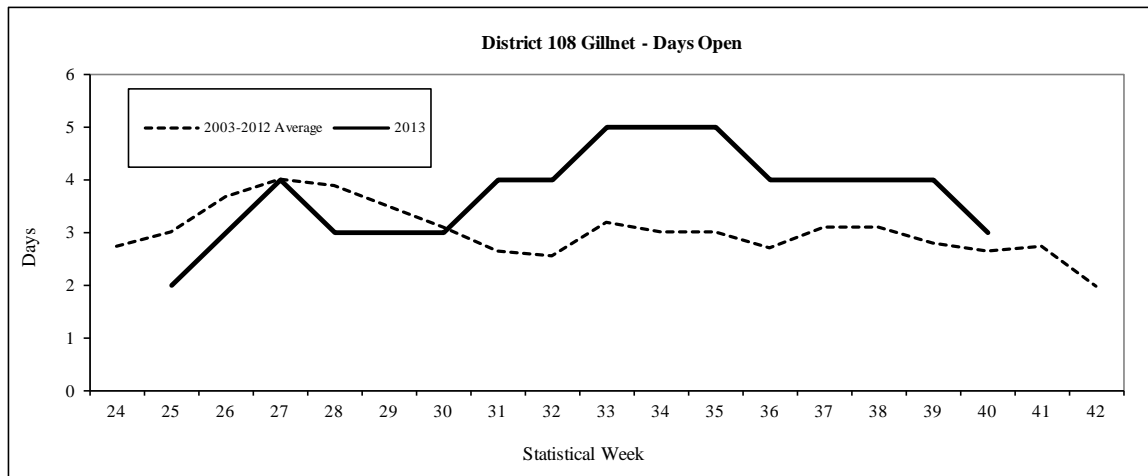


Figure 24.—Days open by week in the District 108 drift gillnet fishery, 2013.

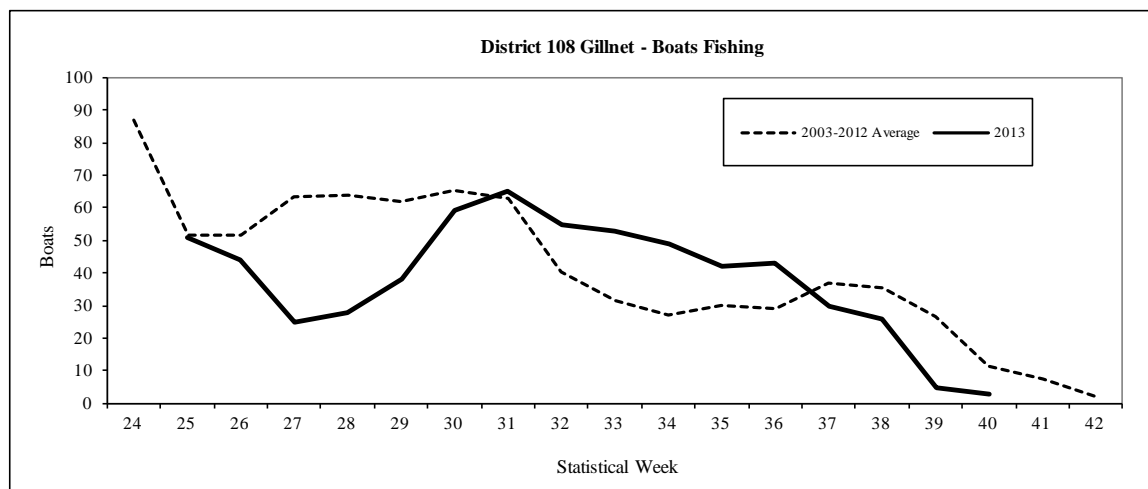


Figure 25.—Number of boats fishing by week in the District 108 drift gillnet fishery, 2013.

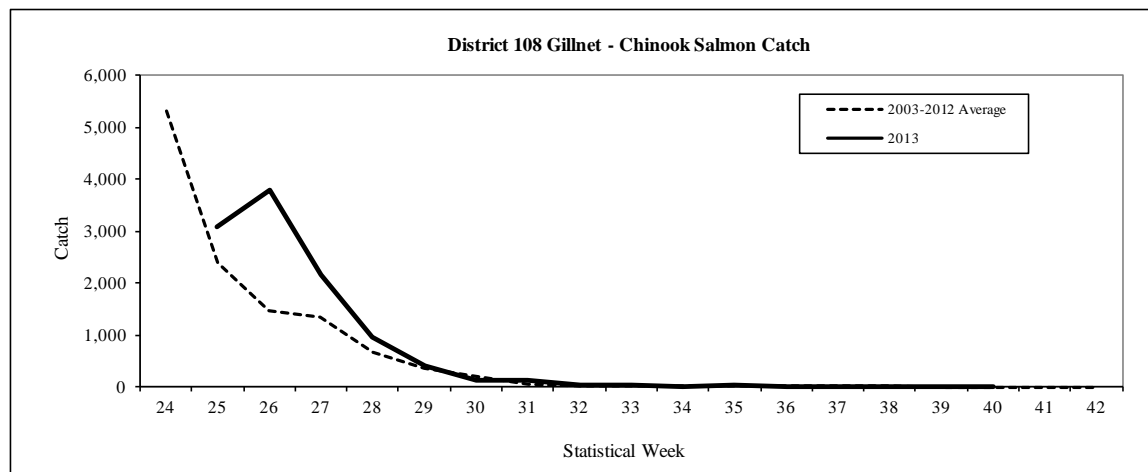


Figure 26.—Chinook salmon catch by week in the District 108 drift gillnet fishery, 2013.

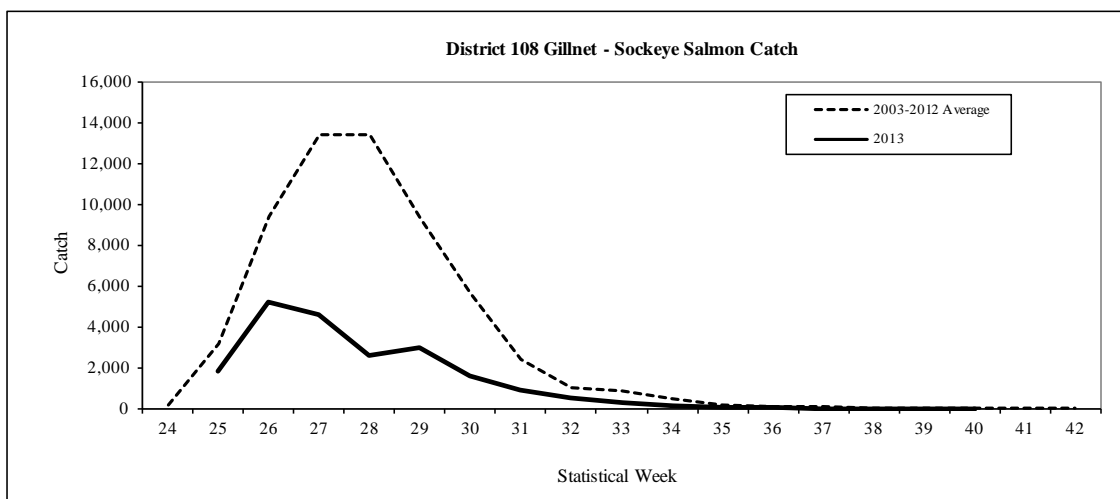


Figure 27.—Sockeye salmon catch by week in the District 108 drift gillnet fishery, 2013.

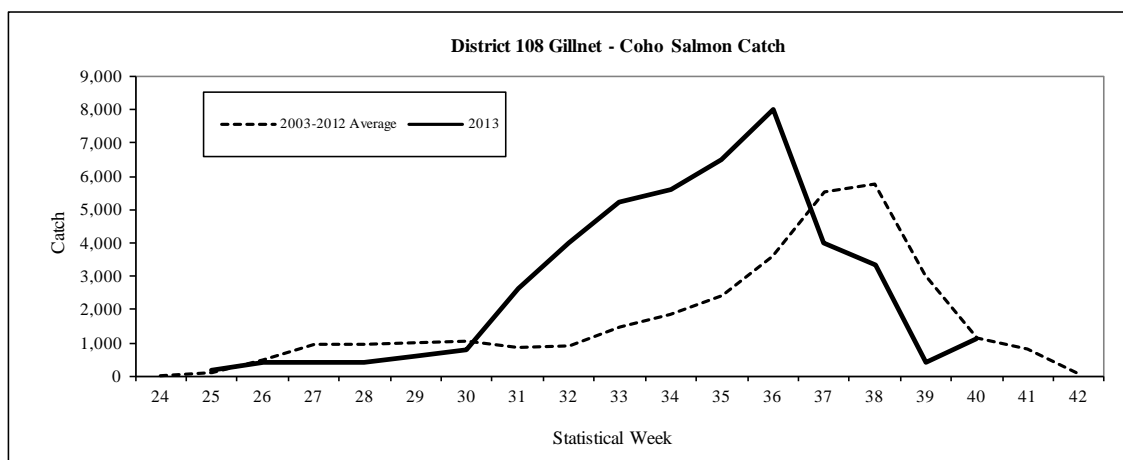


Figure 28.—Coho salmon catch by week in the District 108 drift gillnet fishery, 2013.

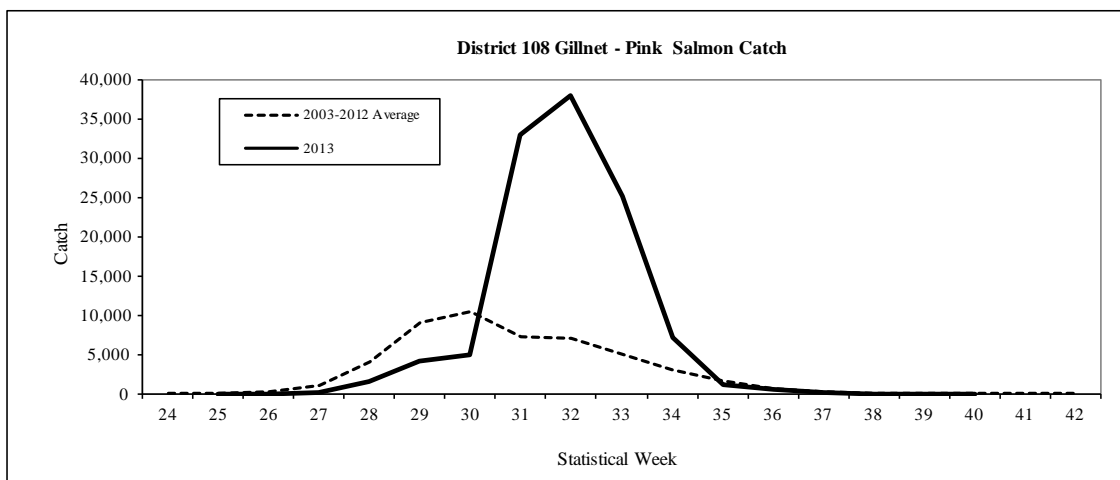


Figure 29.—Pink salmon catch by week in the District 108 drift gillnet fishery, 2013.

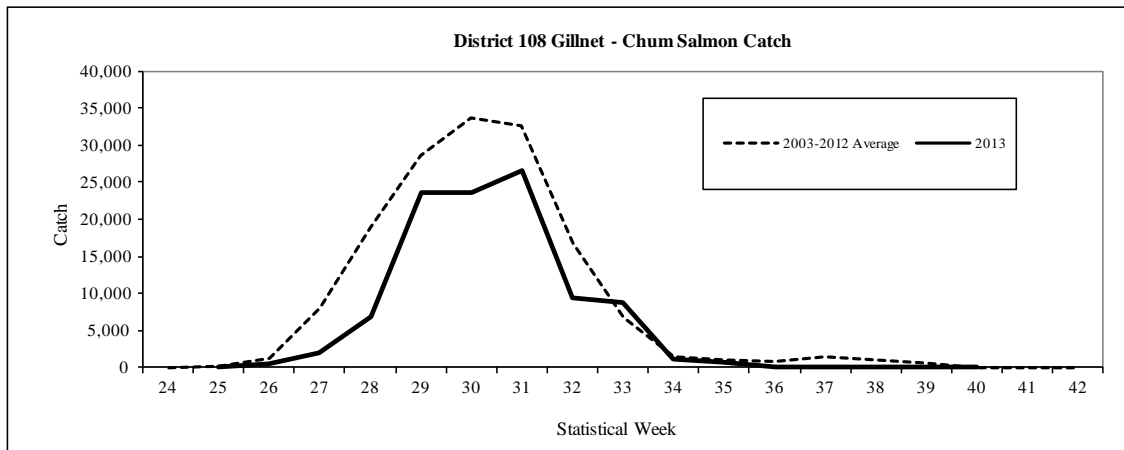


Figure 30.—Chum salmon catch by week in the District 108 drift gillnet fishery, 2013.

*The weekly forecasts of run size and total allowable catch for Stikine River sockeye salmon as determined in-season by the Stikine Management Model, as well as the preliminary post season Stikine River sockeye salmon run reconstruction, were not available at the time this report was submitted.*

### ***Taku River Area Fisheries***

The escapement goal range for large Taku River Chinook salmon is 19,000 to 36,000 fish with a point goal of 25,500 fish. The PST established base level catches of 1,500 and 3,500 large Chinook salmon for Canada and the U.S., respectively, that reflect the average harvests by each country between 1985 and 2003. In years of high abundance, directed fisheries can be implemented to harvest runs in excess of escapement needs. The 2013 preseason terminal run forecast for the Taku River was 18,700 large adult Chinook salmon, which did not allow for any directed Chinook salmon fisheries in District 111.

The sockeye salmon return to the Taku River in 2013 was expected to be approximately 255,000, based on the average of Canadian stock-recruit and sibling forecasts. Douglas Island Pink and Chum, Inc. (DIPAC) forecast 240,000 enhanced sockeye salmon returning to Port Snettisham. For chum salmon, DIPAC forecast a return of 687 thousand fish to Gastineau Channel and Limestone Inlet, which was below the recent average.

The traditional drift gillnet fishery in District 111 began on Sunday, June 16, 2013 (week 25). The initial drift gillnet opening of the season in District 111 was for two days with no possibility of time extension, due to the need for Taku River Chinook salmon conservation. A six-inch maximum mesh restriction was in place and the open area was well off the Taku River flats to pass more king salmon through the fishery. Effort for the opening was 27 boats, which was significantly below the ten-year average of 44 boats. The sockeye salmon catch was near the recent ten-year average, but chum salmon catch rates were well above average, with a harvest



9,400 fish (Table 8; Figures 34 and 37). A total of 357 Chinook salmon were harvested, which was below average for the week (Figure 33).

From late June through late July (weeks 26–31) effort in the District 111 drift gillnet fishery was above average, with a peak of 162 boats fishing in week 29 (Figure 32). Catches of sockeye salmon were well above average through late July and the catch of 36,700 fish in week 29 was nearly three times the recent ten-year average (Figure 34). Enhanced Speel Arm sockeye salmon made up a significant proportion of the total harvest in District 111 throughout late July. Chum salmon catches also greatly exceeded recent averages and approximately 700,000 fish were harvested from late June to late July (Figure 37). Most of the summer-run chum salmon harvest in District 111 consists of hatchery fish returning to the Douglas Island Pink and Chum (DIPAC) hatchery in Gastineau Channel and to the DIPAC remote release site at Limestone Inlet. Chinook salmon catches were near average through the tail end of the run and few fish were caught after mid-July (Figure 33). Pink salmon catches were below average through mid-July, but increased to above average levels in late July (Figure 36).

During August (weeks 32–35) overall effort in the fishery was near average, with four days of fishing each week, but below average numbers of boats participating (Figures 31 and 32). Early in August, a push of sockeye salmon through the Speel Lake weir satisfied the lower bound of the 4,000-13,000 sockeye salmon escapement goal range, allowing an area extension into Port Snettisham and the Speel Arm SHA, and a 24-hour extension in District 111 waters south of Circle Point. The Speel Arm SHA and Port Snettisham opened at 6:00 am Tuesday, August 6, drawing a fleet of 110 boats from nearby districts, which harvested an estimated 50,000 Snettisham Hatchery origin sockeye salmon. The catch of sockeye salmon in the traditional fishing area in District 111 was small as the majority of the fleet fished in the Speel Arm SHA. Taku River wild sockeye salmon had largely passed through the fishery by August (Figure 34). Catches of coho salmon increased rapidly in early August and catches were well above average in most weeks through late September (Figure 35). Pink salmon catches dropped sharply after an above average peak catch in late July (week 31) and were below average in most weeks for the remainder of the season. Chum salmon harvest dropped quickly in August with catches below the recent ten-year average in many of the remaining weeks of the fishery (Figure 37).

The total 2013 sockeye salmon harvest of 138,474 was 111% of the recent ten-year (2003-2012) average. Peak catches of sockeye salmon occurred in weeks 28 and 29 (early to mid-July), which was several weeks earlier than average over the past ten years (Figure 34). The total 2013 coho salmon harvest of 51,022 fish was 142% of the recent ten-year average (Figure 35). Approximately 81% of the coho salmon were harvested in Taku Inlet, which was right at the ten-year average, and 19% were harvested from Stephens Passage. Coho stocks harvested in District 111 include runs to the Taku River, Port Snettisham, Stephens Passage, and local Juneau area streams as well as Alaskan hatcheries.

The total catch of 725,604 chum salmon was 152% of the recent ten-year (2003-2012) average, and was comprised almost entirely of summer run fish (Figure 37). The summer chum run is considered to last through mid-August (week 33) and is comprised mostly of domestic hatchery fish and small numbers of wild stocks. Chum salmon returning both to DIPAC hatcheries in Gastineau Channel and to the DIPAC remote release site at Limestone Inlet contributed a major

portion of the harvest, but quantitative contribution estimates are not available. Approximately 54% of the District 111 chum harvest was taken in Taku Inlet, and 46% in Stephens Passage. The harvest of 5,091 fall chum salmon (i.e. chum salmon caught after week 33) was 118% of the recent ten-year (2003-2012) average. Most of these chums are probably of wild Taku and Whiting River origin. Chum salmon escapement numbers to the Taku River are unknown; however, the numbers of fall chum passing through the fish wheels at Canyon Island were used as an index of escapement. The index of 269 chum salmon was 144% of the 2003-2012 average through 9 September. The Canyon Island fish wheel project ceased operations on September 9, 2013, the earliest end date since 1986, primarily due to the cessation of fishing and mark-recovery efforts in Canada for the mark-recapture study. Fall chum passage on the Taku River typically continues into October and historically, 39% of the Canyon Island chum salmon fish wheel catch occurs after the 2013 end date.

The 2013 District 111 pink salmon harvest of 123,283 fish was 80% of the ten-year (2003-2012) average (Figure 36). The 2013 pink salmon escapement to the Taku River was unknown; however, the number of pink salmon passing through the fish wheels at Canyon Island is used as an index of escapement. The 2011 (parent year) Canyon Island pink salmon fish wheel catch was well above average at 17,775 fish. The 2013 Canyon Island pink salmon fish wheel catch of 4,666 was 60% below the 1993-2011 odd-year average of 11,389.

A number of Chinook salmon stocks are known to contribute to the Juneau area sport fishery, including those from the Taku, Chilkat, and King Salmon rivers, and local hatchery stocks, but the major contributor of mature wild fish is believed to be the Taku River. Preliminary estimates indicate that approximately 226 of the Chinook salmon harvested in the Juneau sport fishery were of Taku River origin (based on genetic stock identification analysis (GSI) and maturity data from onsite survey data). The preliminary District 111 harvest of Taku Chinook salmon was; 356 in the drift gillnet fishery, 226 in the sport fishery, and an estimated 33 in the personal use fishery, for a total of 841, well below the base level catch of 3,500 fish.

Table 8.—Weekly salmon harvest in the Alaskan District 111 traditional commercial drift gillnet fishery, 2013<sup>a</sup>.

Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Days	Boat Days
25	16-Jun	357	1,985	1	1	9,423	27	2	54
26	23-Jun	288	8,262	8	28	68,743	61	4	244
27	30-Jun	201	11,399	57	1,415	184,085	96	3	288
28	7-Jul	123	33,188	477	9,248	217,110	147	3	441
29	14-Jul	67	36,681	562	13,041	148,520	162	2	324
30	21-Jul	57	20,477	1,380	26,827	63,111	113	3	339
31	28-Jul	64	17,906	3,680	43,767	24,977	95	4	380
32	4-Aug	14	4,615	1,595	13,676	3,207	72	4	288
33	11-Aug	15	2,462	3,903	6,729	1,337	43	4	172
34	18-Aug	6	929	6,699	7,884	1,598	45	4	180
35	25-Aug	3	361	8,555	659	1,905	38	4	152
36	1-Sep	5	169	7,728	6	1,076	44	4	176
37	8-Sep	6	28	4,485	0	250	26	3	78
38	15-Sep	4	11	9,563	2	233	25	4	100
39	22-Sep	0	1	1,942	0	27	15	4	60
40-41 <sup>b</sup>	29-Sep	1	0	387	0	2	7	10	35
Total		1,211	138,474	51,022	123,283	725,604	214	62	3,310
2003–2012 Average		1,607	124,745	35,893	153,934	478,196	184	59	3,280
2013 as % of Average		75%	111%	142%	80%	152%	116%	105%	101%

<sup>a</sup> The 2013 District 111 drift gillnet catch and effort, as well as the 2003-2012 averages, are for the directed sockeye salmon portion of the fishery only. There was no directed fishery for Chinook salmon in District 111 in 2013 due to a low pre-season abundance forecast.

<sup>b</sup> Opening with fewer than three permits, confidential information so data combined in catch table.

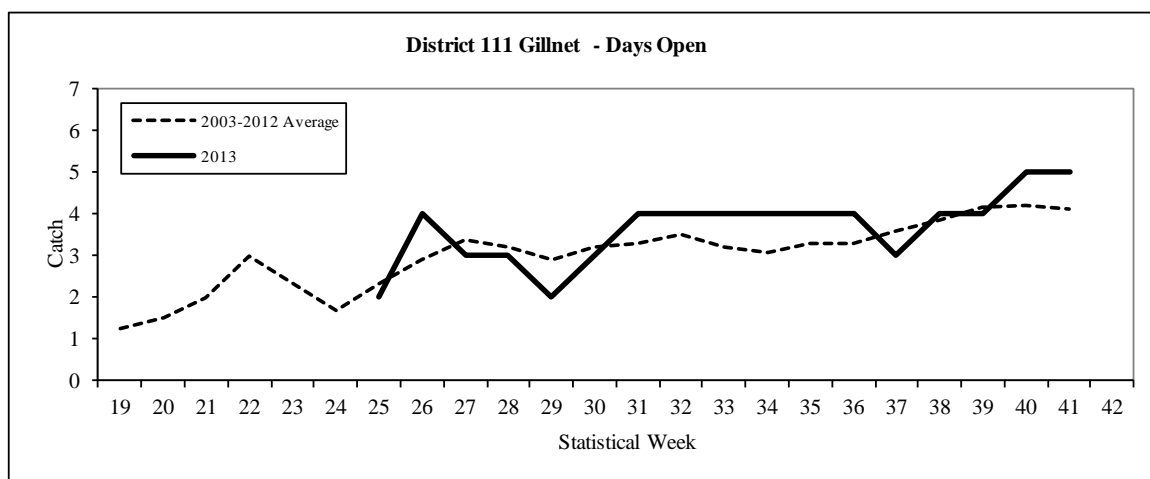


Figure 31.—Days open by week in the District 111 drift gillnet fishery, 2013.

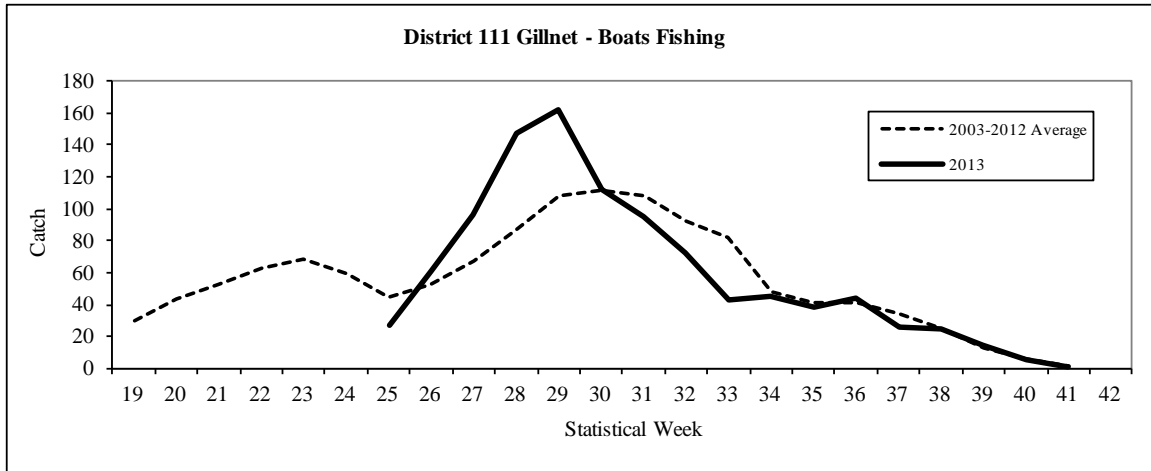


Figure 32.—Number of boats fishing by week in the District 111 drift gillnet fishery, 2013.

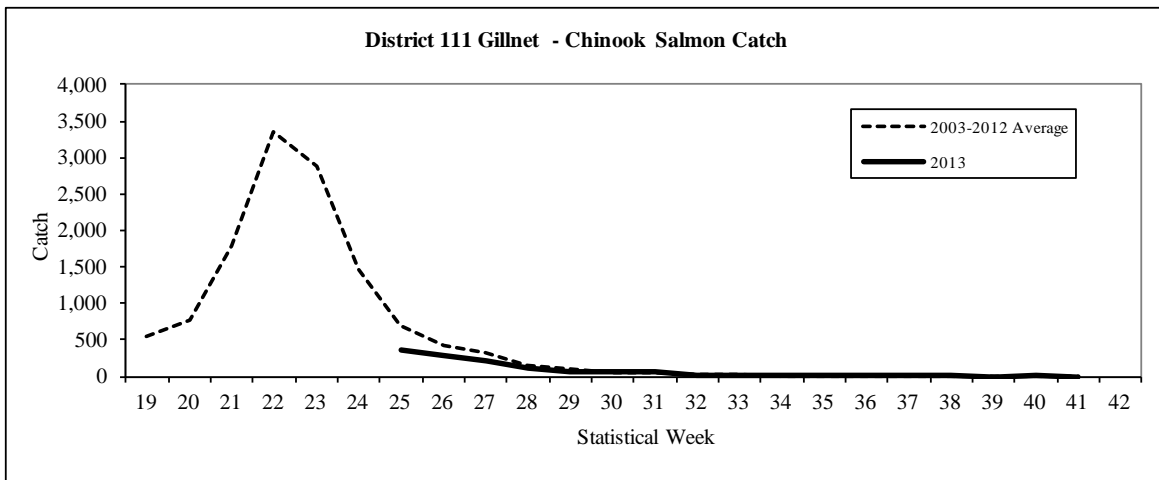


Figure 33.—Chinook salmon catch by week in the District 111 drift gillnet fishery, 2013.

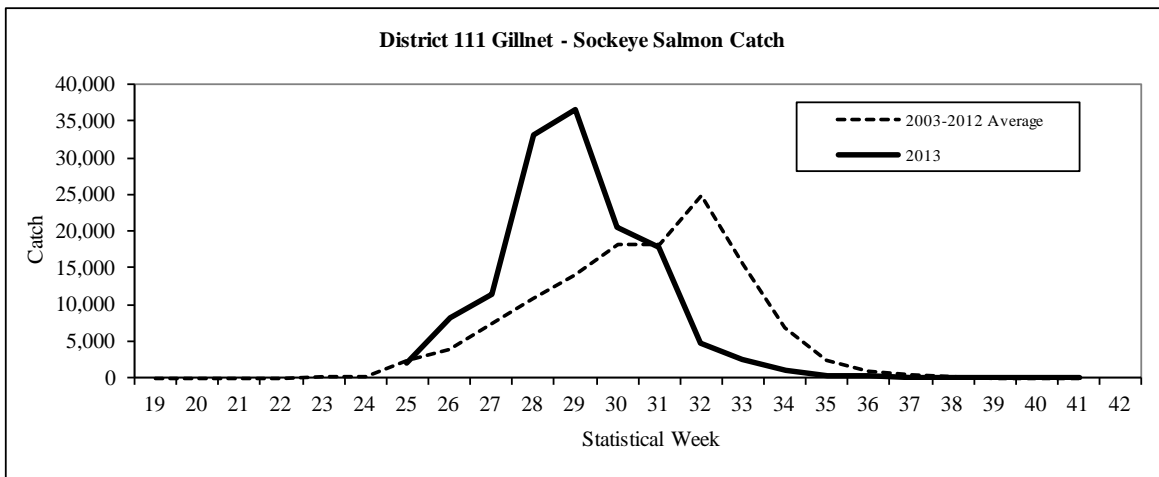


Figure 34.—Sockeye salmon catch by week in the District 111 drift gillnet fishery, 2013.

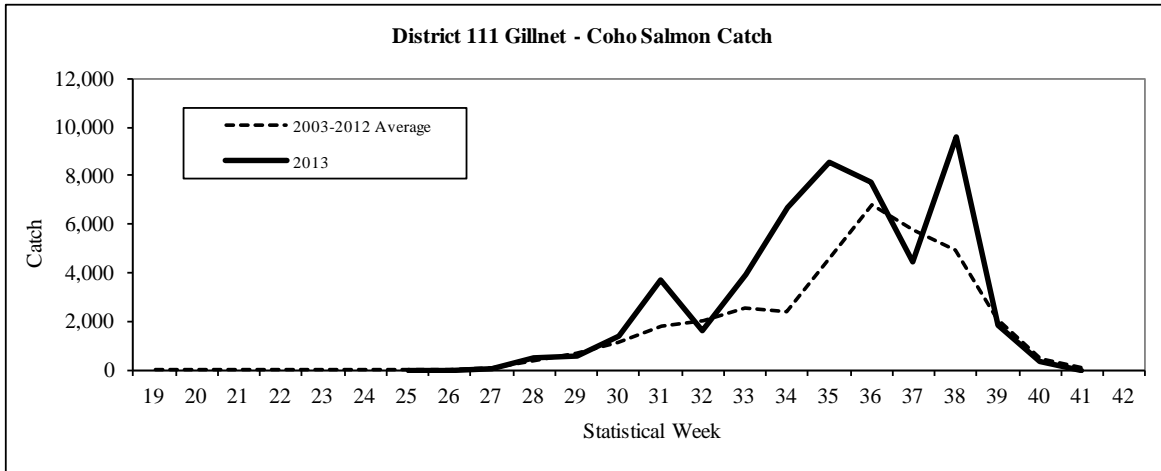


Figure 35.—Coho salmon catch by week in the District 111 drift gillnet fishery, 2013.

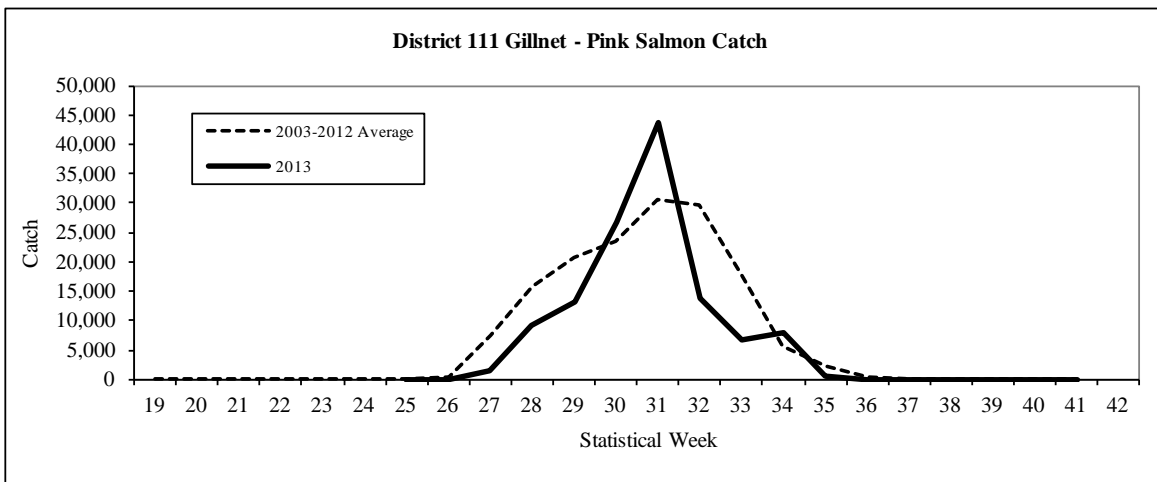


Figure 36.—Pink salmon catch by week in the District 111 drift gillnet fishery, 2013.

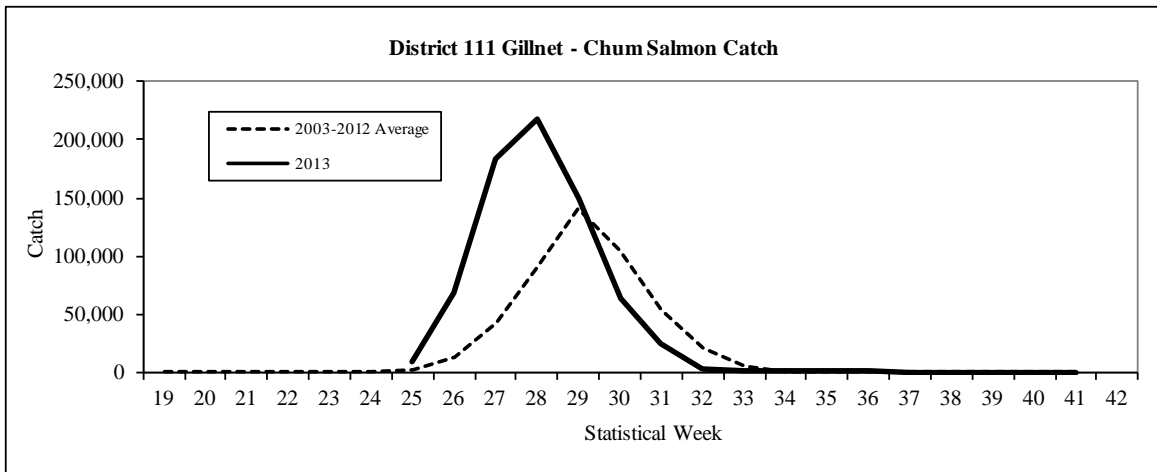


Figure 37.—Chum salmon catch by week in the District 111 drift gillnet fishery, 2013.

### *Transboundary River Joint Enhancement*

The transport of sockeye salmon fry from the Snettisham Hatchery facility back to the Canadian lakes took place between May 29 and June 18, 2013. Approximately 3.94 million fry were released in Tahltan, Tuya, Tatsamenie and King Salmon lakes in Canada. The overall green egg to fry survival of 51.4% for brood year (BY) 2012 releases (Table 9) was below the previous five-year average survival of 65.2% (BY07-BY11) for Tatsamenie and Tahltan fry. Fry from six Tahltan Lake stock incubators tested positive this year for IHNV, accounting for a loss of approximately 1.41 million fry prior to transport/back-planting. No IHNV losses were encountered with the Tatsamenie or the King Salmon Lake stocks. After the transporting of BY12 fry back to their respective lakes, all TBR modules, incubators, and short-term fry rearing containers were broken down, cleaned, and disinfected prior to setting up to receive green eggs from BY13 egg-takes.

Brood year 2013 egg-takes were initiated on August 31 at Tahltan Lake and September 16 at Tatsamenie Lake. An estimated total of 6.0 million green eggs were collected from the two donor lakes. No BY2013 eggs were collected from the King Salmon Lake system. Tahltan Lake egg-takes were completed on September 26, and an estimated 4.27 million eggs in 12 egg lots were taken. Tatsamenie Lake egg-takes were completed on October 10 and 1.73 million eggs were collected in 5 lots. Adult sockeye salmon tissues were collected on the spawning grounds from September 2, 2013 to October 10, 2013 by contractors for DFO and shipped to the ADF&G Juneau Fish Pathology laboratory via Snettisham Hatchery as per treaty agreement.

Table 9.—Summary of numbers and survival rates of brood year 2012 sockeye salmon fry released May-June 2013. Fish were raised at Snettisham Hatchery as part of the Transboundary River Salmon Enhancement Project.

Brood stock	Release site	Number of trips	Survival rate to eyed stage	Survival rate to release	Number released
Tahltan	Tuya Lk	2	81.6%	39.3%	755,300
Tahltan	Tahltan Lk	3	66.4%	36.7%	1,349,000
Tatsamenie	Upper Tats Lk	3	95.7%	88.7%	1,419,400
Tatsamenie	Extended rearing	2	94.6%	91.8%	216,700
King Salmon L.	King Salmon L.	1	89.6	85.0	197,400
Average/Totals		11	77.9%	51.4%	3,938,200

During the 2013 season, the ADF&G Thermal Mark Lab processed 16,764 sockeye otoliths collected by ADF&G and DFO staff as part of the U.S./Canada fry-planting evaluation program. These collections came from commercial and test fisheries in both U.S. and Canadian waters on the Taku and Stikine Rivers over an 11-week period. In addition, several escapement samples were examined. The laboratory provided estimates on hatchery contributions for 90 distinct sample collections. Estimates of the percentage of hatchery fish contributed to commercial fishery catches were provided to ADF&G and DFO fishery managers 24 to 48 hours after samples arrived at the lab.

### *Alsek River Area Fisheries*

Although harvest sharing arrangements of Alsek salmon stocks between Canada and the U.S. have not been specified, Annex IV of the Pacific Salmon Treaty calls for the development and implementation of cooperative abundance-based management plans and programs for Alsek River Chinook and sockeye salmon. Escapement goals are in place for Chinook and sockeye salmon stocks spawning at the Klukshu River, a tributary of the Alsek River. The principle escapement-monitoring tool for Chinook, sockeye, and coho salmon stocks on the Alsek River is the Klukshu River weir, operated by Fisheries and Oceans Canada in cooperation with the Champagne-Aishihik First Nation since 1976. In 2013, Canadian and U.S. biologists adopted a new biological escapement goal range of 7,500 to 11,000 sockeye salmon through the Klukshu River weir. The current biological escapement goal range for Klukshu River Chinook salmon, adopted in February 2013, is a range of 800 to 1,200 fish.

The Department of Fish and Game manages the Alsek River commercial set gillnet fishery to achieve the agreed upon escapement goal ranges. Time and area openings are adjusted by monitoring fishery performance data and comparing it to historical CPUE. The duration of weekly fishing periods is based on fishery performance data (CPUE) and Klukshu River weir data. Historically, gillnets have often been restricted to a maximum mesh size of 6 inches through July 1 to minimize Chinook salmon harvest—the mesh restriction was lifted in 2013.

Preseason expectations were for below average sockeye salmon runs and above average Chinook salmon runs in 2013. The overall Alsek drainage sockeye salmon run was expected to be approximately 40,000 fish, which would have been about half of average. The outlook for 2013 was based on a predicted run of 9,200 Klukshu River sockeye salmon, derived from the latest Klukshu River stock-recruitment data, a Klukshu River contribution rate of 23% to the total run (based on mark-recapture results (2000-04), and run size estimates using GSI (2005-06, 2011)). Principal contributing brood years were 2008 (Klukshu escapement of 2,740 sockeye salmon) and 2009 (Klukshu escapement of 5,730 sockeye salmon); both well below the recent ten-year average escapement of approximately 14,000 fish. Based on the primary brood year escapements, the outlook for Klukshu River Chinook salmon in 2013 was for a return of 1,400 fish, slightly above the average (1,300) and above the new escapement goal range.

The 2013 Alsek River set gillnet fishery opened Sunday June 2 (week 23). The fishery was only opened for one day per week until late July and the number of boats fishing during weekly openings was slightly below the recent ten-year average throughout the season (Table 10). The total number of individual boats fishing during the season was 15, which was below the 2003–2012 average of 19 boats. Catches of Chinook salmon through late June were near the recent ten-year average (Table 10). Catches of sockeye salmon were below average in nearly all weeks of the fishery, with the exception of week 32 (early August), when the catch of 2,188 sockeye salmon was double the recent ten-year average. A total of 7,517 sockeye salmon were harvested, which was only 45% of the 2003–2012 average of 16,571 fish (Table 10). There was little effort after late July and none by late August when coho salmon harvests generally increase. Only 17 coho salmon were harvested in 2013.

The Klukshu River weir count of 3,900 sockeye salmon was below average and below the lower bound of the 7,500 to 11,000 fish escapement goal. The count of 312 early run sockeye salmon (count through August 15) and the late run count of 3,590 were both below average. The 1,261 Chinook salmon counted through the Klukshu River weir was above average and exceeded the top end of the new established goal range of 800 to 1,200 Chinook salmon.

Table 10.—Weekly fishing effort and salmon harvest for Alsek River, 2013.

Statistical Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Boats	Days	Boat Days
23	2-Jun	96	162	0	0	0	9	1	9
24	9-Jun	204	671	2	0	4	12	1	12
25	16-Jun	92	505	0	0	0	11	1	11
26	23-Jun	46	451	0	0	0	9	1	9
27	30-Jun	20	659	0	0	0	10	1	10
28	7-Jul	8	718	0	0	0	11	1	11
29	14-Jul	1	1,008	0	0	0	9	1	9
30	21-Jul	1	918	0	0	0	6	1	6
31-34 <sup>a</sup>	28-Jul	1	2,425	15	0	1	6	11	17
35-41	25-Aug	No Effort							
Total		469	7,517	17	0	5	15	19	94
2003-2012 Avg.		487	16,571	1,471	0	5	19	34	242
2013 as % of Avg.		96%	45%	1%	0%	100%	86%	56%	39%

<sup>a</sup>Weeks with fewer than three permits, confidential information so data combined in catch table.



## SOUTHEAST ALASKA CHINOOK SALMON FISHERY

### *All Gear Harvest*

The Chinook Technical Committee (CTC) of the PSC determined that the Chinook abundance index for Southeast Alaska in 2013 was 1.20. This abundance index equated to an all gear harvest limit of 176,000 Treaty Chinook salmon, which is approximately 91,000 fish fewer than the 2012 quota.

This was the fifth year that the Annex IV, Chapter 3 provisions of the 2009 PST agreement were implemented. Therefore, the harvest limit for SEAK reflects a 15% reduction in allowable catch (AC) from that allowed under the 1999 PST Agreement. The preliminary estimated total Chinook salmon harvest, including Alaskan hatchery fish, by all Southeast Alaska commercial fisheries was 200,940 fish, and the preliminary sport fish harvest was 45,787, for an all-gear harvest of 246,727 (Table 11). The preliminary all-gear treaty harvest was 183,886 fish, which was 4.5% above the all-gear harvest limit of 176,000.

Table 11.—Preliminary estimated all-gear Chinook salmon harvests in 2013.

2013 Preliminary Estimated All-Gear Chinook Salmon Harvests								
Gear	Total Harvest	AK Hatchery Harvest	Wild Terminal Exclusion	Alaska Hatchery Add-on	Treaty Harvest	Quota	O/U	% O/U
Troll	149,615	17,935	240	14,414	134,960			
Total Net	51,325	39,766	27	37,627	13,626			
Total All Commercial Gear	200,940	57,701	267	52,086	148,587			
Sport	45,787	12,504	0	10,488	35,299			
<i>Total All Gear</i>	<i>246,727</i>	<i>70,205</i>	<i>267</i>	<i>62,574</i>	<i>183,886</i>	<i>176,000</i>	<i>+7,886</i>	<i>+4.5%</i>

*Note: Annette Island and terminal area harvests are included*

Table 12.—Chinook all-gear harvests in Southeast Alaska, 1987 to 2013, and deviation from the ceiling for years for which there were ceilings. Harvests are in thousands.

Year	Total Harvest	Add-on and Exclusion Harvest	Target Treaty Harvest	Treaty Harvest	Deviation Number	Deviation Percent
1987	282.4	17.1	263	265.3	2.3	0.9%
1988	279.3	22.5	263	256.8	-7.8	-3.0%
1989	291.0	21.5	263	269.5	6.5	2.5%
1990	366.9	45.9	302	321	19	6.3%
1991	359.5	61.5	273	298	25	9.2%
1992	258.8	36.8	227.4	222	-5.4	-2.4%
1993	304.1	32.9	263	271.2	8.2	3.1%
1994	264.4	29.2	240	235.2	-4.8	-2.0%
1995	235.7	58.8		176.9		
1996	236.3	81.3		155		
1997	343.0	56.3		286.7		
1998	270.6	27.4	260	243.2	-16.8	-6.5%
1999	251.0	52.2	184.2	198.8	14.6	7.9%
2000	263.3	76.8	178.5	186.5	8	4.5%
2001	265.7	78.8	250.3	186.9	-63.4	-25.3%
2002	426.5	69.4	371.9	357.1	-14.8	-4.0%
2003	439.4	59.3	439.6	380.2	-59.5	-13.5%
2004	506.2	82.2	418.3	417	-1.3	-0.3%
2005	493.1	105.0	387.4	388.1	737	0.2%
2006	435.5	75.9	354.5	359.6	5.1	1.4%
2007	404.6	76.9	259.2	327.7	68.5	26.4%
2008	244.2	71.9	152.9	172.3	19.4	12.7%
2009	293.7	66.1	176.0	227.5	51.5	29.3%
2010	284.7	54.4	215.8	230.3	14.5	6.7%
2011	357.0	66.7	283.3	290.3	7.0	2.5%
2012	295.0	53.0	205.1	242.0	36.9	18.0%
2013 <sup>1</sup>	246.7	62.8	176.0	183.9	7.9	4.5%

<sup>1</sup> The actual all-gear harvest limit and deviation cannot be calculated until the CTC completes the postseason calibration.

### ***Troll Fishery***

The preseason abundance index generated for the SEAK AABM fishery in spring 2013 was 1.20, resulting in a preseason troll allocation of 129,862 treaty Chinook salmon under the harvest management plan adopted by Alaska Board of Fisheries. The accounting of treaty Chinook salmon harvested by trollers begins with the winter fishery and ends with the summer fishery. The winter troll fishery is managed for a guideline harvest level (GHL) of 45,000 non-Alaska hatchery-produced Chinook salmon, with a guideline harvest range of 43,000–47,000 non-Alaska hatchery-produced fish, plus the number of Alaska hatchery-produced Chinook salmon harvested during the winter fishery. The 2012-2013 winter troll fishery was open from October 11, 2012 through April 30, 2013 and harvested a total of 26,587 Chinook salmon. Of these, 12.7% (3,383) were of Alaska hatchery origin, of which 2,708 counted toward the Alaska hatchery add-on, resulting in a treaty catch of 23,879 (Table 13).

The spring troll fisheries target Alaskan hatchery-produced Chinook salmon and are conducted along migration routes or close to hatchery release sites. Terminal area fisheries, which begin during the spring, occur directly in front of hatcheries or at remote release sites. While there is no ceiling on the number of Chinook salmon harvested in the spring fisheries, the take of treaty Chinook salmon is limited according to the percentage of the Alaskan hatchery fish taken in the fishery. In 2013, spring troll fisheries were conducted from May 1–June 30 in a total of 32 spring areas and six terminal area fisheries. A total of 38,357 Chinook salmon were harvested in spring and terminal troll areas combined, of which 11,680 (30%) were of Alaska hatchery origin and 9,408 counted toward the Alaska hatchery add-on, resulting in a treaty harvest of 28,709 fish (Table 13).

The 2013 summer troll fishery included only one Chinook salmon retention period. From July 1–6, a total of 84,615 Chinook salmon were harvested, of which 2,872 (3.4%) were of Alaskan hatchery origin with 2,299 counted toward the Alaska hatchery add-on. The resulting treaty catch of 82,316 fish fulfilled the summer troll allocation, so a second Chinook salmon retention period was not opened. A total of 995 permits participated in the summer fishery. The total harvest for all troll fisheries in the 2013 accounting year was 149,615 Chinook salmon, of which 134,960 counted as treaty harvest.

Table 13.—Preliminary 2013 troll fishery Chinook salmon harvest by season.

Gear/Fishery	Total Harvest	Alaska Hatchery Harvest	Alaska Hatchery Add-on	Terminal Exclusion Harvest	Total Term. Exclusion/Alaska Hatchery Add-on	Treaty Harvest
Winter Troll	26,587	3,383	2,708	0	2,708	23,879
Spring Troll <sup>a</sup>	38,357	11,680	9,408	240	9,648	28,709
Summer Troll						
First Period	84,615	2,872	2,299	0	2,299	82,316
Second Period	0	0	0	0	0	0
Total Summer <sup>b</sup>	84,615	2,872	2,299	0	2,299	82,316
Total Traditional Troll	149,559	17,935	14,414	240	14,654	134,904
Annette Is. Troll	56	0	0	0	0	56
Total Troll Harvest	149,615	17,935	14,414	240	14,654	134,960

<sup>a</sup> Spring troll harvest includes all terminal and Wild Terminal Exclusion harvests for year.

<sup>b</sup> Total summer harvest includes confiscated harvest for year.

### *Net Fisheries*

With the exception of directed gillnet harvests of Chinook in SEAK terminal area regulatory Districts 108 and 111 targeting Chinook as provided in the Transboundary River agreement (Chapter 1), harvests of Chinook salmon in the net fisheries are primarily incidental to the harvest of other species and only constituted a small fraction (<1.0%) of the total net harvest of all species.

For the Taku River, the 2013 preseason terminal run forecast of 18,500 large adult Chinook salmon was below the lower bound of the escapement goal range of 19,000-36,000 fish and provided no AC for directed fisheries. Due to the poor forecast and concern over achieving the minimum of the escapement goal range, a non-lethal ADFG/DFO assessment project was conducted inriver for the first time. Instead of harvesting the 1,400 fish provided by the Pacific Salmon Treaty for assessment purposes, the two agencies operated drift tanglenets in the traditional Canadian inriver fishing grounds. Fish captured in this effort were sampled for tags that were placed on Chinook salmon captured downriver in the Canyon Island fish wheel project. Any untagged fish were additionally tagged to boost the overall event 1 release and then later on the spawning grounds fish were sampled for event 2 information used in part to generate a final estimate of escapement. An insufficient number of tags were recaptured in the tangle nets to provide an inseason estimate of run strength; however, this effort produced 60% of the total large fish released as part of event 1. Recovery rates on the few tags recovered on the spawning grounds suggested that handling mortality was similar between fish captured and tagged using fish wheels and drift gillnets. Regardless, too few tags were recovered on the spawning grounds to generate an estimate of large Taku Chinook escapement and the expanded peak aerial survey had to be used to estimate a large escapement of 17,794 (SE=4,827).

The preseason terminal run forecast of 22,400 large Stikine Chinook salmon did not result in a U.S. AC. Inseason forecasts ranging between 20,300 and 24,900 large Stikine Chinook salmon were similar to the preseason forecasts and did result in ACs or ACs large enough to prosecute directed sport or commercial fisheries. The initial sockeye salmon gillnet opening was postponed by one week due a lower than average sockeye salmon forecast, continued low inseason forecasts for Stikine Chinook salmon, and to the very early timing of the potential opening. Area restrictions were implemented during the initial opening gillnet opening in District 108 due to continued Stikine Chinook salmon concerns. The District 108 commercial gillnet harvest from statistical weeks 25 through 29 was 455 fish based on GSI estimates. The final U.S. harvest of large Stikine Chinook salmon through week 29, including the federal Stikine subsistence fishery, was 1,564 fish. The final postseason estimate of approximately 21,700 fish was not large enough to produce a U.S. AC; however, the U.S. harvest was below the base level harvest of 3,400 fish.

Preliminary harvest of treaty Chinook salmon in the Southeast Alaska seine fisheries was 6,706 fish.

### ***Recreational Fisheries***

The preseason abundance index generated for the SEAK AABM fishery in spring 2013 was 1.20, resulting in a preseason sport allocation of 32,466 treaty Chinook salmon under the harvest management plan adopted by Alaska Board of Fisheries. Based on this pre-season AI and the SEAK King Salmon Management Plan, a resident sport fish angler was allowed to use two rods from October through March, and the bag and possession limit for all anglers was one king salmon 28 inches or greater in length. The nonresident harvest annual limit was three king salmon 28 inches in length from January 1 through June 30; two king salmon 28 inches or greater in length from July 1 through July 15; and one king salmon 28 inches or greater in length July 16 through December 31.

The 2013 recreational fishery had an estimated preliminary harvest of 45,787 Chinook salmon, of which 35,990 counted as Treaty harvest. The final total and Treaty harvest in the sport fishery for 2013 will be available in late fall of 2014. Comparisons of the 2013 recreational fishery harvest with recent years indicate that the preliminary harvest of 45,787 fish is 21% below the recent five-year average and 34% below the recent ten-year average. The 2013 freshwater recreational fishery for Chinook salmon 20 inches or greater in length in the Situk River near Yakutat was initially closed due to low predicted run size of large fish. The fishery was then opened on July 16, below the Situk weir, when observed run size exceeded the mid-point of the escapement goal range. Onsite creel surveys indicated a small number (25-30 fish) large Chinook were harvested and a small number (25-30 fish) of Chinook less than 20 inches were harvested in 2013, all below the weir.

During 2013, genetic samples were collected from 4,091 large Chinook salmon (28 inches or greater in Total Length), 78 genetic samples from small Chinook salmon (under 28 inches in TL) in Terminal Harvest Areas (THAs), and 46 genetic samples were collected from small Chinook salmon harvested outside of THAs.

### **SOUTHEAST ALASKA COHO SALMON FISHERIES**

Attachment B of the June 30, 1999 U.S.-Canada Agreement relating to the Pacific Salmon Treaty specifies provisions for in-season conservation and information sharing for northern boundary coho salmon. In 2013, troll CPUE in Area 6 in the early weeks of the fishery averaged 88, which was well above the highest boundary area conservation trigger of 22. The mid-July projection of region-wide total commercial harvest was greater than the 1.12 million trigger for an early region-wide troll closure, specified in Alaska Board of Fisheries regulation and the PST conservation agreement.

The 2013 all-gear catch of coho salmon was the second largest on record and totaled 3.95 million fish, of which 3.59 million (91%) were taken in commercial fisheries (Table 14). The troll catch of 2.39 million fish was 63% above the 10-year average of 1.47 million fish and accounted for 67% of the commercial catch. Average weekly power troll wild coho CPUE of 104 fish per boat-day from the second week of July through mid-September was the highest on record and 77% above the 10-year average, while overall wild stock abundance for the region was estimated at 40% above the 1982–2012 average. The purse seine harvest of coho salmon (553,500 fish) was

93% above the 10-year average while the drift gillnet harvest of 482,400 fish was 39% above average. The set gillnet harvest of 158,000 fish in the Yakutat area was 33% above the 10-year average, with 68% of the catch taken in the Situk-Ahrnklin Lagoon and 28% in the Tsiu River system. A very preliminary estimate of the Southeast Alaska sport catch (363,200 fish) was 37% above the 10-year average and the second highest sport catch on record.

Wild production accounted for 2.57 million fish (72%) in the commercial catch compared with a recent 10-year average of 1.79 million fish (80%). The hatchery percentage of the commercial catch (28%) was the highest on record. Of the estimated hatchery contribution of 1,018,000 fish, over 99% originated from facilities in Southeast Alaska. Escapement counts and estimates were within or above goal in nearly all cases throughout the region. The combined peak count of 9,211 coho salmon in the 14 surveyed streams in the Ketchikan area was well above the goal of 4,250-8,500 fish. The total escapement of 3,048 coho salmon to Hugh Smith Lake was second highest in 32 years, and the 6<sup>th</sup> consecutive escapement above the biological escapement goal range (500-1,600 spawners). The preliminary estimate of the all-fishery exploitation rate on the Hugh Smith Lake stock of 56% was below the 1982–2012 average of 63% but slightly above the recent 10-year average (54%). The estimated total run size of 6,929 adults was the 2<sup>nd</sup> highest on record and well above the long-term average of 4,021 adults.

Marine survival was near the 30-year average for northern inside indicator stocks (15%), but was higher for the southern inside indicator (Hugh Smith Lake) at 17% compared with a 30-year average of 13%. Exploitation rate estimates were moderate for all indicator stocks except for Ford Arm Creek, where the all-fishery exploitation rate of 78% was the second highest on record, as a result of a seine exploitation rate (29%) that was far above average (6%) combined with an Alaska troll exploitation rate (48%) that was below average (52%). In contrast, the estimated all-gear exploitation rate on the Hugh Smith Lake stock of 56% continued the trend toward lower all-gear exploitation rates for that system, from an average of 75% in the 1990s to 53% during 2000–2012. The Alaska troll fishery exploitation rate on the stock (25%) was below the historical average of 34% from 1982–2012 and the peak decade average of 41% in the 1990s. The Alaska troll fishery exploitation rate on the Auke Creek stock of 32% in 2013 was above the 10-year average of 25% and the long-term average of 29%. The all-gear exploitation rate on that stock was estimated at 42% compared with a long-term average of 40% and a 10-year average of 37%.

The 2013 region-wide summer troll coho fishery began on July 1. There was no mid-season closure and the fishery was extended for 10 days past the September 20.

Table 14.—Coho salmon harvest in Southeast Alaska in 2013 by gear type (preliminary).

Gear Type	Harvest
Troll	2,393,800
Purse Seine	553,500
Drift Gillnet	482,400
Set Gillnet	158,000
Sport (marine and freshwater)	363,200
Total	3,950,900

# **PRELIMINARY 2013 CHINOOK AND COHO SALMON FISHERIES IN WASHINGTON AND OREGON**

## **Introduction**

This report describes the conduct of United States (U.S.) fisheries of interest to the Pacific Salmon Commission (PSC) that occurred during 2013 in the area north of Cape Falcon, Oregon and south of the U.S./Canada border. These fisheries were conducted under pre-season management plans that were consistent with Annex IV of the Pacific Salmon Treaty (PST, 2008) including obligations defined within Chapter 3 for Chinook individual stock based management regimes (ISBM) and Chapter 5 for Southern Coho Management.

An overview of the Chinook and Coho salmon conservation challenges facing managers during the 2013 pre-season planning process in this region is provided. The conduct of major fisheries is described, and estimates of landed catch, where available, are compared to pre-season catch limits or expectations for Chinook (Table 1) and Coho (Table 2). For perspective, landed catches for those fisheries since 2008 are also presented. Where available, preliminary estimates of the number of Chinook or Coho salmon released by anglers in 2013 mark-selective fisheries are also presented. All estimates for the 2013 fisheries are preliminary and subject to change. Estimates of spawning escapements and abundance of Coho and Chinook stocks are not available at this time.

## **Pre-season Planning**

Pre-season planning for southern U.S. fisheries of interest to the PSC is a coordinated activity involving Tribal, State and Federal management entities, with the involvement of conservation and fishing interests. The Pacific Fisheries Management Council (PFMC) conducted a series of public meetings to consider options for ocean fishery season structures while the Tribes and States conducted government-to-government and public, open meetings throughout the region to develop and analyze alternative season structures for fisheries in the inside waters of the Columbia River, coastal Washington and Puget Sound. Participants in these various planning sessions evaluated the biological and socio-economic consequences of the alternative season structures for the outside (ocean) and inside (marine and freshwater) fisheries, including the anticipated impacts on U.S. southern origin stocks in fisheries conducted under the PST in Canada and Southeast Alaska. Agreement was reached on season structures expected to achieve conservation goals, domestic fishery objectives and legal obligations, including the PST, assuming fisheries are conducted as planned and pre-season abundance estimates are accurate.

### **Chinook Salmon Management:**

Under the 2008 Pacific Salmon Treaty Agreement, southern U.S. fisheries are subject to the Individual Stock Based Management provisions of Annex IV, Chapter 3. These provisions require the non-ceiling index for aggregated Southern U.S. fisheries on Chinook stocks not achieving their management objectives to be no greater than 60% of the levels

estimated for the 1979 – 1982 base period.

Conservation obligations associated with the U.S. Endangered Species Act (ESA) for threatened and endangered Chinook salmon stocks originating from Puget Sound and the Columbia River have been more constraining to southern U.S. fisheries than PST obligations. Catch quotas for the 2013 U.S. ocean fisheries in the area north of Cape Falcon, Oregon, were defined by the impact limits on ESA-listed lower Columbia River natural tule fall Chinook stocks, ESA-listed Puget Sound Chinook stocks, and the abundance of other healthy, harvestable Chinook salmon stocks contributing to fisheries in this area. Puget Sound fishing seasons were structured to provide fishing opportunity on healthy salmon species or stocks within the impact limits defined for ESA-listed Puget Sound Chinook.

### **Coho Salmon Management:**

During the pre-season fishery planning process of 2013, Canadian fishery managers informed the U.S. that the Interior Fraser management unit was again expected to be in the *low* categorical abundance status, and U.S. fisheries were constrained to ensure that the exploitation rate on this management unit did not exceed 10.0% as defined by the PST Southern Coho Management Plan. All U.S. natural spawning Coho management units specified by the PST Southern Coho Management Plan were forecasted to be in moderate or abundant status.

The impact on natural Coho stocks of seasons and catch limits adopted for southern U.S. fisheries were predicted using the Fisheries Regulation Assessment Model (FRAM). The total exploitation rate on the Interior Fraser management unit was predicted to be 10.0% in Southern U.S. fisheries. Seasons and Coho quota levels for U.S. ocean fisheries were constrained primarily by the management objectives of ESA-listed lower Columbia River natural Coho, while limits to fisheries in northern Puget Sound and the Strait of Juan de Fuca were primarily constrained by management objectives for the Interior Fraser Coho management unit.

## **North of Cape Falcon Ocean Fisheries**

Fisheries in this area are managed to meet conservation objectives for ESA listed stocks, natural stocks and brood stock goals for hatchery stocks. Within these stock management objectives, ocean fishing seasons are defined that meet legal requirements of Tribal treaties and allocations between Non-Tribal troll and sport fisheries. Ocean fishery seasons are also constructed to ensure a balance of opportunity for harvest with the inside fisheries. Lower Columbia River hatchery Coho and Columbia River hatchery fall Chinook have historically been the major stocks contributing to catches of ocean fisheries in the North of Cape Falcon area.

Chinook and Coho salmon catch quotas were defined for the 2013 ocean Tribal, Non-Tribal troll and sport fisheries. Ocean fishery quotas for Chinook salmon were defined by the total exploitation rate limit of 41% on ESA-listed lower Columbia River natural tule fall Chinook stocks in all fisheries. Ocean fishery quotas for Coho salmon were defined by the impact limits of ESA-listed lower Columbia River natural Coho, Interior Fraser Coho management units, and agreements that allocated the total allowable impacts between ocean and inside fisheries.



### **Non-Tribal Troll Fishery**

Pre-season quota levels for the non-Tribal troll fisheries were 44,000 Chinook and 14,220 Coho (with healed ad-clip, hereinafter referred to as marked). The preliminary estimates of non-Tribal harvest in the 2013 North of Falcon troll fishery are 42,234 Chinook (96% of the coast-wide quota), and 6,494 Coho (46% of the coast-wide quota). Trollers harvested 24,035 Chinook in the May 1 – June 30 Chinook-only fishery and the remaining 17,654 Chinook were harvested in the all-species fishery between July 1 and September 17. The Coho catch represents harvest in a mark-selective fishery.

### **Tribal Troll Fishery**

The Tribal troll fishery (also known as the Treaty troll fishery) was restricted due to conservation concerns for ESA listed Lower Columbia River tule Chinook and Mid-Hood Canal Chinook, setting the Chinook quota at 52,500. The Coho quota was constrained by management objectives for Interior Fraser Coho, creating a Coho quota of 47,500. The season was comprised of a May/June Chinook-directed fishery and a July 1 through September 15 all species fishery. The Chinook quota was split 50:50 between the two fisheries. The Chinook-directed fishery ran through all of May and closed on June 19 taking 118% of the 26,250 Chinook sub-quota. The Tribal trollers made 474 landings during this fishery. The all species fishery opened on July 1 with a Chinook sub-quota that was reduced by 5,757 Chinook for the overage in the first fishery and to keep the all species fishery Chinook impact neutral on the stocks of concern. This decreased the Chinook sub-quota to 20,493 Chinook. The all-species fishery closed on September 4 taking 90% of the Chinook quota and 100.2% of the Coho quota. The season concluded with a total catch of 49,417 Chinook (94% of the quota) and 47,611 Coho (100.2% of the quota). The Tribes made 1,030 landings during the ocean Tribal troll season.

### **Sport Fisheries**

Pre-season quotas for the sport fishery were 48,000 Chinook (non mark-selective equivalent of 44,000) and 74,760 marked Coho. The 48,000 Chinook quota included 8,000 in the June mark-selective fishery and 40,000 in the non-selective fishery. Preliminary total catch estimates for the ocean sport fisheries north of Cape Falcon were 30,900 Chinook (64% of the coast-wide quota) and 50,100 Coho (67% of the coast-wide quota). A description of the resulting season structure and catches by management area follows.

### **U.S./Canada border to Cape Falcon**

Sport salmon fishing was open for all species except Coho on May 10 – 11, May 17 – 18, and June 22 – 28 from the U.S./Canada border to the Queets River, from June 8 – 22 between the Queets River and Leadbetter Point, and from June 8 – 21 from Leadbetter Point to Cape Falcon operating under a coastwide quota of 8,000 marked Chinook. The estimate of landed catch for the coastwide mark-selective sport fishery is 2,800 Chinook (35% of the quota). The Chinook minimum size limit was 24 inches.

Preliminary estimates of Chinook retained and the percentage of legal size Chinook encountered that were retained and released in the Chinook mark-selective sport fishery, May 10 – June 28, 2013, for Areas 1-4 combined.		
Chinook retained	Retained %	Released
2,800	53%	2,500

A detailed report of this fishery, including catch, effort and results of sampling and monitoring programs, will be available from the Washington Department of Fish and Wildlife in early 2014.

### **Columbia Ocean Area (including Oregon)**

All-species salmon sport fishing opened in Ocean Area 1 (Columbia Ocean Area) on Saturday, June 22 with a pre-season quota of 37,380 marked Coho (increased in-season to 38,380 following a transfer from the Non-Tribal troll fishery) and a guideline of 9,900 Chinook. Beginning September 1, the fishery was non-selective for Coho (remaining sub-area Coho quota – 19,600 fish – was converted at an impact neutral rate to a non-selective Coho quota of 9,785). The fishery closed on its automatic closure date, September 30. The catch estimates for Area 1 are 7,900 Chinook (80% of the guideline), 18,800 Coho during the selective portion of the fishery (49% of the revised mark-selective quota), and 1,750 Coho during the non-selective portion of the fishery (18% of the non-selective quota). An additional 600 Chinook were landed in the spring mark-selective fishery. The Chinook minimum size limit was 24 inches, with a sub-area closure in the Columbia Control Zone.

Preliminary estimates of Coho encounters (retained and released), and mark rate in the Area 1 Coho mark-selective sport fishery, June 22 – August 31, 2013.			
Coho retained	Coho released	Total encounters	Mark %
18,800	14,200	33,000	57%

### **Westport**

Ocean Area 2 (Westport) opened for all-species salmon sport fishing on Sunday, June 23 with a pre-season quota of 27,660 marked Coho (increased in-season to 29,140 following a transfer from the Non-Tribal troll fishery) and a guideline of 23,500 Chinook (decreased in-season to 20,300 following a transfer to the Non-Tribal troll fishery). Beginning September 6, the fishery was non-selective for Coho (remaining sub-area Coho quota – 12,700 fish – was converted at an impact-neutral rate to a non-selective quota of 6,350). The fishery closed on its automatic closure date, September 30. The catch estimates for Area 2 are 12,000 Chinook (59% of the revised guideline), 16,400 Coho during the selective portion of the fishery (56% of the mark-selective quota), and 3,800 Coho during the non-selective portion of the fishery (60% of the non-selective quota). An additional 1,700 Chinook were landed in the spring mark-selective fishery. The Chinook minimum size limit was 24 inches.

Preliminary estimates of Coho encounters (retained and released), and mark rate in the Area 2 Coho mark-selective sport fishery, June 23 – September 5, 2013.			
Coho retained	Coho released	Total encounters	Mark %
16,400	23,600	40,000	41%

### **La Push**

Ocean Area 3 (La Push) opened for all-species salmon sport fishing on Saturday, June 29 with a pre-season quota of 1,940 Coho (increased in-season to 2,990 following a transfer from the Non-Tribal troll fishery) and a guideline of 1,700 Chinook. The fishery closed on its automatic closure date, September 22, and reopened September 28 through October 13. The catch estimates for Area 3 during the all-species fishery are 2,300 Chinook (35% over the guideline) and 2,800 Coho (94% of the revised quota). An additional 50 Chinook were harvested in the spring mark-selective fishery. The Chinook minimum size limit was 24 inches.

Preliminary estimates of Coho encounters (retained and released), and mark rate in the Area 3 Coho mark-selective sport fishery, June 29 – October 13, 2013.			
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Coho retained	Coho released	Total encounters	Mark %
2,800	5,000	7,800	36%

### **Neah Bay**

Ocean Area 4 (Neah Bay) opened for all-species salmon sport fishing on Saturday, June 29 with a pre-season quota of 7,250 marked Coho (increased in-season to 8,200 following a transfer from the Non-Tribal troll fishery) and a guideline of 4,900 Chinook. The fishery closed on its automatic closure date, September 22. The catch estimates for Area 4 are 5,900 Chinook (20% over the guideline) and 6,500 Coho (79% of the revised quota). An additional 400 Chinook were harvested in the spring mark-selective fishery. The Chinook minimum size limit was 24 inches.

Preliminary estimates of Coho encounters (retained and released), and mark rate in the Area 4 Coho mark-selective sport fishery, June 29 – September 22, 2013.			
Coho retained	Coho released	Total encounters	Mark %
6,500	10,600	17,100	38%

## **North of Cape Falcon Inside Fisheries**

### ***Washington Coastal River Fisheries***

#### **North Washington Coastal Rivers**

Net and sport fisheries directed at salmon in this region were implemented based upon pre-season, Tribal-State agreements and subject to in-season adjustments. The 2013 north coastal rivers net harvest (all by Tribal fisheries that are non-selective) includes catch from the Sooes, Quillayute system, Hoh, Queets, and Quinault rivers. The 2013 commercial Tribal net fisheries in north coastal rivers have harvested an estimated 14,200 Chinook and 43,800 Coho through November 15, 2013.

Recreational fisheries conducted in the Quillayute, Hoh and Queets river systems, included mark-selective fisheries for hatchery Chinook salmon. Recreational fisheries for Coho salmon conducted in the Quillayute River system included mark-selective components. Harvest or impact estimates for these fisheries are unavailable at this time.

#### **Grays Harbor**

Harvest for Grays Harbor includes catch from both the Humptulips and Chehalis rivers through November 15, 2013. The non-selective Tribal net fisheries in Grays Harbor, and including fisheries in the Humptulips and Chehalis rivers, harvested an estimated 2,900 Chinook salmon and 17,600 Coho salmon. Non-Tribal commercial fisheries conducted in the northern portion of Grays Harbor near the Humptulips River (Area 2C) harvested 26 Chinook salmon and 143 Coho salmon. An additional 13 Chinook salmon (mark selective) and 6,000 Coho were harvested in the Non-Tribal commercial gillnet fishery in Areas 2A & 2D. Sport fisheries conducted in the Chehalis and Humptulips rivers included mark-selective components for Coho salmon. Recreational fisheries harvest or impact estimates are unavailable at this time.

## ***Columbia River Fisheries***

Tribal and Non-Tribal net and sport salmon fisheries in 2013 occurred during the winter/spring (January – June 15), summer (June 16 – July) and fall (August – October) periods. All fisheries were constrained by impacts on ESA listed stocks. Winter/spring fisheries were primarily constrained by impacts on ESA listed upper Columbia River spring Chinook, Snake River spring/summer Chinook and wild winter Steelhead. Summer fisheries were constrained by impacts to ESA listed Snake River Sockeye. Fall fisheries were mainly constrained by impacts to ESA listed wild lower Columbia tule fall Chinook and wild lower Columbia River Coho as well as Group B Steelhead which are part of the Snake River Steelhead distinct population segment (DPS). Snake River wild fall Chinook can be a constraint to fall season fisheries, but impacts to other listed stocks generally limit fisheries first.

Columbia River salmon fisheries are developed and regulated to meet conservation standards. Fisheries are managed to operate within the impact limits set for ESA listed stocks, meet the objectives for healthy Columbia River natural stocks, and ensure brood stock needs are met for hatchery salmon. Mainstem Columbia River fisheries are also developed and managed to remain within the requirements of the 2008 – 2017 *US v. Oregon* Management Agreement which include Tribal/Non-Tribal sharing agreements.

### **Winter-Spring Fisheries**

#### **Non-Tribal Net**

The mainstem Winter/Spring commercial fishery has operated under mark-selective fishery regulations since 2002. In 2013, winter sturgeon fisheries consisted of three fishing periods conducted during January 30 through February 7 in the area downstream of Bonneville Dam. No Chinook were landed. The winter/spring salmon season consisted of four fishing periods (47 hours total) between April 9 and May 30. The fishery occurred downstream of Bonneville Dam, with time, area, and gear restrictions in place. Landings included 1,900 hatchery spring Chinook.

#### **Sport**

Columbia River mark-selective sport fisheries began in 2001. The area below Bonneville Dam was open January 1 – April 12 and May 25 – June 15 for hatchery Chinook retention. Catch estimates include 6,000 hatchery Chinook. The area from Bonneville Dam upstream to the Oregon/Washington border 17 miles upstream of McNary Dam was open March 16 – May 6 and June 8 – 15. Catch estimates for this area total 700 hatchery spring Chinook. Kept catch in the Snake River fishery totaled 500 adult spring Chinook.

#### **Tribal**

Tribal mainstem fisheries are not mark-selective. Tribal fisheries are conducted in the mainstem Columbia River from Bonneville Dam upstream to McNary Dam (Zone 6). Platform and hook and line fisheries also occur in accordance with MOUs in the area immediately below Bonneville Dam. No spring Chinook were harvested in the commercial winter season set-line Sturgeon fishery (January 1 – 31). No Chinook were harvested in the winter gillnet fishery (February 1 – March 21). Ceremonial and subsistence (C&S) fisheries include harvest from platform, hook and line, and gillnet fisheries through Tribal permits. Commercial sales were

allowed for platform and hook and line caught fish beginning June 8. Harvest estimates from C&S and commercial fisheries total 9,300 upriver spring Chinook. Fisheries are also conducted in Zone 6 tributaries and in Columbia and Snake river tributaries upstream from McNary Dam. Tributary harvest (including Snake Basin harvest) is not reported in this document.

## **Summer Fisheries**

### **Non-Tribal Net**

Summer season commercial fisheries are not mark-selective. Two fishing periods (16 hours total) occurred on June 16 – July 16 in the area below Bonneville Dam. Time, area, and gear restrictions were in place for all summer season commercial fisheries. Landings are estimated at 2,000 upper Columbia summer Chinook.

### **Sport**

Summer season fisheries were mark-selective for upper Columbia summer Chinook. The area below Bonneville Dam was open for adult Chinook retention during June 16 – 30. An estimated 2,200 hatchery Chinook were kept below Bonneville Dam. The area from Bonneville Dam upstream to Priest Rapids Dam was open for adult hatchery Chinook retention from June 16 – July 31. An estimated 200 adult hatchery Chinook were kept in this area.

### **Tribal**

Tribal fisheries are not mark-selective. Tribal fisheries are conducted in mainstem Columbia River from Bonneville Dam upstream to McNary Dam (Zone 6). Platform and hook and line fisheries also occur in accordance with MOUs in the area immediately below Bonneville Dam. Six weekly commercial gillnet fishing periods were conducted June 17 – July 25. Platform and hook and line fisheries also occurred throughout the season, and fish were sold commercially or retained for subsistence use. Harvest estimates total 13,300 upper Columbia summer Chinook from mainstem fisheries. Minor summer season fisheries were also conducted in some Zone 6 tributaries and in tributaries upstream of McNary Dam. Tributary harvest is not reported in this document.

## **Fall Fisheries**

### **Non-Tribal Net**

Fall season fisheries are traditionally not mark-selective; however, a short pilot mark-selective commercial Coho fishery did occur in 2013. Mainstem fisheries consisted of eight fishing periods during August 11 – 29 and 34 fishing periods September 15 – October 31. Time, area, and gear restrictions were in place to ensure that fishing impact limits on ESA-listed stocks were not exceeded. Harvest estimates total 87,000 fall Chinook.

### **Sport**

Fall season fisheries were mark-selective for Coho salmon with a short mark-selective period conducted for Chinook in an 80-mile stretch in the lower Columbia River. The Buoy 10 fishery was open August 1 through December 31; Chinook retention was allowed August 1 – September 1 (with mark-selective regulations in place beginning August 23) and during September 13 – December 31 (with mark-selective regulations in place during September 13 – 25. Buoy 10 catch estimates include 23,000 Chinook and 8,000 hatchery Coho. The mainstem sport fishery from the Rocky Point – Tongue Point line upstream to Bonneville Dam was open August 1 – December 31. Mark selective rules for Chinook were in effect September 6 – 25

from Rocky Point – Tongue Point line upstream to the Lewis River. Catch estimates from this fishery include 32,000 Chinook. The mainstem sport fishery from Bonneville Dam to the Highway 395 Bridge (near Pasco, Washington) was open August 1 – December 31. Catch estimates include 14,000 fall Chinook.

### **Tribal**

Tribal fisheries are not mark-selective. Tribal fisheries are conducted in mainstem Columbia River from Bonneville Dam upstream to McNary Dam (Zone 6). Platform and hook and line fisheries also occur in accordance with MOUs in the area immediately below Bonneville Dam. Platform and hook and line fisheries were open and allowed commercial sales through October 9. The commercial gillnet fishery consisted of eight weekly fishing periods August 19 – October 3. Preliminary harvest estimates total 228,300 adult fall Chinook. Fisheries are also conducted in some Zone 6 tributaries and in the Snake and Clearwater rivers. Harvest in tributary fisheries is not reported in this document.

## ***Puget Sound Fisheries***

Puget Sound marine fisheries of interest to the Pacific Salmon Commission in 2013 were regulated to meet conservation and allocation objectives for Chinook, Coho, Chum, Pink, and Sockeye salmon stocks, per Tribal-State agreement. For Puget Sound Chinook listed under the ESA, fisheries were managed according to the Puget Sound Chinook Harvest Management Plan. This management plan defines limits to total exploitation rates for natural stocks and was determined by the National Marine Fisheries Service (NMFS) to be consistent with requirements specified under the ESA 4(d) Rule.

Release requirements were applied to many sport and net fisheries for Chinook, Coho, and Chum salmon, the latter to protect ESA-listed Hood Canal and Strait of Juan de Fuca summer Chum.

Puget Sound marine fisheries were constrained by the need to meet management objectives for ESA listed Puget Sound Chinook, including mid-Hood Canal, Skokomish, Nooksack Early, Skagit Summer/Falls, and Green River Chinook. Interior Fraser Coho was the primary Coho management unit of concern for managing fisheries in the Strait of Juan de Fuca and northern Puget Sound.

### **Strait of Juan de Fuca Sport**

Non-selective Chinook retention was allowed for sport fishing in Marine salmon Management Area 5 from February 16 – April 10 and selective retention in Area 6 from December 1, 2012 – April 10, 2013. Sport fishing regulations allowed retention of marked Chinook and marked Coho beginning July 1 in Areas 5 and 6. Chinook mark selective fishing opportunity was limited to the period through August 15. The sport fishery remained open to a Coho mark selective opportunity through September 14 in Area 5 and through September 30 in Area 6. Wild Coho retention was legal September 15 – October 31 in Area 5 and October 1 – 31 in Area 6. Chinook retention was legal in Area 5 and 6 from October 1 – 31. An additional mark-selective fishery for Chinook was open from December 1 – 31, 2013 in Area 6. The preliminary estimate for Area 5 Chinook retained for the entire opened fishing period July 1 – October 31 was 8,924. A preliminary estimate of Coho retained for the mark-selective and non-selective opened periods was 33,919.

Preliminary estimates of Chinook retained, released (legal and sub-legal size), and the legal-size mark rate in the Area 5 sport mark-selective fishery, July 1 – August 15, 2013.			
Chinook retained	Chinook released	Total encounters	Mark % (legal size)
8,546	29,511	38,507	55%

Preliminary estimates of Coho retained, released and the mark rate in the Area 5 Coho mark-selective sport fishery, July 1 – September 14, 2013.			
Coho retained	Coho released	Total encounters	Mark %
11,967	25,001	36,968	35%

A detailed report of this summer period sport fishery, including catch, effort and results of sampling and monitoring programs, will be available from the Washington Department of Fish and Wildlife in early 2014.

### **Strait of Juan de Fuca Tribal Troll (Area 4B, 5, and 6C)**

During the winter Tribal troll fishery in Areas 4B, 5, and 6C (November 1, 2012 – April 15, 2013), 2,000 Chinook and 14 Coho were caught. The summer Tribal troll fishery in Areas 5 and 6C only (June 16 – September 30), 1,400 Chinook and 183 Coho were caught. The Tribal catch estimates from this area do not include catches from Area 4B during the May-September PFMC management period, which have been included in the North of Cape Falcon Tribal troll summary.

### **Strait of Juan de Fuca Net**

Preliminary estimates of the 2013 catch in the Strait of Juan de Fuca Tribal net fisheries (no non-Tribal net fisheries in the Strait of Juan de Fuca) are 567 Chinook and 2,400 Coho salmon.

### **San Juan Islands Net (Areas 6, 7, and 7A)**

Preliminary estimates of the 2013 catch in the San Juan Island net fishery directed at Sockeye or Chum salmon total 108 Chinook and 1,087 Coho salmon for the Non-Tribal fishery. Tribal fishery landings from this area total 3,600 Chinook and 17,800 Coho.

### **San Juan Islands (Area 7) Sport**

Marked Chinook retention was allowed in the entire area for the period December 1, 2012 – April 30, 2013. The numbers of Chinook retained and released by anglers during this fishery were estimated by an intensive sampling program and are presented in the table below. A detailed report of this fishery, including catch, effort and results of sampling and monitoring programs, is available from the Washington Department of Fish and Wildlife. The southern and southeastern (Rosario Strait) portions of this catch area were again closed July 1 – September 30 to protect Puget Sound Chinook salmon. The remaining area was open for retention of Chinook and Coho salmon from July 1 – October 31. Release of unmarked Coho salmon was required for the months of August through October. Additional sub area closures are described in the Washington State Sport Fishing Rules Pamphlet. Catch estimates and sampling information for this area for the period May 1 – November 30 are not available at this time.

Estimated Chinook retained, released (legal and sub-legal size) and the legal size mark rate in the Area 7 sport mark-selective fishery, December 1, 2012 – April 30, 2013.			
Chinook retained	Chinook released	Total encounters	Mark % (legal size)
3,494	2,960	6,454	74%

### **Inside Puget Sound (Areas 8-13) Sport**

Mark-selective sport fisheries directed at hatchery Chinook were conducted in Area 8.1 (Skagit Bay & Saratoga Passage), Area 8.2 (Port Susan & Port Gardner), Area 9 (Admiralty Inlet), Area 10 (Seattle – Bremerton), Area 11 (Tacoma), and Area 12 (Hood Canal) during the winter (October, 2012 – April, 2013) period, and in Areas 9, 10, 11, 12, and 13 (South Puget Sound) during the summer (May – September, 2013) period.

Detailed reports of these fisheries, including retained and released encounters, effort and mark rates from sampling and monitoring programs, will be available from the Washington Department of Fish and Wildlife in the spring of 2014.

Mark-selective sport fisheries directed at hatchery Coho were conducted in Area 13 for the period July 1 to October 31, 2013.



Puget Sound Chinook mark-selective sport fisheries conducted in marine areas during the period November 1, 2012 through December 31, 2013.	
Areas	Season
8.1 & 8.2	November 1, 2012 – April 30, 2013
9	November 1-30, 2012; Jan 16 – April 15, 2013; and July 16 – August 4, 2013
10	October 1, 2012 – January 31, 2013, and July 16 – August 18, 2013
11	February 1 – April 30, 2013 and June 1 – September 30, 2013
12	February 1 – April 30, 2013 and July 1 – December 31, 2013
13	May 1 – September 30, 2013

### **Puget Sound Marine Net (Areas 8-13 & 7B-D)**

To achieve conservation objectives for natural Puget Sound Chinook and Coho, limited marine net fishing opportunities directed at abundant returns of hatchery Chinook and both hatchery and natural returns of Coho were planned for 2013. Chinook and Coho salmon were also intercepted in fisheries directed at Pink salmon in Bellingham Bay (Areas 7B-D) and Areas 8, 10 and 11. A total of 79,000 Chinook and 170,100 Coho were caught in Puget Sound marine net fisheries (Areas 8-13 & 7B-D) during 2013.

### **Puget Sound Rivers Fisheries**

Tribal net and non-Tribal sport fisheries directed at salmon in this region were implemented based upon pre-season, Tribal-State agreements and subject in part to in-season adjustment. The Net harvest (in Puget Sound rivers by Tribal fisheries) included catch from river systems in the Strait of Juan de Fuca, Hood Canal, and Puget Sound. A total of 25,900 Chinook and 132,600 Coho were landed in Puget Sound river net fisheries during 2013.

Mark selective fisheries directed at Chinook salmon were also conducted in the following Puget Sound rivers with PSC Chinook CWT exploitation rate indicator stocks or DIT groups:

Chinook mark-selective sport fisheries conducted in Puget Sound rivers, 2013.	
River	Season
Nooksack River	September 1 - 30
Cascade River (Skagit)	June 1 – July 15
Skagit River	June 1 – July 15
Skykomish River	June 1 – July 31
Nisqually River	January 1 – 31 and July 1 – December 31
Skokomish River	August 3 – September 25

No mark-selective sport fisheries were conducted in 2013 in any Puget Sound rivers with PSC Coho CWT exploitation rate indicator stocks or DIT groups.

**Table 1.** Preliminary 2013 Landed Chinook Catches for Washington and Oregon Fisheries of Interest to the Pacific Salmon Commission (rounded to the nearest 100). <sup>9/</sup>

FISHERIES	2013			Landed				
	Preseason <sup>13/</sup>		Preliminary Landed					
	Total Mortality <sup>1/</sup>	Landed <sup>2/</sup>		2012	2011	2010	2009	2008
OCEAN FISHERIES								
Troll								
Neah Bay and La Push (areas 3/4/4B) <sup>3/</sup>	74,400	65,100	63,200	80,500	42,900	39,600	15,700	23,000
Columbia Ocean Area and Westport (area 1&2)	41,800	31,400	28,400	14,300	17,300	49,000	9,600	11,900
Sport (see text for quota information)								
Neah Bay (area 4) <sup>4/</sup>	6,100	5,300	6,300	5,600	3,000	3,300	2,400	1,400
La Push (area 3) <sup>4/</sup>	2,100	1,900	2,400	1,300	1,500	1,200	700	700
Westport (area 2) <sup>4/</sup>	35,000	30,100	13,700	19,500	19,100	27,000	5,000	9,600
Columbia Ocean Area (area 1) <sup>4/</sup>	11,900	10,700	8,500	9,100	7,200	7,200	5,200	3,700
INSIDE FISHERIES								
Sport <sup>10/</sup>								
Juan De Fuca (area 5&6) <sup>5/</sup>	13,500	9,100	8,900	13,900	9,500	9,100	10,200	4,800
San Juan Is. (area 7)	7,800	6,600	na	5,800	6,500	3,600	4,200	5,800
Puget Sound (area 8-13)	36,500	25,000	na	22,000	11,600	15,600	16,900	21,700
Puget Sound Rivers <sup>12/</sup>	22,700	21,600	na	23,600	18,200	15,600	14,400	15,300
North WA Coastal Rivers	na	na	na	1,700	2,300	1,300	900	800
Grays Harbor <sup>7/</sup>	na	na	na	4,600	3,400	2,200	900	0
Col. R. (Spring) <sup>6/</sup>	na	na	7,200	16,500	15,900	34,700	18,100	22,700
Col. R. (Summer) <sup>6/</sup>	na	na	2,400	3,000	5,300	3,000	2,500	3,100
Col. R. (Fall) (incl. Buoy 10) <sup>6/</sup>	na	na	69,000	46,300	44,900	30,300	24,400	22,200
Commercial <sup>11/</sup>								
Strait Juan de Fuca (area 4B,5,6C) Net & Troll	7,600	6,600	4,000	4,000	4,300	4,400	3,600	6,400
San Juan Is. (area 6,7, 7A)	8,100	8,000	3,800	400	5,500	6,800	1,000	100
P. Sound Marine (8-13;7B-D)	58,400	57,100	79,000	76,800	65,700	43,300	44,700	61,000
Puget Sound Rivers <sup>12/</sup>	51,600	51,600	25,900	39,700	35,200	36,000	33,100	40,800
North WA Coastal Rivers	na	na	14,200	12,800	11,800	9,000	10,500	7,800
Grays Harbor (area 2A-2D) <sup>7/</sup>	na	na	2,900	5,300	8,300	4,600	3,400	2,600
Col. R. Net (Wint/Spr.) <sup>8/</sup>	na	na	11,200	23,800	20,100	52,000	17,300	27,100
Col. R. Net (Sum) <sup>8/</sup>	na	na	15,300	9,500	25,600	20,500	14,200	10,400
Col. R. Net (Fall) <sup>8/</sup>	na	na	315,300	119,700	165,600	163,800	133,600	134,700

**Table 1 Footnotes:**

- <sup>1/</sup> Nominal total mortality is not adjusted for adult equivalents (AEQ) and does include non-retention mortality. Total Mortality is estimated by FRAM as catch + incidental mortality, where incidental mortality = drop off + non-retention mortality.
- <sup>2/</sup> For the ocean fisheries, this column shows the Chinook troll and recreational quotas used for 2013 pre-season fishery planning as distributed by ocean area. Pre-season total troll quota is 96,500 and recreational Chinook quota 48,000. See text for any in-season adjustments.
- <sup>3/</sup> Includes Area 4B catch during the PFMC management period (May 1 – September 15); Area 4B Treaty troll catch outside PFMC period included under Strait Juan de Fuca net and troll.
- <sup>4/</sup> Includes catches from the spring mark selective fishery.
- <sup>5/</sup> 2013 catch represents July 1 – October 31 in Area 5 only, since Catch Record Card (CRC) annual estimates are not yet available.
- <sup>6/</sup> Mainstem retained sport catch only (upstream to McNary Dam and Snake River to WA/ID border for spring, upstream to Priest Rapids Dam for summer and upstream to Hwy 395 for fall). See tables 22 – 23 in the annual Joint Staff Report regarding spring and summer Chinook and tables 29 – 31 in the annual fall report. [http://wdfw.wa.gov/fishing/crc/staff\\_reports.html](http://wdfw.wa.gov/fishing/crc/staff_reports.html).
- <sup>7/</sup> Includes Grays Harbor catch, as well as catch from the Chehalis and Humptulips rivers and their tributaries for sport and Chehalis and Humptulips rivers for net estimates.
- <sup>8/</sup> Mainstem retained catch only, includes tribal C&S and commercial for all gear types and non-tribal (Columbia River mouth upstream to McNary Dam). Catch data from annual Joint Staff Reports. Winter and spring catch T7 and T18. Summer catch is from T10. Fall catch from annual fall report T20, 24 and 26.
- <sup>9/</sup> Includes catches from mark-selective fisheries where estimates are available.
- <sup>10/</sup> Sport catch after March 2011 is preliminary.
- <sup>11/</sup> Includes Non-Tribal and Tribal commercial and take home, as well as Tribal Ceremonial and Subsistence for all gear types. Starting in 2012, the Copalis, Moclips, and Ozette rivers have been removed from the landed catch.
- <sup>12/</sup> Chinook fisheries in Puget Sound rivers are modeled using the Terminal Area Management Module (TAMM), based upon FRAM output of terminal run sizes. Total Mortality is estimated in TAMM as catch + non-retention mortality.
- <sup>13/</sup> FRAM modeled pre-season fishery impacts cover the current fishery planning year, for Chinook defined as May 1 through April 30.

**Table 2.** Preliminary 2013 Landed Coho Catches for Washington and Oregon Fisheries of Interest to the Pacific Salmon Commission (rounded to the nearest 100).<sup>6/</sup>

FISHERIES	2013			Landed				
	Preseason <sup>9/</sup>		Preliminary Landed					
	Total Mortality <sup>1/</sup>	Landed <sup>2/</sup>			2012	2011	2010	2009
OCEAN FISHERIES								
Troll								
Neah Bay and La Push (areas 3/4/4B) <sup>3/</sup>	56,700	49,500	48,800	38,500	14,200	9,600	64,200	14,000
Columbia Ocean Area and Westport (area 1&2)	24,400	12,300	5,300	3,700	8,600	5,000	29,200	2,400
Sport (see text for quota information)								
Neah Bay (area 4)	10,500	7,800	6,500	7,500	3,100	3,700	13,300	2,200
La Push (area 3)	2,500	1,900	2,800	2,200	2,100	1,200	6,900	500
Westport (area 2)	36,400	27,700	20,200	12,000	13,800	12,600	53,900	7,500
Columbia Ocean Area (area 1)	46,400	37,400	20,500	11,400	26,700	24,900	83,800	10,800
INSIDE FISHERIES								
Sport <sup>7/</sup>								
Juan De Fuca (area 5&6) <sup>4/</sup>	42,300	36,300	33,900	76,300	21,400	13,600	32,900	11,400
San Juan Is. (area 7)	700	500	na	2,200	900	600	800	200
Puget Sound (area 8-13)	28,500	27,100	na	91,500	34,500	6,000	42,000	9,700
Puget Sound Rivers	30,700	29,300	na	43,300	40,400	9,600	41,200	15,000
North WA Coastal Rivers	7,000	6,700	na	3,400	7,900	5,800	7,200	1,600
Grays Harbor <sup>5/</sup>	38,300	36,500	na	18,000	14,600	12,500	16,100	3,300
Columbia River Buoy 10	16,100	13,000	8,000	7,400	7,600	8,000	48,100	8,600
Commercial <sup>8/</sup>								
Strait Juan de Fuca (area 4B,5,6C) Net & Troll	4,800	4,700	2,600	3,600	2,800	3,300	3,300	1,200
San Juan Is. (area 6,7, 7A)	8,100	5,900	18,900	10,500	11,300	4,800	6,400	200
P. Sound Marine (area 8-13, 7B-D)	194,200	190,200	170,100	237,400	138,000	102,400	173,600	147,400
Puget Sound Rivers	79,800	78,300	132,600	132,800	101,000	64,400	92,800	85,400
North WA Coastal Rivers	77,100	75,600	43,800	39,700	82,900	97,100	126,500	50,200
Grays Harbor (area 2A-2D) <sup>5/</sup>	92,400	90,600	23,700	44,000	32,300	31,100	28,200	19,400

**Table 2 Footnotes:**

- <sup>1/</sup> Estimates of total mortality include non-retention mortality. Total Mortality is estimated by FRAM as catch + incidental mortality, where incidental mortality = drop off + non-retention mortality.
- <sup>2/</sup> For ocean fisheries this column shows the Coho troll and recreational quotas used for 2013 pre-season fishery planning as distributed by ocean area. Pre-season total troll quota is 61,700 and recreational marked Coho quota is 74,800. See text for any in-season adjustments.
- <sup>3/</sup> Includes area 4B catch during the PFMC management period (May 1 – September 15); area 4B Treaty troll catch outside PFMC period included under Strait Juan de Fuca net and troll.
- <sup>4/</sup> 2013 catch represents selective fisheries July 1 – October 31 in area 5 only, since CRC annual estimates are not yet available.
- <sup>5/</sup> Includes Grays Harbor catch, as well as catch from the Chehalis and Humptulips rivers and their tributaries for sport estimates and Chehalis and Humptulips rivers for net estimates.
- <sup>6/</sup> Includes catches from mark-selective fisheries where estimates are available.
- <sup>7/</sup> Sport data after March 2011 are preliminary.
- <sup>8/</sup> Includes Non-Tribal and Tribal commercial and take home, as well as Tribal Ceremonial and Subsistence for all gear types. Starting in 2012, the Copalis, Moclips, and Ozette rivers have been removed from landed catch.
- <sup>9/</sup> FRAM modeled pre-season fishery impacts cover the current fishery planning year, for Coho defined as January 1 through December 31.

**Table 3.** Mark-Selective Chinook and Coho Fisheries by Area and Year. <sup>1/</sup>

<b>Selective Coho</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>	<b>2008</b>	<b>2007</b>	<b>2006</b>
<b>Ocean Troll</b>								
Cape Flattery & Quillayute (Areas 3/4)	yes	yes	yes	yes	yes	yes	yes	yes
Columbia R & Grays Harbor (Areas 1 & 2)	yes	yes	yes	yes	yes	yes	yes	yes
<b>Ocean Sport</b>								
Neah Bay (Area 4)	yes	yes	yes	yes	yes	yes	yes	yes
LaPush (Area 3)	yes	yes	yes	yes	yes	yes	yes	yes
Grays Harbor (Area 2)	yes	yes	yes	yes	yes	yes	yes	yes
Col. R. (Leadbetter Pt. to Cape Falcon)	yes	yes	yes	yes	yes	yes	yes	yes
<b>Inside Fisheries</b>								
<b>Sport</b>								
Juan de Fuca (Areas 5 & 6)	yes	yes	yes	yes	yes	yes	yes	yes
San Juan Islands (7)	yes	yes	yes	yes	yes	yes	yes	yes
Puget Sound Sport (Areas 8-13 all year)	yes	yes	yes	yes	yes	yes	yes	yes
Puget Sound Rivers	yes	yes	yes	yes	yes	yes	yes	yes
North WA Coastal Rivers	yes	yes	yes	yes	yes	yes	yes	yes
Grays Harbor (Areas 2-2)	yes	yes	no	yes	yes	yes	no	no
Columbia River Buoy 10	yes	yes	yes	yes	yes	yes	yes	yes
<b>Commercial</b>								
North WA Coastal Rivers	no	no	no	no	no	no	no	no
Grays Harbor (Areas 2A-2D)	no	no	yes	yes	yes	no	no	no
Columbia River Net/ - Fall	yes	no	no	no	no	no	no	no
Strait of Juan de Fuca (Areas 4B/5/6C) Net & Troll	no	no	no	no	no	no	no	no
San Juan Islands (Areas 6, 7 & 7A)	yes	yes	yes	yes	yes	yes	yes	yes
Puget Sound Marine (Areas 8 - 13)	no	no	no	no	no	yes	no	no
Puget Sound Rivers	no	no	no	no	no	no	no	no
<b>Selective Chinook</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>	<b>2008</b>	<b>2007</b>	<b>2006</b>
<b>Ocean Troll</b>								
Cape Flattery & Quillayute (Areas 3/4/4B)	no	no	no	no	no	no	no	no
Columbia. R & Grays Harbor (Areas 1&2)	no	no	no	no	no	no	no	no
<b>Ocean Sport</b>								
Neah Bay (Area 4)	yes	yes	yes	yes	no	no	no	no
La Push (Area 3)	yes	yes	yes	yes	no	no	no	no
Grays Harbor/Westport (Area 2)	yes	yes	yes	yes	no	no	no	no
Col. R./Ilwaco (Leadbetter Pt. to Cape Falcon)	yes	yes	yes	yes	no	no	no	no
<b>Inside Fisheries</b>								
<b>Sport</b>								
Juan de Fuca (Area 5&6)	yes	yes	yes	yes	yes	yes	yes	yes
San Juan Islands (Area 7)	yes	yes	yes	yes	yes	yes	no	no
Puget Sound Sport (Areas 8-13)	yes	yes	yes	yes	yes	yes	yes	yes
Puget Sound Rivers	yes	yes	yes	yes	yes	yes	yes	yes
North WA Coastal Rivers	yes	yes	yes	yes	yes	yes	yes	yes
Grays Harbor (Areas 2-2)	yes	yes	no	no	no	no	yes	yes
Columbia River Sport - Winter/Spring	yes	yes	yes	yes	yes	yes	yes	yes
Columbia River Sport - Summer	yes	yes	yes	yes	no	no	no	no
Columbia River Sport - Fall	yes	yes	no	no	no	no	no	no

<b>Commercial</b>								
North WA Coastal Rivers	no	no	no	no	no	no	no	no
Grays Harbor (Areas 2A-2D)	yes	yes	no	no	no	no	no	no
Columbia River Net-Winter/Spring	yes	yes	yes	yes	yes	yes	yes	yes
Columbia River Net - Summer	no	no	no	no	no	no	no	no
Columbia River Net - Fall	no	no	no	no	no	no	no	no
Strait of Juan de Fuca(4B/5/6C) Net & Troll	no	no	no	no	no	no	no	no
San Juan Islands (Areas 6, 7 & 7A)	yes	yes	yes	yes	yes	yes	no	no
Puget Sound Marine (Areas 8 - 13)	no	no	yes	yes	no	no	no	no
Puget Sound Rivers	yes	yes	yes	no	no	no	no	no

**Table 3 Footnotes:**

<sup>1/</sup> "Yes" denotes that a mark selective fishery occurred, even if it only occurred in a subset of the fishing area, season, gear type, or user group.

## **PRELIMINARY REVIEW OF THE 2013 WASHINGTON CHUM SALMON FISHERIES OF INTEREST TO THE PACIFIC SALMON COMMISSION**

December 12, 2013

This summary report provides a preliminary review of the 2013 U.S. Chum salmon fisheries conducted in the Strait of Juan de Fuca (Salmon Catch Areas 4B, 5 and 6C), the San Juan Islands (Areas 6 and 7) and the Point Roberts area (Area 7A), conducted in compliance with provisions of Chapter 6 of Annex IV of the Pacific Salmon Treaty. The harvest and abundance information provided are based on preliminary data reported through November 15 and is subject to correction and revision as additional information becomes available.

### **MIXED STOCK FISHERIES**

#### **Areas 4B, 5 and 6C**

As in previous years, the Chum salmon fishery in Areas 4B, 5 and 6C was restricted to Treaty Indian fishers using gill nets. The fall Chum salmon fishery opened the week of October 6, with a schedule of six days per week and continued through November 9. A total of 1,123 Chum salmon were harvested. Including incidental catches of Chum salmon prior to the Chum-directed fishing season, 1,201 Chum salmon were harvested (Table 1). During the fall Chum fisheries in Areas 4B, 5, and 6C, there was a reported by-catch of 711 Coho, 11 Chinook, and zero Steelhead.

#### **Areas 7 and 7A**

Chum salmon fisheries in Areas 7 and 7A are regulated to comply with a base harvest ceiling of 130,000 Chum salmon, unless a critically low level of abundance is identified for those stocks migrating through Johnstone Strait ("Inside Southern Chum salmon"). Chapter 6 of Annex IV specifies that U.S. commercial fisheries for Chum salmon in Areas 7 and 7A will not occur prior to October 10. Paragraph 10 (a-b) specifies run sizes below 1.0 million as estimated by Canada as critical. For run sizes below the critical threshold, the U.S. catch of Chum salmon in Areas 7 and 7A will be limited to those taken incidentally to other species and in other minor fisheries, and shall not exceed 20,000. U.S. commercial fisheries were initiated on October 10.

Paragraph 10 (d) says that Canada will provide an estimate of Fraser River run size no later than October 22, and if that estimate is below 900,000, then the U.S. will limit its fishery to not exceed a catch of 20,000 additional Chum salmon from the day following notification. An estimated Fraser River Chum salmon run size of 1,489,000 was provided by Canada on October 15. The fishery was therefore continued without restriction through November 9. The U.S. catch between October 10 and November 9 in Areas 7 and 7A was 79,332 Chum salmon. The Non-Treaty gill net and purse seine fleets were open daily October 12, 13, 15, and then continuously October 19 through November 9. The Treaty Indian gill net and purse seine fisheries were opened on October 10 and ran continuously from October 22 through November 9.

Non-Indian reef net fisheries targeting adipose-marked Coho salmon were conducted from the end of Fraser Panel control (September 28) until September 30, with Chum salmon retention prohibited. From October 1 through November 9, reef nets were open daily with Chum salmon retention allowed. Chum salmon catch in this fishery, between October 1 and October 10, was 96 fish. Effort was low and there was no reef net fishing effort after early October.



The total 2013 Chum salmon catch by all gears in Areas 6, 7, and 7A, reported through November 9, was 80,292. Catch distribution, between Areas 7 and 7A, was 72% and 28% respectively. However, it should be noted that these catch reports may be incomplete as of the date of this report (Table 2). There were 828 Chum salmon reported caught in Areas 7 and 7A during Fraser Panel approved Sockeye and Pink salmon fisheries in August and September. During the fall Chum salmon fisheries in Areas 6, 7 and 7A, there was a reported by-catch of 8,764 Coho, 4 Chinook, and 2 Steelhead.

#### PUGET SOUND TERMINAL AREA FISHERIES AND RUN STRENGTH

Preseason forecasts for Chum salmon returns to Puget Sound were for a fall Chum run totaling approximately 837,000 fish. In-season estimates as of the date of this report indicate that the returns to Puget Sound are generally well above forecast with some exceptions. The 2013 fall Chum run to Hood Canal, in particular, has been exceptional, with over 1.1 million Chum harvested in those terminal areas to date. South Puget Sound fall Chum were above forecast. Estimates are not yet available for other areas, though some Central Sound fall Chum stocks appear to be below forecast. Some Puget Sound Chum fisheries are still underway and additional in-season estimates of abundance may occur. As of the date of this report, spawning escapement surveys are in the early stages for most Puget Sound stocks and therefore escapement estimates are not yet available.

TABLE 1. PRELIMINARY 2012 CHUM SALMON HARVEST REPORT FOR  
WASHINGTON CATCH REPORTING AREAS 4B, 5, 6C

<b>Areas 4B, 5, 6C</b>	
Treaty Indian, Gill Net Only	
Time Periods	GN
Through 9/21	78
9/22-9/28	0
9/29-10/5	0
10/6-10/12	616
10/13-10/19	254
10/20-10/26	9
10/27-11/2	157
11/3-11/9	87
Total	1,201

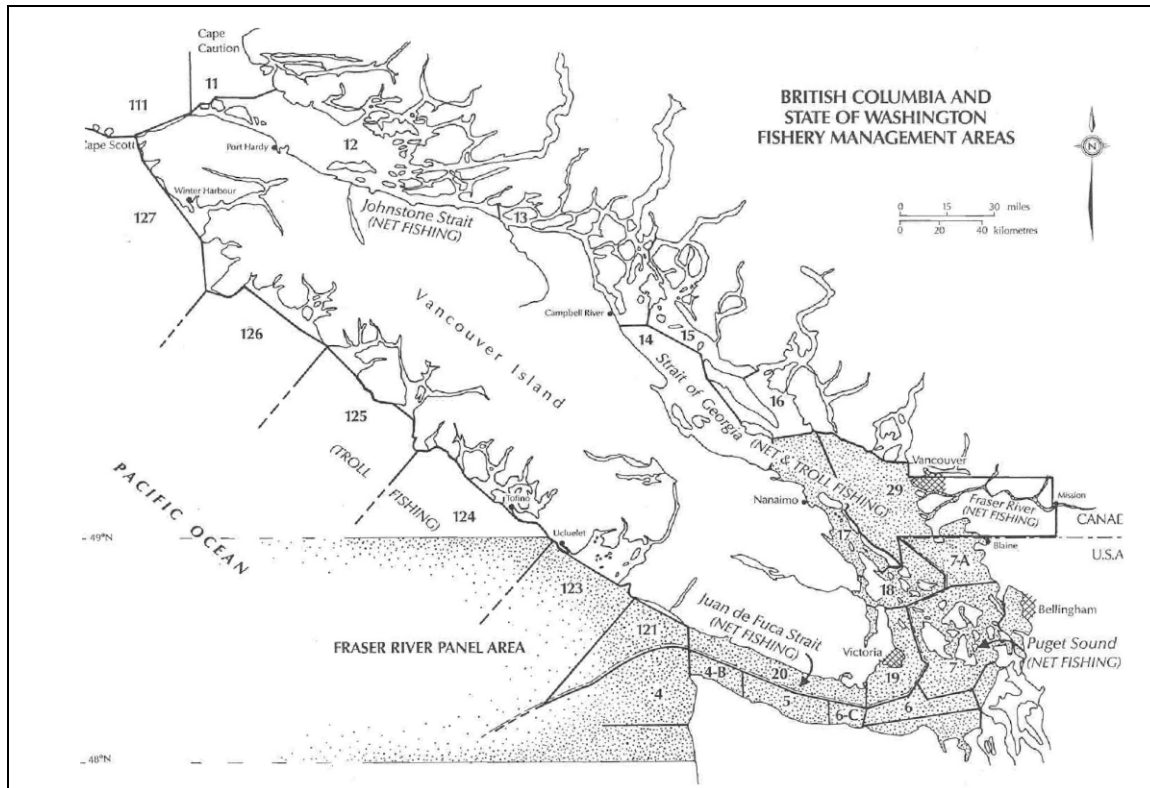
TABLE 2. PRELIMINARY 2012 CHUM SALMON HARVEST REPORT FOR  
WASHINGTON CATCH REPORTING AREAS 6, 7, 7A

	Area 6	Area 7				Area 7A			Area 6, 7, 7A
Time Periods	GN	PS	GN	RN	Area Total	PS	GN	Area Total	Total
Through 9/28	0	701	9	0	710	116	2	118	828
9/29-10/5	0	0	0	81	81	0	0	0	81
10/6-10/12	0	11,815	125	15	11,955	95	721	816	12,771
10/13-10/19	0	27,650	2,466	0	30,116	2,810	12,461	15,271	45,387
10/20-10/26	0	7,842	853	0	8,695	0	2,367	2,367	11,062
10/27-11/2	0	5,262	126	0	5,388	530	2,119	2,649	8,037
11/3-11/9	36	944	0	0	944	0	1,146	1,146	2,126
Total	36	54,214	3,579	96	57,889	3,551	18,816	22,367	80,292
Gear Type Abbreviations: GN = Gill net; PS = Purse seine; RN = Reef net									
10/10-11/9	Coho: 8,764		Chinook: 4		Steelhead: 2				
By-catch									

# Preliminary Review of 2013 United States Fraser River Sockeye and Pink Salmon Fisheries

## Introduction

The 2013 Fraser River Panel fishing season was implemented under Annex IV of the Pacific Salmon Treaty (PST), and guidelines provided by the Pacific Salmon Commission to the Fraser River Panel. The treaty establishes a bilateral (U.S. and Canada) Fraser River Panel (Panel) that develops a pre-season management plan and approves in-season fisheries within Panel Area waters directed at Sockeye and Pink salmon bound for the Fraser River (Figure 1). In partial fulfillment of Article IV, paragraph 1 of the PST, this document provides a season review of the 2013 U.S. Fraser River salmon fisheries as authorized by the Panel. Catch and abundance information presented is considered preliminary.



**Figure 1.** British Columbia and State of Washington Fishery Management Areas, 2013. The shaded area in the figure represents the marine waters managed by the Fraser River Panel.

## Preseason Expectations and Plans

### ***Forecasts and Escapement Goals***

Pre-season run size forecasts and escapement goals by stock group (run) at various probability levels were provided to the Panel by the Department of Fisheries and Oceans, Canada (DFO). Table 1 shows the 2013 agreed pre-season Sockeye forecasts based on the 50 percent probability level forecasts, which represent the mid-point of the range of possible run sizes for all the stock management groups. Table 1 also provides the escapement goals for the Sockeye management groups based on the pre-season forecasted abundance. The escapement goals for all timing groups can change in-season as the run size estimates change.

Fraser River Pink salmon returns were projected pre-season at 8,926,000 fish, with an escapement goal of 6 million fish.

**Table 1.** 2013 Pre-season Fraser River Sockeye Forecasts and Escapement Goals, by Stock Group. (Esc. Plan 1)

	Early Stuart	Early Summer	Summer	Late	Total
Forecast of Abundance	211,000	253,000	3,718,000	583,000	4,765,000
Escapement Goal	108,000	141,000	1,487,200	313,000	2,049,200

### ***Diversion***

Diversion is defined as the percentage of Fraser Sockeye or Pink salmon migrating through Johnstone Strait (rather than the Strait of Juan de Fuca) in their approach to the Fraser River. Diversion through Johnstone Strait was forecasted pre-season to be 38% for Sockeye and 41% for Pink salmon.

### ***Management Adjustment (MA) and Environmental Conditions***

Management Adjustments for Sockeye salmon reflect the expected difference between escapement estimates at Mission (minus catch above Mission) and actual spawning escapements. If the adjustments are adopted by the Panel, they are added to the gross escapement goal, effectively increasing the goal for an impacted run. For 2013, Management Adjustments were modeled using forecasts of environmental conditions and return timing or median historical differences between estimates. Table 2 provides the pre-season projected MA's that were used for planning fisheries. In-season management adjustments use MA models that are based on both measured and forecasted temperatures and discharges or, for late runs, upstream migration timing.

**Table 2.** 2013 Pre-Season Management Adjustments (MA)

<b>Early Stuart</b>		<b>Early Summer</b>		<b>Summer</b>		<b>Lates</b>	
Proportional Management Adjustment	Management Adjustment	Proportional Management Adjustment	Management Adjustment	Proportional Management Adjustment	Management Adjustment	Proportional Management Adjustment	Management Adjustment
0.57	61,600	0.46	64,900	0.10	143,000	0.67	209,200

### ***Run Timing***

Run timing is temporal information about the presence of a salmon stock in a specific time and area. Run timing is an important variable when planning fisheries and predicting run size in-season. The following Area 20 50% dates (the dates when 50% of the stock or run group is forecasted to have passed through Area 20) were predicted pre-season for the major Fraser Sockeye run groups and for Fraser Pink salmon.

**Table 3.** 2013 Area 20 Pre-Season 50% Run Timing Dates

<b>Run Group</b>	<b>Area 20 50% Run Timing Date</b>
Early Stuart	July 5
Early Summers	July 23
Summers	August 3
Lates	August 12
Pink	August 28

### ***U.S. Total Allowable Catch (TAC)***

Pre-season, the U.S. TAC was established at 283,800 Sockeye and 752,000 Pink salmon. This difference in magnitude between the Sockeye and Pink salmon allowable catches and the overlap between Sockeye and Pink salmon run timings presented a management challenge for the U.S. to be able to access the abundant Pink salmon while staying within the Sockeye allocation.

### ***Preseason Management Plans***

During the preseason planning process the Fraser Panel evaluates and adopts management approaches for Fraser Sockeye and Pink salmon that address conservation and harvest objectives for each major stock group. The Fraser River Panel develops fishing plans and in-season decision rules with the objective of meeting management goals. Managing Fraser River Sockeye and Pink salmon involves a trade-off between catching abundant stocks and meeting escapement objectives for less abundant stock groups.

In 2013 the Panel was faced with a situation where fishing opportunities would be constrained somewhat by Early Summer runs at the beginning of the season and Late Run stocks later in the season, and by the available Sockeye harvest to access Pink salmon. There was no TAC predicted to be available for Early Stuart Sockeye in 2013, and commercial fisheries were not contemplated on this timing group preseason.

The early entry behavior of Late Run Sockeye, observed in recent years, which results in an apparent high loss of fish prior to reaching the spawning grounds, was expected to continue in 2013, resulting in a proportional management adjustment of 67%.

Given the abundance of Pink salmon expected, and anticipated good prices, the U.S. Section decided to structure its fishery to have an early Sockeye-directed fishery, but to save some of the Sockeye TAC to access Pink salmon. The U.S. Section of the Panel developed a pre-season fishing plan that focused Sockeye fishing effort on the Early Summer and Summer Runs, but then retained enough Sockeye TAC to open Pink salmon fishing at the peak of the Pink migration to afford an opportunity to harvest most of the Pink salmon TAC. For the major U.S. fisheries this meant that Sockeye openings would likely be constrained to about a week of fishing during the second week of August. Pink salmon directed fisheries were anticipated to begin the first week of September when Pink abundance would be the highest.

## **In-Season Management**

In-season, the Pacific Salmon Commission staff analyzes a variety of information to produce best estimates of diversion, management adjustments, run-timing, abundance, and harvest by stock group. These estimates are created using stock ID information, test fishing data, counts of escapements past Mission, harvest data and environmental information.

### ***Run Assessment***

The final in-season abundance estimates for 2013 (Table 4) indicate that Sockeye returned below preseason expectations at ~78% of the preseason forecast of 4,765,000. The majority of the reduced Sockeye return can be accounted for in the Summer run which came back at 65% of the preseason forecast but was anticipated to contribute 78% to the total forecasted Fraser Sockeye return. Quesnel Sockeye which returned at ~ 19% of the preseason forecast, account for much of the reduced Summer-run return. Early Stuart Sockeye also returned below forecast at 86% of forecasted abundance. The two remaining stock groups, returned at or above preseason forecast with Early summer run Sockeye doubling the preseason forecast, while Late run Sockeye surpassed the preseason forecast by 3%.

Pink salmon returns were much better than expected preseason, with an in-season estimated run size of a record 26,000,000 fish, relative to a preseason expectation of 8,926,000 fish (291% of expected). This Pink salmon abundance estimate resulted in a significant TAC and U.S. fishing opportunity late in the season.

Run timing for Early Stuart Sockeye was 3 days early relative to preseason forecast while the remaining stock groups were all later than preseason forecast, ranging from 1 – 7 days late. Pink salmon returned at the preseason forecasted timing.

**Table 4.** Comparison of 2013 Pre-season vs. In-season Abundance Estimates for Fraser River Sockeye Salmon by Stock Group (run) and Pink salmon.

Stock Group	Pre-Season 50% Probability Forecast	In-Season Run Size Estimate	Comparison: In-Season vs. Pre-Season Forecast
Early Stuart	211,000	182,000	86%
Early Summer	253,000	550,000	217%
Summer	3,718,000	2,400,000	65%
Lates	583,000	600,000	103%
<b>Total Sockeye</b>	4,765,000	3,732,000	78%
Pink	8,926,000	26,000,000	291%

**Table 5.** 2013 Preliminary 50% Run Timing Dates in Area 20

Run Group	Pre-season 50% Run Timing Date	In-season 50% Run Timing Date
Early Stuart	July 5	July 2
Early Summers	July 23	July 24
Summers	August 3	August 10
Lates	August 12	August 17
Pink	August 28	August 28

## Season Description

### Prior to July 27:

**Run size Changes:** Early Stuart Sockeye run size was downgraded to 180,000 and migration completed.

**Timing:** Early Stuart Sockeye migration timing was advanced to July 2.

**Diversion:** Sockeye diversion has already exceeded the preseason forecast, reaching 43%.

**Stock ID:** Early summer run and Summer run Sockeye are now the dominant stock groups in migrating through marine areas.

**Environmental Conditions/MA:** In-river temperatures are rising and the Early Stuart management adjustment increased to 1.33 (0.57 preseason).

**Fisheries:** All Treaty Indian and All citizens fisheries remain closed.

### **Week ending August 3:**

**Run size Changes:** The early Stuart Sockeye runsize was updated to 182,000 and Early Summer-runs were updated to 400,000 from the 253,000 preseason forecast. Summer run Sockeye are not building in abundances in marine test fisheries as expected per the preseason forecast.

**Timing:** Early Stuart timing is still estimated to be July 2<sup>nd</sup>, 3 days early relative to preseason forecast. Early summer-run Sockeye also appear to be early with a 50% date of July 21 adopted by the panel (2 days early relative to preseason).

**Diversion:** The diversion rate for Sockeye continues to increase and is now estimated at 65%.

**Stock ID:** Marine test catches are now dominated by Summer run Sockeye followed by Early summers. Summer run stock groups Chilko and Quesnel, which make up the majority of the summer run forecast are not building to the proportions expected preseason.

**Environmental Conditions/MA:** In-river flows are ~ 25% lower than average for this date at 3,390 cms, and temperatures have increased to 19.1 C, 1.4 C higher than avg. Early summer-run MA was increased to 0.54 from the preseason forecast of 0.46.

**Fisheries:** Treaty Indian fisheries opened in areas 4B/5/6C on July 30 – Aug. 3. All citizens fishing remains closed.

### **Week ending August 10:**

**Run size Changes:** Early summer-run Sockeye runsize increased from 400,000 to 452,000. The Summer-run Sockeye runsize was updated from the preseason forecast of 3,718,000 to 2,000,000, just over half of the preseason forecast. It is too early to assess Late-run Sockeye runsize.

**Timing:** Early summer-run 50% timing was updated to July 22 with Summer-run timing updated from preseason forecast of August 3<sup>rd</sup> to August 8.

**Diversion:** The diversion rate for Sockeye is estimated at 62% and 51% for Pink salmon.

**Stock ID:** Early summer-run Sockeye continue to decline in marine area stock ID samples, while Chilko make up the majority of Sockeye Summer-run test catches. Pink salmon stock ID is currently dominated by Canada South Coast and Washington origin fish, with Fraser Pink making up only 4% in the most recent stock ID sample.

**Environmental Conditions/MA:** Record high river temperatures have increased management adjustments for Early summer-run to 0.57 and Summer-run Sockeye to 1.56 (0.09 preseason).

**Fisheries:** The poor return of Summer-run Sockeye along with large management adjustments has reduced US Sockeye TAC to 0. Treaty Indian fisheries that had been open in areas 4B/5/6C since July 30 were closed on August 10. All citizens fishing remains closed.



### **Week ending August 17:**

**Run size Changes:** The Early summer-run Sockeye runsize increased to 520,000 and Summer-run Sockeye runsize increased to 2,300,000.

**Timing:** Early summer-run Sockeye run timing was updated to July 24<sup>th</sup>, 2 days later than the week prior and 1 day later than preseason expectations. Summer-run Sockeye run timing was updated to August 9<sup>th</sup>.

**Diversion:** Fraser Sockeye diversion has increased to 71% and Pink diversion increased to 60%.

**Stock ID:** Summer-run Sockeye are now dominating the test catches composed primarily of Chilko, while the Quesnel run is now indicating <10% preseason forecast abundances. Late-run Sockeye are beginning to show up in increasing numbers. Fraser Pink salmon currently comprise ~23% of Pink salmon migrating through marine waters.

**Environmental Conditions/MA:** Record high river temperatures continue, resulting in further increases to the management adjustments. Early summer-run Sockeye management adjustment was increased to 0.72 and Summer-run to 2.35.

**Fisheries:** Treaty Indian and All citizens fishing are closed due to no TAC available on Summer-run Sockeye.

### **Week ending August 24:**

**Run size Changes:** Both Early summer-run and Summer-run Sockeye runsizes remain unchanged. It is still early to make a runsize adjustment for Late-run Sockeye. The Pink salmon runsize was upgraded to 10,000,000 from the preseason forecast of 8,926,000.

**Timing:** Timing for Early summer and Summer-run Sockeye remain unchanged. Pink salmon timing also remains unchanged.

**Diversion:** Sockeye diversion is now estimated at 90% while Pink diversion is currently at 50%.

**Stock ID:** Summer-run Sockeye migration is declining in marine waters and Late-run Sockeye now make up 21-58% of stock ID samples. Fraser River Pink salmon are increasing in proportion, though currently comprise only 16% of migrating Pink in Johnstone Strait and 48% in the Strait of Juan de Fuca.

**Environmental Conditions/MA:** No changes were made to Sockeye management adjustments this week.

**Fisheries:** Due to high river temperatures and diminished summer Sockeye returns, no US TAC remains for Fraser Sockeye. This week Treaty Indian fisheries targeting Pink salmon in 4B/5/6C were opened on August 24. All citizens reef nets were opened on August 24.

### **Week ending August 31:**

**Run size Changes:** The Early summer-run Sockeye runsize was increased to 550,000 and Summer-run Sockeye to 2,400,000. Late-run Sockeye runsize also increased to 500,000. Pink salmon runsize was increased to 16,000,000.

**Timing:** Migration timing of Sockeye stock groups are all getting later with Early Summer-run, Summer-run, and Early summer-run Sockeye moving to July 25<sup>th</sup>, August 10<sup>th</sup>, and August 13<sup>th</sup> respectively. The Pink salmon run timing was moved to August 29<sup>th</sup>.

**Diversion:** Diversion of Sockeye is presently 91% and 35% for Pink salmon.

**Stock ID:** Summer run Sockeye stock proportions in marine areas have increased from last week to 54-68% of stock ID samples in marine waters. Fraser Pink salmon have also increased to 56-74%.

**Environmental Conditions/MA:** Management adjustments for Sockeye continue to rise as high river temperatures persist. Management adjustments increased to 0.85 for Early Summer-run, 2.48 for Summer-run, and 0.91 for Late-run Sockeye.

**Fisheries:** Treaty Indian fisheries in Areas 4B/5/6C were open daily Aug. 25-31 and 6/7/7A were open on Aug. 25-27 and Aug. 28-Aug. 31. All citizens fisheries were open to gillnets and purse seines in Areas 7/7A Aug. 27 and 30, and reef nets on August 25 and daily August 28-31. The Iwerson Dock line closure was in effect to protect remaining Sockeye stocks due to the high in-river temperatures.

### **Week ending September 7:**

**Run size Changes:** Late-run Sockeye runsize increased to 600,000. All other Sockeye stock group runsizes remain unchanged. The Fraser Pink salmon runsize was updated to 26,000,000.

**Timing:** Early summer-run Sockeye timing is now July 24<sup>th</sup>, one day earlier than last week. Summer-run Sockeye timing remains unchanged though Late-run Sockeye was moved to August 17<sup>th</sup>. Fraser Pink 50% marine timing remains at August 29<sup>th</sup>.

**Diversion:** Diversion of Fraser Sockeye and Pink salmon is currently 98% and 74% respectively.

**Stock ID:** Summer-run Sockeye now make up ~49% of Sockeye migrating through marine waters with Late-run stocks making up the remainder. Fraser Pink salmon now dominate stock ID samples over Canada south coast and Washington Pink stocks. Currently Fraser Pink make up 80-85% of fish migrating through marine waters.

**Environmental Conditions/MA:** Management adjustments decreased for Early Summer-run Sockeye to 0.80 due to run timing changes. Summer-run Sockeye management adjustment is unchanged at 2.48 and Late-runs increased to 0.92 due to the continued warm river temperatures.

**Fisheries:** Treaty Indian fisheries in Areas 4B/5/6C were open Sept. 1-7 and Areas 6/7/7A were open Sept. 1-2, 3-5, and 6-7. All citizens fisheries were open in Areas 7/7A to purse seines and gillnets on Sept. 2 and Sept. 5. Reef nets in Area 7 were open daily. The Iwerson dock line closure was in place for both Treaty Indian and All-citizen fisheries until Sept. 3.

## Week ending September 14:

**Run size Changes:** Fraser Sockeye and Pink runsizes remain unchanged.

**Timing:** No changes were made to the timing of Fraser Sockeye or Pink salmon.

**Diversión:** Due to marine test fisheries closing down for the season, no update to diversion rates could be made.

**Stock ID:** Fraser Pink salmon stock proportions have continued to increase and are now 74-94% of Pink salmon in marine areas.

**Environmental Conditions/MA:** Management adjustments were unchanged.

**Fisheries:** Treaty Indian fisheries in Areas 4B/5/6C were open daily through Sept. 14<sup>th</sup>. Treaty Indian fisheries in 6/7/7A were open Sept. 8-9, 10-14 and are scheduled through Sept. 18. All citizens fisheries were open to purse seines and gillnets in areas 7/7A Sept. 9 and 13 and no further fisheries are scheduled for the season. Reef nets were open every day and will remain open because there is US TAC for Pink salmon still remaining.

## Harvest

Between July 30 and Sept. 28 the United States caught a total of 19,988 Fraser River Sockeye and 4,034,600 Pink salmon in Panel area waters (Tables 6 and 7). During this time period the Treaty Indian fisheries in Areas 4B/5/6C were open for a total of 37 days, and in Areas 6/7/7A for 18 days. The All citizens fishery in Areas 7/7A was open for 34 days for reef nets and 6 days for gillnet and purse seine gear. The All citizens fishery landed 176 Sockeye salmon (illegally retained) and 2,320,506 Fraser Pink salmon. All citizens recreational fishers caught an additional 22,473 Pink in Area 5, though recreational catch estimates from other panel waters are not yet available. The Treaty Indian fishery caught 19,812 Fraser Sockeye salmon and 1,714,094 Fraser Pink salmon.

**Table 6.** Preliminary estimate of 2013 U.S. catches of Fraser River Sockeye salmon in Panel area waters.

	Treaty Indian	All Citizens
Ceremonial and Subsistence (all areas)	15,680	0
Commercial Catch in Areas 4B/5/6C	4,093	0
Commercial Catch in Areas 6/7/7A	39	176
Total Catch	19,812	176
% of U.S. Catch	99.1%	0.9%

**Table 7.** Preliminary estimate of 2013 U.S. catches of Fraser River Pink salmon in Panel area waters. Does not incorporate genetic stock identification (GSI) of Southern BC or Washington Pink salmon.

	<b>Treaty Indian</b>	<b>All Citizens</b>
<b>Recreational</b>	0	22,473
<b>Ceremonial and Subsistence (all areas)</b>	17,260	0
<b>Commercial Catch in Areas 4B/5/6C</b>	8,621	0
<b>Commercial Catch in Areas 6/7/7A</b>	1,688,213	2,298,033
<b>Total Catch</b>	1,714,094	2,320,506
<b>% of U.S. Catch</b>	42.5%	57.5%

**POST-SEASON REPORT FOR  
2013 CANADIAN TREATY LIMIT FISHERIES**

Prepared By Fisheries and Oceans Canada

January 6<sup>th</sup>, 2014

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## TABLE OF CONTENTS

1	INTRODUCTION.....	6
2	TRANSBOUNDARY RIVERS.....	6
2.1	STIKINE RIVER .....	6
2.2	TAKU RIVER.....	13
2.3	ALSEK RIVER.....	17
3	NORTHERN BRITISH COLUMBIA .....	18
3.1	CHINOOK AABM FISHERIES.....	19
3.2	CHINOOK INDIVIDUAL STOCK-BASED MANAGEMENT (ISBM) FISHERIES.....	20
3.3	OVERVIEW OF NORTHERN B.C. CHINOOK STOCK STATUS.....	21
4	FRASER RIVER SOCKEYE .....	21
4.1	OBJECTIVES AND OVERVIEW .....	21
4.2	PRE-SEASON ASSESSMENT.....	23
4.3	IN-SEASON ASSESSMENT .....	28
4.4	FISHERIES .....	31
4.5	POST-SEASON.....	35
5	FRASER RIVER PINK .....	36
5.1	PRE-SEASON ASSESSMENT.....	36
5.2	IN-SEASON ASSESSMENT .....	37
5.3	FIRST NATIONS .....	38
5.4	COMMERCIAL.....	38

5.5	RECREATIONAL .....	38
5.6	POST-SEASON ESCAPEMENT AND CATCH .....	39
6	SOUTHERN B.C. AGGREGATE ABUNDANCE-BASED MANAGEMENT CHINOOK .....	39
6.1	OBJECTIVES AND OVERVIEW .....	39
6.2	RECREATIONAL .....	41
6.3	FIRST NATIONS .....	43
6.4	COMMERCIAL.....	43
7	SOUTHERN B.C. ISBM CHINOOK.....	47
7.1	OBJECTIVES AND OVERVIEW .....	47
7.2	RECREATIONAL .....	48
7.3	FIRST NATIONS .....	54
7.4	COMMERCIAL.....	56
7.5	STOCK STATUS .....	56
8	SOUTHERN B.C. COHO.....	60
8.1	OBJECTIVES AND OVERVIEW .....	60
8.2	TIDAL RECREATIONAL .....	62
8.3	NON-TIDAL RECREATIONAL .....	64
8.4	FIRST NATIONS FISHERIES (FOOD SOCIAL AND CEREMONIAL, ECONOMIC OPPORTUNITY AND EXCESS SALMON TO SPAWNING REQUIREMENTS) .....	67
8.5	COMMERCIAL.....	68
8.6	STOCK STATUS .....	69
9	JOHNSTONE STRAIT CHUM.....	71
9.1	OBJECTIVES AND OVERVIEW .....	71

9.2	FIRST NATIONS .....	72
9.3	MARINE RECREATIONAL .....	72
9.4	NON-TIDAL RECREATIONAL .....	73
9.5	COMMERCIAL.....	73
9.6	STOCK STATUS .....	74
10	FRASER RIVER CHUM.....	75
10.1	OBJECTIVES AND OVERVIEW .....	75
10.2	GENERAL OVERVIEW OF FISHERIES .....	76
10.3	FIRST NATIONS .....	76
10.4	RECREATIONAL .....	76
10.5	COMMERCIAL.....	77
10.6	STOCK STATUS .....	77
11	STRAIT OF GEORGIA CHUM.....	78
11.1	OBJECTIVES AND OVERVIEW .....	78
11.2	FIRST NATIONS .....	80
11.3	RECREATIONAL .....	80
11.4	COMMERCIAL.....	81
11.5	STOCK STATUS .....	81
12	WEST COAST VANCOUVER ISLAND CHUM.....	82
12.1	OBJECTIVES AND OVERVIEW .....	82
12.2	FIRST NATIONS .....	84
12.3	RECREATIONAL .....	85
12.4	COMMERCIAL.....	85
12.5	STOCK STATUS .....	87



13	APPENDICES .....	88
	Appendix 1: Catches in Canadian Treaty Limit Fisheries, 1996 to 2013 (Preliminary) .....	88
	Appendix 2: Preliminary 2013 South Coast Sockeye Catch By Fishery and Area .....	89
	Appendix 3: Preliminary 2013 South Coast Pink Catch By Fishery and Area .....	90
	Appendix 4: Preliminary 2013 South Coast AABM Chinook Catch By Fishery and Area .....	91
	Appendix 5: Preliminary 2013 South Coast ISBM Chinook Catch By Fishery and Area.....	92
	Appendix 6: Preliminary 2013 South Coast Coho Catch By Fishery and Area .....	93
	Appendix 7: Preliminary 2013 South Coast Chum Catch By Fishery and Area .....	94
	Appendix 8: Preliminary 2013 Southern B.C. Commercial Catch Totals By Gear and Area .....	95
	Appendix 9: Preliminary 2013 Southern B.C. Recreational Catch Totals By Area .....	96
	Appendix 10: Preliminary 2013 Southern B.C. First Nations Catch Estimates By Area.....	97
	Appendix 11: Preliminary 2013 South Coast Test Fishery Catches .....	98

## **1 INTRODUCTION**

The chapters in Annex IV of the Pacific Salmon Treaty outline the joint conservation and harvest sharing arrangements between Canada and the U.S. for key stocks and fisheries subject to the Treaty. On December 23, 2008, Canada and the U.S. ratified new provisions for five chapters under Annex IV of the Pacific Salmon Treaty. These chapters came into effect on January 1, 2009. Chapter 4, which covers Fraser River sockeye and pink salmon, was set to expire on December 31, 2010. However an Order in Council, and the corresponding exchange of diplomatic notes, allowed for the extension of the chapter until December 31, 2013. All management regimes under Annex IV continue to be implemented by Fisheries and Oceans Canada (DFO) for the 2013 season.

The catches reported below provide the best information available to December 1, 2013, and may change once all catch information for 2013 has been reviewed. The catches are based on in-season estimates (hailed statistics), on-grounds counts by Fisheries and Oceans Canada and independent observers, logbooks, dockside tallies, landing slips (First Nation fisheries), fish slip data (commercial troll and net), creel surveys, logbooks and observers (sport and commercial).

Annex fisheries are reported in the order of the Chapters of Annex IV. Comments begin with expectations and management objectives, followed by catch results by species, and where available and appropriate, escapements. The expectations, management objectives, catches and escapements are only for those stocks and fisheries covered by the Pacific Salmon Treaty; domestic catch allocations have been excluded. Appendix 1 summarizes 1996-2013 catches in Canadian fisheries that have at some time been under limits imposed by the Pacific Salmon Treaty.

## **2 TRANSBOUNDARY RIVERS**

### **2.1 STIKINE RIVER**

Canada developed a fishing plan for Stikine River salmon fisheries based on the catch sharing and management arrangements outlined in Annex IV, Chapter 1, Paragraph 3 of the Pacific Salmon Treaty (PST), including the arrangements agreed to on January 17, 2008 for the 2009 to 2018 period. Accordingly, the 2013 management plan was designed to meet agreed escapement targets and the following harvest objectives: 1) to harvest 50% of the total allowable catch (TAC) of Stikine River sockeye salmon in existing fisheries; 2) to allow additional harvesting opportunities in terminal areas for enhanced sockeye that were surplus to spawning requirements; 3) to harvest up to 5,000 coho salmon in a directed coho fishery; and, 4) to harvest approximately 1,400 large Chinook salmon in a test fishery, conducted by the commercial fleet. As the preseason run size estimate of

22,400 Chinook was less than the PST preseason threshold run size of 28,100 large Chinook, neither Canada or the United States (U.S.) engaged in a directed net fishery. The allowable catch for the U.S. and Canada, therefore, was limited to its historical base level catches of 3,400 and 2,300 large Chinook salmon respectively. In addition, Canada was permitted to harvest 1,400 large Chinook salmon for in-season and post season run size assessments purposes.

The 2013 commercial fishing season opened on May 6 (statistical week 19) and ended August 30 (statistical week 35). From statistical weeks 19 through to 24, the commercial fishing fleet engaged in weekly Chinook salmon test fishery openings. In statistical week 25 a directed Chinook salmon fishery was prosecuted as a result of the in-season Chinook salmon run size estimate exceeding 24,500 fish (in-season threshold number used to trigger a directed Chinook salmon fishery). From statistical week 26 through to 34 a directed sockeye fishery was prosecuted followed by a directed coho fishery which occurred post statistical week 34.

Commercial gear consisted of one 135-metre (443 ft.) gill net per licence holder. The maximum mesh size allowed was 204 mm (8") through June 22<sup>nd</sup> after which time the maximum mesh size was restricted to 140 mm (5.5"). Only one gill net was permitted throughout the course of the commercial fishery. The lower Stikine commercial fishing grounds covered the area from the international (U.S. / Canada) border upstream to near the confluence of the Porcupine and Stikine rivers and also included the lower 10 km (6 mi.) of the Iskut River.

In the upper Stikine commercial fishery, which is located upstream from the Chutine River, fishing periods generally mirrored those in the lower Stikine commercial fishery, but lagged by one week. Fishers were permitted one net however effort was low throughout the season. As in past years, the commercial fishing area was extended upstream to the mouth of the Tuya River. This action was taken in order to provide for a terminal fishing opportunity on Tuya River bound sockeye salmon, specifically at sites located upstream of the Tahltan River. For the sixth consecutive year no commercial fishing activity occurred at this site. The Tuya run, which consists entirely of sockeye produced from the Canada-U.S. Stikine enhancement program, has no spawning escapement requirement since these fish are unable to return to Tuya Lake due to several velocity barriers located in the lower reaches of the Tuya River. Tuya sockeye are released into Tuya Lake as young of the year juveniles.

The First Nation Food, Social and Ceremonial fishery (FSC) located near the community of Telegraph Creek, B.C. was active from late May to mid-August, with no time or gear restrictions imposed in 2013.

Most of the Chinook salmon sport fishing effort in the Stikine River watershed typically occurs in the lower reaches and at the mouth of the Tahltan River. Additional activity occurs less intensively in the Iskut River and other areas within the Stikine River

drainage. Sport fishing activity commenced in late June however fishing effort and catch was relatively low. The Tahltan First Nation closed a popular camping site within the principal fishing grounds in order to reduce the harvest of Little Tahltan Chinook salmon which have experienced persistent decline since 2007.

### **Chinook Salmon**

The pre-season forecast of Stikine River Chinook salmon, as developed by the Canada / U.S. Technical Committee for the Transboundary Rivers (TCTR), was for a below average terminal run size of 22,400 large Chinook salmon (i.e. fish with a mid-eye to fork length of >659mm (~26") or a fork length of >734mm (~29")). For comparison, the previous 10-year (2003-2012) average terminal run size was approximately 33,800 large Chinook salmon. A forecast run size of <24,500 precluded Canada or the U.S. from scheduling a directed fishery. To confirm in-season run strength, Canada engaged in a test fishery relying on the commercial fleet.

The total combined gill net catch of Chinook salmon in the First Nation and commercial fisheries included 1,953 large Chinook salmon and 1,323 jacks compared to 2003-2012 averages of 7,061 large Chinook salmon and 1,490 jacks, while the test fishery yielded a harvest of 1,412 large Chinook and 271 jack Chinook salmon. The 2013 sport fishery yielded a total catch of 50 large Chinook salmon.

In-season management was influenced significantly by run size projections derived from the Stikine Chinook Management Model (SCMM), a joint Canada-U.S. mark-recapture program, and other stock assessment tools (including the relationship between the commercial fishery catch per unit effort (CPUE) and run size from 2005-2012). Harvest rate assessments by week were also used concurrently with the above-mentioned in-season run size estimation techniques. In-season estimates based on the average of the mark-capture and model estimates were calculated post statistical week 22. In-season terminal run size projections ranged from 20,300 fish in statistical week 23 to 24,800 fish in statistical week 27. According to the in-season projections, the TAC for Canada in a directed Chinook salmon fishery varied from 3,880 to 3,900 large Chinook salmon. The TAC included the allowable catch based on current run size estimates and PST catch shares, the base level catch of 2,300 fish, plus 1400 fish allocated under a test fishing regime. The final post season run size was 21,700 large Chinook salmon.

A test fishery was required to determine weekly run sizes by both test fish CPUE and the ratio of spaghetti tags recovered in the fishery (mark-recapture project). Canada endeavoured to partition the Chinook harvest (Canada's base level catch of 2,300 and 1,400 large Chinook provided by a test fishery) over the season through weekly fishery openings based on weekly guideline harvests. Based on an in-season run size estimate that exceeded the trigger level of 24,500 large Chinook salmon, a commercial fishery was initiated in statistical week 25. The first week of the targeted sockeye fishery, which commenced in statistical week 26, had a mesh size restriction of 140 mm (~5.5"); this

action was aimed at minimizing the catch of large Chinook salmon while providing a fishing opportunity on the early component of the sockeye salmon return.

The preliminary post-season estimate of the terminal run was 21,700 large Chinook salmon, including an in river run size based on mark-recapture data of 20,100 large Chinook salmon and a total U.S. catch estimate of 1,600 large Chinook salmon. Accounting for the total Canadian catch of 3,400 large Chinook salmon (includes commercial, First Nation, sport and test catches), the total system-wide spawning escapement is estimated to be approximately 16,700 large Chinook salmon. This escapement estimate is 33% below the 2003-2012 average of 25,500 large Chinook salmon and 4% below the target  $S_{MSY}$  escapement goal of 17,400 large Chinook salmon (and within the escapement goal range of 14,000 to 28,000 large Chinook salmon). A run size of 21,700 large Chinook salmon translates into no allowable harvest in directed commercial fisheries. Both Canada and the U.S. were entitled to harvest a base level of catch of 2,300 and 3,400 large Chinook salmon respectively. In addition, Canada was entitled to harvest the test fish allocation.

The 2013 Chinook salmon escapement enumerated at the Little Tahltan weir was 878 large fish and 183 jack Chinook salmon while the escapement of large Chinook salmon in the Little Tahltan River was 79% below the average of 4,929 fish (73% below the (Canadian recognized) MSY escapement goal of 3,300 large Chinook salmon for this stock). The weir count was also well below the low end of the escapement goal range of 2,700 to 5,300 large fish, representing only 5% of the Stikine River wide escapement. This proportion of the escapement is well below the average Little Tahltan contribution of 14%, and is the seventh consecutive year that the lower end of the escapement was not reached. The 2013 return is a product of a very weak escapement in 2007 (represented by six year old fish) when only 562 large Chinook were enumerated. The failure from the 2008 escapement of 2,663 (five year old fish in 2013) cannot be fully explained at this time. The jack Chinook salmon count was 13% above the average count of 162 fish.

Escapement counts in Verrett River (a tributary to the Iskut River) were deemed to be unreliable in 2013 due to poor viewing conditions as reported by the carcass pitch crew stationed at the creek from August 4-10. However, an above average number of Chinook salmon were sampled from this site in 2013. A relatively strong return of Chinook salmon to Shakes Creek (near Telegraph Creek) was reported by residents living at the creek mouth.

Stikine River Chinook run timing to the lower Stikine commercial fishing and timing to the spawning grounds appeared to be near average however Chinook salmon entered the Little Tahltan spawning site approximately two weeks later than average.

In addition to the mark-recapture study, the Little Tahltan weir project, and aerial surveys, genetic samples were collected on a weekly basis from Chinook salmon caught in the

U.S. District 108 fishery and from weekly catches taken in the Canadian commercial fishery. This data will be used to assess run timing of Stikine River stocks in District 108 and the lower Stikine River commercial fishery.

### **Sockeye Salmon**

The pre-season forecast for Stikine River sockeye salmon, as provided by the TCTR, was for a terminal run size<sup>1</sup> of 135,800 fish including: 60,600 Tahltan Lake origin sockeye salmon (34,300 wild and 26,300 planted); 28,400 planted Tuya Lake sockeye; and 46,800 non-Tahltan wild sockeye salmon, which constituted a below average forecast (for comparison, the previous 10-year average (2003-2012) terminal run size was approximately 208,400 fish).

Preliminary combined catches from the Canadian commercial and First Nation (food, social, ceremonial (FSC)) gill net fisheries in the Stikine River totaled 32,700 sockeye in 2013, which was below the 2003-2012 average of 60,837 fish. The lower Stikine River commercial fishery harvested 24,314 sockeye, while the upper Stikine River commercial and First Nation fisheries harvested a total of 876 and 7,528 sockeye salmon, respectively. The preliminary estimate of the total contribution of sockeye salmon from the Canada/U.S. Stikine sockeye enhancement (i.e. the fry-planting program) to the combined Canadian First Nation and commercial catches was 13,785 fish (or 42% of the catch).

In addition to these catches, 1,302 sockeye salmon were taken in the stock assessment test fishery located near the U.S./ Canada border. For the sixth consecutive year, a fishery designed to target Tuya-bound sockeye operated in the mainstem Stikine River upstream of the mouth of the Tahltan River succeeded in harvesting 2,144 sockeye salmon.

A total of 15,828 sockeye salmon was counted through the Tahltan Lake weir in 2013, 45% below the 2003-2012 average of 34,501 fish. The 2013 count was below the escapement goal range of 18,000 to 30,000 fish. An estimated 7,898 fish (49%) originated from the fry-planting program, which was above the 45% contribution observed in smolts leaving the lake in 2010, the principal smolt year contributing to the 2013 return. A total of 3,292 sockeye salmon was collected for broodstock, resulting in a spawning escapement of 12,536 sockeye salmon in Tahltan Lake.

The total estimated run size of 38,753 Tahltan Lake sockeye was approximately 36% below the pre-season expectation of 60,600 fish.

The spawning escapements for the non-Tahltan and the Tuya stock groups are calculated using stock ID, test fishery and in-river commercial catch and effort data. The average of the test fishery and the commercial fishery catch-per-unit of effort (CPUE), which

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<sup>1</sup> Terminal run excludes U.S. interceptions that occur outside Districts 108 and 106.

operated over the full duration of the run, were used as the principal tool in assessing the spawning ground escapements of non-Tahltan Lake and the Tuya sockeye stock groupings. Based on the run reconstructions generated from the test and commercial fishery CPUE, the preliminary escapement estimates for 2013 were 32,689 non-Tahltan and 8,767 Tuya sockeye salmon. The non-Tahltan spawning escapement estimate was within the escapement goal range of 20,000 to 40,000 and was 9% above the mid-point escapement goal of 30,000 sockeye salmon (2% above the recent 10 year average of 32,386 fish). Although the mainstem escapement based on the above ratio based estimate was above average, aerial surveys to assess the inter-annual returns to select spawning index sites indicated the return was below average. This discrepancy may be explained by the substandard viewing conditions (high turbid flows). The estimated escapement of 8,767 Tuya Lake sockeye salmon was close to the recent 10 year average of 9,244 fish. These fish do not contribute to the natural production of Stikine River sockeye salmon due to migration barriers that obstruct entry to their nursery lake and potential spawning areas.

Based on the in-river run reconstruction of the Tahltan Lake run expanded by run timing and stock ID data in the lower river and estimated harvests of Stikine River sockeye salmon in U.S. terminal gill net fisheries, the preliminary post-season estimate of the terminal sockeye run size is approximately 116,900 fish. This estimate includes 38,600 Tahltan Lake origin fish, 25,700 Tuya Lake origin fish, and 52,600 sockeye of the non-Tahltan stock aggregate. A Stikine River run size of this magnitude is below the 2003-2012 average terminal run size of 208,400 sockeye salmon and is approximately 14% below the preseason forecast of 135,800 fish.

Similar to 2008-2012, Canada relied on other in-season abundance estimates than those derived from the Stikine sockeye management model (SMM). As a result in 2013, most of the in-season run projections used in management of the Canadian fisheries were based on the average of the SMM model and an in-river regression model. The run size projections ranged from 106,100 fish in statistical week 34 to 150,200 fish in statistical week 28. The final in-season run size estimate was 106,100 fish, based on the average of the two approaches, while the final estimate based solely on the SMM was 121,600 fish. The preliminary post-season estimate was 116,901 sockeye salmon with a Canadian allowable harvest of 22,792 fish. The actual harvest was 32,718 fish, 44% above the allowable catch.

### **Coho Salmon**

For the fifth consecutive year, most of the fishing fleet remained in the fishery to harvest coho salmon resulting in a total catch of 6,757 coho salmon. A total catch of 4,835 coho salmon was taken during the targeted coho fishery from statistical week 35, slightly below Canada's 5,000 piece allocation, however above the 10 year average of 2,645 fish.

The annual coho salmon test fishery was not conducted in 2013. Incidental catches and CPUE taken in the sockeye salmon test and commercial fisheries were recorded as high.

The CPUE collected from the targeted coho salmon fishery was also record high. Aerial surveys of six index spawning sites, however, yielded below average counts taken under fair viewing conditions. The reasons for the discrepancy between aerial surveys and the high coho salmon CPUE could not be fully explained.

### **Joint Sockeye Salmon Enhancement**

Joint Canada/U.S. enhancement activities continued from 2012 through 2013 with the collection of sockeye salmon eggs from Tuya and Tahltan Lakes in British Columbia, transportation of eggs to the Snettisham Hatchery in Alaska where they were raised to fry, and subsequent transportation and release at out-plant sites in British Columbia.

Approximately 1.3 million fry were out-planted into Tahltan Lake and 755,000 fry into Tuya Lake through late May and early June 2013. The fry originated from the 2012 egg-take and were mass-marked at the Snettisham hatchery with thermally induced otolith marks. Green egg to released fry survival was approximately 39% for the eggs designated for Tuya Lake and approximately 37% for those designated for Tahltan Lake. A total of 1.06 million fry held at the Snettisham hatchery were destroyed due to Infectious Hematopoietic Necrosis virus (IHNV) infection and an additional 352,000 were lost due to an unintentional water supply interruption at the hatchery. Sockeye salmon enhancement programs have been subject to IHNV outbreaks before and while unfortunate the losses are within normal occurrence levels.

In the fall of 2013 approximately 4.4 million sockeye salmon eggs of a targeted 6.0 million were collected at Tahltan Lake and transported to Snettisham Hatchery in Alaska. Sockeye salmon returns to the Lake were lower than expected at 15,828 making brood stock collection difficult. As in 2012 additional efforts were employed to collect brood stock including temporarily holding approximately 65% of female brood stock to mature in floating net pens in the lake. Based on historical egg to survival rates an estimated 2.8 million sockeye salmon fry will be available in 2014 for release with a proposed split of 2.3 million to Tahltan Lake and 0.5 million to Tuya Lake.

For the sixth consecutive year, an experimental test fishery designed to target Tuya River sockeye at fishing sites located in the lower Grand Canyon of the Stikine River upstream from the mouth of the Tahltan River was conducted. The 2013 Tuya test fishery yielded a total catch of 2,144 sockeye salmon in late July; the Tuya component of this catch comprised a 15% harvest rate on terminally bound Tuya fish. There were also 28 Chinook salmon incidentally caught and released.

Through 2012, efforts were undertaken to explore the design and cost estimates of both an access road and a fish trap to improve terminal harvest opportunities of Tuya-bound sockeye salmon. At this time, the cost and design of a suitable access road to potential fishing sites is likely to be challenging.



## **2.2 TAKU RIVER**

As with the Stikine River, the fishing plan developed by Canada for the Taku River was based on the arrangements in Annex IV, Chapter 1, Paragraph 3 of the PST in effect for 2009 through 2018. Accordingly, the plan addressed conservation requirements and contained the following harvest objectives: 1) to harvest 23% of the TAC of Taku River sockeye salmon (adjusted as necessary according to projections of the number of enhanced sockeye), plus the projected wild sockeye in-river escapement in excess of 1.6 times the spawning escapement goal; 2) to harvest enhanced Taku River sockeye salmon incidentally to wild sockeye salmon; and, 3) to harvest 3,000 to 10,000 coho salmon in a directed coho salmon fishery, depending on in-river run size projections, plus projected escapement in excess of the spawning escapement goal. There were no directed Chinook salmon fisheries planned in 2013 due to the absence of an allowable catch allocation.

The 2013 commercial fishing season on the Taku River opened on June 16 (SW25) and closed on October 6 (SW41). However, all commercial fishing activity effectively ceased by early September (SW37) due to marketing challenges experienced on the Taku River at this time of year. Fishing area and gear restrictions were as per recent years and incorporated the maximum gill net length of 36.6 metres which was established in 2008 for drift gill nets and in 2009 for set gill nets.

The Taku River commercial fishing grounds in Canada consist of the mainstem of the river from the international border upstream approximately 18 km (11 mi.), to a geological feature known locally as Yellow Bluff. Almost all fishing activity takes place in the lower half of this area, downstream of the Tulsequah River.

The First Nation fishery is primarily located in the lower Taku River in the same area as the commercial fishery described above. However, small numbers of fish are also harvested on the lower Nakina River and at the outlet of Kuthai Lake. There were no time or gear restrictions imposed on the First Nation fishery in 2013.

Most of the Chinook salmon sport fishing effort in the Taku watershed typically occurs on the lower Nakina River. Additional sport fishing sites used less intensively exist on the Tatsatua River, the Sheslay River and other areas within the Taku River drainage. Effort and catches are poorly documented but are believed to be negligible for all species except Chinook salmon and steelhead (due to the remote nature of the watershed and difficult access).

### **Chinook Salmon**

The bilateral pre-season forecast was for a terminal run of 18,700 large Chinook salmon, approximately 56% below the previous 10-year average of 42,466 fish. The forecast generated by the Taku River Chinook salmon model was 26,100 fish. However, due to persistent overestimation in recent years coupled with a pattern of decline in Chinook salmon stocks in the North Pacific, the forecast was reduced by 29%. A run size of

18,700 fish was below both the SMSY escapement point goal of 25,500 fish, and the lower end of the escapement goal range (19,000 fish). As a result, there was no allowable (AC) for either the U.S. or Canada, and a minor adjustment to the base level catches (BLCs) of 1,500 fish for Canada and 3,500 fish for the U.S. was required. To respect the poor forecast, the test fishery (1,400 fish) was not conducted.

The catches of Chinook salmon in Canadian Chinook salmon base level fisheries were: 579 large Chinook salmon captured incidentally in the directed commercial sockeye salmon gill net fishery; 54 large Chinook salmon in the First Nation fishery; and an estimated 105 large Chinook salmon in the recreational fishery. The total harvest of 738 large Chinook salmon was within the base level allowance of 1,500 fish.

Due to challenges with the mark-recapture project stemming in part from the low run size, a spawning escapement estimate has not yet been finalized for 2013. However, both the spawning escapement and the terminal run are believed to be below the SMSY of 25,500 large Chinook. The 2003-2012 average spawning escapement is 33,353 large Chinook (which was associated with a higher target until 2009). During aerial surveys of five index areas, a total of 3,274 large Chinook salmon were observed; this was 34% below the 2003-2012 average.

There were no in-season or post-season indications that an AC existed. Base level catches were 748 fish (Canada) and 1,159 fish (U.S.). The Canadian catch of large Chinook was 81% below the 2003-2012 average of approximately 4,000 fish (excluding test fisheries). The 2013 harvest of small Chinook was 669 fish (653 commercial and 16 First Nation), 12% above the 2003-2012 average of 595 fish.

### **Sockeye Salmon**

The Canadian pre-season run outlook for wild sockeye salmon was 254,974 fish, approximately 29% above the previous 10-year average total run size of 197,000 fish. In addition, approximately 21,364 adult sockeye salmon (21,314 of Tatsamenie Lake origin and 50 of Trapper Lake origin) were expected to return from fry outplants associated with the Canada/U.S. joint Taku sockeye salmon enhancement program. The forecast return of enhanced Tatsamenie Lake origin sockeye salmon was 3.7 times the average return of 5,800 fish.

The Canadian sockeye salmon catch was 25,113 fish, of which 25,014 were taken in the commercial fishery and 99 in the First Nation fishery. This harvest was 14% above the 2003-2012 average total of 22,070 fish, with the contribution of sockeye salmon from the bilateral enhancement program estimated at 3,950 fish (16% of the total Canadian catch).

To reduce bycatch of Chinook salmon the maximum permissible mesh size in the directed sockeye salmon fishery which commenced in mid-June was 140 mm (5.5").

Projections of the total wild sockeye salmon run size, TAC, and total escapement were made frequently throughout the fishing season. As in past years, projections were based

on the bilateral mark-recapture program, the estimated catch of Taku River sockeye in U.S. fisheries, the catch in the Canadian fishery, and historical run timing information. Projections in 2013 ranged from 163,000 in SW28 (July 7-13) to 217,000 in SW 30 (July 21-27). The preliminary post-season estimate of run size is 202,667 fish, comprising 181,730 wild sockeye and 20,937 enhanced sockeye with a “wild” component 21% below the preseason forecast, and an enhanced component within 3% of the forecast). Subtracting the escapement target of 75,000 from the run of 181,730 fish results in a TAC of 106,730 wild fish. The Canadian allowable catch, based on a 23% harvest share (which in turn is associated with an enhanced return of 15,000 – 25,000 fish), was 24,548 fish; the actual catch was 21,163 wild fish, representing 20% of the TAC of wild fish. Likewise, the U.S. allowable catch of wild fish, based on a 77% harvest share, was 82,182 fish; the actual catch was 85,344 fish, representing 80% of the TAC of wild fish.

The estimated spawning escapement of sockeye salmon in the Canadian section of the Taku River was 75,244 fish which matched the mid-point of the target range, 71,000 to 80,000 fish. The escapement is 28% below the 2003-2012 average of 106,157 fish. Based on weir counts, escapements to the Kuthai, Little Trapper, Tatsamenie and King Salmon lakes were 1,195, 4,840, 10,246, and 485 sockeye salmon, respectively. The Kuthai Lake escapement 23% was below the primary brood year count, and 59% below the 2003-2012 average. The Little Trapper escapement was 26% above the primary brood year count but 58% below average. The Tatsamenie count was 14% above the primary brood year escapement, and 26% above average while the escapement to King Salmon Lake was 45% below the primary brood year escapement and 82% below average.

### **Coho Salmon**

The catch of 10,374 coho salmon (10,263 commercial and 111 First Nation) was 8% above the 2003-2012 average of 9,953 fish. The catch during the directed coho salmon fishery, i.e. after SW33, was 7,021 fish. A test fishery was not initiated in 2013. Based on bilateral mark-recapture data, the preliminary estimate of the run into the Canadian section of the drainage is 78,492 fish. In accordance with PST harvest arrangements for Taku River coho salmon, at a run size of this magnitude, Canadian harvesters were entitled to harvest up to 10,000 coho salmon in a directed fishery starting in SW34, plus projected surplus escapement. The preliminary post-season spawning escapement estimate is 68,118 fish, 39% below the previous 10-year average of 111,238 fish. The 2013 return was well above the top end of the interim escapement goal range of 27,500 to 35,000 fish; however, this escapement goal is under review and is likely to increase pending conclusion of technical and scientific review. The preliminary post-season estimate of total run is 142,172, within 15% of the pre-season forecast of 162,787 fish.

### **Joint Sockeye Enhancement**

Joint Canada/U.S. enhancement activities continued from 2012 through 2013 with sockeye salmon fry hatched at Snettisham Hatchery in Alaska transported to Tatsamenie Lake and King Salmon Lake British Columbia (where these fish were collected as eggs in 2012).

Approximately 90% of the 2 million sockeye salmon eggs collected in 2012 from Tatsamenie Lake survived to the fry stage at the Snettisham Hatchery in Alaska. There were no Infectious Hematopoietic Necrosis virus (IHNV) losses in the Tatsamenie Lake hatchery raised sockeye salmon fry in 2012/13. By June 10, 2013 approximately 1.7 million emergent sockeye salmon fry were out-planted into Tatsamenie Lake. In addition, as part of an onshore extended rearing project, approximately 216,000 fed fry were released into four onshore rearing tanks. These fish were released in two groups into floating net pens in Tatsamenie Lake. Fry groups were held for 15 and 10 days and released July 28 and August 9 at weights of 3.6 and 4.6 grams respectively. Water temperatures were warm in Tatsamenie Lake and both hatchery and wild sockeye salmon were observed to have grown well. As was observed in 2011 and 2012, a portion of the extended reared fry appeared to out-migrate almost immediately, rather than remaining in the lake to rear over the winter. Smolt assessment results estimate that 571,000 smolts left Tatsamenie through spring and summer 2013 with a hatchery smolt contribution of 46%.

Approximately 79% of the 250,000 sockeye salmon eggs collected from King Salmon Lake survived to the fry stage at Snettisham Hatchery in Alaska with no IHNV losses. On June 2, 2013 approximately 197,000 fry were transported and released to King Salmon Lake.

For 2013, the agreed bilateral Taku River enhancement production plan was collection of up to 2.0 million sockeye salmon eggs from Tatsamenie Lake, up to 250,000 eggs from King Salmon Lake and pending project feasibility and permitting up to 250,000 eggs from Trapper River for transport to Snettisham Hatchery in Alaska for incubation and thermal marking.

Sockeye salmon eggs were not collected from King Salmon River in 2013 due to low escapement (485 sockeye counted at the King Salmon weir). Sockeye salmon eggs were not collected from Trapper Lake in 2013 either. Information continues to be compiled as part of the feasibility study associated with removal of a migration barrier near the outlet of Trapper Lake (detailed in the 2010 Taku Enhancement Plan) to provide for potential fish passage to Trapper Lake.

A total of approximately 1.7 million sockeye salmon eggs were collected from Tatsamenie Lake between September 16 and October 10, 2013 and transported to Snettisham Hatchery for incubation and return in 2014.

## **2.3 ALSEK RIVER**

Although catch sharing provisions for Alsek River salmon stocks between Canada and the U.S. have not yet been specified, Annex IV of the Pacific Salmon Treaty calls for the development and implementation of cooperative abundance-based management plans and programs for Alsek River Chinook and sockeye salmon. Interim escapement goal ranges for Alsek River sockeye and coho salmon were initially set by the TCTR at 33,000 to 58,000 sockeye, and 5,400 to 25,000 coho salmon. The principal escapement-monitoring tool for Chinook, sockeye, and coho salmon stocks on the Alsek River is the Klukshu weir, in operation since 1976 by DFO in cooperation with the Champagne-Aishihik First Nation (CAFN).

To enable for better definition of management objectives for Chinook and sockeye salmon (in terms of Klukshu stocks), revised goals, expressed in terms of Klukshu escapements were established in 1999. This approach was used again in 2013.

Previously, a joint escapement goal for Klukshu Chinook salmon was developed by both DFO and Alaska Department of Fish and Game, which recommended an escapement goal range of 1,100 to 2,300 Chinook spawners in the Klukshu drainage (McPherson, Etherton and Clark 1998). A review of the recent escapement goal analysis completed by Bernard and Jones in 2010 was conducted by the Canadian Science Advisory Pacific (CSAP). The 2010 analysis suggested a revised escapement goal of 800-1,200 fish. The revised goal was adopted by the TCTR early in 2013 and implemented for the 2013 season.

Prior to 2013, the biologically-based escapement goal for Klukshu sockeye salmon was 7,500 to 15,000 fish (Clark and Etherton, 2000). Similar to the Chinook salmon goal review, an updated escapement goal analysis for sockeye salmon was completed in 2010 by Eggers and Bernard, and was reviewed by CSAP. The 2010 analysis suggested a revised escapement goal of 7,500-11,000 which was adopted by the TTC early in 2013 and implemented for the 2013 season.

Total drainage abundance programs are being investigated as part of the development of abundance-based management regimes and to accurately assess whether the escapement goals for Alsek River Chinook and sockeye salmon stocks are appropriate and achievable. At this time, there are no programs in place to estimate the drainage-wide coho salmon escapement. A large and variable proportion of the escapement of each species is enumerated at the weir on the Klukshu River. Current escapement monitoring programs include the Klukshu weir, Village Creek electronic counter and aerial surveys, which allow for annual comparisons of escapement indices. The most reliable long-term comparative escapement index for Alsek River drainage salmon stocks is the Klukshu River weir count.

The harvest estimate for the 2013 First Nation fishery comprised of the fish taken from the Klukshu River weir (elders only) and an estimate of catches above/below the weir (based on the past relationship with the weir count and harvest). An estimated 67 Chinook, 508 sockeye and no coho salmon were harvested in the food fishery. The recent average catches are 71 Chinook, 1,405 sockeye, and 6 coho salmon. Preliminary catch estimates for the Tatshenshini recreational fishery were an estimated 5 Chinook salmon retained (197 released), and zero sockeye salmon retained (15 released). There were 23 coho salmon retained (72 released) although this value is considered incomplete as some effort and harvest may have occurred after monitoring ceased. 2013 catches were 8%, 0%, and 57% of average for Chinook, sockeye and coho salmon, respectively. As the Chinook salmon return to the Klukshu River achieved the escapement objective, retention was permitted on July 26th (for the Yukon portion of the Tatshenshini River). Non-retention of sockeye salmon was maintained for the season due to the poor return. Coho salmon retention limits were liberalized on October 11th due to an above average return.

The preliminary weir count and escapement estimates of Klukshu River sockeye salmon in 2013 were 3,902 and 3,800 fish, respectively. The count of 312 early run fish (counted through August 15) was well below the average of 2,848 as was the count of 3,590 late run fish with an average of 11,351. The total escapement of 3,800 fish was well below the lower end of the recommended escapement goal range of 7,500 to 11,000 fish. The 2013 sockeye salmon escapement to Village Creek was 129, well below the average of 2,500 fish.

The most reliable comparative Chinook salmon escapement index for the Alsek River drainage is considered to be the Klukshu River weir count. The preliminary Chinook salmon weir and escapement estimate in 2013 was 1,261 and 1,227 fish, respectively. With a minimal harvest above the Klukshu River weir is assumed, the 2013 escapement estimate was slightly above the upper end the escapement goal range of 800 to 1,200 Klukshu Chinook salmon.

The Klukshu River coho salmon weir count was 7,322 well above the 10 year average of 1,630 fish. The 2013 count, as in past years, is not considered a complete indicator of run strength as the weir is prior to the end of the coho salmon run to the Klukshu River.

### **3 NORTHERN BRITISH COLUMBIA**

#### **Areas 3-1 to 3-4 Pink Net Catch**

For the year 2013, Canada was to manage the Area 3-1 to 3-4 net fishery to achieve an annual catch share of 2.49 % of the annual allowable harvest (AAH) of Alaskan Districts 101, 102 and 103 pink salmon. With a Total Return of approximately 80.81 million pinks, the Alaskan Districts 101, 102 and 103 AAH was 70.06 million pinks. The resulting Area 3-1 to 3-4 Canadian commercial net total allowable catch of this AAH was approximately 1.74 million pinks of Alaskan Districts 101, 102 and 103 origin.

In the Canadian northern boundary area, pink salmon returns were anticipated to be very poor for both Area 3 and Area 4, based on brood year return strength. Actual returns to Area 3 and 4 streams were well above average. The 2013 preliminary Canadian pink salmon catch in Sub-areas 3-1 to 3-4 was 1.24 million and the Alaska stock component of this catch is estimated to be 1.15 million, or 1.64 % of the AAH, well below the agreement of 2.49 % in Annex IV of the Pacific Salmon Treaty.

### **Area 1 Pink Troll Catch**

For the year 2013, Canada was to manage the Area 1 troll fishery to achieve an annual catch share of 2.57 % of the annual allowable harvest (AAH) of Alaskan Districts 101, 102 and 103 pink salmon. The resulting Area 1 Canadian commercial troll total allowable catch of this AAH was approximately 1.44 million pinks of Alaskan Districts 101, 102 and 103 origin.

The Canadian commercial troll fishery targeting pink salmon was open in the northern portion of Area 1 (Dixon Entrance AB Line) from July 1<sup>st</sup> to September 30<sup>th</sup>. Pink retention was also permitted during the Chinook directed fishery in parts of Area 1 which opened from June 21<sup>st</sup> to July 7<sup>th</sup>. Area 1 pink salmon directed effort was very minimal and the fishery harvested a total of 84,216 pink salmon, with an estimated 80,590 of Alaskan origin. This equates to 0.12 % of the Alaskan District 101, 102 and 103 pink AAH, well below the annex IV agreement of 2.57%.

## **3.1 CHINOOK AABM FISHERIES**

The pre-season abundance index for North Coast B.C. troll and Haida Gwaii sport fisheries in 2013 was 1.10, which allowed a total catch of 143,400 Chinook salmon in these fisheries. Preliminary estimates indicate a total catch of 115,914 Chinook salmon; 69,264 caught in commercial troll fisheries and 46,650 caught in sport fisheries.

The North Coast B.C. troll fishery was opened for Chinook fishing from June 21 to July 7. The entire 2013 Northern B.C. troll fishery was conducted under a system of individual transferable quotas. The size limit was 67 cm. Barbless hooks and revival boxes were mandatory in the troll fishery. No troll test fisheries were conducted in the North Coast of B.C. in 2013.

Sport fishing was open with a daily limit of 2 Chinook and a possession limit of 4 Chinook. An estimated 46,650 Chinook were caught in the Haida Gwaii (Queen Charlotte Islands) sport fishery. A minimum size limit of 45 cm was in effect and barbless hooks were mandatory in the sport fishery.

### **3.2 CHINOOK INDIVIDUAL STOCK-BASED MANAGEMENT (ISBM) FISHERIES**

Fisheries included in this category are commercial net fisheries throughout north and central B.C., marine sport fisheries along the mainland coast and freshwater sport, and First Nations fisheries in both marine and freshwater areas. Under the PST, obligations in these fisheries are for a general harvest rate reduction (estimated in aggregate across fisheries) for ocean mixed-stock fisheries and for stock-specific objectives (i.e., achieving the escapement goal) in terminal areas.

North Coast commercial gill net catches totalled 2,126 Chinook from Areas 3 to 6 (from hail catch data). Chinook catch in Areas 3 and 4 were 1,129 and 997 Chinook respectively. No Chinook were reported caught in Area 5 or in Area 6. These preliminary estimates of gill net catches include Chinook less than 5 pounds (graded as jacks and small red fleshed Chinook) not normally included for PSC accounting. Small Chinook typically make up less than 5% of commercial gill net catches. Hail catch data tend to underestimate catch reported in fish slips by 25 to 30%. In addition, a total of 547 large Chinook and 95 jacks were caught in the Tyee Test fishery on the Skeena River.

Central Coast commercial gill net catches totalled 5,301 Chinook with 5,299 from Area 8 and 2 from Area 7 (from hail catch data).

Johnstone Strait commercial fisheries including Area B seine and Area D gill net was managed by South Coast and corresponding catches are reported in the South Coast section of this report.

Tidal sport catch from lodges operating in the Rivers Inlet, Hakai Pass and Bella Bella areas were estimated using log books. Approximately 4,457 Chinook were retained at lodges in these areas in 2013.

Preliminary estimates for tidal sport catches near the mainland coast of Northern B.C. were 10,259 from a creel survey conducted in Areas 3 and 4 in 2013. The 2013 catches in the mainland sport fishery in Areas 5 and 6 were unknown. The preliminary estimate from a freshwater creel survey conducted in the Skeena River below Terrace in 2013 was 1,552 large Chinook and 838 jacks. It was unusual to see this many jacks in the recreational catch on the Skeena River. Tidal and freshwater catches in Northern B.C. were better in 2013 after a low year in 2012.

Catches by First Nations in the North Coast exceeded 8,511 Chinook in 2013. Nisga'a and Gitanyow catches from the Nass River were 4,398 Chinook. Haida catches on Haida Gwaii were estimated to exceed 1,800 Chinook. Only a portion of catches from First Nations fisheries in the Skeena have been reported but current estimates exceed 2,359 Chinook.



Catches by First Nations in the tidal portion of the Central Coast were reported as 978 Chinook. The non-tidal catches included 2,871 Atnarko River Chinook (Area 8) and 25 Chinook from Rivers Inlet (Area 9).

### **3.3 OVERVIEW OF NORTHERN B.C. CHINOOK STOCK STATUS**

Since assessments of the ISBM fisheries are relative to the escapements achieved in the Chinook indicator stocks, a brief overview of the 2013 returns is provided. Northern B.C. terminal runs were low again in 2013 in the Nass and Skeena Rivers. Preliminary estimates of Nass River escapements were 8,011. Skeena River Chinook escapements declined to approximately 26,699. Atnarko River Chinook escapements were estimated at 27,292, much better than returns in 2012.

## **4 FRASER RIVER SOCKEYE**

### **4.1 OBJECTIVES AND OVERVIEW**

The 2013 Fraser sockeye forecast had an 80% prediction interval of 1.55M – 15.61M. From this distribution of run size forecasts, the Fraser River Panel (FRP) adopted the 50% (p50) probability level of abundance forecast for pre-season planning purposes of 4.77 million Fraser sockeye. A majority of the total return (~78%) was expected to be Summer run sockeye. Pre-season planning focused the Food, Social and Ceremonial (FSC) fisheries and limited commercial and recreational fisheries on Summer run sockeye, with constraints on harvest opportunities to minimize impacts on less abundant stock groups at the p50 pre-season run size forecasts.

Pre-season planning incorporated provisions to meet escapement objectives and meet conservation objectives for stocks of concern while considering international and domestic objectives. Significant effort was placed on developing a pre-season plan for anticipated fisheries. The pre-season plan included the following assumptions and guiding principles in no particular order:

- The Commission's guidance provided in 2011 (direction to the FRP with respect to implementing Paragraphs 3 and 8 of Chapter 4, Annex IV of the Pacific Salmon Treaty) remained in effect for 2013;
- The U.S. share of the annual Fraser River sockeye salmon total allowable catch (TAC), harvested in the waters of Washington State was set at 16.5% of the aggregate. To the extent practicable, the Fraser River Panel shall manage the United States fishery to implement a fishing plan that concentrates harvest on the most abundant management group (or groups). It is understood that the U.S. harvest may exceed 16.5% of the TAC for one or more of the less abundant management groups despite concentrating the harvest in this manner;

- For computing TAC by stock management groupings, the Aboriginal Fishery Exemption (AFE) of 400,000 Fraser River sockeye, shall be allocated to management groups as follows: The Early Stuart sockeye exemption shall be up to 20% of the Fraser River AFE, and the remaining balance of the latter exemption shall be based on the average proportional distribution of First Nations Food, Social and Ceremonial catch for the most recent three cycles and modified annually as required to address concerns for Fraser River sockeye stocks and other species and as otherwise agreed by the Fraser River Panel;
- Although the capability to assess in-season run size and marine migration timing would be good for Late run sockeye, an in-season run size estimate for Cultus Lake sockeye would not be possible due to low abundance relative to co-migrating sockeye stocks. As a result the Cultus exploitation rate is assumed to be the same as the exploitation rate from the similarly timed Late run stocks (excluding Birkenhead) caught seaward of the confluence of the Fraser and the Vedder rivers;
- Cultus Lake sockeye will be managed within the constraints of the exploitation rate identified for the Late run aggregate;
- The four stock aggregates identified under the Pacific Salmon Treaty Annex generally contain stocks with similar timing in the marine area. Recent trends in timing of some stocks, including Raft River and North Thompson (in the Early Summer run prior to 2012), and Harrison River (in the Late run prior to 2012) sockeye now differs substantially from the other stocks in their recent run timing groups. In 2013 Fisheries and Oceans Canada continued to manage these stocks as part of the Summer run aggregate to better align these stocks with other stocks of similar run timing. Escapement plans, management adjustments and harvest rules have been adjusted to account for this change;
- Canada's escapement plan specified escapement requirements that varied with run size for each of the run timing aggregates;
- At low abundances, low abundance exploitation rates (LAERs) are implemented to protect 90% of the run timing aggregate (10% LAER) while allowing for fisheries on more abundant co-migrating run timing groups and/or species. The exception is the Late run aggregate where a 20% LAER has been implemented consistent with recent years' practice. If the return of Late run sockeye was at or above the p75 forecast, consideration would be given to increasing the Late run LAER up to 30%;
- For Early Stuart sockeye, window closures and other fishing restrictions were planned for commercial, recreational and First Nations fisheries to protect a significant proportion (90%) of the Early Stuart return. These measures included a rolling three week window closure based on run timing of the Early Stuart sockeye migration through various fishery areas; and
- Conservation concerns for other sockeye stocks and species continued to impact the planning of sockeye fisheries in 2013. The stocks and species of concern in 2013 were: Early Stuart sockeye, Cultus Lake sockeye, Nimpkish River sockeye,

Sakinaw Lake sockeye, Interior Fraser River coho, Fraser Spring 4<sub>2</sub> Chinook, Fraser Spring and Summer 5<sub>2</sub> Chinook, and Interior Fraser River steelhead.

## **4.2 PRE-SEASON ASSESSMENT**

In addition to Canada's escapement plan, estimates of run size, diversion rate, run timing and assumptions about in-season environmental conditions are key inputs required to seed the pre-season Harvest Planning Model prior to observing in-season information. The main objective of the model is to identify potential fishing opportunities while attempting to meet conservation, international and domestic harvest objectives.

The 2013 sockeye run size forecasts were calculated using methods similar to 2012, which assesses the performance of both long-term stock-recruit models by assuming average productivity and non-parametric models based on recent recruit per spawner data over the entire time series via jack knife analysis. The final forecast model for each stock was selected based on its ability to predict the stock's true returns over the full stock-recruitment time series.

As outlined in the Pacific Salmon Treaty, the mid-point of the forecast provided by Canada was used for management purposes, until in-season updates of run size are available. For pre-season planning purposes, the FRP used the 50% probability level for all run timing groups and stocks. The 2013 50% probability forecasts for all four management aggregates were as follows: Early Stuart 211,000; Early Summer run 253,000; Summer run 3,718,000; and Late run 583,000, for a total of 4,765,000 Fraser sockeye. The total four year old proportion of the 2013 forecast (~90% of the total four plus five year old forecast at the 50% probability level) is above average (82%) due mostly to the low brood year returns for many stocks which are normally comprised of 5 year old sockeye.

### **Diversion Rate**

The pre-season forecast of the percentage of Fraser sockeye migrating through Johnstone Strait was based on the mean of two diversion forecasts - the Northern Diversion Rate values for the aggregate stocks (time series provided by the Pacific Salmon Commission) regressed against time series for three physical variables, and an estimate based on the relationship between the mean daily sea surface temperature measured at the Kains Island (Quatsino) lighthouse in May and June and the estimated post-season Northern Diversion Rate for 1977-2012. The final pre-season forecast of the proportion of Fraser sockeye diverting through Johnstone Strait was 35%.

For the purposes of pre-season planning, it is assumed that Northern Diversion increases over the course of the season. In addition, Early Stuart and Harrison sockeye are assumed to migrate predominately through the Juan de Fuca approach, regardless of migration timing.

### Timing Forecasts

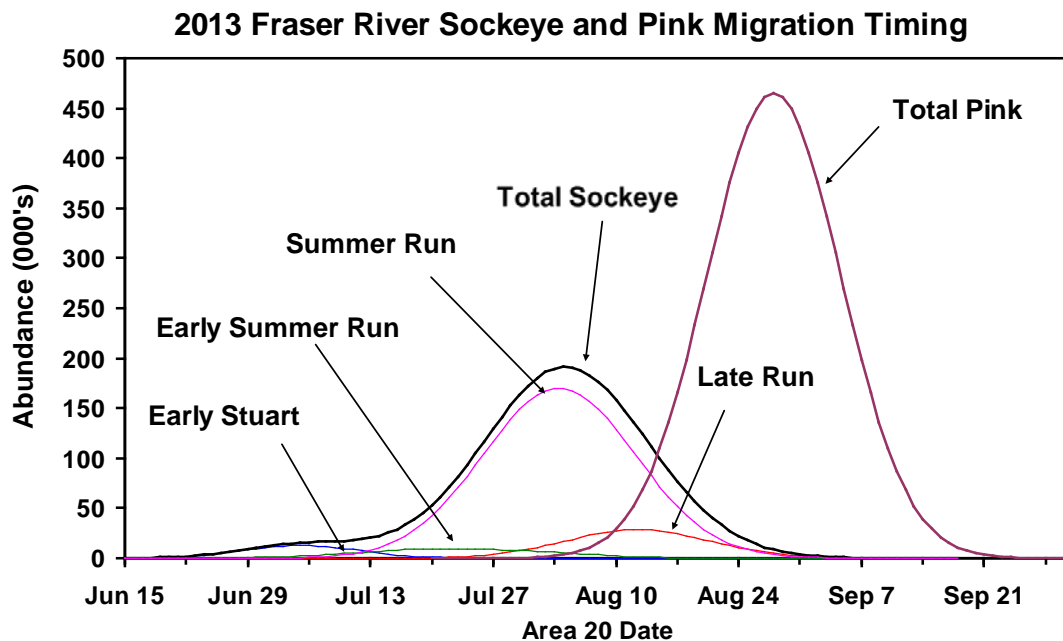
The pre-season forecasts are based on the 50% marine arrival times for the two sockeye salmon stocks (Early Stuart and Chilko River time series provided by the Pacific Salmon Commission) regressed against time series for five physical variables. The forecast of the 50% date (peak timing) for Early Stuart and Chilko Lake sockeye arriving to Area 20 was July 5 and August 4, respectively.

The FRP considered expected run timings for the other stock groups, and reconsidered Chilko sockeye timing, based on their historic relationship to Early Stuart sockeye timing. The following are the pre-season estimates of timing in Area 20 adopted by the FRP.

**Table 4-1: Timing Estimates Used for Pre-Season Planning in Area 20**

Stock	2013 Area 20 Timing
Early Stuart	July 5
Early Summers	July 23
Summer run	August 3
Late run	August 12

The following figure graphically illustrates the relative run size forecasts and run timing overlaps expected in 2013.



**Figure 4-1: Relative Run Size Forecasts and Run Timing Overlaps Expected in 2013**

## Environmental Conditions and Management Adjustments

Management Adjustments (MAs) reflect a quantity of fish that are added to the spawning escapement targets for the purpose of increasing the likelihood of achieving the spawning escapement targets. The general concept is that more fish are needed to be counted going past Mission, than needed for spawning ground escapement and the anticipated catch above Mission, to account for the historic discrepancy between the number of fish estimated at Mission in-season (minus the actual catch above Mission) and the number of fish counted on the spawning grounds. This discrepancy may be due to a number of factors, including (but not limited to): critically high temperatures and/or discharge in the Fraser River, bias in estimates at Mission hydroacoustics and/or spawning ground escapement estimates, biased catch estimates, unreported catch, delayed mortality associated with escapes or releases from fishing gear, natural mortality, and/or predation. While all of these factors are included in the difference between estimates, generally the inputs used to estimate MAs are temperature and discharge for Early Stuart, Early Summer and Summer run sockeye and the 50% migration timing at Mission for Late run sockeye. In some cases a MA for an aggregate may include alternatives such as observed medians when the temperature and discharge models are thought not to apply for some stocks.

For the Early Stuart, Early Summer run and Summer run sockeye, MA estimates can be updated in-season, as river conditions, peak timing and run size information is acquired. In some years Late run sockeye MA estimates can be updated in-season based on peak timing estimates.

In 2013 the pre-season Early Summer run MA was the weighted average using a zero pMA for Pitt River, 0.57 for Chilliwack River, and a modelled pMA for the remaining stocks based on in river migration conditions. The Summer run MA was the weighted average using a pMA of 0.37 for Harrison sockeye and a modelled pMA for the remaining stocks based on migration conditions. The Late run MA was the weighted average of the observed median for Birkenhead sockeye (0.34) and a timing based MA for all other Lates.

The pre-season MA expressed as a percentage of the spawning escapement goal (pMA) and the number of sockeye this represents for 2013 p50 pre-season run sizes are outlined in the table below.

**Table 4-2: MA Estimates used for Pre-Season Planning in 2013**

	<b>Pre-season Run Size</b>	<b>pMA</b>	<b>MA</b>
<b>Early Stuarts</b>	211,000	0.57	61,600
<b>Early Summers</b>	253,000	0.46	64,900

<b>Summers</b>	3,718,000	0.10	148,700
<b>Late run</b>	583,000	0.67	209,700

### **2013 Escapement Plan**

The *Fraser River Sockeye Spawning Initiative* is a multi-year collaborative planning process to develop a long-term escapement strategy. The annual escapement strategy seeks a balance between long-term objectives and short-term practical considerations, and combines technical analyses with qualitative judgment. A plan is developed every year and is vetted through consultative processes prior to the fishing season. The annual allowable exploitation rate for each run timing aggregate is adjusted based on run size and environmental conditions. The table below represents the pre-season escapement plan for 2013 as reflected in the final Salmon Integrated Fisheries Management Plan (IFMP). Note that the Management Adjustments in the Table below have been modified subsequent to the release of the IFMP by the Panel based on adjustments to pre-season timing expectations.

**Table 4-3: 2013 Fraser River Sockeye Escapement Plan – Pre-Season Run Estimates**

Management Unit		Pre-season Forecast Return				
		p10	p25	p50	p75	p90
Early Stuart	forecast	92,000	137,000	211,000	331,000	507,000
	TAM Rule (%)	0%	21%	49%	60%	60%
	Escapement Target	92,000	108,000	108,000	132,400	202,800
	MA	61,600	72,400	72,400	88,700	135,900
	Esc. Target + MA	153,600	180,400	180,400	221,100	338,700
	LAER	10%	10%	10%	10%	10%
	ER at Return	0%	0%	15%	33%	33%
	Allowable ER	10%	10%	15%	33%	33%
	available for harvest	9,200	13,700	30,600	109,900	168,300
	2013 Performance					
	Projected S (after MA)	50,000	74,000	108,000	132,000	203,000
	BY Spawners	45,300	45,300	45,300	45,300	45,300
	Proj. S as % BY S	110%	163%	238%	291%	448%
	cycle avg S	210,300	210,300	210,300	210,300	210,300
	Proj. S as % cycle S	24%	35%	51%	63%	97%
Management Unit		Pre-season Forecast Return				
		p10	p25	p50	p75	p90
Early Summer (w/o RNT)	lower ref. pt. (w misc)	141,000	141,000	141,000	141,000	141,000
	upper ref. pt. (w misc)	351,000	351,000	351,000	351,000	351,000
	forecast (incl. misc)	73,000	130,000	253,000	468,000	844,000
	TAM Rule (%)	0%	0%	44%	60%	60%
	Escapement Target	73,000	130,000	141,000	187,200	337,600
	MA	37,200	66,300	71,900	95,500	172,200
	Esc. Target + MA	110,200	196,300	212,900	282,700	509,800
	LAER	10%	10%	10%	10%	10%
	ER at Return	0%	0%	16%	40%	40%
	Allowable ER	10%	10%	16%	40%	40%
	available for harvest	7,300	13,000	40,100	185,300	334,200
	2013 Performance					
	Projected S (after MA)	44,000	77,000	141,000	187,000	338,000
	BY Spawners	80,200	80,200	80,200	80,200	80,200
	Proj. S as % BY S	55%	96%	176%	233%	421%
	cycle avg S	91,000	91,000	91,000	91,000	91,000
	Proj. S as % cycle S	48%	85%	155%	205%	371%
Management Unit		Pre-season Forecast Return				
		p10	p25	p50	p75	p90
Summer (w. RNT & Har)	lower ref. pt. (w misc)	1,254,000	1,254,000	1,254,000	1,254,000	1,254,000
	upper ref. pt. (w misc)	3,136,000	3,136,000	3,136,000	3,136,000	3,136,000
	forecast	1,222,000	2,095,000	3,718,000	6,663,000	12,131,000
	TAM Rule (%)	0%	40%	60%	60%	60%
	Escapement Target	1,222,000	1,254,000	1,487,200	2,665,200	4,852,400
	MA	122,200	125,400	148,700	266,500	485,200
	Esc. Target + MA	1,344,200	1,379,400	1,635,900	2,931,700	5,337,600
	LAER	10%	10%	10%	10%	10%
	ER at Return	0%	34%	56%	56%	56%
	Allowable ER	10%	34%	56%	56%	56%
	available for harvest	122,200	715,600	2,082,100	3,731,300	6,793,400
	2013 Performance					
	Projected S (after MA)	1,000,000	1,254,000	1,487,000	2,665,000	4,852,000
	BY Spawners	796,200	796,200	796,200	796,200	796,200
	Proj. S as % BY S	126%	157%	187%	335%	609%
	cycle avg S	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400
	Proj. S as % cycle S	55%	69%	81%	146%	266%
Management Unit		Pre-season Forecast Return				
		p10	p25	p50	p75	p90
Late (w/o Har)	lower ref. pt. (w misc)	313,000	313,000	313,000	313,000	313,000
	upper ref. pt. (w misc)	782,000	782,000	782,000	782,000	782,000
	forecast	167,000	293,000	583,000	1,133,000	2,126,000
	TAM Rule (%)	0%	0%	46%	60%	60%
	Escapement Target	167,000	293,000	313,000	453,200	850,400
	MA	111,900	196,300	209,700	303,600	569,800
	Esc. Target + MA	278,900	489,300	522,700	756,800	1,420,200
	LAER	20%	20%	20%	30%	30%
	ER at Return	0%	0%	10%	33%	33%
	Allowable ER	20%	20%	20%	33%	33%
	available for harvest	33,400	58,600	116,600	376,200	705,800
	2013 Performance					
	Projected S (after MA)	80,000	140,000	279,000	453,000	850,000
	BY Spawners	134,000	134,000	134,000	134,000	134,000
	Proj. S as % BY S	60%	104%	208%	338%	634%
	cycle avg S	104,200	104,200	104,200	104,200	104,200
	Proj. S as % cycle S	77%	134%	268%	435%	816%
Available for Harvest (TF, US, CDN)		172,100	800,900	2,269,400	4,402,700	8,001,700
Total projected spawners		1,174,000	1,545,000	2,015,000	3,437,000	6,243,000

### 4.3 IN-SEASON ASSESSMENT

In-season assessments in 2013 were challenging at times due to the following:

- High Fraser River discharge delayed the start of Mission hydro-acoustic estimates. This increased the uncertainty in estimates of sockeye passage at Mission for Early Stuart sockeye;
- Test fishery catch per unit effort was higher in the marine area test fisheries than the in-river test fisheries for much of the sockeye migration. This made it difficult to confirm appropriate expansion lines used to project sockeye returning to the Mission hydro-acoustic site;
- Record Fraser River water temperatures observed during extended periods of sockeye migration likely increased uncertainty in MA estimates for some groups;
- The protracted return profile of the Summer run sockeye increased the uncertainty in the timing and abundance for this group; and
- Although Late run delay was suspected, it was difficult to determine in-season given the low abundance of Late run sockeye relative to the large abundance of co-migrating pink salmon.

#### Migration and Timing

The final in-season Area 20 migration date (peak) was earlier for Early Stuart sockeye and later for Early Summer, Summer, and Late run sockeye when compared to the pre-season timing estimates (Table 4-4).

**Table 4-4: Expected vs. Observed Timing by Stock Group**

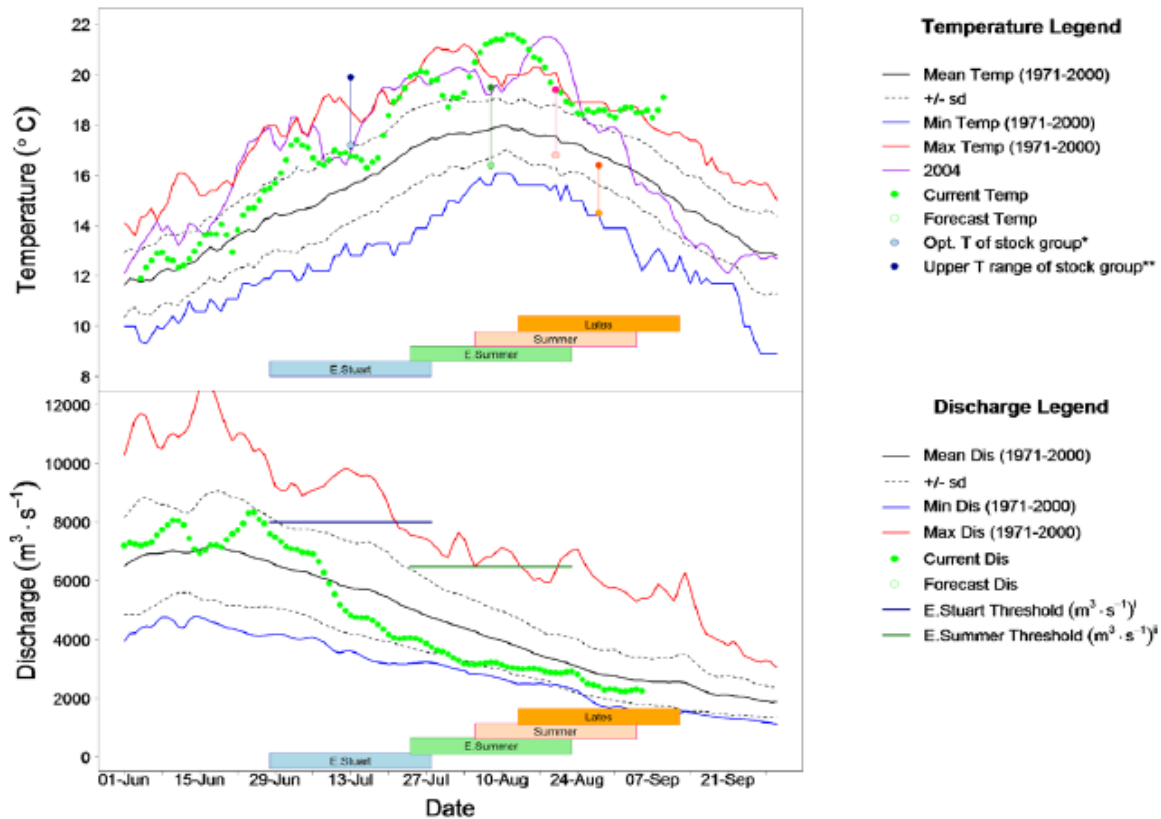
Stock	Area 20 Timing	
	Pre-season	Final In-season
Early Stuart	July 5	July 2
Early Summer	July 23	July 24
Summer run	August 3	August 10
Late run	August 12	August 17

#### Fraser River Environmental Conditions and Management Adjustment

The Fraser River discharge was above average for the early portion of the Early Stuart migration and below average for the remainder of the season. Conversely, water temperatures were above average (at times extreme) for the entire sockeye migration. High water temperatures can cause serious adverse effects on migratory fish. The figures below illustrate the observed in-season Fraser River discharges at Hope and temperatures



at Qualark Creek as well as the corresponding estimated stock aggregate migration periods.



**Figure 4-2: Fraser River Discharge at Hope and Temperature at Qualark Creek**

Management Adjustment models can use environmental conditions and run timing as inputs. Due to the high temperatures observed in July and August the Early Stuart, Early Summer, and Summer run MAs increased significantly from pre-season estimates.

**Table 4-5: Pre-season and In-season Management Adjustments**

<b>Stock</b>	<b>p50 Forecast</b>	<b>Pre- Season pMA</b>	<b>Pre- Season MA</b>	<b>Final In- season Run Size</b>	<b>Final In- Season pMA</b>	<b>Final In- Season MA<sup>a</sup></b>
<b>Early Stuart</b>	211,000	0.57	61,600	182,000	1.33	143,600
<b>Early Summer</b>	253,000	0.46	64,900	550,000	0.80	176,000
<b>Summer</b>	3,718,000	0.10	148,700	2,400,000	2.48	3,109,900
<b>Late run</b>	583,000	0.67	209,700	600,000	0.92	288,000

<sup>a</sup> Final in-season MA as of September 23, 2013.

### **Run Size**

As the season progressed the FRP considered technical advice provided by the Pacific Salmon Commission, the Fraser River Panel Technical Committee members and bilaterally adopted run sizes that reflected in-season assessment information.

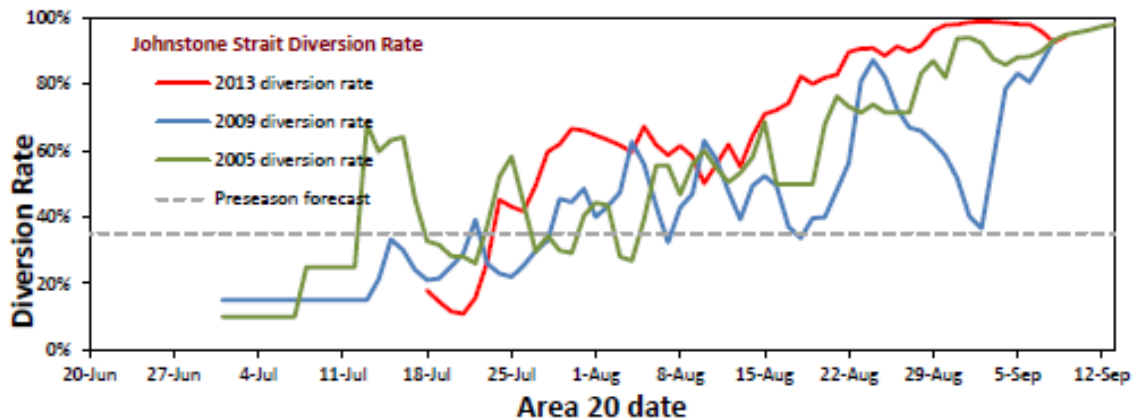
The final in-season run size estimates were higher than the pre-season p50 forecasts for the Early Summer and Late run management aggregates and slightly lower for the Early Stuart sockeye. The Summer run sockeye run size estimate was much lower, closer to the pre-season p25 forecast (see the Table below).

**Table 4-6: Pre-Season Forecasts vs. Final In-Season Run Size Estimates**

Stock	Pre-Season Forecast			Final In-Season Estimate (Sept 23)
	25% Probability	50% Probability	75% Probability	
Early Stuart	137,000	211,000	331,000	182,000
Early Summer	130,000	253,000	468,000	550,000
Summer	2,095,000	3,718,000	6,663,000	2,400,000
Late	293,000	583,000	1,133,000	600,000
<b>Total</b>	<b>2,655,000</b>	<b>4,765,000</b>	<b>8,595,000</b>	<b>3,732,000</b>

### Diversion Rate

The diversion rate of sockeye through Johnstone Strait was higher than forecast and estimated to be 71% (versus the 35% forecast). The figure below outlines diversion rate estimates in 2013 relative to other cycle years.



**Figure4-3: The 2013 Diversion Rate Compared to Recent Diversion Estimates for the 2013 Cycle.**

## 4.4 FISHERIES

There were directed harvest opportunities for Fraser sockeye in First Nations FSC fisheries. With the exception of the use of fish for test fishing purposes, there were no directed commercial or recreational fisheries in Canada in 2013. Some small, incidental by-catch of Fraser sockeye occurred when conducting fisheries on other species.

Initially, Fraser River sockeye harvest opportunities were restricted for all harvest groups based on the requirement for a three week moving window closure to protect Early Stuart sockeye. During the Early Stuart window closure time period in-season assessments indicated there was limited TAC for this group designated under the Aboriginal Fishery Exemption (AFE). At the time there was a small harvest of Early Stuart sockeye in First Nations in-river FSC fisheries. As the season progressed in-season information indicated that there was Early Summer and Summer run TAC available. Some directed harvest occurred by First Nations for FSC purposes both in the marine and in-river fisheries. Within a short time there was no TAC available for Summer run sockeye due to a decrease in run size and a large increase in the Management Adjustment. Some Late run TAC was also identified, but with no associated Summer run TAC, only fisheries that were selective and directed at other species could be prosecuted. Although there was no TAC for Summer run sockeye identified, in Canada there was directed harvest permitted in some terminal areas for FSC fisheries where First Nations had limited access to other species and stocks and observations in terminal areas indicated stronger than expected sockeye returns.

The Table 4-7 below outlines final in-season estimates of Fraser River sockeye catch in Canada and the U.S.

**Table 4-7: Final In-season Estimates of Fraser River Sockeye Catch in Canada & in the U.S.**

<b>Total Fraser Sockeye Caught <sup>a</sup></b>	<b>507,000</b>
Test fisheries (incl. Albion and Qualark)	100,300
<b>Canadian Catch</b>	<b>386,100</b>
Canadian First Nation FSC fisheries- Marine	123,400
Canadian First Nation FSC fisheries- Fraser	260,600
Canadian commercial fisheries (includes commercial selective & FN economic)	2,100
Canadian recreational fisheries	0
<b>United States Catch</b>	<b>20,600</b>
U.S. non-Treaty Indian fisheries	0
U.S. Treaty Indian fisheries	4,600
U.S. Treaty Indian ceremonial fisheries	15,900

<sup>a</sup> Preliminary in-season catch as of October 1, 2013 rounded to the nearest 100 fish. Does not include non-Fraser sockeye.

### **Total Allowable Catch**

The TAC for Fraser sockeye is calculated using: run size estimates, the escapement plan, management adjustment, run timing, and estimates of test fishing catches. In-season, Canadian PST Post-season Report 2013

fisheries are planned using in-season information and are not conducted based on pre-season forecasts.

In 2013, generally fisheries were planned in Canada targeting the stock aggregates with available TAC. Other stock aggregates that could constrain fisheries were harvested incidentally to levels identified in Canada's Escapement Plan. The following table shows the pre-season and final in-season TAC and catch by aggregate.

**Table 4-8: Final In-season Estimates of Fraser River Sockeye Catch as of November 14, 2013 in Canada and the U.S.**

<b>Stock</b>	<b>Pre-season total TAC<sup>a</sup></b>	<b>Final In-season total TAC<sup>b</sup></b>	<b>Final In-season Catch<sup>c,d</sup></b>
<b>Early Stuart</b>	36,400	16,100	11,100
<b>Early Summer</b>	40,100	142,000	63,100
<b>Summer</b>	1,992,500	165,600	385,800
<b>Late</b>	51,400	108,100	47,000
<b>Total</b>	<b>2,120,400</b>	<b>431,800</b>	<b>507,000</b>

<sup>a</sup> TAC includes the Canadian Aboriginal Fisheries Exemption amount of 400,000 fish.

<sup>b</sup> Includes LAER of 10% for Early Stuarts and Summers, and 20% for Lates.

<sup>c</sup> Catch up to October 1, 2013 rounded to the nearest 100 fish.

<sup>d</sup> Includes catch from test fisheries.

The Table below outlines the final in-season TAC and catch for each country.

**Table 4-9: Final In-Season TAC and Final In-season Catch as of October 1, 2013.<sup>a</sup>**

<b>Stock</b>	<b>Early Stuart</b>	<b>Early Summer</b>	<b>Summer</b>	<b>Late</b>	<b>Total</b>
<b>Test Fisheries<sup>b</sup></b>	2,100	12,000	73,900	11,800	99,700
<b>U.S. Catch</b>					
Commercial	0	500	3,700	400	4,600
C&S	0	1,000	9,900	5,000	15,900
<b>U.S. Total</b>	0	1,500	13,600	5,400	20,600
<b>U.S. TAC<sup>c</sup></b>	0	15,200	0	0	15,200
<b>CDN Catch</b>					
Commercial	0	0	1,200	900	2,100
Recreational	0	0	0	0	0
FSC	9,000	49,600	296,500	28,800	384,000
<b>Other<sup>d</sup></b>	10	80	510	70	700
<b>CDN Total</b>	9,100	49,600	298,300	29,800	386,800
<b>CDN TAC<sup>e</sup></b>	9,000	126,800	296,600	28,800	461,200

<sup>a</sup> Catch rounded to nearest 100 fish

<sup>b</sup> Includes Fraser sockeye catch in Panel approved Test Fisheries in U.S. waters.

<sup>c</sup> TAC as of October 5, 2013 (relinquishment date). Test fishing and AFE are actual catches.

<sup>d</sup> Other catch is sockeye captured in multi-species non-Panel approved test fisheries (Albion and Qualark).

<sup>e</sup> TAC as of October 5, 2013. Includes AFE.

### **Fraser Sockeye Exploitation Rates**

The Table below outlines pre-season exploitation rate expectations based on the p50 forecast, pre-season MAs, 2013 Total Allowable Mortality (TAM) rules, and final in-season exploitation rate estimates based on final in-season estimates of run size and catch, along with the estimated final in-season exploitation rate after incorporating fishery induced mortalities.

**Table 4-10: Potential Exploitation Rates**

	Pre-season <sup>a</sup>	Final In-season <sup>b</sup>	Final In-season <sup>c</sup>
<b>Early Stuart</b>	17%	6%	6%
<b>Early Summer</b>	16%	12%	12%
<b>Summer</b>	54%	16%	17%
<b>Late</b>	20%	8%	9%
<b>Cultus <sup>d</sup></b>	20%	8%	9%

<sup>a</sup> ER is the max allowable ER based on 2013 TAM rules, pre-season pMAs, the lower allowable ER, and the p50 forecast

<sup>b</sup> ER is based on 2013 TAM rules, in-season pMAs, the lower allowable ER, the final adopted in-season run size and in-season catch

<sup>c</sup> Includes release mortalities

<sup>d</sup> ER is assumed to be the same as similarly timed Late-run stocks

## 4.5 POST-SEASON

### Sockeye Migration and Escapement Estimates

Early Stuart sockeye did experience difficult migratory conditions in the Fraser River. As opposed to recent years where water discharges were extremely high throughout their migration, this year the discharge levels were high early in the migration, but more normal to below normal around the peak of the Early Stuart migration. Water temperatures were more of the concern, with high water temperatures early and late in the Early Stuart migration.

The 2013 preliminary escapement estimate of 86,202 Early Stuart sockeye is almost double the brood year (45,297) but only 34% of the recent (1992-2009) cycle average of 253,956. Spawning success for Early Stuart sockeye in 2013 is an estimated 87.2% (12.8% pre-spawn mortality), slightly below the long term average of 88.9%.

Early Summer run sockeye also experienced high water temperatures for the duration of their migration, at times reaching extremes when compared to historical temperature information. These high temperatures persisted for both the Summer run and Late run sockeye migrations into the river.

The 2013 preliminary escapement estimate of 217,789 Early Summer sockeye is triple the brood year (77,947) and 73% higher than the recent (1992-2009) cycle average of 125,926. This is the second largest Early Summer run sockeye spawning escapement on record for this cycle year. The estimated spawning success for the Early Summer run aggregate in 2013 is 90.1%, which is similar to the long term average of 89.5%.

The Table below outlines the predicted escapement relative to the escapement goals at the final in-season sockeye run sizes. Spawning ground estimates for Summer run and Late run sockeye are currently not available.

**Table 4-11: Preliminary Escapement Information to Date**

Management Group	Escapement Goal @ final in-season run size <sup>a</sup>	Predicted Diff. Btw Estimates (DBE) <sup>b</sup>	Predicted Spawn. Escapement <sup>c</sup>	Prelim. Spawn. Escapement <sup>d</sup>
Early Stuart	108,000	-57%	73,595	86,158
Early Summer	220,000	-44%	304,879	212,299
Summer	1,254,000	-71%	713,666	Not Available
Late-run	313,000	-48%	300,295	Not Available
<b>Total</b>	<b>1,895,000</b>		<b>1,392,435</b>	

<sup>a</sup> Spawning Escapement Target based on adopted run size and Canada's escapement plan.

<sup>b</sup> DBEs are calculated from the final in-season Fraser Panel adopted proportional MA values

<sup>c</sup> Predicted spawning escapement: Run Size - Catch to date + DBE. In-season estimates as of Sept 23 2013.

<sup>d</sup> Preliminary adult spawning escapement estimates. Preliminary Summer and Late spawning ground estimates will be available in January 2014. There were no adult Fraser Pink spawning ground assessments conducted in 2013.

## Post-season Catch Estimates

The current estimates of catch in this report are final in-season estimates as of October 1, 2013 and will likely increase slightly when the post-season catch estimates are finalized. Preliminary post season estimates of catch by stock group will be available in January 2014.

## 5 FRASER RIVER PINK

### 5.1 PRE-SEASON ASSESSMENT

In 2013, the Fraser pink forecast was highly uncertain given the changes to the assessment methods through time. The median (50% probability) forecast for Fraser River pink salmon was 8.9 million, with 25% and 75% probability levels of 6.4 million and 12.5 million respectively. The DFO forecast 50% date (peak timing) for Fraser pink salmon arriving to Area 20 was August 28 and the pre-season diversion rate estimate through Johnstone Strait was predicted to be 41%.

The escapement strategy for Fraser River pink salmon continues to be based on an interim escapement goal of 6 million Fraser River pink salmon; with an escapement target of 30% of the total return for run sizes above 20 million. The Table below outlines total allowable mortality rules for various Fraser pink run sizes. The total allowable mortality at the p50 pre-season run size forecast is 33%.



**Table 5-1: 2013 Fraser River Pink Escapement Plan- Pre-season Run Size Estimates and Allowable Exploitation Rates.**

<b>Fraser Pinks</b>						
7,059,000	Lower Fishery Reference Point					
20,000,000	Upper Fishery Reference Point					
70%	Maximum Exploitation Rate					
	<b>Pre-season Forecast Return</b>					
		<b>p10</b>	<b>p25</b>	<b>p50</b>	<b>p75</b>	<b>p90</b>
	forecast	4,794,000	6,401,000	8,926,000	12,473,000	17,111,000
	escapement target	4,306,000	5,530,000	6,000,000	6,000,000	6,000,000
	allowable ER	10%	14%	33%	52%	65%

In 2013 there were pre-season concerns expressed by Canada and the US around sockeye by-catch in directed pink fisheries as there could be limited sockeye TAC available when pink fisheries were anticipated. Both parties agreed that pink fisheries would be undertaken while striving to stay within sockeye harvest constraints.

Due to conservation concerns for some co-migrating species, it was anticipated that, similar to previous years, alternative fishing gear may be employed to access Fraser Pink TAC. Alternative gears used in the past have included beach seines & shallow seines in the Fraser River.

## 5.2 IN-SEASON ASSESSMENT

There was no change between the pre-season peak timing date (August 28) and the final in-season estimate. The final in-season annual diversion rate through Johnstone Strait was higher than expected and estimated to be 65%.

As the season progressed the Fraser River Panel (FRP) considered technical advice provided by the Pacific Salmon Commission (PSC), the Fraser River Panel Technical Committee (FRPTC) members and bilaterally adopted run sizes that reflected in-season assessment information. On September 6 the FRP adopted a final in-season run size estimate of 26 million Fraser River pink, which is well above the p90 forecast level of 17 million. The following table highlights the timeline of run size changes that were adopted by the FRP.

**Table 5-2: Timeline of Run Size Changes Adopted by FRP in 2013.**

<b>Stock</b>	<b>Preseason</b>	<b>Aug 23</b>	<b>Aug 27</b>	<b>Aug 29</b>	<b>Sept 3</b>	<b>Sept 6</b>
<b>Fraser Pink</b>	8,926,000	10,000,000	14,000,000	16,000,000	24,000,000	26,000,000

Standard in-season run size estimates for Fraser River pink salmon are based on marine area test fishery CPUE multiplied by historical expansion lines. A review of the Mission hydroacoustic data and DIDSON data will be analyzed post-season to generate an alternative Fraser pink passage estimate at Mission. When added to catch estimates (seaward of Mission), this may provide an alternative to the test fishery based estimates of total pink salmon run size. This approach is supported given there is no comprehensive spawning ground assessment programs for Fraser pinks.

### **5.3 FIRST NATIONS**

There were directed pink harvest opportunities for First Nations (FSC), and commercial fisheries (including First Nations demonstration and economic opportunities). The majority of First Nation FSC harvesting occurred in early August in the marine approach areas.

### **5.4 COMMERCIAL**

Commercial fisheries occurred from early to late September. In marine waters, Canada managed the majority of the Fraser River pink fisheries as an Area B Seine and Area H Troll pink Individual Transferable Quota (ITQ) Demonstration Fishery. Fraser River pink salmon accounting included retained catch and Fraser River sockeye salmon accounting was based on total mortalities, including retained catch and assessed release mortalities. Sockeye were to be released, however there were some landings of sockeye recorded in the pink validations.

For any pink or sockeye retained, catches were attributed to available vessel ITQ. Sockeye release mortalities were attributed to available vessel ITQ based on the sockeye to pink salmon encounters (as determined by independent observer data by area and gear), the validated pink catch, and the number of sockeye retained.

There were no Area D and E Gill net fisheries for Fraser pinks or sockeye.

First Nations economic opportunity and demonstration fisheries occurred at various locations in the Fraser watershed in 2013.

### **5.5 RECREATIONAL**

Fraser River pink recreational harvest opportunities were available in marine areas and in the Fraser River.

The table below outlines preliminary Fraser pink catch estimates in Canada and the United States in 2013.

**Table 5-3: Preliminary Fraser Pink Catch Estimates in Canada and US in 2013**

<b>Total Fraser Pink Caught <sup>a</sup></b>	<b>5,994,600</b>
Test fisheries (including Albion and Qualark)	38,100
<b>Canadian Catch</b>	<b>2,894,700</b>
Canadian commercial fisheries (includes commercial selective & First Nation economic and demonstration fisheries)	2,855,400
Canadian First Nation FSC fisheries	9,900
Canadian recreational fisheries	29,400
<b>United States Catch</b>	<b>3,061,800</b>

<sup>a</sup> Preliminary in-season catch as of October 1, 2013 rounded to the nearest 100 fish. Does not include non-Fraser pink catch.

## **5.6 POST-SEASON ESCAPEMENT AND CATCH**

Since 2003, the final estimate of escapement has been calculated as the final run size minus catch (comprehensive spawning ground estimates for pink salmon have not been undertaken since 2001). The preliminary in-season net escapement estimate for the 2013 return is 22,345,000 pink salmon.

Post-season catch estimates will be available in January 2014. The post-season catch of Fraser pinks will likely be much higher than the in-season estimates outlined above. Preliminary data suggests an additional 300,000 Fraser pinks were likely caught in Fraser River Economic Opportunity and Demonstration fisheries. Non-Fraser pink catch was estimated to be 1,378,000 pinks.

## **6 SOUTHERN B.C. AGGREGATE ABUNDANCE-BASED MANAGEMENT CHINOOK**

### **6.1 OBJECTIVES AND OVERVIEW**

Chinook fisheries are managed by either an aggregate abundance-based management (AABM) or individual stock-based management regime. Allowable harvest impacts in AABM areas are determined by provisions in the Pacific Salmon Treaty and subject to domestic considerations, such as conservation and allocation. In Southern B.C., all AABM Chinook fisheries are located off the West Coast Vancouver Island (WCVI), including components of the recreational fishery, First Nations fisheries, and the WCVI Area G troll fishery.

For the period October 2012 through September 2013, the forecast Chinook abundance index was 0.77 of the PST base period. Therefore, under treaty provisions, the maximum allowable catch was 115,300 Chinook for WCVI AABM fisheries; which includes a 30% reduction consistent with the treaty provisions that came into effect in January 2009.

Of this total, 74,227 was the pre-season expected catch for the offshore recreational and First Nations fisheries. The remaining 41,073 Chinook were allocated to the commercial fisheries (Area G and T'aaq-wiihak).

Further considerations for managing Chinook catch in WCVI AABM fisheries are driven by concerns regarding the low status of natural WCVI, Lower Strait of Georgia (LGS), and Spring 4<sub>2</sub>/5<sub>2</sub> and summer 5<sub>2</sub> Fraser River Chinook and Interior Fraser coho populations.

Several ocean fisheries in Canada intercept WCVI origin Chinook, including Northern troll, Queen Charlotte Islands (Haida Gwaii) sport, WCVI troll and WCVI sport. Ocean fisheries are limited to a 10% exploitation rate, even if PST provisions allow for a higher catch. Management measures are in place to reduce the impact of fisheries on WCVI origin Chinook while still providing harvest opportunities.

Continued efforts were made in 2013 to limit the impact of the troll fishery on low status Chinook populations, including time and area constraints, and limits on effort (boat-days) to protect stocks of concern.

AABM Chinook catch and release information from all fisheries can be found in Appendix 4.

**Table 6-1: Pre-Season and Post-Season Total Allowable and Preliminary Catch Estimates for October 2012-September 2013 WCVI AABM Chinook**

	Pre-Season	Post-Season
WCVI AABM Abundance Index	0.77	under review
WCVI AABM Chinook TAC	115,300	under review
AABM Recreational Catch	60,000	61,712
First Nations Catch (FSC)	5,000	3955**
Maa-nulth First Nations Catch (FSC)	3,927	1,710**
T'aaq-wiihak Catch	5,300	7,650
Area G Troll Catch	<b>41,073*</b>	35,393
<b>Total AABM Catch</b>		<b>110,179</b>

\*The total Area G troll TAC is calculated as the difference between the WCVI AABM Chinook TAC less offshore recreational catch ,NTC First Nations Expected FSC catch, Maa Nulth Domestic Allocation and T'aaq wiihak Allocation.

\*\*First Nations catch is under review.

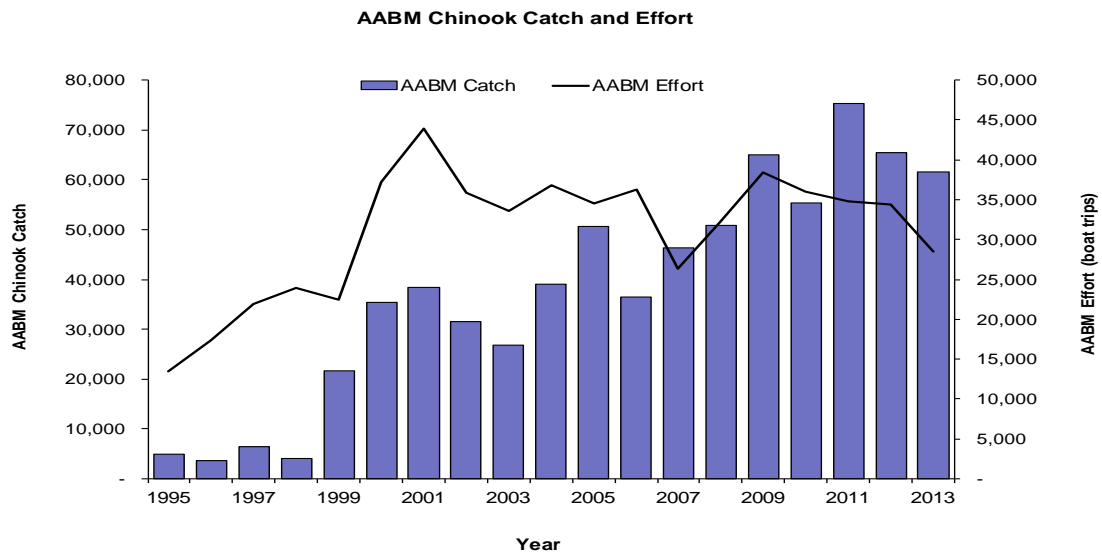
## **6.2 RECREATIONAL**

The WCVI AABM recreational Chinook fishery primarily takes place in offshore areas 121-127 from May-September. Catch and effort are largely driven by abundance and change annually; weather can also be a factor at certain times of the year. Management measures include a 77 cm maximum size limit in those portions of Areas 123-127 that lie shoreward of a line drawn 1-mile seaward of the surf line. This area is commonly referred to as the 'Chinook Corridor', and is in place to protect migrating WCVI origin Chinook. In areas along the WCVI, where hatchery origin Chinook are considered to make up a high portion of the recreational catch, anglers are permitted to retain two (2) Chinook per day of which one (1) can be larger than 77 cm. The mandatory use of barbless hooks, and a daily limit of two (2) Chinook are also in place.

Chinook catch in the AABM recreational fishery is estimated through several catch monitoring programs, including a creel survey, a logbook program and DFO's electronic survey iREC. The creel survey continues to be the most utilized catch monitoring program in this area particularly because it collects effort (number of boat trips), and catch per unit effort data. Catch for any given species within a defined time-area stratum is estimated by multiplying effort by CPUE. Total effort is estimated through vessel counts, gathered through either aerial or on-water boat surveys of the fishing area. CPUE is estimated from interviews with anglers at specific landing sites and from trip logbooks and manifests submitted by lodges and guides through a voluntary monitoring program. Data regarding the daily activity profile of the fishery, fishing locations, and the proportion of guided versus un-guided effort are also gathered from angler interviews.

Total recreational catch and release in the 2013 WCVI AABM fishery was estimated to be 61,712 and 56,100 Chinook, respectively, during the survey period (June-Sept). Previous sampling has indicated that there is minimal recreational effort outside of this period and catch is expected to be low.

Effort in the AABM area for 2013 was 28,534 boat trips.



**Figure 6-1. Preliminary Recreational WCVI Chinook AABM Catch and Effort, 1995-2013**

**Table 6-2: Preliminary Estimates of WCVI Recreational AABM Effort, Chinook Catch, and Chinook Releases by PFMA, 2013**

2013	Area	AABM Effort (Boat Trips)	AABM Chinook Catch	AABM Chinook Releases
Inshore	Juan de Fuca (20W)	-	-	-
	Area 21	142	63	64
	Alberni Inlet (23)	5,047	-	70
	Barkley Sound (23)	4,782	5,503	6,632
	Clayoquot (24)	829	2,026	286
	Nootka (25)	-	-	-
	Kyuquot (26)	120	214	-
	Quatsino (27)	243	274	-
Offshore	Area 121	2,161	9,884	9,631
	Area 123	6,110	21,868	30,462
	Area 124	2,060	6,145	3,490
	Area 125	1,814	3,018	1,310
	Area 126	2,205	6,181	2,214
	Area 127	3,022	6,537	1,939
Total		28,534	61,712	56,100

### 6.3 FIRST NATIONS

The 2013 WCVI NTC First Nations AABM Chinook reported catch was 1,540 and catch from Maa-nulth Nations domestic fisheries was estimated at 1,715. Total AABM Chinook reported for First Nations FSC and domestic fisheries was 3,955.

### 6.4 COMMERCIAL

After the completion of the April 2013 Chinook Technical Committee (CTC) Chinook model calibration, the WCVI AABM Canadian allowable harvest was 115,300. The FSC harvest was set at 8,937; and the recreational expected catch was 60,000, leaving 46,363 available for commercial harvest. The commercial TAC was apportioned with 88.6% to Area G Troll and 11.4% to the T'aaq wiihak First Nations Demonstration fishery. The Area G Troll TAC was 41,073 Chinook. The total estimated Area G troll catch was 35,393 Chinook. The T'aaq wiihak First Nations TAC was 5,300 Chinook. The total estimated T'aaq wiihak First Nations catch was 7,650 Chinook.

For the 2012/2013 Chinook year, fisheries continued to be shaped by conservation concerns for the following domestic stocks: Spring 4<sub>2</sub>/5<sub>2</sub> and summer 5<sub>2</sub> Fraser River Chinook, Interior Fraser River coho, WCVI origin Chinook salmon, and LGS Chinook.

### **Area G Troll Summary**

The Area G Troll annual management plan is designed to maintain exploitation rates on stocks of concern within established limits by the use of fishing time and area closures in conjunction with fishing effort limits. The management plan distributes catch and effort throughout the fishing year.

The management plan is subject to change as required to address specific conservation concerns as they arise. For the 2013 fishing season the following changes to annual fishing plan were implemented:

- Conservation measures introduced in the Area G troll fishery in 2011-12 to address low returns of Fraser spring and summer 5/2 were implemented again in the 2012-13 season. For Area G troll that meant there was no June or July fisheries.
- To avoid exceeding the overall WCVI AABM TAC, 20% of the Area G TAC was allocated to September fisheries. If preliminary AABM catch estimates to August 31 indicate the overall WCVI AABM TAC may be exceeded, the Area G TAC set aside for September would be used to assist Canada with staying within its overall WCVI Chinook TAC.
- Retention of all coho salmon bycatch was permitted in Areas 125, 126 and 127 in all openings between September 15 to December 31; and, between October 1 and December 31 for Areas 123 and 124.

### **Area G Troll Fishing Periods:**

- October to March period

During the period from October 1 to March 15, a harvest level of approximately 20% of the Area G annual TAC was recommended, based on the PST Chinook model calibration and assigned harvest levels for the outer WCVI area.

- March 16 to April 18 period

A full time-area closure was maintained from March 16 to April 18 annually to avoid interception of spring 4<sub>2</sub>/5<sub>2</sub> and summer 5<sub>2</sub> Fraser River Chinook.

- Late April/ mid-June period

During the period from April 19 to June 15, a harvest of approximately 40% of the Area G annual TAC was recommended, based on the PST Chinook model calibration and assigned harvest levels for the outer WCVI area. In addition, effort (boat-days) was



limited to recent year averages, and areas of SWVI were closed until May 7 (partial openings from May 2-7) in order to avoid interception of spring 4<sub>2</sub>/5<sub>2</sub> and summer 5<sub>2</sub> Fraser River Chinook.

- June 16 to July 23 period

A full time-area closure was maintained from June 15 to July 23 in Management Areas 125 to 127 and from June 16 to July 31 in Management Areas 123 to 124 to avoid interception of spring 4<sub>2</sub>/5<sub>2</sub> and summer 5<sub>2</sub> Fraser River Chinook.

- July 24 through early August

During this period, a harvest of approximately 20% of the Area G annual TAC was recommended, based on the PST Chinook model calibration and assigned harvest levels for the outer WCVI area. In addition, the fishery was managed to minimize mortality on wild coho through: i) a maximum interception of coho, and ii) the mandatory use of large (minimum 6") plugs. As well, the fishery was managed to minimize mortality of WCVI origin Chinook through the use of time-area closures of near shore areas ("Chinook conservation corridor") where WCVI Chinook stocks are prevalent.

- September period

During the September period, a harvest of approximately 20% of the Area G annual TAC was recommended based on the PST Chinook model calibration and assigned harvest levels for the outer WCVI area. The Area G harvest level in September has the potential to increase if there is available remaining WCVI AABM TAC after accounting for First Nation FSC and recreational fisheries. However, if First Nations or the recreational sector exceed their expected catch the available Area G TAC is reduced. For any harvest opportunities prior to September 15 to December 31, retention of all coho salmon bycatch was permitted in Areas 125, 126 and 127 in all openings; and, between October 1 and December 31 for Areas 123 and 124.

For all troll fisheries, selective fishing practices were mandatory, including single barbless hooks and revival tanks for resuscitating non-retention species prior to release.

Since 1999, a major objective for the management of the WCVI troll fishery has been to distribute the catch throughout the fall-winter-spring-summer periods. This objective was continued in 2012/2013.

The late July and August plug fisheries were monitored to determine encounter rates of other species and estimate numbers of released Chinook. Biological sampling was conducted for size distributions, and stock compositions (Coded Wire Tags, DNA and otolith samples).

**Table 6-3: Post-Season Preliminary Monthly Catch Estimates for 2007/08 to 2011/12 WCVI AABM Chinook Troll Fisheries**

	2012/2013	2011/2012	2010/2011	2009/2010	2008/2009
October	3,344	0	0	0	1,882
November	230	57	0	0	1,209
December	312	188	0	0	1,107
January	1,018	129	0	0	3,394
February	358	542	1,849	0	1,540
March	501	243	875	0	586
April	1,374	10,493	8,670	8,553	3,616
May	25,737	22,334	41,239	31,296	18,062
June	0	0	34,394	23,652	12,165
July	0	0	15,619*	0	0
August	0	4,280*	21,284*	11,642*	9,630*
September	2,519	17,264	0	3,980	0
<b>Total</b>	<b>35,393</b>	<b>55,530</b>	<b>123,930</b>	<b>79,123</b>	<b>53,191</b>

\*Plug fishery

#### **T'aaq wiihak First Nations Demonstration Fishery Summary:**

In addition to other considerations relating to aboriginal rights, DFO acknowledges that, in its November 3, 2009, the British Columbia Supreme Court decision in *Ahousaht Indian Band et al. v Canada and British Columbia*, the Supreme Court found the plaintiffs (five Nuu-chah-nulth First Nations located on the West Coast of Vancouver Island – Ahousaht, Ehattesaht, Hesquiaht, Mowachaht/Muchalaht, and Tla-o-qui-aht) have what the Court recognized as “aboriginal rights to fish for any species of fish within their Fishing Territories and to sell that fish.”

The B.C. Court of Appeal subsequently confirmed the B.C. Supreme Court decision, except that it found that the rights do not included geoduck. The consultations and negotiations between the DFO and the *Ahousaht* five plaintiff First Nations, self-designated as T'aaq-wiihak, commenced in April 2010.

Part of this consultation and negotiation process involved the continuation of an AABM Chinook salmon demonstration fishery for the 2013 fishing season. The fishery was carried out in portions of statistical Areas 24, 25, 26, 124, 125 and 126 on the west coast of Vancouver Island between April 19<sup>th</sup> and August 11<sup>th</sup>, 2013. The fishery was managed similar to the Area G fishery with the exception of a limited June fishery which occurred when Area G was closed. Total catch estimated for the fishery was 7,650 Chinook.

The fishery was monitored by T'aaq-wiihak fishery monitors, independent observers and DFO staff. Biological samples for DNA, and heads from salmon indicating presence of a coded wire tag, were collected by J.O. Thomas and Associates.

## **7 SOUTHERN B.C. ISBM CHINOOK**

### **7.1 OBJECTIVES AND OVERVIEW**

In addition to the PST regime, Canada implemented management actions as required to ensure conservation of Canadian origin Chinook and to meet domestic allocation requirements. These Chinook fisheries were managed to harvest rates on an individual stock basis (ISBM).

Measures were taken in 2013 in First Nations FSC, recreational and commercial Chinook fisheries to protect WCVI, LGS, Spring 4<sub>2</sub> and Spring/Summer 5<sub>2</sub> Fraser River Chinook stocks. FSC management actions included time and area closures and reduced fishing times. Recreational measures included barbless hooks, time/area closures, size restrictions and mark selective fisheries. Commercial measures included barbless hooks, time and area closures, gear restrictions, mandatory use of revival tanks, daily catch reporting, mandatory logbooks, hailing catches on a regular basis, and independent on-board observers on vessels when requested. Post-release mortality information for Chinook included in ISBM management was determined from studies conducted in 2000-2001 and detailed in the Canadian Stock Assessment Secretariat, Research Document 99/128 (CSAS, Doc 99/127.). The recreational post-release mortality rate for Chinook is 15%.

Specific management actions were taken to protect WCVI origin Chinook in Canadian ocean fisheries (not including enhanced terminal areas), the harvest of which was restricted to an exploitation rate of 10%.

Most Southern B.C. commercial fisheries were regulated so that impact on WCVI wild Chinook stocks was minimized, with the exception of terminal recreational, commercial and First Nations fisheries.

Lower Strait of Georgia (LGS) Chinook stocks are improving from historic lows seen in 2009 and are rebuilding slowly. Significant management measures in the recreational and commercial fisheries continued to be in place throughout 2013 to protect these stocks. Some LGS Chinook stocks are seeing a gradual increase in terminal returns, particularly in the Cowichan River, which is encouraging. Overall their productivity and their Salmon Outlook category remains low.

Spring 4<sub>2</sub> Fraser River Chinook and Spring/Summer 5<sub>2</sub> Fraser River Chinook stocks had specific management measures in place to reduce exploitation in FSC, recreational and commercial fisheries. FSC management actions in the Fraser River included time and area closures and reduced fishing times. Recreational fisheries in Juan de Fuca Strait, the Strait of Georgia and the approach waters of the Fraser River had specific time, area, size and mark selective restrictions designed to minimize the amount of exploitation on these Chinook stocks. Fraser River tidal and non-tidal recreational fisheries had delayed start up times, implemented to protect Spring 4<sub>2</sub> Fraser River Chinook and Spring/Summer

Fraser River 5<sub>2</sub> Chinook stocks. Commercial troll fisheries on the WCVI were also managed with time and area closures in 2013 for Spring/Summer Fraser Chinook stocks.

ISBM Chinook catch and release information from all fisheries can be found in Appendix 5.

## **7.2 RECREATIONAL**

### **West Coast Vancouver Island**

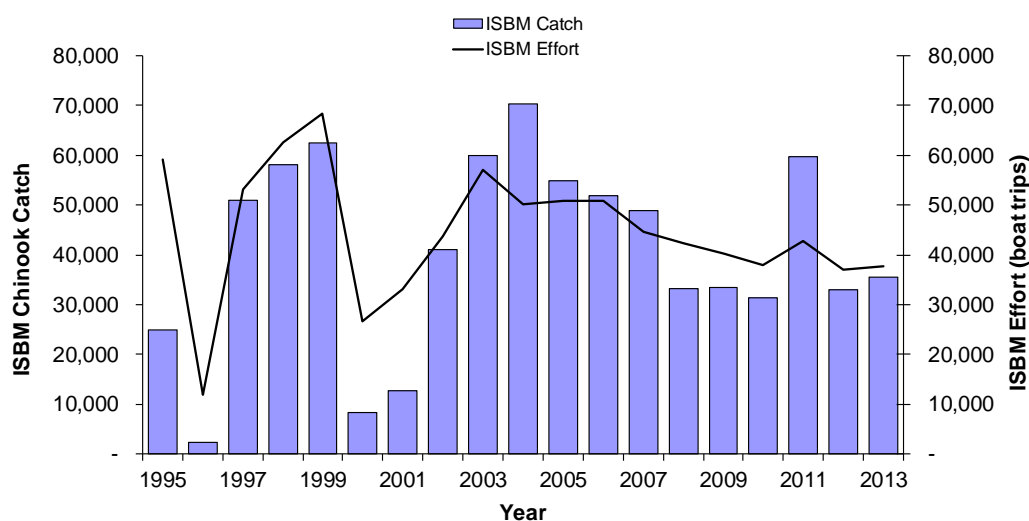
WCVI recreational ISBM fisheries are managed to fall within Canada's 10% exploitation rate on WCVI wild Chinook. To help achieve this objective a slot limit was put into place in the Chinook management corridor, which is an area one nautical mile seaward of the surfline extending from Areas 123 to 127. In the past, the slot limit for Chinook in the corridor was one fish greater and one fish smaller than 77cm. It should be noted that the majority of male Chinook are 3 year olds and are less than 77cm. However, more recently there was a requirement to protect wild 4 and 5 year old female Chinook greater than 77cm that were returning to spawn in natal systems along the WCVI. Therefore, the management measure of retaining only two Chinook less than 77cm was continued with the restriction starting July 15<sup>th</sup> in those waters north of Estevan Point and August 1<sup>st</sup> for those waters south of Estevan Point. These restrictions expire after September 30 and October 15, respectively.

Retention of Chinook greater than 77cm is permitted in some terminal areas of Nootka and Barkley Sound where there is a large hatchery contribution to the ISBM Chinook harvest. In Port San Juan, Chinook non-retention restrictions were in effect from July 15 through October 25 to protect San Juan Chinook. Barbless hooks, a daily limit of 2 Chinook per day and an annual limit of 30 were also in effect.

**Table 7-1: Estimated WCVI Recreational ISBM Effort, Chinook Catch and Release by PFMA, 2013.**

Table 7.1

2013	Area	ISBM Effort (Boat Trips)	ISBM Chinook Catch	ISBM Chinook Releases
Inshore	Juan de Fuca (20W)	7793	12594	8180
	Area 21	412	33	62
	Alberni Inlet (23)	7332	84	1953
	Barkley Sound (23)	10455	3420	8909
	Clayoquot (24)	1506	205	1185
	Nootka (25)	10815	15957	12030
	Kyuquot (26)	639	712	722
	Quatsino (27)	2620	2514	1470
Total		41571	35519	34511



**Figure 7-1: Recreational WCVI Chinook ISBM Catch and Effort, 1995-2013**

## **West Coast Vancouver Island Terminal Areas**

### **Somass/ Stamp**

During 2013 there was a non-tidal opening on the Somass/Stamp River (Area 23) with Chinook non-retention from August 25, 2013 to December 31, 2013. The daily limit was two salmon per day. Anglers were not allowed to retain Chinook because of the low forecast for Robertson Creek hatchery returns. The Somass/Stamp Rivers were not monitored by creel survey during 2013.

### **Nitinat**

During 2013 there was a planned non-tidal opening for the Nitinat River (Area 22) from August 25, 2013 to September 30, 2013. The daily limit was four salmon per day of which only two could be Chinook salmon and only one could be greater than 77 cm in length. The salmon fishery was closed for retention of Chinook from October 1 until October 15 to protect Chinook salmon during the peak spawning period. The fishery reopened from October 15 until December 31 with zero retention on Chinook salmon. The Nitinat River was not monitored by creel survey during 2013. The area above Parker Creek was closed to fishing.

### **Conuma**

During 2013 there was a non-tidal opening for the Conuma River (Area 25) from August 25, 2013 to December 31, 2013. The daily limit was four salmon per day of which two could be Chinook salmon and one could be greater than 77 cm in length. The Conuma River was not monitored by creel survey during 2013.

### **Inside Areas: Strait of Georgia, Johnstone Strait, and Juan de Fuca Strait**

Recreational fisheries in 2013 in these areas were designed to minimize impact on returning Fraser River Spring 4<sub>2</sub> Chinook, and Fraser River Spring and Summer 5<sub>2</sub> Chinook management measures put in place to protect these stocks included mark selective fisheries and size limits in specific areas/times.

In those waters near Victoria between Cadboro Point and Sheringham Point (Areas 19-1 to 19-4 and Area 20-5), retention regulations were adjusted from March 1 to June 14 where anglers were permitted to retain two (2) Chinook per day wild or hatchery marked between of 45cm and 67cm or hatchery marked only Chinook over 67 cm in length. From June 15 to July 19 the daily limit remained at two (2) Chinook per day wild or hatchery between 45-85 cm, or hatchery marked greater than 85 cm.

The “Chinook corridor” extending from Subareas 18-1 to 18-6, 18-9, 18-11, 19-5 and a portion of 29-4 and 20-5 that lies south from a point on the east side of Valdes Island and extending 57 degrees true for 5 nautical miles remained in place in 2013. In this corridor the daily limit was two (2) Chinook with a minimum size of 62 cm of which only one (1) could be over 67 cm from May 16 to June 14. From June 15 to July 19 the daily limit was two (2) Chinook per day wild or hatchery between 67-85 cm, and this was a change for 2013 compared to the year previous, as returns were anticipated to be very poor.

Concern for Cowichan River Chinook also prompted a restriction in Subareas 18-6 and 18-7 and 19-7 to 19-12. These areas saw Chinook non-retention measures in effect from August 1 through October 15. Additionally, a portion of Subarea 18-7 and 18-8 east of a line from Separation Point to Wilcuma Wharf in Cowichan Bay, across Satellite Channel to Saltspring Island was closed to all finfish fishing from August 1 through October 15. Cowichan Bay west of the Separation/Wilcuma line was closed to all finfish fishing from August 1 through October 21. Chinook non-retention remained in effect until October 31.

For the Johnstone Strait and Strait of Georgia areas Chinook regulations included an annual limit of 15 Chinook, a daily limit of two (2) Chinook and a minimum size limit of 62 cm. For the Canadian portion of Juan de Fuca Strait south of Cadboro Point, regulations included an annual limit of 20 Chinook, a daily limit of two (2) Chinook and a minimum size limit of 45 cm.

### **Strait of Georgia, Johnstone Strait, and Juan de Fuca Strait Tributaries**

Restrictions were also in effect on many tributaries within the Strait of Georgia, Johnstone Strait and the Strait of Juan de Fuca. The Qualicum River provided some opportunity to harvest enhanced stocks.

The Qualicum River opened for Chinook on August 1 and remained open until the end of the year. Through October 15<sup>th</sup> the daily limit was 4 salmon none of which could be greater than 62 cm. After October 15<sup>th</sup>, two of the four Chinook that anglers were

permitted to retain could be greater than 62 cm. The Little Qualicum River was open from October 1<sup>st</sup> until November 30<sup>th</sup> with a daily limit of 1. In both systems there was a minimum size limit of 30 cm, anglers were restricted to the use of barbless hooks and there was an annual limit of 10 Chinook salmon greater than 50 cm. No catch monitoring effort is directed at these fisheries.

### **Fraser River and Tributaries**

Fraser River Spring 4<sub>2</sub>, as well as Fraser River Spring/Summer 5<sub>2</sub> Chinook stocks of concern entering the Fraser River in Subareas 29-6, 29-7, 29-9 and 29-10 required additional management measures again in 2013 due to continued concerns about stock status. Starting May 16 to July 26 the daily limit for Chinook was zero. The daily limit was increased to two (2) wild or hatchery marked fish with a minimum length of 62 cm from July 27<sup>th</sup> to December 31<sup>st</sup>.

In the tidal (Subareas 29-11 to 29-17) and the non-tidal areas (Region 2) of the Fraser River there was no fishing for salmon from January 1<sup>st</sup> to July 26<sup>th</sup>. From July 27<sup>th</sup> to August 31<sup>st</sup> the daily limit was four (4) with only one (1) over 50 cm. From September 1<sup>st</sup> to December 31<sup>st</sup> the daily limit for wild or hatchery marked Chinook salmon was four (4) with only one (1) over 62 cm.

In addition, there were several tributaries to the Fraser River in which Chinook retention was authorized including:

- Alouette River, daily limit of one (1) Chinook from July 1<sup>st</sup> to December 31<sup>st</sup>.
- The Chehalis River, daily limit of four (4) with only one over 50 cm from June 1<sup>st</sup> until August 10<sup>th</sup> and again from September 16<sup>th</sup> until December 31<sup>st</sup>, a daily limit of four (4) Chinook with only one over 62 cm.
- The Chilliwack/Vedder River, daily limit of four (4) with only one over 62 cm from July 1<sup>st</sup> until December 31<sup>st</sup>.
- The Harrison River, daily limit of four (4) with only one over 62 cm from September 1<sup>st</sup> until December 31<sup>st</sup>.

Tributaries to the Fraser River above Sawmill Creek in which Chinook retention was authorized included:

### **Region 3**

- Fraser River: No fishing for salmon until Aug 21, then 4 Chinook per day, none over 50 cm until Sep 15.
- Clearwater and North Thompson: No fishing for salmon.
- Thompson River downstream of the confluence of the North and South Thompson rivers: No fishing for salmon until Aug 31 (Kamloops Lake) and Sept 6 (Thompson River).
- Kamloops Lake: Aug 31 – Sep 22, 4 Chinook per day, 1 over 50 cm.



- Kamloops Lake outlet, Thompson River to Goldpan, Sep 6 – Sep 30, Chinook and pink, daily aggregate of 4, one may be a Chinook over 50 cm.
- Thompson River: Goldpan to the Fraser, Chinook, none over 50 cm, Sep 6 – Sep 30.
- South Thompson River: 4 Chinook per day, 2 over 50 cm, Aug 16 – Sep 22.

#### Region 8

- Osoyoos Lake: Aug 1 – Aug 18, 2 sockeye per day.
- Mabel Lake and Lower Shuswap River: Jul 25 – Aug 15, 1 Chinook per day over 77cm, then Aug 16 – Sep 12, 4 Chinook per day and 2 over 50 cm.
- Middle Shuswap River: Jul 25 – Aug 15, 1 Chinook per day must be over 77 cm.

Note that this year, there was no fishing for salmon in Region 5A or 7 as a result of Spring and Summer 5(2) management.

In 2013 marine recreational fisheries were monitored by creel surveys in three main areas; 1) Juan de Fuca including Victoria (south of Cadboro Point) and Juan de Fuca Strait through PFMA 20-1; 2) Strait of Georgia including Areas 14 through 18, that portion of Area 19 north of Cadboro Point, 28 and 29; and 3) Johnstone Strait including Areas 11 to 13. Monitoring of the Strait of Georgia sport fishery (May to September) and Juan de Fuca Strait sport fishery (February to December) has been fairly consistent from year to year using an access point (landing site) survey for collecting catch, CPUE, and biological information combined with an aerial survey for effort counts. In addition, logbook programs, directed at estimating the recreational catch by fishing guides during guided trips, were conducted in the Campbell River and Victoria Areas in 2013. The Johnstone Strait creel survey commenced in Area 13 in May and continued through until the end of September; and from June through August to include Areas 11 and 12.

Overall, effort increased the Strait of Georgia and Juan de Fuca Strait by 34% and 18%, respectively, from 2010 to 2013. The corresponding Chinook catch increased by about 51% in the Strait of Georgia and decreased by about 17% in Juan de Fuca from 2010 to 2013. Interestingly, Chinook releases increased by a similar amount to kept catch from 2010 to 2013 (approx. 48%) in the Strait of Georgia, while Chinook releases in Juan de Fuca increased by 150% from 2010 to 2013. Estimates of kept and released catch, along with effort and survey duration are summarized in Table 7-2.

**Table 7-2: Preliminary Catch and Effort Estimates for Southern B.C. Inside Recreational ISBM Fisheries in 2013.**

<b>Fishing Area</b>	<b>Survey Period</b>	<b>Chinook Kept</b>	<b>Chinook Released</b>	<b>Effort (Boat Trips)</b>
Strait of Georgia	Mar - Oct	11,580	49,889	45,100
Johnstone Strait	Jun - Sep	21,935	32,267	38,139
Juan de Fuca Strait	Mar- Oct	22,922	18,000	46,982
Fraser River <sup>1</sup>	Jul - Oct	2,527	199	n/a
<b>TOTAL</b>		<b>58,964</b>	<b>100,355</b>	<b>130,221</b>

<sup>1</sup> subject to change; Fraser River recreational assessments are incomplete or preliminary as of November 26, 2013

### **7.3 FIRST NATIONS**

#### **WCVI FSC and Economic Opportunity Fisheries**

In 2013 an agreement was reached with the Hupacasath and Tseshah First Nations for an economic opportunity fishery; however the low forecast of Robertson Creek Chinook prevented any commercial fishery. Hupacasath and Tseshah First Nations closed their fishing areas to Chinook retention voluntarily, choosing not to harvest the allotted 1500 pieces allocated for FSC. There was an incidental harvest during coho and chum fisheries of approximately 200 Chinook. Catch reports for Maa-nulth domestic harvest indicate a combined ISBM FSC Chinook harvest of 59 pieces. NTC First Nations ISBM catch reported to date was 842 pieces. The total WCVI ISBM Chinook catch was 1,101.

#### **WCVI Excess Salmon to Spawning Requirements (ESSR) Fisheries**

The Tseshah and Hupacasath First Nations were issued a joint Excess Salmon to Spawning Requirements (ESSR) Licence for Chinook at the Robertson Creek Hatchery facility. The total catch was 21,967 Chinook (including jacks).

The Ditidaht First Nation was issued an ESSR Licence for Chinook at Nitinat Lake and the Nitinat Hatchery. The catch was 15,629 Chinook. The total catch for both ESSR fisheries was 37,596 Chinook.

**Strait of Georgia FSC Fisheries**

Data are still being compiled on various First Nations catches in the Strait of Georgia; however, preliminary catch is estimated at 843 Chinook. There were no economic opportunity fisheries.

**Strait of Georgia ESSR Fisheries**

There was an ESSR fishery at the Big Qualicum hatchery; total harvest was 2,266 Chinook salmon.

**Strait of Georgia Economic Opportunity Fisheries**

There were no Economic Opportunity fisheries in the Strait of Georgia in 2013.

**Johnstone Strait FSC Fisheries**

Data are still being compiled on various First Nations catches in Johnstone Strait; however, preliminary catch is estimated at 258 Chinook. There were no economic opportunity fisheries.

**Fraser River FSC, Economic Opportunity and Inland Demonstration Fisheries**

FSC fisheries, economic opportunity and inland demonstration fisheries took place in the Fraser River in 2013, harvesting ISBM Chinook in both the upper and lower reaches of the Fraser River.

In the BC Interior there are currently three Inland Commercial Fishing Enterprises operating in the BC Interior: Okanagan Nation Alliance, Upper Fraser Commercial Fishing Enterprise and Riverfresh Secwepemc Fisheries Commission (SFC). Riverfresh (SFC) operated a 14-day 8-inch set gill net fishery on Kamloops Lake targeting S. Thompson 4-1 Chinook. Riverfresh was allocated 5.06% of the available CCTAC specific to South Thompson ISBM 4-1 Chinook. This amount equated to 1,800 Chinook available for harvest in 2013. Approximately 5,179 Chinook were harvested in the upper Fraser River (above Sawmill Creek) in FSC fisheries (3,446) and demonstration fisheries (1,733).

The total Chinook harvested in the lower Fraser River, (below Sawmill Creek), was 19,538 which includes mostly FSC (10,663) and ESSR (8,745). In 2013, Chinook were to be released during the chum economic opportunity and demonstration fishery; however 119 fish were harvested during the economic opportunity and demonstration fisheries in the lower Fraser River.

## **7.4 COMMERCIAL**

In 2013 commercial fisheries in Tlupana Inlet (Nootka Sound) which targeted ISBM Chinook.

### **Area B Seine**

In 2013, no seine fisheries occurred on WCVI ISBM Chinook

### **Area D Gill Net**

In 2013, gill net fisheries occurred in Tlupana Inlet targeting Chinook returns to Conuma River hatchery. Area D gill net openings in Tlupana Inlet occurred on August 13<sup>th</sup>, 20<sup>th</sup> and 27<sup>th</sup>, 2013 for a total Chinook catch of 8,688. Maximum effort was 56 vessels per day.

In Area 23, there was no Area D Chinook fishery due to the low forecast of Robertson Creek Chinook. There was an incidental catch of Chinook during the Area D sockeye fishery in June and July with 171 Chinook retained and 14 released. The total WCVI commercial net ISBM harvest was 8,859 Chinook.

## **7.5 STOCK STATUS**

### **Fraser River and Area Chinook**

#### **Interior Fraser**

Spring Chinook returns to the Fraser continue to be of concern. Preliminary indications are that returns to the Spring 5<sub>2</sub> aggregate remained at very low levels, although the aggregate as a whole likely escaped at a greater total abundance than the 2008 parent brood. Stocks of concern continue to include the Salmon River near Prince George and the Upper Chilcotin River.

Returns to the Spring 4<sub>2</sub> aggregate improved considerably over brood, however the aggregate total escapement was still very low compared to escapements in the early 2000's. All populations achieved or exceeded parental escapement levels.

Yearling (stream-type) summer Chinook (Summer 5<sub>2</sub> aggregate) returns were also poor to modest, however on average; returns were almost as abundant as the parent brood year escapements. Nechako and Clearwater returns were low and Quesnel River escapements recovered somewhat.

The South Thompson ocean-type 4<sub>1</sub> aggregate rebounded from the declines observed in 2012. All stocks except Mid Shuswap exceeded parental escapements.

## **Lower Fraser River**

***Spring-run:*** Lower Fraser Spring Chinook returns were also mixed. Preliminary estimates of returns to Birkenhead River were low (~200), but were roughly equivalent to the parental escapements. No estimates are available for the upper Pitt River (Blue Creek).

***Summer-run:*** Summer-run Chinook returns to Maria Slough were approximately 1050; much more than that observed in the parental brood year (~590). Returns to Big Silver Creek were estimated to be approximately 80; more than the 20 estimated for the parent brood. Information for other Lower Fraser summer populations is not available at this time.

***Fall-run:*** Annual lower Fraser River fall-run Chinook stock group escapements are, on average, large (>100,000). The major contributor and principal focus of assessment of this stock group is Chinook returning to the Harrison River, and Harrison River transplants to the Chilliwack River. For both the Harrison and Chilliwack rivers, the field study portions of the escapement assessments are just concluding; and data entry and analyses have not started. Field estimates for Harrison indicate escapements are likely to be under 40,000 adults. No in-season estimates have been developed at Chilliwack, and the preliminary escapement estimates will not be available for either system until early January.

## **Howe Sound/Squamish River**

No information is available at this time.

## **Burrard Inlet**

No information is available at this time.

## **Boundary Bay**

No information is available at this time.

## **Strait of Georgia Chinook**

### ***Fall Stocks***

Total returns to Strait of Georgia streams north of Nanaimo, virtually all of which are enhanced, have been stable for the last seven to ten years (Puntledge and Englishman rivers) or eighteen years (Big Qualicum and Little Qualicum rivers). In general, 2013 Chinook escapements were similar to or slightly higher than 2012 throughout the Strait of Georgia.

On the mainland side of the northern Strait of Georgia, Sliammon and Lang hatcheries continue to have variable returns, however in the last five years the returns to Lang Creek

have been stronger than in previous years. There are a few very small, wild populations remaining in the Theodosia and Skwakwa rivers, and those rivers entering Jervis Inlet, where assessment data are poor or not available. Historically, a large proportion of the Chinook stock aggregate originating from rivers north of Nanaimo migrate into central and northern B.C. and Alaska. Exploitation rates on this stock aggregate have gradually been reduced over the last 15 years, thus the stable trend in annual returns to rivers over this period suggests a reduction in marine survival.

In the southern Strait of Georgia, returns to the Nanaimo River have been generally stable since 1995 at slightly higher levels than those recorded back to 1975. Escapement to Nanaimo River in 2013, although not yet finalised, appear higher than recent year averages. The area of most concern is further south, where Chinook stocks returning to the Chemainus and Goldstream rivers have experienced declines in recent years. Unlike the central and northern Strait stocks, these southern populations historically rear within the Strait of Georgia. However, there appears to be an increasing proportion rearing off the west coast of Vancouver Island.

In particular, Cowichan River Chinook (a wild Chinook indicator stock) has been in decline since 1995-1996 and reached a low total adult return to river of 1260 in 2009. This population continues to be a stock of concern. Exploitation rates on Cowichan Chinook were historically high (averaging 80-90%), declined to a low of 34% on the 1995 brood year, and have steadily increased to 75% on the 2000 and 2001 brood years. Various harvest restrictions have been put into effect over the last 20 years to reduce exploitation on Strait of Georgia Chinook. Additional conservation measures were introduced in 2005 to reduce the harvest of Cowichan Chinook by the Strait of Georgia sport and WCVI troll fisheries. First Nations harvest of Cowichan Chinook has been substantially reduced in recent years. The declining trends since 2000 in various southern Strait of Georgia rivers are attributed to high exploitation rates, a decline in marine survival, and habitat issues.

In 2013 Chinook escapement to Cowichan River appears to be an improvement over 2012; however, escapement estimates are incomplete and will be based on mark recapture estimates this year. Water levels were high during the spawning migration which was positive for Chinook migration compared to 2012 as in-river mortalities prior to spawning were likely low in 2013. High water did hamper both escapement enumeration at the Cowichan Fence and broodstock collection this year. Approximately 191 adults and 13 jacks were used for hatchery brood stock in 2013. The number of Chinook caught in local FSC fisheries has not yet been reported.

### ***Spring/Summer stocks***

Of the three early runs in the Strait of Georgia, assessment data are available for Puntledge and Nanaimo; the Cowichan summer run still exists but it is small and quantitative data are not available for that stock. Efforts to recover Puntledge Summers to viable levels have resulted in improved returns to the river since 1999. The 2006 and

2007 natural spawning escapements ranged from 200 - 500 adults (not including brood capture), which is down from the record high in 2005 of approximately 2,500 adults, but is substantially higher than escapements recorded in the previous decades. The preliminary estimate for 2013 escapement to Puntledge is approximately 450 adults (including 251 brood removals) which continues a slight decreasing in abundance over the past three years. Monitoring of Nanaimo spring and summer Chinook escapement has occurred less frequently. This year's escapement of Nanaimo summers is estimated to be between 700 and 800 Chinook adults which is above average for the last 15 years.

### **West Coast Vancouver Island Chinook**

The status of wild WCVI origin Chinook has remained low for several years. Those populations that are not enhanced have remained well below target or declined since major El Niño events in the mid 1990s. Populations in the SWVI area (e.g. Area 24 and southward) tend to be lower status than those populations in the NWVI area.

For WCVI hatchery stocks, the terminal return is defined as total catch (First Nation, recreational and commercial) in the near approach areas of the hatchery plus escapement (brood collection plus natural spawners). In these approach areas, catch is dominated by the hatchery stock (e.g. >95%), therefore, higher exploitation rates are permitted than in times and areas dominated by naturally produced WCVI Chinook stocks.

The preliminary total terminal return of Stamp River/Robertson Creek hatchery Chinook was approximately 30,000 adults, relative to the pre-season forecast of 16,000. The preliminary escapement through Stamp Falls is 29,000 adult Chinook. The total terminal return to the Conuma River hatchery system was about 60,000 relative to a pre-season forecast of 17,000. The total terminal return to the Nitinat River hatchery system was about 40,000 relative to a pre-season forecast of 13,000. (All data are still being reviewed and will be revised.)

### **Johnstone Strait/Mainland Inlet Chinook**

Currently only three systems are monitored consistently in Areas 12 and 13. The Nimpkish River is assessed using standardized swim surveys and stream walks by hatchery staff; an intensive mark-recapture program is carried out by Quinsam Hatchery to estimate escapement on the Campbell/Quinsam system; and a mark-recapture program has been in development over the past few years on the Phillips River, with the plan to eventually establish it as a mainland Chinook indicator. Other systems are covered using intermittent visual surveys.

### **Nimpkish River**

Observations from swim surveys indicate a significant increase in the abundance of Chinook returning to the main spawning areas downstream of Woss Lake. Preliminary estimates of 2,500 Chinook have continued the improvements observed in 2012 (2,300 adults) relative to the past decade of returns which have averaged around 600 adults.

### **Campbell/Quinsam System**

The Campbell/Quinsam, a long-term Chinook indicator, has been assessed by carcass mark-recapture since 1984. Preliminary results for the 2013 program have the combined system Chinook estimate at close to 4,700 adults; slightly lower than the 2012 estimate and continuing the below average trend observed over the past few years.

Quinsam Hatchery was successful in attaining their Chinook brood stock target.

### **Phillips River**

Preliminary results from the mark-recapture program on the Phillips River estimate the Chinook escapement in the range of 2,700 adults, another strong return following the 2012 estimate of 2,063. However, the recovery of fewer marked carcasses this year due to very low river levels and the vulnerability of carcasses to bear activity, have consequently doubled estimate error as compared to 2012.

The local hatchery was again able to meet its brood target and plan to release 150,000 coded wire tagged Chinook smolts next spring to contribute to the assessment program.

## **8 SOUTHERN B.C. COHO**

### **8.1 OBJECTIVES AND OVERVIEW**

Coho stocks in Southern BC are managed domestically and through international Abundance Based Management provisions which are outlined in the Pacific Salmon Treaty. Harvest levels are outlined in the Treaty's Southern Coho Management Plan, which provides maximum exploitation rates dependant on abundance, and its Canada's responsibility to ensure that its domestic stocks are not harvested beyond the maximum exploitation rate as outlined in the Treaty.

In Southern BC coho management measures in commercial and recreational fisheries are implemented based on their impacts to specific stocks. Southern BC coho management is primarily based on managing Interior Fraser River, Lower Fraser, Georgia Strait, Johnstone Strait and WCVI coho stocks or management units (MU's).

In 2013 the status of Interior Fraser River coho (including Thompson River) was forecast as a Salmon Outlook category 1 – Stock of Concern. The Lower Fraser and the Georgia Basin (east and west) stocks were forecast as Salmon Outlook category 2 – Low, Johnstone Strait stocks were forecast to be low to near target (Outlook categories 2-3) and WCVI coho were forecast to be abundant (Outlook category 4) .

Coho management measures varied in Southern BC in 2013 depending on the area of harvest and impact on specific coho stocks.



Management measures in place to protect Interior Fraser River coho are extensive due to it being a stock of concern. Canada manages its commercial, recreational and First Nation fisheries to limit the total mortality of Interior Fraser Coho to 3% across all domestic fisheries. The total exploitation on Interior Fraser coho is restricted to 13% (10% from the US.) of a maximum 20% ER as per the provisions of the Pacific Salmon Treaty. To reduce the exploitation on Interior Fraser coho, fisheries occurring in areas and times when these stocks are known to be prevalent are not permitted to retain wild “unmarked” coho. This includes the majority of recreational fisheries in the South Coast, and all commercial troll and net fisheries.

The extensive management measures in place for protecting IFR coho essentially provide the protection that would be needed for Lower Fraser River and Georgia Strait coho stocks. No specific management measures were in place in 2013 to protect these stocks beyond measures put in place for Interior Fraser River coho. Local opportunities were provided for wild coho retention in portions of Johnstone Strait, Queen Charlotte Strait, the Mainland Inlets, the Strait of Georgia and Juan de Fuca Strait for recreational fisheries targeting local coho stocks. Commercial fisheries in these areas remained coho non-retention.

Management measures in place for WCVI coho provided some recreational and commercial fisheries with full access harvest opportunities in WCVI areas where Interior Fraser Coho were not considered to be impacted. These were largely terminal opportunities in portions of PFMA’s 23-27 where stock composition information showed that IFR coho were not found in these areas.

In WCVI areas/times where IFR coho are known to be prevalent, non-retention of unmarked coho remained in effect. Small adjustments were made in 2013 commercial troll fishery plans to allow unmarked coho retention on the WCVI once IFR were considered to have moved through the area.

Preliminary coho catch estimates are outlined in table 8-1. Coho catch and release information from all fisheries can be found in Appendix 6.

**Table 8-1: Preliminary coho catch estimates of the recreational, First Nations (FSC, economic opportunity and ESSR), and commercial fisheries for Southern B.C. in 2013.**

	<b>Kept</b>	<b>Released</b>
<b>Recreational</b>	122,471	268,742
<b>First Nations</b>	88,472	12,177
<b>Commercial</b>	9,256	28,886
<b>Total</b>	<b>220,199</b>	<b>309,805</b>

## **8.2 TIDAL RECREATIONAL**

Tidal recreational fisheries can be categorized as either occurring in mixed stock areas, where multiple stocks are found concurrently in the same fishing area, and in terminal areas where local single stocks dominate the catch. These areas typically have different management measures to protect stocks of concern and where appropriate to provide harvest opportunities. The table below outlines the areas in Southern B.C. where these mixed stock fisheries occurred and the general regulations pertaining to them.

**Table 8-2: Southern B.C. coho fishery regulations in 2013.**

<b>Mixed stock fishing area</b>	<b>Daily Limit (marked or unmarked)</b>	<b>Size Limit</b>	<b>Coho Season</b>
Area 11	2	30 cm.	June 1 – July 31
Area 11	2, 1 may be wild	30 cm.	Aug 1 – Dec 31
Area 12	2, 1 may be wild	30 cm.	June 1 – July 31
Area 12	2 marked	30 cm.	Aug 1 – Dec 31
Area 13 – Bute Inlet	2, 1 may be wild	30 cm.	Aug 1 – Sept 15
Strait of Georgia: areas 13-19, 28, portions of 29, excluding some terminal areas and times.	2 marked	30 cm.	June 1 – Dec 31
WCVI areas 121, 21, portion of 23	2 marked	30 cm.	Jun 1 – Aug 31
WCVI areas 121, 21, portion of 23	4 marked	30 cm.	Sept 1 – Dec 31
WCVI areas 123-124	2 marked	30 cm.	Jun 1 – Aug 31
WCVI areas 123-124	4 marked	30 cm.	Sept 1 – Oct 3
WCVI areas 123-124	4	30 cm.	Oct 4 – Dec 31
WCVI areas 125-127	2 marked	30 cm.	Jun 1 – Aug 31
WCVI areas 125-127	4 marked	30 cm.	Sept 1 – Sept 15
WCVI areas 125-127	4	30 cm.	Sept 16 – Dec 31
Kyuquot: 26	4, 2 may be wild	30cm	June 1 – Dec 31
WCVI inshore area 22, 23, 25, 27	4	30 cm.	Jun 1 – Dec 31
WCVI inshore area 24	2	30 cm.	Jun 1 – Aug 31
WCVI inshore area 24	4, 2 may be wild	30cm	Sept 1 – Dec 31
Juan de Fuca: areas 19-20	2 marked	30 cm.	Jun 1 – Dec 31
Port San Juan: 20-2	4, 2 may be wild	30cm	Sept 4 – Dec 31

The table below outlines coho catch and release information for recreational coho fisheries in Southern B.C. The WCVI coho fisheries had a boundary in place distinguishing coho catch in the mixed-stock fishery (outside the coho boundary) and catch in the terminal area (inside the coho boundary). This coho boundary was put in place to protect Interior Fraser River wild coho which are found off WCVI during mid to late summer.

**Table 8-3: Recreational coho catch and effort estimates for Southern B.C. in 2013.**

<b>Area</b>	<b>Kept</b>	<b>Released</b>
<b>WCVI – Inshore (20W – 27)</b>	47,685	40,974
<b>WCVI – Offshore (21 – 127)</b>	24,258	65,284
<b>Strait of Georgia (14-19 May – Sep**)</b>	10,335	34,234
<b>Fraser River***</b>	0	5
<b>Juan de Fuca (19-20 Mar – Sep)</b>	20,108	59,081
<b>Johnstone Strait (11-13)</b>	20,085	69,164
<b>TOTALS</b>	<b>122,471</b>	<b>268,742</b>

\*\* subject to change; recreational assessments preliminary

\*\*\* Subject to change; Fraser River recreational assessments are incomplete or preliminary as of November 26 2013.

### **8.3 NON-TIDAL RECREATIONAL**

#### **Northern Vancouver Island**

Non-tidal openings for coho were available on:

- Cayeghle River (including the Colonial River) from April 1<sup>st</sup> to March 31<sup>st</sup> for one (1) per day.
- Campbell/Quinsam River from October 1<sup>st</sup> to December 31<sup>st</sup> for four (4) per day, two (2) of which could be marked over 35 cm.
- Cluxewe River from April 1<sup>st</sup> to March 31<sup>st</sup> for two (2) per day, hatchery marked only.
- Kokisilah River from April 1 to March 31 for one (1) per day, maximum size limit of 35 cm.
- Nahwitti River from April 1<sup>st</sup> to March 31<sup>st</sup> for one (1) per day.
- Quatse River from June 15<sup>th</sup> to March 31<sup>st</sup> for two (2) per day, hatchery marked only.

Anglers are restricted to the use of barbless hooks. The Campbell/Quinsam fishery was the only fishery of the above that was monitored by creel survey during 2013.

## **Strait of Georgia**

During 2013 there were limited non-tidal openings throughout the Strait of Georgia.

- Qualicum River from October 18<sup>th</sup> to March 31<sup>st</sup> for four (4) per day, two (2) of which could be over 35 cm.
- Chemainus River from October 15<sup>th</sup> to March 31<sup>st</sup> for one (1) per day, maximum size limit of 35 cm.
- Little Qualicum River – closed due to poor coho escapement.
- Nanaimo River from November 1<sup>st</sup> to December 31<sup>st</sup> for one (1) per day, maximum size limit of 35 cm.
- Cowichan River from November 1<sup>st</sup> to December 31<sup>st</sup> for one (1) per day, minimum size limit 25 cm.

## **West Coast Vancouver Island**

### **San Juan River**

There was a non-tidal opening for the San Juan River (Area 20) from November 8, 2013 to December 31, 2013. The daily limit was one coho per day either marked or unmarked. This fishery was not monitored by creel survey during 2013. The San Juan River is closed above its confluence with the Fleet River. A single barbless hook restriction is in effect all year and there is also a bait restriction in effect.

### **Somass/ Stamp River**

During 2013 there was a non-tidal opening for the Somass/Stamp Rivers (Area 23) from August 25, 2013 to December 31, 2013. The daily limit was two coho either marked or unmarked. The Somass/Stamp Rivers were not monitored by creel survey during 2013. Some portions of the Somass/Stamp Rivers had extended closures in 2013 to protect migrating Chinook salmon. These closures were lifted in late September due to stronger than expected Chinook returns. A single barbless hook restriction is in effect all year and there is a bait restriction in the Upper Somass and Stamp after September 15.

### **Nitinat River**

During 2013 there were two planned non-tidal openings for Nitinat River coho from August 25, 2013 to September 30, 2013 and October 15, 2013 to December 31, 2013. The daily limit for coho was 2 (marked or unmarked). The 2 week closure between October 1 and October 14 provides protection to Chinook salmon during the peak spawning period. After the closure, the daily limit for salmon was 4; anglers were allowed to retain two coho (marked or unmarked) and two chum salmon. The Nitinat River was not monitored by creel survey during 2013. The area above Parker Creek is closed to fishing.

### **Conuma River**

During 2013 there was a non-tidal opening for the Conuma River (Area 25) from August 25, 2013 to December 31, 2013. The daily limit was four salmon per day of which two could be coho (marked or unmarked). The Conuma River was not monitored by creel survey during 2013.

### **Washlawlis River and Waukwass River and Other West Coast Rivers**

The Washlawlis and Waukwass rivers are open year-round with a daily limit of one coho, marked or unmarked. Barbless hooks are required. No creel survey information is collected. Other rivers receiving some directed effort for coho stocks are the Wakeman, Artlish, Zeballos, Tahsis, Burman, Ash, Taylor, Pacheena, Toquart, Leiner. The quota for all west coast streams unless identified above is zero.

### **Fraser River and Tributaries**

During 2013 the retention of 2 hatchery marked coho per day was authorized in the lower Fraser River up to Sawmill Creek. Due to the migration timing of Interior Fraser coho, the openings were scheduled to occur once the majority of this coho population was through the area. A description of the areas in the Fraser River which were open to the retention of hatchery marked coho follows with the corresponding opening dates.

- From the CPR Bridge at Mission, B.C. upstream to the Highway #1 Bridge at Hope - open from October 8<sup>th</sup> to December 31<sup>st</sup>.
- From the Highway #1 bridge at Hope to Sawmill Creek - open from October 13<sup>th</sup> until December 31<sup>st</sup>.
- There are no directed coho openings in the Fraser River or tributaries upstream of Sawmill Creek.

In addition, the following tributaries to the Fraser River allowed a daily retention of one (1) hatchery marked coho from October 1<sup>st</sup> to December 31<sup>st</sup>: Alouette River and Coquitlam River. Kanaka Creek allowed a daily retention of one (1) hatchery marked coho from November 1<sup>st</sup> to November 30<sup>th</sup>.

The following tributaries to the Fraser River allowed a daily retention of four (4) hatchery marked coho from July 1<sup>st</sup> to December 31<sup>st</sup>: Chilliwack River/Vedder, and Chehalis River.

The Harrison River allowed a daily retention of four (4) hatchery marked coho from September 1<sup>st</sup> to December 31<sup>st</sup>.

The following tributaries to the Fraser River allowed a daily retention of four (4) hatchery marked coho, with only two (2) over 35cm from January 1<sup>st</sup> to December 31<sup>st</sup>: Nicomen Slough, Norrish Creek and Stave River.

The following rivers, which enter Boundary Bay allowed the retention of one (1) hatchery marked coho per day from October 1<sup>st</sup> to December 31<sup>st</sup>: Little Campbell River, Serpentine River and Nicomekl River.

#### **8.4 FIRST NATIONS (FOOD SOCIAL AND CEREMONIAL, ECONOMIC OPPORTUNITY AND EXCESS SALMON TO SPAWNING REQUIREMENTS)**

##### **WCVI Economic Opportunity, and FSC, Fisheries**

In 2013 an agreement was reached with the Hupacasath and Tseshah First Nations for an economic opportunity fishery targeting coho (Area 23). This agreement was not signed until early November, and coupled with Chinook conservation concerns, no EO fishery occurred. There were limited FSC gillnet and hook and line openings in September and October. To protect Chinook, these fisheries had voluntary Chinook non retention, limited numbers of designated fishers and, 6-inch mesh nets tended at all times. The total FSC catch was 2095 coho. The Maa-nulth domestic harvest was 1,705 pieces. The remainder of WCVI First Nation's reported catch 10,529 coho. The combined harvest was 14,329 coho.

##### **ESSR Fisheries**

The Tseshah and Hupacasath First Nations were issued a joint ESSR Licence for coho at the Robertson Creek Hatchery facility. The total catch was 13,316 coho.

The Ditidaht First Nation was issued an ESSR Licence for Nitinat Lake and the Nitinat Hatchery but no harvest occurred.

The total catch WCVI for the ESSR fisheries was 13,316 coho.

##### **Lower Fraser**

Total FSC, EO and ESSR catch in 2013 for the Lower Fraser River was 47,727 coho, the majority of which was caught in ESSR fisheries (43,932).

##### **B.C. Interior**

There were no EO, Demonstration or ESSR fisheries in the B.C. Interior- (Fraser River above Sawmill Creek) targeting coho in 2013. A small directed FSC fishery was permitted in Dunn Creek where stronger than expected escapements were observed. The fishery was licenced to retain 180 coho. No catch update has been received for this fishery. The preliminary coho catch estimate in 2013 FSC fisheries above Sawmill Creek is 2.

##### **Strait of Georgia FSC Fisheries**

Data are still being compiled on various First Nations catches in the Strait of Georgia with the total preliminary catch estimated to be 230 coho caught in FSC fisheries.

### **Strait of Georgia ESSR Fisheries**

There were two (2) ESSR licences issued where coho salmon were harvested; 11,719 coho salmon were harvested at Big Qualicum Hatchery. Coho salmon were also harvested at the Chapman Creek CEDP Hatchery in Sechelt however the ESSR total is not available at this time.

### **Johnstone Strait**

Data are still being compiled on various First Nations catches in the Johnstone Strait with the total preliminary catch estimated at 1017 coho caught in FSC fisheries.

## **8.5 COMMERCIAL**

In 2013, Southern B.C. commercial fisheries were regulated so that impacts on coho, in particular Interior Fraser coho stocks, were minimized. Terminal opportunities to retain coho by-catch during directed Chinook and chum fisheries were available to Area D gill nets.

Area G troll AABM Chinook fisheries were permitted to retain selective hatchery marked coho only in Areas 123 and 124 from September 15 2013 until September 30, 2013 and all coho by-catch from October 01, 2013 to December 31, 2013. In Areas 125 -127 from September 15, 2013 until December 31, 2013, Area G troll fisheries were permitted to retain all coho by-catch.

For the 2012/2013 (October 1, 2012 to September 30, 2013) AABM Chinook fishing periods, the estimated total coho retained was 5,499 and releases during this period were estimated at 1,949 coho salmon.

### **WCVI Terminal Area Coho**

In 2013, commercial gill-net and seine fisheries occurred in Alberni Inlet and off-shore from Nitinat Lake. Gill-net fisheries occurred in Barkley Sound, and Nootka Sound. When targeting sockeye, chum or hatchery Chinook returns harvesters may encounter and retain or release coho by-catch. In 2013 the total WCVI coho by-catch in commercial sockeye, chum and Chinook net fisheries was 1,103 pieces retained and 43 released.



## **8.6 STOCK STATUS**

### **Upper Fraser**

Field programs to estimate escapements are still underway, and only very preliminary results are available for some systems. Early returns to the Interior Fraser River indicate that escapement may be similar to 2012 returns and are likely at levels above those observed in the 2010 parent brood escapements. Very preliminary data indicate returns to the entire Interior Fraser River may range between 40,000 and 60,000; however, preliminary estimates are not yet available for many systems, and near final estimates will not be available until early February, as most field studies are not yet completed.

### **Lower Fraser**

The Lower Fraser Area (LFA) can be divided into four sub-areas: lower Fraser River, Howe Sound/Squamish River, Burrard Inlet and Boundary Bay.

#### **(i) Lower Fraser River**

Escapement studies are currently underway, and many populations have not reached peak spawning at the time of writing. Preliminary escapement estimates for the surveyed systems should be available by late February 2014.

A hatchery coho indicator stock is provided by Inch Creek hatchery. Adult escapement is assessed annually and marine survival and exploitation rates are calculated, these estimates are not yet available. Adult coho visual surveys are conducted for a number of systems within the lower Fraser River sub-area as part of multi-species assessments; however estimates are not yet available as the field programs will not be complete until late January or early February 2014.

#### **(ii) Howe Sound/Squamish River**

Assessments for Howe Sound and Squamish River are incomplete at this time. Staff at the DFO Tenderfoot hatchery will be taking brood stock until February 2014.

#### **(iii) Burrard Inlet**

An assessment of the returns to DFO Capilano hatchery is not yet complete. The 2013 abundance and status of this stock group is not known at this time.

#### **(iv) Boundary Bay**

Community-run SEP projects contribute significantly to coho returns to this sub-area. The 2013 data will not be available until late February 2014.

## **Strait of Georgia**

Coho salmon have been in a low productivity regime since the early 1990s. Marine survivals have been less than replacement levels in recent years. Updated estimates are not yet complete, but abundance in the Strait and in escapements this year suggests that marine survivals have exceeded predictions this year.

### **Hatchery stocks**

The preliminary 2013 coho escapement estimates of monitored hatcheries generally showed a continuation of increasing escapements from the low returns in recent years. Escapements to northern Strait of Georgia stocks (Puntledge, Qualicum, Lang) are in general better than recent years. Escapements to Qualicum River were higher than last year and again high enough to allow non-tidal fisheries to proceed in 2013, while Puntledge escapements appear lower in 2013 than 2012. Escapements to southern Strait of Georgia stocks (Nanaimo, Goldstream) were also mixed. Limited assessment in Nanaimo River suggests a strong improvement in escapement over 2012, while Goldstream escapement is very similar to last year. In general, coho returns in 2013 appear to follow the recent trend for improvements over brood year escapements.

### **Wild stocks**

In the past, both Black Creek and Myrtle Creek have served as indicators of Strait of Georgia coho. In 2013, Myrtle Creek adult monitoring was not conducted.

Escapement to date in Black Creek is very strong and well above average. The majority of adult coho have moved past the fence, but low levels of fish will continue to migrate into early December. The preliminary escapement (fence count) of 10,284 adults is a significant increase from last year (6,865) and continues a building trend evident over the past several years.

### **Black Creek**

The 2013 Black Creek Adult project is ongoing; escapement to date has been well above average with moderate to high water levels since the first weekend in November. The majority of adult coho have moved past the fence, however the migration continues and may remain at moderate to low levels into early December. In 2013, run timing for Black Creek coho has altered slightly (later peak) due to exceptionally low water levels, throughout October. The dead pitch program has now commenced. The preliminary escapement (fence count) of 8,538 adults is higher than 2002-2012 estimates, the second highest escapement in 15 years, and appears to be similar to that of 2001 (12,100 adults). The 2013 escapement may be a continuation of the building trend of the past several years (2008-2012), with the 2011 escapement being an anomaly. This adult return indicates favourable marine conditions in 2012 for Strait of Georgia coho salmon.

## **West Coast Vancouver Island**

There are two indicator stocks in WCVI: Robertson Creek Hatchery and Carnation Creek. Both are located in DFO Statistical Area 23. In 2013, preliminary escapement to Robertson Creek Hatchery is estimated at about 51,000; higher than expected and higher than recent year averages. Escapement to the Carnation Creek indicator system is under review. Preliminary estimates of escapement to other WCVI systems suggest levels are also higher than recent year averages, but there is some variability in this observation.

## **Johnstone Strait and Mainland Inlets**

The Keogh River plays an important role as the wild coho indicator stock for the upper Johnstone Strait area. Smolt production in 2012 was around 108,000, the highest production since the inception of the program in 1977 and well above the long term average of 63,000. Preliminary indications from the resulting adult escapement in 2013 are that marine survival continues to improve for this population. Smolt production from the Keogh in 2013 of approximately 111,000, which is now the highest on record, may result in a strong return in 2014 if marine conditions stay the same or improve.

The marine survival indicator for Area 13 is the Quinsam River Hatchery. Coho moved into the Quinsam early with the increased flows of late September, but migration slowed with lower river levels in October. Early November rainfall encouraged the migration to continue and early estimates by the hatchery have the 2013 Quinsam escapement above average, at 13,000 adults and 2,640 jacks. This is the largest return since 2009, equivalent in size in both adult and jack components.

Preliminary extensive escapement reports for coho in many systems are also indicating abundances higher than the past few years, but well below average escapements for a few scattered systems. At this time it is still too early to provide an indication of stock status.

## **9 JOHNSTONE STRAIT CHUM**

### **9.1 OBJECTIVES AND OVERVIEW**

The Johnstone Strait chum fisheries primarily target chum that spawn in Johnstone Strait, Strait of Georgia, and Fraser River areas. In order to improve the management of Johnstone Strait chum fisheries and to ensure sufficient escapements, a 20% fixed exploitation rate strategy was implemented in 2002 in Johnstone Strait. This year constituted the 12<sup>th</sup> year of the fixed exploitation rate harvest strategy. Of the 20% exploitation rate, 15% is allocated to the commercial sector and the remaining 5% is set aside for test fisheries, First Nations, and recreational harvesters and to provide a buffer to commercial exploitation. Since the implementation of this management strategy, annual fisheries have been planned well in advance of the chum return.

The pre-season commercial fishing plan was developed based on expectation of effort, exploitation levels by gear group, and historical run timing (peak estimated as October 9<sup>th</sup>). The fishing plan was developed to achieve the commercial allocation sharing guidelines of 77% for seine, 17% for gill net and 6% for troll. Adjustments to the fishing plan are made in-season, if warranted.

As outlined in Chapter 6 of the Pacific Salmon Treaty, commercial chum fisheries in Johnstone Strait are suspended when an abundance estimate of less than 1 million chum salmon migrating through Johnstone Strait is identified. This did not occur in 2013 and all fisheries proceeded as scheduled.

In 2013, the Area B (seine) and Area D (gill net) were competitive derby fisheries.

The Area H (troll) fleet was managed using an effort based individual transferable effort (ITE) demonstration fishery for the 6<sup>th</sup> year (2008 - 2013). A total of 300 boat-days (180 in period 1 and 120 in period 2) were modeled to correspond to the troll share of the harvest rate described above, and two time periods were defined to spread the catch over a 38 day period. Each Area H licence holder was assigned three boat-days in period 1 and two boat-days in period 2. Boat-days from each period could be transferred to other licence holders within each period but not between periods. The transfer of boat days between fishing periods was not permitted in 2012 and 2013 (had been permitted previously). Subareas 13-6 and 13-7 (Deepwater Bay area) were closed to troll fishing on weekends and holidays.

Chum catch and release information from all fisheries can be found in Appendix 7.

## **9.2 FIRST NATIONS**

First Nations fisheries for chum were not restricted. The preliminary estimated catch by First Nations in the Johnstone Strait area is 10,020 chum salmon.

## **9.3 MARINE RECREATIONAL**

The marine recreational daily limits for chum are four (4) per day and a possession limit of eight (8). Peak participation in the recreational chum fishery occurred on the Thanksgiving weekend on October 11 to 13 and during the annual Brown's Bay chum derby which took place on the weekend of October 18 to 20. The total catch during the derby was reported at 661 chum. The total recreational catch in Johnstone Strait, Areas 11, 12 and 13, was estimated to be approximately 4500 chum this season. Since there was no creel survey in the month of October in Areas 11, 12 and 13, this estimate is based on anecdotal information from local fishermen and guides. The majority of the recreational chum salmon fishing effort occurs in Area 13.

## **9.4 NON-TIDAL RECREATIONAL**

There is anecdotal information of limited recreational chum fisheries in non-tidal waters in the Johnstone Strait area. Overall effort and catch is not estimated but expected to be minimal.

## **9.5 COMMERCIAL**

The commercial chum fisheries in Johnstone Strait were planned for September 27 to November 3, 2013. The total commercial chum catch from Johnstone Strait during chum directed fisheries is estimated at 589,110 pieces. An additional 7,893 pieces of chum were harvested during Area B seine pink directed fisheries in Johnstone Strait.

Area and gear restrictions, including the mandatory use of revival tanks, were in place for commercial chum fisheries. Catch monitoring included requirements for catch reporting and mandatory logbooks.

A description of each fishery is provided below:

### **Area B Seine**

In 2013, there were two commercial seine openings for chum salmon in portions of Areas 12 and 13. The first opening took place on October 2 for twelve hours and was extended for an additional four hours on October 3. The second opening took place October 21 for ten hours. The first opening was originally scheduled for only October 2 but was extended by 4 hours because of lower than expected effort.

The chum catches for the first and second openings were estimated at 249,506 pieces and 174,651 pieces respectively; for a total catch of 424,157 chum.

### **Area D Gill net**

In 2013, there were three 41 hour commercial gill net openings for chum salmon in portions of Areas 12 and 13. The first opening took place from 16:00 hours on October 7 to 09:00 hours on October 9, the second opening from 16:00 hours on October 15 to 09:00 hours on October 17 and the third opening from 16:00 hours on October 25 to 09:00 hours on October 27.

The estimated chum catches for the three Area D gill net fisheries were 45,768 pieces, 45,809 pieces and 31,002 pieces respectively; for a total estimated catch of 122,579 chum.

### **Area H Troll**

In 2013, the Area H troll ITE demonstration fishery was divided into two fishing periods: September 27 to October 13 (period 1) and October 15 to November 3 (period 2); with

closures during the Area B seine fisheries on October 2 and 21. Each licence was allocated three boat days during the first fishing period and two boat days during the second fishing period. Boat days could be transferred between vessels within each fishing period, but could not be transferred between fishing periods.

The catch for the first fishing period was 22,403 chum and 19,971 chum for the second fishing period, with a total catch of 42,374 chum. Total effort for the Johnstone Strait fishery was 204 boat days; 121 in period 1 and 83 in period 2.

**Table 9-1: Johnstone Strait Commercial Catch and By Date and Gear Type**

<b>Gear Type</b>	<b>Fishery Dates</b>	<b>Effort<sup>a</sup></b>	<b>Catch</b>
B - Seine	Oct 2 and 3	82	249,506
	Oct 21	88	174,651
D - Gill net	Oct 7-Oct 9	140	45,768
	Oct 15-Oct 17	155	45,809
	Oct 25-Oct 27	110	31,002
H - Troll	Sep 27-Oct 13	121	22,403
	Oct 15-Nov 3	83	19,971

<sup>a</sup> Number of vessels for seine and gill net, and boat days for troll.

**Table 9-2: Johnstone Strait Fisheries Catch and Allocation**

<b>Gear Type</b>	<b>Total Catch</b>	<b>% of catch</b>	<b>J.S. Allocation Plan</b>
<b>Area B</b>	424,157	72.0%	77%
<b>Area D</b>	122,579	20.8%	17%
<b>Area H</b>	42,374	7.2%	6%
<b>Total Catch:</b>	<b>589,110</b>		

## 9.6 STOCK STATUS

### Mixed Stocks

The main components of the Inside South Coast (ISC) chum return was expected to be both Fraser and non-Fraser stocks. These stocks are typically dominated by four year old

fish from a below average 2009 brood return which out-migrated to the ocean in 2010. It was quite apparent that other salmon species that also out-migrated in 2010 encountered lower productivity and reduced survivals (pinks and coho returns in 2011). The pre-season expectation for ISC chum suggested low to near target returns to the area.

The Johnstone Strait test-fishery provided timing and abundance information for the 2013 return, which is important in assessing the performance of the 20% fixed exploitation rate strategy. It also provided an index of abundance, used to determine the likelihood of the number of returning chum being over the 1.0 million critical level (requirement for commercial openings). Catch per unit effort in the test fishery was relatively strong and it was determined that the ISC index of abundance was likely above the 1.0 million critical level. Age composition derived from the test-fishery and commercial samples was dominated by 4 year olds throughout the season.

Preliminary information on escapements and catches to date suggest returns were average to below average in most Inner South Coast chum populations. In-season information is still being collected and analyzed regarding total stock size.

### **Terminal returns**

Most summer run chum returns in Area 12 demonstrated similar or improved returns relative to parental broods in 2008 and 2009.

Preliminary information on the status of fall run chum in the Johnstone Strait area indicates returns are below average for a variety of systems within the area. Initial observations on the Nimpkish River indicate very low abundance of returning chum.

## **10 FRASER RIVER CHUM**

### **10.1 OBJECTIVES AND OVERVIEW**

Chum salmon return to the Fraser River from September through December, with the typical peak of migration through the lower river occurring from mid to late-October. Spawning locations are predominately located in the Fraser Valley downstream of Hope, B.C., with major spawning aggregations occurring within the Harrison River (including Weaver Creek and Chehalis River), the Stave River, and the Chilliwack River. No spawning locations have been identified upstream of Hells Gate.

The escapement objective for Fraser River chum is 800,000. Since 2001, this objective has been achieved in all but two years. Escapements in 2009 and 2010 did not meet the escapement goal, with approximately 460,000 and 550,000 returning to spawn in those years, respectively.

## **10.2 GENERAL OVERVIEW OF FISHERIES**

Fraser River chum are typically harvested in Johnstone Strait, the Strait of Georgia, Juan de Fuca Strait, in U.S. waters of 7 and 7A, as well as in the Fraser River.

Within the Fraser River, chum directed fisheries include: First Nations FSC fisheries; recreational fisheries; and commercial fisheries. In recent years, significant conservation measures have been implemented in-river during the Fraser River chum migration period in order to protect co-migrating stocks of concern (Interior Fraser coho and Interior Fraser steelhead). Depending on the fishery, these measures have included both time and area closures, as well as gear restrictions. These conservation measures have restricted Fraser River commercial chum fishing opportunities in recent years.

Catch data from all chum fisheries can be found in Appendix 7.

## **10.3 FIRST NATIONS**

FSC gill net fisheries commenced October 5<sup>th</sup> (below Mission) and October 11<sup>th</sup> (above Mission) following closures to protect co-migrating Interior Fraser coho. The estimated catch from all fisheries (includes FSC, Economic Opportunity, Demonstration, Treaty, and ESSR) below Sawmill Creek was 170,942. There were 39,969 Chum harvested in FSC fisheries, 87,597 harvested in Economic Opportunity fisheries, 18,870 harvested in the Demonstration fishery, 5,934 harvested in the Tsawwassen Treaty fisheries, and as of November 20 there have been 28,103 chum reported harvested through ESSR fisheries. ESSR harvests are ongoing for 2013.

## **10.4 RECREATIONAL**

In 2013, some of the major Fraser River watershed recreational salmon fisheries impacting chum Salmon were assessed, including significant salmon fisheries occurring in the lower Fraser River mainstem and the Chilliwack River (a tributary to the Fraser River in the lower Fraser Valley).

The lower Fraser River mainstem recreational fishery was open to the retention of chum salmon from July 27<sup>th</sup> to August 15<sup>th</sup> and August 30<sup>th</sup> to December 31<sup>st</sup> (with a daily limit of two (2)). In 2013, this mainstem fishery was assessed from July 27<sup>th</sup> to August 15<sup>th</sup> and August 31<sup>st</sup> to September 30<sup>th</sup>; in-season estimates are still being compiled. The Chilliwack River recreational fishery was open to the retention of chum salmon from July 1<sup>st</sup> to December 31<sup>st</sup>. The Chilliwack River fishery was assessed from September 1<sup>st</sup> to November 15<sup>th</sup> in 2013. In-season estimates are still being compiled.

The Harrison River, Stave River and Nicomen Slough recreational fisheries were open to the retention of chum salmon year round (daily limit of two (2)). In 2013, no assessment was conducted on the Harrison River or Stave River fisheries; however, the Nicomen Slough/Norrish Creek fishery was assessed from October 12<sup>th</sup> to November 30<sup>th</sup>. In-season estimates are still being compiled.



## **10.5 COMMERCIAL**

The Fraser River chum test fishery at Albion operated every other day from September 1st until October 19<sup>th</sup>, alternating days with Albion Chinook test fishery. From October 21<sup>st</sup> until November 9<sup>th</sup>, the chum net fished every day, and then fished every other day from November 11<sup>th</sup> until November 23<sup>rd</sup>. In 2013, the total number of chum harvested during the Albion chum test fishery was 10,902 fish. The Albion Chinook test fishery caught an additional 3,308 chum.

Commercial fisheries in the lower Fraser River (below Mission) remained closed during the Interior Fraser coho window closure and further closures were in place until late October to meet requirements of the Interior Fraser steelhead objective. One Area E Gill Net commercial opening took place in the Fraser River (Area 29) during the 2013 chum season, consisting of a 24-hour duration fishery on October 24-25, 2013 for a total estimated harvest of 93,189 chum salmon retained and 61 released.

## **10.6 STOCK STATUS**

The number of adult chum returning to the Fraser River each fall is estimated in-season with a Bayesian model based on Albion test fishing catch. Catch of chum was strong and consistent at Albion all season, with daily catches exceeding 300 chum occurring throughout the last two weeks of October.

For fishery planning purposes, and given early indications of a strong chum return to the Fraser River, Fisheries and Oceans Canada provided a provisional in-season update on October 15<sup>th</sup> of 1.489 million chum. Confidence intervals and estimates of peak run timing were not provided at this time, as the 50% migration date for the run had not yet been confirmed.

A subsequent estimate of Fraser River chum abundance was provided on October 21<sup>st</sup>. The estimated return on that date was 1.634 million (80% probability interval of 0.915 to 2.554 million), with a 50% migration date through the lower river of October 18. This peak date is consistent with that observed in recent years (average peak date from 1997-2012 is October 18).

Additional in-season estimates were not provided, as subsequent test fishing information was consistent with a run size of 1.634 million.

Fraser River chum salmon return to numerous spawning locations in the lower Fraser River and its tributaries. Spawning escapement for Fraser River chum salmon is currently assessed annually for four of the six largest chum producing systems, as well as for a number of smaller tributaries. The largest observed escapement of Fraser chum (greater than 3 million fish), was seen in 1998. Since that time, spawning escapements for annually assessed Fraser River chum systems trended downwards to 2009 and 2010 when chum salmon escapements estimates fell below the established 800,000 escapement goal.

However, escapements improved in 2011 and 2012 and exceeded the escapement goal, with estimated spawners of 1.1 and 1.4 million in those years, respectively.

Current year escapement assessment programs are still ongoing, and preliminary estimates of escapement are not available. However, observations of spawners to this date seem consistent with 2013 Albion-based in-season assessments.

## **11 STRAIT OF GEORGIA CHUM**

### **11.1 OBJECTIVES AND OVERVIEW**

Strait of Georgia chum fisheries consist of terminal opportunities for chum returning to their natal spawning streams. Many of the potential terminal fishing areas have enhancement facilities and/or spawning channels associated with the rivers. Terminal fishery strategies consist of monitoring and assessing stocks (escapement and returning abundance) with the objective of ensuring adequate escapement and providing harvest opportunities where possible. Stock assessments may include test fisheries, escapement enumeration, and over flights. In some areas where stocks receive considerable enhancement or where stocks have above average productivity, limited fishing may occur prior to major escapement occurring.

#### **Commercial**

##### **Area 14**

Chum returning to this area have been enhanced since the late 1960s and terminal fisheries have occurred in October and November since the 1970s. The returning Area 14 chum abundance is forecasted pre-season using brood escapement, average survival and age composition. In-season run strength is assessed from any early catches, visual observations at river estuaries and by escapement counts to the three major river systems.

This fishery is directed at the enhanced stocks of three systems: Puntledge, Qualicum and Little Qualicum rivers. The Qualicum River is often referred to as the 'Big' Qualicum River, to better distinguish it from the Little Qualicum River. The escapement goals for the three river systems are 60,000 for Puntledge River, 130,000 for Little Qualicum River, and 100,000 for Qualicum River, adding up to an overall escapement goal of 290,000 chum not including enhancement facility requirements (about 10,000 chum bringing the total escapement goal to 300,000).

The Area 14 fishery has a specific harvest strategy, implemented since 1981. The strategy consists of limited early harvest prior to escapement occurring. The allowable early chum harvest is calculated from 65% of the predicted surplus (terminal return run size minus escapement of 300,000 and buffer of 100,000). The buffer safeguards against errors in forecast stock abundance. The surplus within the 100,000 buffer and remaining 35% of the surplus may be harvested provided that escapement targets have been achieved. If

there is no significant surplus identified in the pre-season forecast potential fishing opportunities are determined in-season based on pre-set in-river escapement targets and run timing information.

#### **Area 16**

This fishery targets wild chum stocks returning to river systems in the Jervis Inlet area. The main systems are Tzoonie, Deserted and Skwawka rivers. The overall escapement goal for Jervis Inlet streams is 110,000. These terminal fisheries occur when the individual or combined escapement goals have been assured. Fishing opportunities do not occur on a regular basis. There were no fisheries in Area 16 in 2013.

#### **Area 17**

This fishery is a terminal fishery targeting Nanaimo River stocks. The Nanaimo River chum stocks are supplemented by the Nanaimo River hatchery (supplementation is on a sliding scale), where increased enhancement occurs during poor escapement years. Escapements fluctuate annually and fishery openings are planned in-season based on escapement estimates. The overall escapement goal for the Nanaimo River is 60,000. An assessment fishery was triggered when the escapement reached approximately 75% of the escapement target. In 2013 there were two days of fishing for Area E gill nets on November 3 and 4 for 12 hours each day. Total catch for the two days was 9,773 chum.

#### **Area 18**

This fishery is directed primarily at Cowichan River stocks, however, Goldstream chum are also harvested. Fishery openings in mid to late November are limited to Satellite Channel in order to minimize impacts on Goldstream stocks. Chemainus River stocks could also be impacted if the fisheries are earlier in November, but likely to a lesser extent.

Fishery openings are planned in-season based on escapement estimates from a DIDSON counter and information from a test fishery. Management is also guided by advice from the Cowichan Fisheries Roundtable (the Roundtable) and the Mid Vancouver Island (MVI) Chum Subcommittee and an in-season Chum Escapement Forecast Tool based on the Didson count and date. The overall escapement goal for the Cowichan River is currently 160,000 chum counted by the DIDSON counter. There were no gill net or seine fisheries in Area 18 in 2013.

The Area 18/19 seine test fishery in conjunction with the DIDSON fish counter provide timely in-season stock information regarding chum returns to the Cowichan system. A weekly conference call was held with the Cowichan Fisheries Roundtable Harvest Committee to discuss stock status and potential fishing opportunities. As of November 19 the Cowichan chum escapement was 123,900.

## **Area 19**

This fishery is directed primarily at Goldstream River stocks although some Cowichan River chum salmon are also harvested. Fishery openings set for mid to late November are limited to the portion of Saanich Inlet (Sub area 19-8) which is outside or to the north of Squally Reach. This area restriction is implemented to minimize impact on Goldstream Chinook and coho stocks.

Fisheries are planned in-season based on escapement estimates and a test fishery. Area 19 falls under the same management regime as Area 18. The overall escapement goal for the Goldstream River is 15,000. There were no fisheries in Area 19 in 2013.

Chum catch and release information from all fisheries can be found in Appendix 7.

## **11.2 FIRST NATIONS**

### **Food, Social and Ceremonial Fisheries**

The preliminary estimated FSC catch by First Nations in the Strait of Georgia is estimated to be approximately 4,790 chum; additional catch data is currently being compiled.

### **ESSR Fisheries**

The K'omoks First Nation was issued an ESSR Licence for chum and incidental catch of coho and Chinook at the Puntledge River Hatchery. The total K'omoks First Nation ESSR licence harvest was 16,038 chums.

The Qualicum First Nation was issued an ESSR Licence for chum and incidental catch of coho and Chinook at the Big Qualicum River hatchery. There was no ESSR fishery at the Big Qualicum hatchery in 2013 as the river did not achieve its escapement target.

The Sliammon First Nation had an ESSR harvest at the CEDP hatchery on Sliammon Creek. The First Nation harvested 2,296 chum salmon.

The total ESSR harvest for Areas 14 – 19 was 18,334 chum salmon.

## **11.3 RECREATIONAL**

The majority of recreational effort directed at chum salmon occurs in the lower portions of the Discovery Passage area, particularly in the waters around Campbell River. These catch estimates are reported in the Johnstone Strait Chum, Section 9. Some marine chum fisheries take place in the approach waters of the Puntledge and Qualicum Rivers but the catch and effort are both very low and not currently surveyed.

Tidal recreational fisheries are subject to the normal salmon daily and possession limits (daily limit of four (4) per day and possession of eight (8)) and are open throughout the area. In all areas anglers were restricted to the use of barbless hooks and there was a minimum size limit of 30 cm. Occasionally recreational in river fisheries occur where

surpluses or target escapements will be met. These fisheries occur almost exclusively where enhancement facilities are present. Details on chum opportunities are reported in the Tidal Waters Sport Fishing Guide and also in the Freshwater Supplement. In-season changes and opportunities are also posted online at the Pacific Region recreational fisheries website: <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.htm>.

#### 11.4 COMMERCIAL

Strait of Georgia commercial chum fisheries for seine, and gill net were conducted between November 3 and November 20. The total commercial chum catch from the Strait of Georgia is estimated at 40,652 pieces (see Table 11-1 below). A description of each fishery is provided in the following table.

In 2013 seine and gill net fisheries targeting Puntledge River chums took place in Area 14. There was an Area D gill net opening in portions of Area 14 from November 03 to November 20 and an Area B seine opening from November 06 to November 14. The preliminary gill net catch estimate is 30,872. The effort and catch in the seine fishery was low. Three vessels participated and reported a total catch of 7.

Chum catch and release information from all fisheries can be found in Appendix 7.

**Table 11-1: Strait of Georgia Commercial Chum Catch by Date and Gear Type**

<b>Fishery Date</b>	<b>Gear type</b>	<b>Area</b>	<b>Effort (boat days)</b>	<b>Catch</b>
Nov 3–20	GN	14	474	30,872
Nov 6 – 14	SN	14	4	7
Nov 3 – 4	GN	17	78	9,773

#### 11.5 STOCK STATUS

Historically, chum returns have been highly variable relative to brood year escapements. For 2013, generally at or below average chum returns to the Strait of Georgia were forecast. The forecast was based on below average brood year escapements (in either 2009 or 2010) and anticipated average survival.

Conditions for returning chum migration and spawning were adequate although water flows tapered off near the end of the run. Spawning escapements continue to be monitored and are currently being compiled. To date, returns have been generally close to forecasts (Table 11-2).

Two marine test-fisheries were conducted, one off the Cowichan River and the other adjacent to Goldstream River. The Cowichan and Goldstream seine test-fishery commenced on October 29<sup>th</sup> and will continue until December 4<sup>th</sup> for a total of twelve (12) fishing days. Test catches have totaled 16,663 chum for both areas to date with the largest catches from Mill Bay, Tozier Rock and McCurdy Point. Each test fishing day

generally consists of six sets. This year, 8,270 chum were retained to cover the costs of the test fishery and the remainder were released.

**Table 11-2: Strait of Georgia Chum Preliminary Spawning Escapements**

<b>Stock</b>	<b>Target Escapement Target</b>	<b>2013 forecast Expected range</b>	<b>Preliminary 2013 Escapement</b>
Jervis Inlet	110K	21K – 37K	56K
Mid-Island	300K	198K – 297K	236K
<i>Puntledge</i>	<i>60K</i>		<i>62K</i>
<i>Little Qualicum</i>	<i>130k</i>		<i>97K</i>
<i>Big Qualicum</i>	<i>100K</i>		<i>77K</i>
Nanaimo	63.5K	47K – 70K	55K
Cowichan	160K	124K – 186K	130K
Goldstream	15K	16K – 24K	29K

## **12 WEST COAST VANCOUVER ISLAND CHUM**

### **12.1 OBJECTIVES AND OVERVIEW**

Commercial chum salmon fisheries normally occur on the WCVI from late September to early November in years of chum abundance. The majority of chum fishing on WCVI takes place adjacent to Nitinat Lake (Area 21), in Nootka Sound and Tlupana and Esperanza Inlets (Area 25). During the past few years there have been limited-fleet gill net fisheries in Barkley Sound (Area 23), Clayoquot Sound (Area 24), Nootka Sound and Esperanza Inlet (Area 25). Commercial fisheries target wild chum stocks returning to local streams and enhanced chum stocks from Nitinat and Conuma hatcheries.

With the exception of Nitinat and Tlupana Inlet where hatchery stocks dominate adult returns, WCVI chum fisheries are managed to between 10% and 20% harvest rate. Fishery managers consider run timing, fishing effort and fleet distribution when implementing in-season management measures. In-season management measures, such as limiting fishing effort to one or two days per week, are implemented to ensure that target harvest rate objectives are not exceeded. As well, in 2012, revised fishery lower and target reference points (LRPs and TRPs) were developed based on the Sustainable Escapement Goal (SEG) method. The SEG approach uses the long-term escapement series to set fishery reference points. Conservative “SEGs” are defined as the 25% and 75% of a long-term escapement time series. The lower SEG is estimated to represent approximately 0.8  $S_{MSY}$ . Although the WCVI chum forecast is highly uncertain, the forecast is used to inform pre-season fishery planning. Where the forecast is below the LRP for an area, fisheries are curtailed. Where the forecast is below the TRP, fisheries are more limited.

**Table 12-1. Southwest Vancouver Island Chum Conservation Unit Preseason Forecast for 2013 in relation to fishery reference points.**

Location	PFMA	2013 Forecast	Limit Reference Point (LRP) *	Target Reference Point (TRP) **
Barkley	23	54,000	46,000	149,000
Clayoquot	24	53,000	19,000	70,000
Nootka	25	26,000	34,000	149,000
Esperanza	25	15,000	16,000	46,000
Kyuquot	26	87,000	19,000	74,000
<b>SW VI CU</b>	<b>all</b>	<b>563,000</b>	<b>151,000</b>	<b>676,000</b>

\* Interim LRP's are equivalent to the 25% SEG (Sustainable Escapement Goal), or 25% of the long term average escapement. LRP's represent the escapement level below which fisheries should not be conducted.

\*\* Interim TRP's are equivalent to the 75% SEG, or 75% of the long term average escapement. TRP's represent the target escapement for each area.

Area D and Area E commercial gill-net fleets and the Area B commercial seine fleet target WCVI chum. Seine opportunities generally occur once surplus to escapement and hatchery brood requirements have been identified for Nitinat Lake, Nitinat River and Nitinat hatchery. In 2013 a test fishing program was not conducted for Nitinat chum. In lieu of a test fishery, the fishery was managed through a fixed-harvest rate strategy to limit the harvest rate to approximately 25%. The allowable effort of the commercial fleets was determined from an analysis of the average exploitation rate per unit effort in Nitinat chum fisheries over the last decade.

For 2013, the pre-season forecast was for escapement to all areas to be below the provisional target limit reference point for fisheries, with the exception of Barkley and Kyuquot Sound. All other areas, with the exception of Nootka, were above the lower reference point where limited fisheries could occur.

There have been limited-fleet gill net fisheries in Esperanza Inlet (Area 25) and Barkley Sound (Area 23) since 2004 and a limited-fleet assessment fishery was initiated and has continued in Clayoquot Sound (Area 24) since 2007. In 2013, only Area 23 was approved for commercial openings due to the low pre-season forecast chum abundance for most WCVI areas.

Escapement to Nootka Sound streams has been at or below both the target escapement and the limit reference point since 2006 and there is concern for the sustainability of these stocks. In addition, Conuma Hatchery has been unable to reach their broodstock target in

recent years. As the 2013 forecast return was below both the target escapement and the limit reference point, commercial fisheries were not conducted for Outer Nootka in 2013.

Esperanza stocks have been at or below the LRP for four of the last five years, and the 2013 forecast was for the return to be below both the target escapement and the limit reference point. Limited effort commercial fisheries were not conducted in 2013.

First Nations Food, Social and Ceremonial (FSC) and Treaty Domestic Allocation fisheries for chum salmon occur primarily in terminal areas. Excess Salmon to Spawning Requirements (ESSR) fisheries were conducted by the Ditidaht First Nation at Nitinat Lake targeting Nitinat hatchery surplus production. Economic Opportunity fisheries were carried out by the Hupacasath and Tseshah First Nations in upper Alberni Inlet and in the lower Somass River.

In-river recreational fisheries generally have low effort, but recently effort has increased in some terminal area rivers (i.e. Nitinat River). Directed effort and catch of chum in recreational marine fisheries off the WCVI remains low.

Chum catch and release information from all fisheries can be found in Appendix 7.

## **12.2 FIRST NATIONS**

The Ditidaht First Nation conducts annual chum FSC fisheries and operates ESSR fisheries in Nitinat Lake and rack harvests at Nitinat hatchery in years of higher chum abundance.

Tseshah and Hupacasath First Nations conducted chum catch monitoring and chum adult enumeration surveys in Alberni Inlet local river systems in 2013. Observations were reported weekly to DFO Stock Assessment and Resource Management staff.

### **WCVI FSC and Economic Opportunity Fisheries**

In 2013, an agreement was reached with the Hupacasath and Tseshah First Nations for an economic opportunity fishery targeting chum (Area 23). The agreement was signed in early November. The timing when the agreement was completed combined with the low chum returns in local streams, resulted in no Economic Fishery occurring. There was a limited gillnet and hook line fishery for FSC with a target of 1000 pcs. Total catch in the fishery was 957 pcs. The remaining WCVI NTC First Nations including Maa-nulth domestic harvest was reported as 1,052 chum. The total combined catch for the WCVI First Nations was 2,009 chum.



## **ESSR Fisheries**

The Ditidaht First Nation was issued an ESSR Licence for chum at Nitinat Lake and Nitinat hatchery. The catch was 1061 in the lake and 24,089 from brood capture. The total catch for the ESSR fisheries was 25,150 pieces

### **12.3 RECREATIONAL**

The WCVI recreational fishery is open year-round with a limit of four (4) per day. Anglers are restricted to the use of barbless hooks and there is a minimum size limit of 30 cm. In both offshore and inshore areas of WCVI, recreational catch of chum is very low (estimated at less than 200 combined).

There was also a chum fishery in the Nitinat River which was open from October 15 until December 31. The daily limit was two (2) chum per day and anglers were restricted to the use of barbless hooks. This fishery was not monitored by creel survey in 2013.

### **12.4 COMMERCIAL**

#### **Nitinat**

In previous years the Nitinat commercial chum fishery was the largest on the West Coast of Vancouver Island; this fishery targets returning Nitinat River hatchery stocks. The fishing period is generally October 1<sup>st</sup> to November 15<sup>th</sup>. In 2013 no test fishing program was conducted and a fixed effort approach was developed to target a harvest rate of approximately 25%. The pre-season forecast was 328,000 which was above the lower reference point and resulted in a small anticipated surplus. The preliminary return in 2013 is estimated at 67,000 chum which was much lower than expected and only limited gillnet fishing occurred.

#### **Area B Seine**

In 2013 there was no Area B seine fishery planned due to low escapement levels and poor gillnet catches.

#### **Area E Gillnet**

In 2013 the Area E gillnet fishery was open for a total of 4 days on Oct 3-4 and Oct 10-11. The total catch was 15,730 chum and the peak effort was 48 vessels.

The total commercial catch for Nitinat Chum was 15,730.

#### **Limited Entry Chum WCVI**

#### **Barkley (Area 23), Clayoquot (Area 24) and Nootka/Esperanza (Area 25)**

Commercial chum fisheries in Areas 23, 24 and 25 are typically managed using weekly in-season effort estimates. The harvest-rate approach is designed to achieve a harvest rate of 20% or less on all stocks in Nootka Sound and 10% to 15% in Esperanza Inlet, Clayoquot Sound and Barkley Sound chum stocks. In Tlupana Inlet, where hatchery stocks are predominant, exploitation rates may be higher in years of higher abundance.

The main objective of the gill net fishery strategy is to provide advance indication of chum salmon abundance that could initiate larger fleet fisheries in Nootka Sound and Tlupana Inlet.

### **Barkley Sound (Area 23)**

#### Commercial

Effort was to be limited to four vessels Area D vessels fishing two days per week from 8:00 hrs to 18:30 hrs starting October 2 to avoid potential impacts on returning Chinook stocks (i.e. Robertson, Nahmint, Sarita, etc.). The fishery typically tails out by the first week of November; however if in-season information suggests the return will be below the LRP, the fishery will be curtailed sooner.

In 2013 there were three openings in the first 3 weeks of October and the catch was poor. The vessels did not fish the second day of week 3 and there was no further interest in any future fisheries.

Fishery opened 3 weeks in a row beginning Oct 1-2, 8-9, 15-16

Oct 1-2 Catch - 730  
Oct 8-9 Catch - 675  
Oct 15-16 Catch - 13

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Total 1418 pcs

#### First Nations

Tseshah and Hupacasath First Nations FSC fishing by gillnet in Alberni Inlet for chum from September 23 to October 16 was limited to small daily openings due to Chinook concerns.

Total Catch - 945 chum

### **Clayoquot Sound**

The chum forecast for Clayoquot Sound was 53,000 pieces. This identifies a TAC of 5,300 pcs for harvest (10% exploitation rate). The First Nations FSC chum allocation in Area 24 was 12,100 pieces. This left no fish available for commercial harvest.

**Nootka**

Limited effort assessment fisheries were not recommended in 2013 as the forecast is below both the target escapement and the limit reference point. Conuma Hatchery was unable to achieve brood stock targets in recent years due to low escapements. In addition, all other Nootka Sound systems regularly surveyed for escapement trends (Canton, Sucwoa, Tlupana, Burman) have had escapements at or below the LRP for the last 6 years.

**Esperanza**

Limited effort assessment fisheries was not recommended in 2013 as the forecast was below both the target escapement and the limit reference point.

**Kyuquot**

Kyuquot was above the target reference point for 2013 at a forecast of 87,000 pieces. This resulted in a TAC of 8,700 pieces for harvest (10% exploitation rate). The Maa-nulth First Nations have indicated that they will harvest their FSC chum from Area 26 for a target of 10,000 pcs. As a result there was no fish available for commercial harvest.

**12.5 STOCK STATUS**

Abundance of chum populations in the WCVI conservation unit (CU) was average to above average from 2001 to 2006. Low returns from 2007 to 2010 reflect a decline in productivity most likely related to lower than average marine survival rates, particularly during the 2005 to 2007 sea entry years. Chum returns in 2011 showed some improvement, likely due to the favorable 2008 sea entry year; returns were about average in SWVI but were still well below average in NWVI. However, overall returns in 2012 and 2013 were generally below long-term averages. Some improvement might be expected in 2014 with contribution from the 2011 brood year.

## 13 APPENDICES

### Appendix 1: Catches in Canadian Treaty Limit Fisheries, 1996 to 2013 (Preliminary)

Fisheries/St ocks	Species	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996
Stikine River (all gears)	Sockeye	36,146	30,352	55,623	50,543	48,049	33,614	59,237	101,209	85,890	84,866	58,784	17,294	25,600	27,468	38,055	43,803	65,559	74,281
	Coho	4,835	5,748	4,703	4,952	5,061	2,398	47	72	276	275	190	82	233	301	181	726	401	1,404
	Chinook-Ig	3,415	4,573	2,307	1,766	2,330	7,860	10,576	15,776	18,997	3,857	1,396	1,362	1,480	3,086	2,916	2,164	4,483	2,471
	Chinook-jk	1,594	1,213	1,165	1,001	714	1,067	1,735	2,078	2,177	2,574	1,052	578	103	628	1,264	423	286	421
Taku River (commercial gill net)	Sockeye	21,163	30,209	24,012	20,211	11,057	19,445	16,564	21,093	21,932	19,860	32,730	31,053	47,660	28,009	20,681	19,038	24,003	41,665
	Coho	10,374	8,689	6,102	10,349	5,649	4,866	5,399	9,180	6,860	5,954	3,168	3,082	2,568	4,395	4,416	5,090	2,594	5,028
	Chinook-Ig	738	1,909	2,333	4,658	7,031	1,184	862	7,312	7,534	2,074	1,894	1,561	1,458	1,576	908	1,107	2,731	3,331
	Chinook-jk	N/A	478	514	697	1,183	330	337	198	821	334	547	291	118	87	257	227	84	144
Alsek River (all gear)	Sockeye	508	1,786	2,110	1,716	717	0	1,340	1,327	594	2,122	2,795	2,255	1,177	745	554	585	520	1,361
	Coho	29	N/A	29	7	3	34	1	0	71	127	192	289	99	52	28	112	5	65
	Chinook	73	85	214	294	125	7	41	19	114	185	228	2,194	277	142	412	346	530	1,098
Areas 3 (1- 4)* (commercial net)****	6	1,249,570	118,164	160,757	30,686	404,460	8,330	1,740,270	228,378	878,552	402,459	667,103	876,631	473,318	127,000	2,162,280	61,000	329,000	987,000
Area 1 (commercial troll)****	Pink	84,216	57,013	52,221	19,948	60,402	29,295	61,276	34,854	39,430	27,751	98,347	41,418	175,000	28,295	25,000	0	261,000	732,000
North Coast** (troll + sport)	Chinook	115,914 69,264+ 46,650	120,305 80,256+ 40,050	122,660 74,660+ 48,000	136,613 90,213+ 46,400	109,470 75,470+ 34,000	95,647 52,147+ 43,500	144,235 83,235 + 61,000	215,985 151,485 +	243,606 174,806 +	241,508 167,508 + 74,000	191,657 137,357 + 54,300	150,137 103,037 + 47,100	43,500	32,048	70,701	144,650	145,568	26,900
West Coast Vancouver Island (troll + sport + FN)	Chinook	108,710 43,043+ 61,712+ 3,955	130,719 62,573+ 61,822+ 4,300	206,569 123,930+ 78,350+ 4,289	137,660 79,123+ 52,698+ 5,839	125,488 53,191+ 68,775+ 3,381	143,81789,704 + 50,319+ 3794	139,150 87,921 + 46,229 + 5,000	145,970 103,978 +	195,791 143,614 +	210,875 168,837+ 42,038	179,706 152,677 + 27,029	165,824 134,308+ 31,516	102,266 78,302+ 23,964	89,139 64,216+ 24,923	28,540 6,906+ 21,634	10,855 6,678+ 4,177	59,796 53,396+ 6,400	3677 4+ 3,673
Fraser River Canadian Commercial Catch	Sockeye Pink	2,124 2,855,441	0 0	443,000 4,751,80 0	9,305,10 4	0 1,442,84 0	16,942 0	0 333,300	4,633,62 3	137,000 338,000	1,993,80 0	1,042,98 6 0	2,182,70 0	295,000 579,000	953,000 0	54,000 3,000	1,295,00 0	8,737,00 0	1,019,00 0
Fraser River U.S. Commercial Catch	Sockeye Pink	4,609 3,057,222	105,100 0	266,000 2,893,40 0	1,970,00 0	0 2,726,23 0	49,800 0	3,900 377,600	701,300 0	0 0	192,200 0	244,000 773,000	434,600 0	240,000 427,000	494,000	41,000 3,000	707,000 0	1,578,00 0	257,000 0
West Coast Vancouver Island (commercial troll)	Coho	5,499	1,988	0	458	0	369	1,424	2,399	5,989	0	0	0	0	0	0	0	0	761,000
Johnstone Strait (commercial catch)***	Chum	597,003	391,324	751,560	62,510	510,708	298,931	494,944	800,363	787,226	1,089,100	1,026,029	700,000	236,000	161,000	41,411	1,820,000	104,593	101,971

\*AREA 5-11 CATCHES INCLUDED PRIOR TO 1995 AND EXCLUDED FROM 1995-1998 INCLUSIVE. NOT PART OF 1999 ANNEX IV PROVISIONS.

\*\* NORTH COAST CATCH EXCLUDES TERMINAL EXCLUSION CATCHES OF 6,000 ('91), 6,100 ('92), 7,400 ('93), 6,400 ('94), 1,702 ('95), 16,000 ('96), 5,943 ('97), and 2,182 in 1998. NO TERMINAL EXCLUSION IN THE 1999 AGREEMENT - COVERED UNDER THE AABM ARRANGEMENT;

CENTRAL COAST AREAS NOT PART OF 1999 ANNEX IV PROVISIONS.

\*\*\* CANADIAN CATCH INCLUDES COMMERCIAL, FSC AND TEST-FISH CATCHES IN AREAS 11-13 FOR 1991-94 INCLUSIVE, AND IN AREAS 12-13 FOR 1995 TO 2004 INCLUSIVE. 2002-PRESENT, CATCHES FROM FISHERIES MANAGED TO FIXED HARVEST RATE OF 20%.

\*\*\*\*ALL PINK CATCHES FOR ALL YEARS (1995-2012) IN AREAS 3(1-4) AND AREA 1 HAVE BEEN UPDATED TO REFLECT FINAL ESTIMATES. NOTE 1: WCVI CHINOOK CATCHES FROM 1995-1998 ARE REPORTED BY CALENDAR YEAR; CATCHES FROM 2008-1999 ARE REPORTED BY CHINOOK YEAR (OCT-SEPT) NOTE 2: 1999 CATCHES ARE REPORTED ACCORDING TO FISHERIES/STOCKS UNDER THE 1999 ANNEX IV PROVISIONS.

## Appendix 2: Preliminary 2013 South Coast Sockeye Catch by Fishery and Area

Fishery	Gear	Fishery (Area)	Numbers			
			Non-Fraser Kept	Unknown Origin	Fraser Kept	All stocks Released
<b>Commercial</b>	Area G Troll	WCVI AABM Chinook (23 - 27, 123 - 127)				
	Area H Troll	Fraser Sockeye (12,13) <sup>a</sup>				<10
	Area H Troll	JST Chum (12,13)				0
	Area H Troll	MVI Chum (14)				0
	Area B Seine	Barkley Sockeye (23)	9,128		0	0
	Area B Seine	Fraser Sockeye (12,13)	15		870	14,589
	Area B Seine	Fraser Sockeye (29)	0		1,233	10,356
	Area B Seine	Squamish Pink (28)	0	3	0	3
	Area B Seine	Nitinat Chum (21, 121)	0		0	0
	Area B Seine	JST Chum (12,13)	0		1	12
	Area B Seine	Fraser Chum (29)				
	Area B Seine	MVI Chum (14)				
	Area D Gillnet	Barkley Sockeye (23)	11,390		0	0
	Area D Gillnet	Barkley Chum (23)	0		0	0
	Area D Gillnet	Somass Chinook (23)	0		0	0
	Area D Gillnet	Clayoquot Chum (24)	0		0	0
	Area D Gillnet	Tlupana Chinook (25)	0		0	0
	Area D Gillnet	JST Chum (12,13)	0		0	1
	Area D Gillnet	MVI Chum (14)				
	Area E Gillnet	Fraser Chum (29)	0		0	4
	Area E Gillnet	Nitinat Chum (21, 121)	0		0	0
	Area E Gillnet	Cowichan Chum (Area 18)				
	Maa-nulth HA	Henderson Sockeye (23)	323		0	0
<b>Total Commercial Catch</b>			<b>20,856</b>	<b>3</b>	<b>2,104</b>	<b>24,965</b>
<b>Recreational</b>	Sport	Juan de Fuca (19,20)	185			1485
	Sport	Strait of Georgia (14-18,28,29)	31			532
	Sport	Johnstone Strait (11-13)	0			3091
	Sport	WCVI - Inshore (20W-27)	16796	**		5336
	Sport	WCVI - Offshore (121-127)	4			0
	Sport	Fraser River				
<b>Total Recreational Catch</b>			<b>17,016</b>		<b>0</b>	<b>10,444</b>
<b>First Nations FSC</b>		Johnstone Strait	3,336		111,003	
		Strait of Georgia	0		7,725	
		WCVI	26,189	8,377 <sup>b</sup>		
		Fraser River	80		260,598	2,605
<b>Total First Nations FSC Catch</b>			<b>29,605</b>	<b>8,377</b>	<b>379,326</b>	<b>2,605</b>
<b>First Nations EO</b>		Johnstone Strait				
		Strait of Georgia				
		WCVI	21,208		0	
		Fraser River	0		21	14,143
<b>Total First Nations EO Catch</b>			<b>21,208</b>		<b>21</b>	<b>14,143</b>
<b>First Nations ESSR</b>		Johnstone Strait				
		Strait of Georgia				
		WCVI				
		Fraser River	0	0	0	0
<b>Total First Nations ESSR Catch</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>TOTAL - ALL FISHERIES</b>			<b>88,685</b>	<b>8,377</b>	<b>381,451</b>	<b>52,157</b>
<sup>a</sup> Fewer than 3 vessels participated in this fishery therefore the actual catch is considered confidential.						
<sup>b</sup> 8377 sockeye caught in Areas 20, 121, 123; stock ID not confirmed as of Dec 1, 2013						
**includes 3528 jacks						
*Estimates not yet available for all the assessed Fraser River recreational fisheries						

### Appendix 3: Preliminary 2013 South Coast Pink Catch By Fishery and Area

Fishery	Gear	Fishery (Area)	Numbers	
			Kept	Released
<b>Commercial</b>	Area G Troll	WCVI AABM Chinook (23 - 27, 123 - 127)	38	21
	T'aa-wiihak	WCVI AABM Chinook (23 - 27, 123 - 127)	161	0
	Area H Troll	Fraser Sockeye (12,13) <sup>a</sup>	<100	0
	Area H Troll	JST Chum (12,13)	19	26
	Area H Troll	MVI Chum (14)		
	Area B Seine	Barkley Sockeye (23)		
	Area B Seine	Fraser Sockeye (12,13)	827,701	171
	Area B Seine	Fraser Sockeye (29)	1,451,459	2,215
	Area B Seine	Squamish Pink (28)	282,417	2,400
	Area B Seine	Nitinat Chum (21, 121)		
	Area B Seine	JST Chum (12,13)	792	5
	Area B Seine	Fraser Chum (29)	2	0
	Area B Seine	MVI Chum (14)		
	Area D Gillnet	Barkley Sockeye (23)	0	1
	Area D Gillnet	Barkley Chum (23)	4	0
	Area D Gillnet	Somass Chinook (23)	0	0
	Area D Gillnet	Clayoquot Chum (24)	0	0
	Area D Gillnet	Tlupana Chinook (25)	0	0
	Area D Gillnet	JST Chum (12,13)	4	11
	Area D Gillnet	MVI Chum (14)	0	0
	Area E Gillnet	Fraser Chum (29)	1	46
	Area E Gillnet	Nitinat Chum (21, 121)	0	0
	Area E Gillnet	Cowichan Chum (Area 18)	0	0
<b>Total Commercial Catch</b>			<b>2,562,598</b>	<b>4,896</b>
<b>Recreational</b>	Sport	Juan de Fuca (19,20)	41476	23124
	Sport	Strait of Georgia (14-18,28,29)	11268	4675
	Sport	Johnstone Strait (11-13)	36446	15498
	Sport	WCVI - Inshore (20W-27)	2223	2584
	Sport	WCVI - Offshore (121-127)	4079	11581
	Sport	Fraser River		
<b>Total Recreational Catch</b>			<b>95,492</b>	<b>57,462</b>
<b>First Nations FSC</b>		Johnstone Strait	31,384	16,502
		Strait of Georgia	133	0
		WCVI	661	0
		Fraser River	17,110	3,771
<b>Total First Nations FSC Catch</b>			<b>49,288</b>	<b>20,273</b>
<b>First Nations EO</b>		Johnstone Strait		
		Strait of Georgia		
		WCVI	0	0
		Fraser River	914,122	7,460
<b>Total First Nations EO Catch</b>			<b>914,122</b>	<b>7,460</b>
<b>First Nations ESSR</b>		Johnstone Strait	155,830	0
		Strait of Georgia		
		WCVI		
		Fraser River	0	0
<b>Total First Nations ESSR Catch</b>			<b>155,830</b>	<b>0</b>
<b>TOTAL - ALL FISHERIES</b>			<b>3,777,330</b>	<b>90,091</b>
<sup>a</sup> Fewer than 3 vessels participated in this fishery therefore the actual catch is considered confidential.				
*Estimates not yet available for all the assessed Fraser River recreational fisheries				

**Appendix 4: Preliminary 2013 South Coast AABM Chinook Catch By Fishery and Area**

AABM Chinook				
PST Regime	Fishery	Month	Numbers	
			Kept	Released
WCVI-AABM	Area G Troll *	Oct-12	3,344	1,214
		Nov-12	230	77
		Dec-12	312	119
		Jan-13	1,018	194
		Feb-13	358	50
		Mar-13	501	25
		Apr-13	1,374	43
		May-13	25,737	3,578
		Jun-13	0	0
		Jul-13	0	0
		Aug-13	0	0
	**	Sep-13	2,519	273
	Taaq-wiihak	April -Aug 13	7,650	0
<b>Total</b>			<b>43,043</b>	<b>5,573</b>
Recreational	Sport	WCVI - Inshore (20W-27)	8,080	7,052
	Sport	WCVI - Offshore (121-127)	53,632	49,048
<b>Total</b>			<b>61,712</b>	<b>56,100</b>
First Nations	Johnstone Strait			
	Strait of Georgia			
	WCVI Offshore		3,955	0
	WCVI Inshore		0	0
	Fraser River			
<b>Total</b>			<b>3,955</b>	<b>0</b>
<b>All Total</b>			<b>108,710</b>	<b>61,673</b>
*Oct'12-Sept'13				
** includes release data from Sub-legal DNA sampling program				

## Appendix 5: Preliminary 2013 South Coast ISBM Chinook Catch By Fishery and Area

Fishery	Gear	Fishery (Area)	Numbers	
			Kept	Released
<b>ISBM</b>	Area G Troll	WCVI Chinook	0	0
Taaq-wiihak	Demo Fishery	Tlupana Chinook (25)	0	0
	Area H Troll	Fraser Sockeye (12,13) <sup>a</sup>	0	0
	Area H Troll	JST Chum (12,13)	0	13
	Area H Troll	MVI Chum (14)		
	Area B Seine	Barkley Sockeye (23)	0	19
	Area B Seine	Fraser Sockeye (12,13)	31	674
	Area B Seine	Fraser Sockeye (29)	75	3,923
	Area B Seine	Squamish Pink (28)	2	5
	Area B Seine	Nitinat Chum (21, 121)	0	0
	Area B Seine	JST Chum (12,13)	4	56
	Area B Seine	Fraser Chum (29)	0	3
	Area B Seine	MVI Chum (14)		
	Area D Gillnet	Barkley Sockeye (23)	171	14
	Area D Gillnet	Barkley Chum (23)	0	0
	Area D Gillnet	Somass Chinook (23)	0	0
	Area D Gillnet	Clayoquot Chum (24)	0	0
	Area D Gillnet	Tlupana Chinook (25)	8,688	0
	Area D Gillnet	JST Chum (12,13)	0	7
	Area D Gillnet	MVI Chum (14)		
	Area E Gillnet	Fraser Chum (29)	5	21
	Area E Gillnet	Nitinat Chum (21, 121)	0	0
	Area E Gillnet	Nanaimo Chum (Area 17)	0	0
<b>Total Commercial Catch</b>			<b>8,976</b>	<b>4,735</b>
<b>Recreational</b>	Sport	Juan de Fuca (19,20)	22922	18000
	Sport	Strait of Georgia (14-18,28,29)	11580	49889
	Sport	Johnstone Strait (11-13)	21935	32267
	Sport	WCVI - Inshore (20W-27)	35519	27,052
	Sport	WCVI - Offshore (121-127)	NA	NA
	Sport	Fraser River	2,527	199
<b>Total Recreational Catch</b>			<b>94,483</b>	<b>127,407</b>
<b>First Nations FSC</b>		Johnstone Strait	258	0
		Strait of Georgia	843	0
		WCVI	1,101	0
		Fraser River	14,109	113
<b>Total First Nations FSC Catch</b>			<b>16,311</b>	<b>113</b>
<b>First Nations EO</b>		Johnstone Strait		
		Strait of Georgia		
		WCVI	0	0
		Fraser River	1,852	6,202
<b>Total First Nations EO Catch</b>			<b>1,852</b>	<b>6,202</b>
<b>First Nations ESSR</b>		Johnstone Strait		
		Strait of Georgia*	2,266	0
		WCVI	37,596	0
		Fraser River	8,745	0
<b>Total First Nations ESSR Catch</b>			<b>48,607</b>	<b>0</b>
<b>TOTAL - ALL FISHERIES</b>			<b>170,229</b>	<b>138,457</b>
*Number includes both adults and jacks; FSC & ESSR combined.				
°only includes in-river chum fisheries				
*Estimates not yet available for all the assessed Fraser River recreational fisheries				



## Appendix 6: Preliminary 2013 South Coast Coho Catch By Fishery and Area

Fishery	Gear	Fishery (Area)	Numbers	
			Kept	Released
Commercial	Area G Troll	WCVI AABM Chinook (23 - 27, 123 - 127)	5,499	1,949
	Taaq-wiihak	WCVI AABM Chinook (23 - 27, 123 - 127)	0	0
	Area H Troll	Fraser Sockeye (12,13) <sup>a</sup>	0	9
	Area H Troll	JST Chum (12,13)	7	850
	Area H Troll	MVI Chum (14)	0	0
	Area B Seine	Barkley Sockeye (23)	0	5
	Area B Seine	Fraser Sockeye (12,13)	502	12,360
	Area B Seine	Fraser Sockeye (29)	428	5,578
	Area B Seine	Squamish Pink (28)	3	11
	Area B Seine	Nitinat Chum (21, 121)	0	0
	Area B Seine	JST Chum (12,13)	1,662	4,995
	Area B Seine	Fraser Chum (29)	0	101
	Area B Seine	MVI Chum (14)	0	0
	Area D Gillnet	Barkley Sockeye (23)	1,070	40
	Area D Gillnet	Barkley Chum (23)	33	4
	Area D Gillnet	Somass Chinook (23)	0	0
	Area D Gillnet	Clayoquot Chum (24)	0	0
	Area D Gillnet	Tlupana Chinook (25)	2	0
	Area D Gillnet	JST Chum (12,13)	17	1,269
	Area D Gillnet	MVI Chum (14)	0	93
	Area E Gillnet	Fraser Chum (29)	30	1,551
	Area E Gillnet	Nitinat Chum (21, 121)	3	44
	Area E Gillnet	Nanaimo Chum (Area 17)	0	27
<b>Total Commercial Catch</b>			<b>9,256</b>	<b>28,886</b>
Recreational	Sport	Juan de Fuca (19,20)	20108	59081
	Sport	Strait of Georgia (14-18,28,29)	10335	34234
	Sport	Johnstone Strait (11-13)	20085	69164
	Sport	WCVI - Inshore (20W-27)	47685	40974
	Sport	WCVI - Offshore (121-127)	24258	65284
	Sport	Fraser River	0	5
<b>Total Recreational Catch</b>			<b>122,471</b>	<b>268,742</b>
First Nations FSC		Johnstone Strait	1,017	0
		Strait of Georgia	230	0
		WCVI	14,329	0
		Fraser River	3,643	418
<b>Total First Nations FSC Catch</b>			<b>19,219</b>	<b>418</b>
First Nations EO		Johnstone Strait		
		Strait of Georgia		
		WCVI		
		Fraser River	154	11,759
<b>Total First Nations EO Catch</b>			<b>154</b>	<b>11,759</b>
First Nations ESSR		Johnstone Strait		
		Strait of Georgia	11,719	0
		WCVI	13,316	0
		Fraser River	43,932	0
<b>Total First Nations ESSR Catch</b>			<b>68,967</b>	<b>0</b>
<b>TOTAL - ALL FISHERIES</b>			<b>220,067</b>	<b>309,805</b>
<sup>a</sup> only includes in-river chum fisheries				
<sup>*</sup> Estimates not yet available for all the assessed Fraser River recreational fisheries				

## Appendix 7: Preliminary 2013 South Coast Chum Catch By Fishery and Area

Fishery	Gear	Fishery (Area)	Numbers	
			Kept	Released
<b>Commercial</b>	Area G Troll	WCVI AABM Chinook (23 - 27, 123 - 127)	176	3
	Taa-wiihak	WCVI AABM Chinook (23 - 27, 123 - 127)	11	0
	Area H Troll	Fraser Sockeye (12,13) <sup>a</sup>		
	Area H Troll	JST Chum (12,13)	42,374	0
	Area H Troll	MVI Chum (14)	0	0
	Area B Seine	Barkley Sockeye (23)	0	0
	Area B Seine	Fraser Sockeye (12,13)	7,893	377
	Area B Seine	Fraser Sockeye (29)	943	226
	Area B Seine	Squamish Pink (28)	0	0
	Area B Seine	Nitinat Chum (21, 121)	0	0
	Area B Seine	JST Chum (12,13)	424,157	0
	Area B Seine	Fraser Chum (29)	6,535	0
	Area B Seine	MVI Chum (14)	7	0
	Area D Gillnet	Barkley Sockeye (23)	1	0
	Area D Gillnet	Barkley Chum (23)	1,418	1
	Area D Gillnet	Somass Chinook (23)	0	0
	Area D Gillnet	Clayoquot Chum (24)	0	0
	Area D Gillnet	Tlupana Chinook (25)	3	2
	Area D Gillnet	JST Chum (12,13)	122,579	8
	Area D Gillnet	MVI Chum (14)	30,872	0
	Area E Gillnet	Fraser Chum (29)	93,189	61
	Area E Gillnet	Nitinat Chum (21, 121)	15,730	1
	Area E Gillnet	Nanaimo Chum (Area 17)	9,773	0
<b>Total Commercial Catch</b>			<b>755,661</b>	<b>679</b>
<b>Recreational</b>	Sport	Juan de Fuca (19,20)	132	34
	Sport	Strait of Georgia (14-18,28,29)	1,000	0
	Sport	Johnstone Strait (11-13)	4,500	26
	Sport	WCVI - Inshore (20W-27)	26	2
	Sport	WCVI - Offshore (121-127)	43	41
	Sport	Fraser River		
<b>Total Recreational Catch</b>			<b>5,701</b>	<b>103</b>
<b>First Nations FSC</b>		Johnstone Strait	10,020	1
		Strait of Georgia	4,790	0
		WCVI	2,009	0
		Fraser River	36,969	42
<b>Total First Nations FSC Catch</b>			<b>53,788</b>	<b>43</b>
<b>First Nations EO</b>		Johnstone Strait		
		Strait of Georgia	0	0
		WCVI	0	0
		Fraser River	112,401	1,720
<b>Total First Nations EO Catch</b>			<b>112,401</b>	<b>1,720</b>
<b>First Nations ESSR</b>		Johnstone Strait		
		Strait of Georgia	18,334	0
		WCVI	25,150	0
		Fraser River	28,103	0
<b>Total First Nations ESSR Catch</b>			<b>71,587</b>	<b>0</b>
<b>TOTAL - ALL FISHERIES</b>			<b>999,138</b>	<b>2,545</b>
°only includes in-river chum fisheries				
*Estimates not yet available for all the assessed Fraser River recreational fisheries				

# Appendix 8: Preliminary 2013 Southern B.C. Commercial Catch Totals By Gear and Area

License Group	Fishing Area	Adult Sockeye Kept	Sockeye Released	Coho Kept	Coho Released	Pink Kept	Pink Released	Chum Kept	Chum Released	Chinook Kept	Chinook Released
Area G Troll	WCVI AABM Chinook (23 - 27, 123 - 127)	0	0	5,499	1,949	38	21	176	3	35,393	5,573
Taaq-wiihak Demo	WCVI AABM Chinook (23 - 27, 123 - 127)	0	0	0	0	161	0	11	0	7,650	0
Area H Troll	Fraser Sockeye (12,13) <sup>a</sup>	0	<10	0	9	<100	0	0	0	0	0
Area H Troll	JST Chum (12, 13)	0	0	7	850	19	26	42,374	0	0	13
Area H Troll	MVI Chum (14)	0	0	0	0	0	0	0	0	0	0
Area B Seine	Barkley Sockeye (23)	9,128	0	0	5	0	0	0	0	0	19
Area B Seine	Fraser Sockeye (12,13)	885	14,589	502	12,360	827,701	171	7,893	377	31	674
Area B Seine	Fraser Sockeye (29)	1,233	10,356	428	5,578	1,451,459	2,215	943	226	75	3,923
Area B Seine	Squamish Pink (28)	3	3	3	11	282,417	2,400	0	0	2	5
Area B Seine	Nitinat Chum (21, 121)	0	0	0	0	0	0	0	0	0	0
Area B Seine	JST Chum (12, 13)	1	12	1,662	4,995	792	5	424,157	0	4	56
Area B Seine	Fraser Chum (29)	0	0	0	101	2	0	6,535	0	0	3
Area B Seine	MVI Chum (14)	0	0	0	0	0	0	7	0	0	0
Area D Gillnet	Barkley Sockeye (23)	11,390	0	1,070	40	0	1	1		171	14
Area D Gillnet	Barkley Chum (23)	0	0	33	4	4	0	1,418	1	0	0
Area D Gillnet	Somass Chinook (23)	0	0	0	0	0	0	0	0	0	0
Area D Gillnet	Clayoquot Chum (24)	0	0	0	0	0	0	0	0	0	0
Area D Gillnet	Tlupana Chinook (25)	0	0	2	0	0	0	3	2	8,688	0
Area D Gillnet	JST Chum (12, 13)	0	1	17	1,269	4	11	122,579	8	0	7
Area D Gillnet	MVI Chum (14)	0	0	0	93	0	0	30,872	0	0	5
Area E Gillnet	Fraser Chum (29)	0	4	30	1,551	1	46	93,189	61	5	21
Area E Gillnet	Nitinat Chum (21, 121)	0	0	3	44	0	0	15,730	0	0	0
Area E Gillnet	Nanaimo Chum (Area 17)	0	0	0	27	0	0	9,773	0	0	0
Maa-nulth HA	Henderson Sockeye (23)	323	0								
<b>TOTALS</b>		<b>22,963</b>	<b>24,965</b>	<b>9,256</b>	<b>28,886</b>	<b>2,562,598</b>	<b>4,896</b>	<b>755,661</b>	<b>678</b>	<b>52,019</b>	<b>10,313</b>

<sup>a</sup> Few er than 3 vessels participated in this fishery therefore the actual catch is considered confidential.

## Appendix 9: Preliminary 2013 Southern B.C. Recreational Catch Totals By Area

Fishing Area	Sockeye Kept	Sockeye Released	Coho Kept	Coho Released	Pink Kept	Pink Released	Chum Kept	Chum Released	Chinook ISBM Kept	Chinook ISBM Released	Chinook AABM Kept	Chinook AABM Released	
Juan de Fuca (19,20)	185	1,485	20,108	59,081	41,476	23,124	132	34	22,922	18,000	NA	NA	
Strait of Georgia (14-18,28,29)	31	532	10,335	34,234	11,268	4,675	1,000	0	11,580	49,889	NA	NA	
Johnstone Strait (11-13)	0	3,091	20,085	69,164	36,446	15,498	4,500	26	21,935	32,267	NA	NA	
WCVI - Inshore (20W-27)	16,796	5,336	47,685	40,974	2,223	2,584	26	2	35,519	27,052	8,080	7,052	
WCVI - Offshore (121-127)	4	0	24,258	65,284	4,079	11,581	43	41	NA	NA	53,632	49,048	
Fraser River			0	5			0	0	2,527	199	0	0	♦
<b>TOTAL</b>	<b>17,016</b>	<b>10,444</b>	<b>122,471</b>	<b>268,737</b>	<b>95,492</b>	<b>57,462</b>	<b>5,701</b>	<b>103</b>	<b>91,956</b>	<b>127,208</b>	<b>61,712</b>	<b>56,100</b>	
All totals are preliminary.													
JDF includes all of 19 and a portion of Area 20 (20 SG).													
WCVI Inshore contains a portion of 20W (West of Sherringham)													
*Estimates not yet available for all the assessed Fraser River recreational fisheries													

**Appendix 10: Preliminary 2013 Southern B.C. First Nations Catch Estimates By Area**

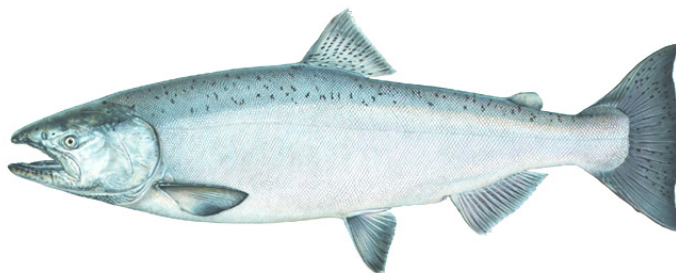
Fishery type	Fishing Area	Sockeye Kept	Sockeye Released	Coho Kept	Coho Released	Pink Kept	Pink Released	Chum Kept	Chum Released	Chinook ISBM Kept	Chinook ISBM Released	Chinook AABM Kept	Chinook AABM Released
<b>FSC</b>	Johnstone Strait	114,339		1,017		31,384	16,502	10,020	1	258			
	Strait of Georgia	7,725		230		133		4,790		843			
	WCVI	34,566		14,329		661		2,009		1,101	0	3,955	0
	Fraser River	260,678	2,605	3,643	418	17,110	3,771	36,969	42	14,109	113		
<b>TOTAL</b>		<b>417,308</b>	<b>2,605</b>	<b>19,219</b>	<b>418</b>	<b>49,288</b>	<b>20,273</b>	<b>53,788</b>	<b>43</b>	<b>16,311</b>	<b>113</b>	<b>3,955</b>	<b>0</b>
<b>EO</b>	Johnstone Strait												
	Strait of Georgia												
	WCVI	21,208		0	0	0	0	0	0	0	0	0	0
	Fraser River	21	14,143	154	11,759	914,122	7,460	112,401	1,720	1,852	6,202		
<b>TOTAL</b>		<b>21,229</b>	<b>14,143</b>	<b>154</b>	<b>11,759</b>	<b>914,122</b>	<b>7,460</b>	<b>112,401</b>	<b>1,720</b>	<b>1,852</b>	<b>6,202</b>	<b>0</b>	<b>0</b>
<b>ESSR</b>	Johnstone Strait					155,830	0						
	Strait of Georgia			11,719				18,334		2,266			
	WCVI			13,316	0			25,150	0	37,596	0	0	0
	Fraser River	0	0	43,932	0	0	0	28,103	0	8,745	0	0	0
<b>TOTAL</b>		<b>0</b>	<b>0</b>	<b>68,967</b>	<b>0</b>	<b>155,830</b>	<b>0</b>	<b>71,587</b>	<b>0</b>	<b>48,607</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>All FN fisheries</b>		<b>438,537</b>	<b>16,748</b>	<b>88,340</b>	<b>12,177</b>	<b>1,119,240</b>	<b>27,733</b>	<b>237,776</b>	<b>1,763</b>	<b>66,770</b>	<b>6,315</b>	<b>3,955</b>	<b>0</b>

## Appendix 11: Preliminary 2013 South Coast Test Fishery Catches

Test-Fisheries	Sockeye retain	Sockeye release	Coho retain	Coho release	Pink retain	Pink release	Chum retain	Chum release	Chinook retain	Chinook release	GRAND TOTAL
Albion Chinook Gillnet	669	0	0	43	177	0	3,308	0	1,054	0	5,251
Albion Chum Gillnet	126	0	0	383	1,029	0	10,902	0	340	0	12,780
Area 12 Chum Seine	8	31	0	2,291	4,400	60	38,426	70,691	0	14	115,921
Naka Creek Sockeye Gillnet	2,136	0	0	101	1,385	0	0	30	7	5	3,664
Area 13 Sockeye Seine	23,685	34,150	0	624	69,980	284,557	223	1,200	0	193	414,612
Area 23 Sockeye Seine	9,358	131	0	137	0	5	0	1	0	225	9,857
Blinkhorn Sockeye Seine	35,550	64,752	0	896	84,478	556,960	772	1,701	0	219	745,328
Cowichan Chum Seine	0	0	0	25	0	0	3,441	1,969	0	2	5,437
Saanich Chum Seine	0	0	0	14	0	0	4,829	6,424	0	0	11,267
Round Island Sockeye Gillnet	1,699	9	233	169	2,633	8	36	0	27	19	4,833
San Juan Sockeye Seine	12,506	3,253	256	4,505	32,253	133,211	9	110	2	1,103	187,208
Qualark Gillnet	3,541	11	56	17	1,444	409	1	1	293	67	5,840
San Juan Sockeye Gillnet	8,778	0	221	671	6,307	0	5	1	271	308	16,562
Whonnock Gillnet	3,426	44	0	482	5,586	74	1,148	18	1,097	17	11,892
Cottonwood Gillnet	2,461	24	0	61	820	1	4	0	116	38	3,525
<b>Grand Total</b>	<b>103,943</b>	<b>102,405</b>	<b>766</b>	<b>10,419</b>	<b>210,492</b>	<b>975,285</b>	<b>63,104</b>	<b>82,146</b>	<b>3,207</b>	<b>2,210</b>	<b>1,553,977</b>

### NOTES:

Area 12 Chum Seine	catch includes 4 sockeye jacks released, 2 sockeye jacks kept, 15 coho jacks released, 2 chinook jacks released
Naka Creek Sockeye Gillnet	catch includes 1 sockeye jack kept, 1 chinook jack retained, 2 chinook jacks released
Area 13 Sockeye Seine	catch includes 403 sockeye jack released, 211 sockeye jacks kept, 10 chinook jacks released
Area 23 Sockeye Seine	catch includes 116 chinook jacks released, 106 coho jack released, 4,047 sockeye jacks kept, 130 sockeye jacks released
Blinkhorn Sockeye Seine	catch includes 539 sockeye jacks released, 366 sockeye jacks kept, 6 coho jacks released, 11 chinook jacks released
Cowichan Chum Seine	catch includes 1 coho jack released, 2 chinook jacks released
Saanich Chum Seine	catch includes 1 chinook jack released
Round Island Sockeye Gillnet	catch includes 2 chinook jacks retained, 1 chinook jack released, all coho retained given to Fort Rupert Native Band
San Juan Sockeye Seine	catch includes 15 sockeye jacks released, 81 sockeye jacks retained, 827 chin jacks released
San Juan Sockeye Gillnet	catch includes 22 chinook jacks retained, 268 chinook jacks released
Whonnock Gillnet	catch includes 8 sockeye jacks retained, 97 chinook jacks retained, 7 chinook jacks released
Cottonwood Gillnet	catch includes 5 chinook jacks released
Qualark Gillnet	catch includes 51 Chinook jacks and 80 Sockeye jacks retained.



**PSC Coded Wire Tag Implementation Team**

**Progress Report for Projects funded through the PSC Coded Wire Tag  
Improvements Program, 2009-2013**

**Report to the Pacific Salmon Commission  
January, 2014**

## **1. Introduction**

### **Background**

The Coded-Wire-Tag (CWT) Improvement Program was established as a condition of the 2009 Pacific Salmon Treaty (PST) Annex IV, chapter 3, paragraph 3(b). The Parties agreed to provide \$7.5 million each in their respective currencies over a five year period to implement critical improvements to the coast wide coded wire tagging program operated by their respective management agencies.

The goal of this coordinated bilateral effort was to improve the precision and accuracy of aspects of the coast wide CWT program for the purpose of better implementing the abundance-based Chinook management regime outlined in Chapter 3 of the 2009 PST Agreement.

The Commission established a bilateral body, the Coded-Wire-Tag Implementation Team (CWTIT) to provide recommendations to the Commission and the Parties on use of the funding to support specific actions identified in the Pacific Salmon Commission (PSC) Technical Report Number 25 (TR 25; Pacific Salmon Commission 2008) and to coordinate implementation to optimize the benefits of the CWT programs operated in the various jurisdictions.

Canada implemented the program in 2009, a year earlier than in the U.S. due to differences in the beginning of the fiscal years. 2013-14 is the final year of funding for this initiative in Canada; the program will continue through 2014-15 in the U.S.

## Benefits

Benefits derived from CWTIT-funded projects can be usefully categorized on a time-scale basis as: (1) “short term” and (2) “legacy”.

### Short Term

“Short term” projects are those that provide temporary benefits, maintain existing capabilities, and/ or require annual investment to maintain.

Examples of short term projects include:

- a. Indicator stock tagging and sampling programs to fill information gaps. Examples of such projects include increased representation of production regions by indicator systems (e.g., Fraser River, Philips River south coast B.C. mainland inlets, Atnarko River central coast B.C., Oregon coastal stocks, and Southeast Alaska stocks) and increased tagging of existing indicators. CWTs from augmented CWT releases began being encountered in two-year-old Chinook in fishery and escapement sampling programs in 2011 but all possible marine ages will not be represented until at least 2015 or later.
- b. Increased coverage and sampling of terminal, sport and selected commercial fisheries resulting in increased accuracy and precision of exploitation rate estimates for CWT indicator stocks, and
- c. Increased effort in monitoring and sampling escapements of indicator stocks, which result in increased accuracy and precision of indicator cohort abundance, survival rates, and exploitation rates.

The full realization of the improvements resulting from these types of CWT projects will depend on the availability of funding beyond the anticipated end of the CWTIT program.

### Legacy

“Legacy” projects are those that will provide lasting improvements to the CWT system, including improvements to database and reporting activities, reduced costs, improved efficiency of CWT data collection and improved accuracy of CWT data and statistics.

Examples of legacy projects include:

- a. Improvements to the coordination of agency CWT programs including collection, transfer and management of CWT heads and data reporting procedures,
- b. Improvements to intra and inter-agency data exchange protocols,
- c. Validation and corrections to data and historical CWT estimation algorithms,
- d. Updating and integration of agency computer programs to improve the consistency, timeliness, and accuracy of CWT data retrieval and data reporting,
- e. Development of a Decision-Theoretic Tool for planning individual or multiple CWT improvement programs (tagging, sampling, catch/escapement estimation), and
- f. Purchase of new or replacement equipment for sampling and processing CWTs, such as electronic CWT detectors and microscopes.



## 2. Achievements

Projects funded under the CWTIT authority fall into two main categories: 1) improvements in CWT tagging, sampling, and harvest and escapement estimation (which address stock and fishery-specific issues as identified in PSC Technical Report 25 (TR 25) Figure 4-2 and 2) improvements in the respective agency /tag labs data coordination and reporting, as identified in TR 25 but not captured in Figure 4-2. Total expenditures by Party and by TR 25 issue are reported in Table 1. Some individual projects address multiple issues, so the allocation of funding by issue is approximate.

Canada has invested close to \$7.5 M over 5 years on a total of 64 individual projects. The majority of investment has occurred on multi-year projects under category 1 (improvements to CWT tagging, sampling, harvest and escapement estimation). Improvement projects under data coordination and reporting have generally been one time investments. The U.S. has invested \$6.0 M over 4 years on a total of 46 individual projects. Like Canada, the majority of funding has been spent on category 1, but a substantial investment has been made on improvements in category 2 including major upgrades to the CWT reporting systems in Oregon and Washington, and minor upgrades to the same in Alaska.

In addition to funding provided by the Parties, Northwest Marine Technology, Inc. has worked with agencies to defray costs of increasing tagging levels, and to reduce costs and improve availability of equipment, such as electronic CWT detectors. The objective of these measures is to reduce uncertainties about CWT-derived statistics.

Figure 1 uses TR 25, Figure 4-2 as a basis to indicate the specific stocks and fisheries that benefited from CWT Improvement funding. The original Figure 4-2 provided results of an evaluation of tagging and fishery and escapement sampling levels using criteria set by workgroup for Chinook salmon. In Figure 1 highlighted stocks indicate stock-specific improvements to tagging rates and / or sampling rates for CWTs in terminal fisheries and escapement. Highlighted marine fisheries indicate fishery-specific improvements to sampling rates, catch estimation, and reporting. Note, a quantitative re-evaluation of PSC TR 25 Figure 4-2 is premature at this time. Results from increased tagging of indicator stocks (rows) and subsequent recoveries of CWTs in escapements and fisheries (columns) are limited. To date the CTC has completed CWT analysis through calendar year 2011; in 2011 fish from increased or newly tagged stocks have just started to appear in escapements, but have not yet recruited to fisheries.

At times it can be difficult to separate CWTIT funded projects from programs conducted by agencies using other funding. For example, in Canada some CWTIT projects were developed to estimate costs and quality of information that would result from the redesign of CWT sampling programs. In the U.S., CWTIT projects have included funding provided for CWT sampling of Washington and Oregon marine fisheries to address the loss of funding from Anadromous Fish Act grants. Operational projects have also included projects to evaluate the feasibility of methods to reduce costs or improve the timelines of providing CWT data.

# Bilateral CWTIT Progress Report to the PSC –January 2014

Table 1. Total investment (2009-2013) in the CWT improvement program by Party and by issue identified in PSC Technical Report 25. Issue priority for each Party as identified in TR 25 is rated as low, medium or high (L, M and H) under the column headed by 'Priority TR 25'.<sup>1</sup>

Issue #	Tech Rpt 25 Issue	Canada			US	
		Priority TR 25	Total Funding	% Funding	Total Funding	% Funding
CWT Tagging and Sampling						
1	Representation of Production Regions	H	\$732,761	9.9%	\$1,106,463	18.5%
2	Determination of Tagging Levels	M-H	\$2,214,074	29.8%	\$153,432	2.6%
3	Representation o f Hatchery Production	L	\$5,500	0.1%	\$132,695	2.2%
4	Low Sampling Rates in Terminal Fisheries	M_H	\$698,500	9.4%	\$417,048	7.0%
5	Low Sample Rates in Escapements	L-M	\$403,765	5.4%	\$5,628	0.1%
6	Uncertainty in Estimates of Escapement or Catch	L-H	\$425,295	5.7%	\$133,339	2.2%
7	Low Sample Rates in Highly Mixed Stock Fisheries	L-M	\$449,900	6.1%	\$1,770,150	29.5%
8	Uncertainty in Estimates of Catch in Mixed Stock Fisheries	M-H	\$324,100	4.4%	\$14,843	0.2%
9	Non-representative Sampling	M-H	\$326,215	4.4%	\$111,604	1.9%
10	Incomplete Coverage of Fisheries or Escapement	L-M	\$611,355	8.2%	\$126,670	2.1%
11	Voluntary Sport Fishery Sampling Programs	H	\$423,940	5.7%	\$0	0.0%
12	Sampling to Facilitate MSF Evaluations	L	\$101,040	1.4%	\$330,595	5.5%
	sub total		\$6,716,445	90.5%	\$4,302,467	71.8%
Data Coordination and Reporting						
13	Timeliness of Reporting	H	\$176,000	2.4%	\$723,585	12.1%
14	Incomplete/No Exchange of CWT Data		\$188,100	2.5%	\$283,078	4.7%
15	Inter/Intra Agency Coordination	M	\$166,500	2.2%	\$82,775	1.4%
16	Unclear Authority to Enforce/Establish Protocols		\$0	0.0%	\$0	0.0%
17	Updating CWT Data is Difficult/Cannot Be Tracked		\$88,000	1.2%	\$149,629	2.5%
18	Validation is Inadequate For Current Uses of CWT Data		\$88,000	1.2%	\$167,850	2.8%
19	Lack of Formal Designation of RMPC as US Public Database & Lack of Adequate Funding Support		\$0	0.0%	\$143,464	2.4%
DTT	Funding Guidance		\$0	0.0%	\$141,586	2.4%
	sub total		\$706,600	9.5%	\$1,691,966	28.2%
	2009-2013 Total		\$7,423,045		\$5,994,433	

<sup>1</sup> The Canadian summary is for 5 years and the U.S. summary is for 4 years.

Since the completion of TR 25, a total of 14 additional CWT indicator stocks have been developed and these occur throughout the geographic range under jurisdiction of the Pacific Salmon Treaty (Figure 2). Four have been added in southeast Alaska, all based on wild smolt tagging programs. Eight have been added in British Columbia. One occurs along east coast Vancouver Island. Two indicators, the Atnarko River and the Phillips River, occur along coastal mainland BC where previously none existed between the Fraser River in the south and the Skeena River in the north. Five others are within the Fraser River drainage and these fill gaps in geographic coverage and life history variation. Two of the eight recently developed BC indicators have been discontinued due to funding shortfalls. In the southern U.S., one indicator has been added in Puget Sound and one in coastal Oregon. These additional indicators extend the geographic coverage both northward and southward (Figure 2, see Chilkat River - 1 in Alaska and Elk River – 14 in Oregon).

The cohort analysis procedure used in the annual exploitation rate procedure of the Chinook Technical Committee has been applied to 11 of the additional indicators and the results will be published for the first time in the annual report on the exploitation rate analysis and Chinook Model calibration from 2013.

STOCK INFORMATION		REGIONAL MARINE FISHERIES																								
Region	Stock	Key Issues					Fishery Specific Key Issues																			
		Release	Escapement (Hatchery)	Escapement (Sp Grounds)	Term Com	Term Native	Term Spt	SEAK Troll	SEAK SPT	SEAK Net	NCBC Troll	NCBC Sport	NCBC Net	WCVI Troll	WCVI Sport	Geo Strait Troll	Geo Strait Spt	SBC Net	WAOcn Troll	WA Ocn Sport	PS Sport	WA Net	Col Riv Sport	Col Riv Net	OR Coast Troll	OR Coastal Sport
Alaska	Alaska Central Inside	1	1	1				1	2																	
	Little Port Walter	1	1	1				1																		
	Alaska Southern Inside	1	1	1	1			1	2																	
Canada	Big Qualicum	1	1		3	3	3	2			3						3									
	Chilliwack (Harrison Fall Stock)	2		2		3							1	3		2		1								
	Cowichan	1	1			3	3						2	3							2					
	Kitsumkalum	1				3	3	1			3															
	Puntledge	2	1		3	3	3	2			3						3									
	Quinsam	1	1	1	3	3	3	1			3															
	Robertson Creek	2	1	1	1	2	3	1			3				3											
Atnarko / Snootli	3			3	3	3	2			2	3	2														
Washington	George Adams Fall Fingerling	1	1	3	2		3							1	3				1		1	2				
	Green River Fall Fingerling	1	1	2	1									1	3		3		2		1	1				
	Grovers Creek Fall Fingerling	1	1											1	3				1		1	1				
	Hoko Fall Fingerling	3	1	2				1			2															
	Nisqually Fall Fingerling	1	1		1		3							1							1					
	Nooksack Spring Fingerling	2	1	2			2							1	3		3									
	Queets Fall Fingerling	2		3	1			1			1	3														
	Samish Fall Fingerling	1	1				3							1	3		3		2		2	1				
	Skagit Spring Fingerling	1	1											1	3						2					
	Skagit Spring Yearling	2	1											1	3						1					
	Sooes Fall Fingerling	2	1		2			2			2	3														
	South Puget Sound Fall Yearling	1	2		2										3						2	2				
	Skagit Summer Fingerling	3						1				3		2	3		3									
Stillaguamish Fall Fingerling	3	1	2										2	3		3										
White River Spring Yearling	3	1																		2						
Oregon	Salmon River	2		1			2	1			1															
Columbia River	Cowlitz Tule	1	1	3			2						2	3				2	2					2	2	
	Hanford Wild	1		2			1			2														1		
	Columbia Lower River Hatchery	1	1											1	3			1	2				1	1		
	Lewis River Wild	3					2			2			2	3				2					2	2		
	Lyons Ferry	3												2					1	1			1	2		
	Spring Creek Tule	1	1											1	3				1	1			1	1		
	Columbia Summers	1	1				1				1	3		1	3			1						1		
	Upriver Bright	1	1				1				2													1		
	Willamette Spring	1	1				2	1																1		

1 indicates that all criteria were met; 2 indicates that one criteria is not met; 3 indicates that two or more criteria are not met.

Figure 1. PSC TR 25, Figure 4-2 revised to indicate stock and fishery-specific issues addressed by CWT Improvement funding. Highlighted stocks (rows) indicate stock-specific improvements to tagging rates and / or recoveries of CWTs in terminal fisheries and escapement. Highlighted marine fisheries (columns) indicate fishery -specific improvements to sampling, catch estimations, and reporting. [Figure 4-2. Results of evaluating tagging and fishery and escapement sampling levels using criteria set by workgroup for Chinook salmon. A blank cell indicates a fishery did not represent over 2.5% of the total exploitation for a stock. Green (1), yellow (2), or red (3) cells represent different situations with respect to the criteria as noted below; corresponding numbers are useful for black and white reproduction.]

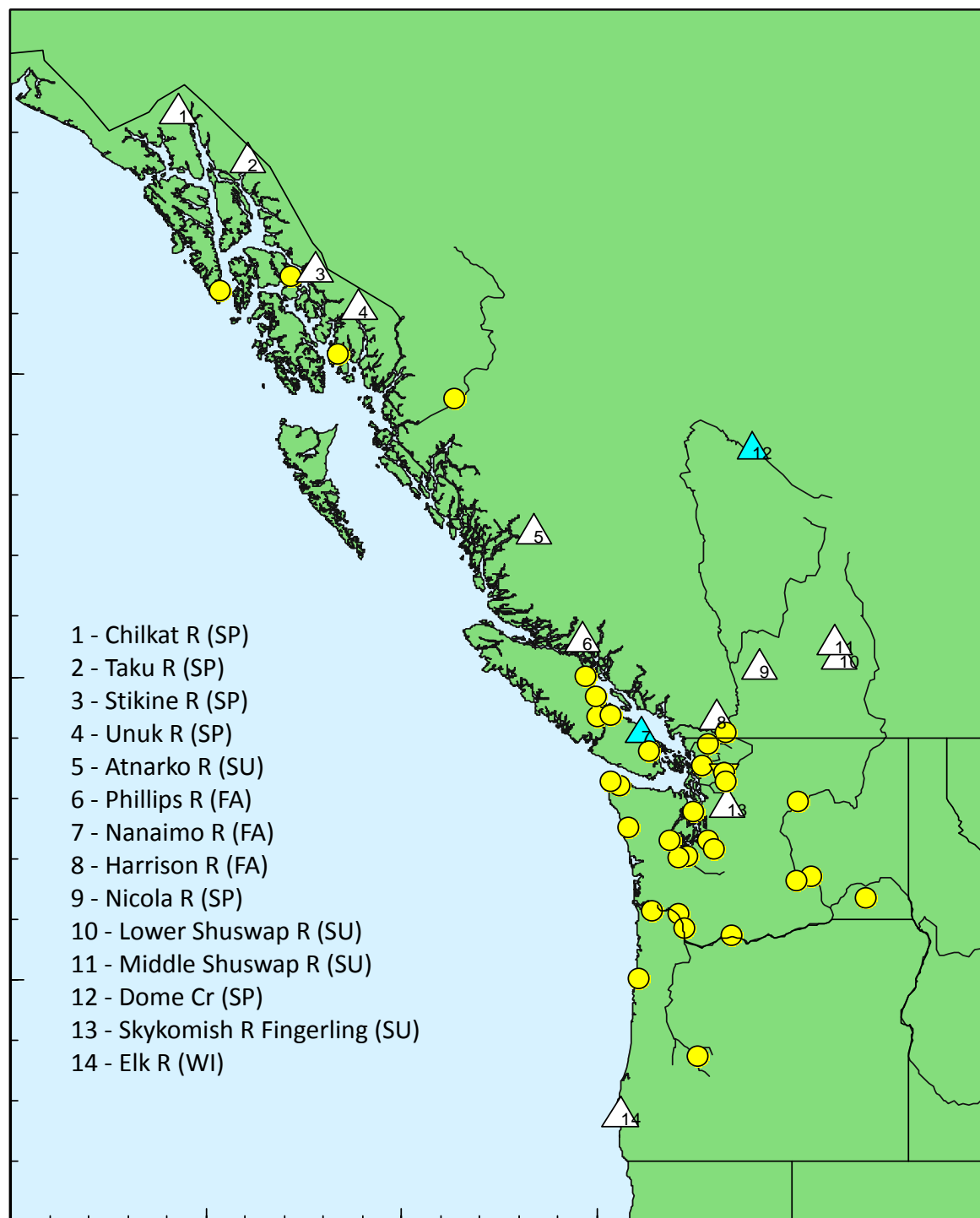


Figure 2. Geographical distribution of coast wide Chinook salmon CWT indicator stocks. Yellow circles mark previously existing CWT indicators. Numbered triangles mark the location of CWT indicators developed since the completion of TR 25. Their names are given in the legend followed by adult run timing in brackets (SP = spring, SU = summer, FA = fall and WI = winter). Blue triangles mark the location of discontinued indicators.

## Short Term Improvements

Highlighted stocks and fisheries in Figure 1 indicate where CWT improvement funding was directed. Many of the CWT improvement projects addressed stock and/or fishery-specific issues of inadequate CWT tagging, catch monitoring, and sampling rates identified in TR 25, Figure 4-2. Benefits from these types of projects are considered short term and will require annual investment to maintain. Once results from projects become available, the color of many of the cells in Figure 4-2 will change (improve). In the interim, Table 2 provides identifies specific examples of improvements in key issues identified in TR 25 directly attributed to CWT funding.

Table 2. Improvements in releases, escapement, and fisheries (terminal and ocean) resulting from CWT improvement funding.

Key Issues		
Tagged Releases	Canada	Increased CWT application at 10 Canadian ER indicator stocks from 2.5M in 2007 to average 4.7 M tags during 5 year funding period meeting all tag application standards for desired precision in estimates (TR 25, table 5.1). CWTs from augmented releases have been encountered in fisheries and escapement sampling program since 2011 and will continue to be encountered until 2018.
	US Alaska	Wild CWT indicators were developed and implemented on several Southeast Alaskan rivers, including the Stikine, Taku, and Chilkat rivers. Development of several transboundary and SEAK wild indicators allows for more precise estimates of exploitation rate and survival in northern and transboundary fisheries.
	Oregon	Extended the geographic coverage of releases to include the mid-Oregon Coastal production area.
Escapement (Hatchery)	Canada & US	Sampling rates in Canadian and US hatcheries were adequate prior to the 5 year funding period. With increased CWT application in Canada, the number of tagged fish recruiting to escapement has increased and target sampling rates have been maintained.
Escapement (Spawning Grounds)	Canada	With increased CWT application, sample rates were maintained or increased at 7 indicators, including a new BC Central Coast indicator at Atnarko River (Snootli Hatchery).
	US Oregon	Escapement sampling rate has been maintained above 12% since the CWTIT has supported tagging and recovery efforts in the Elk river from 2010 through 2012. Total terminal escapement sampling rates (sport, hatchery and spawning ground) have increased from 34% in 2010 to 38% in 2011 to 61% in 2012.

Terminal Commercial	Canada	With increased CWT application, terminal commercial fishery sample rates were maintained or increased at all indicators, including a new BC Central Coast indicator at Snootli Hatchery / Atnarko River (Snootli Hatchery). Sampling the BC Central Coast terminal fishery has not been conducted since 2004. CWTIT funds supported sampling at 40% to meet CWT standard target of 20 observed tags for all ages combined.
	US Alaska	Maintained or increased sample rates of over 30% in SEAK drift gillnet, troll and purse seine fisheries. CWTIT funds used to purchase new electronic detection wands, which reduced the incidence of “No Pin” heads processed and sent to dissection lab. This resulted in direct savings in shipping, processing and handling costs.
Terminal Native	Canada	Terminal Native economic opportunity fishery sampling targets were met for Robertson Cr. Terminal Native food, social and ceremonial fisheries sampling targets were met for Atnarko River and Robertson Creek and improvements were made for Big Qualicum River, Cowichan River, Lower Shuswap River and Harrison River indicator stocks.
	US Washington	Makah Fisheries utilized CWTIT funding to purchase tag reading microscope and other related sampling supplies and staff time to maintain sampling rates of 30-40% in the summer troll fishery. In 2013, ~3,200 heads with CWTs were processed by the Makah.
Terminal Sport	Canada	CWT estimates for terminal sport fisheries were historically calculated using average sample rates from coast-wide ocean fisheries. Data recovery projects have resulted in improvements calculating CWT estimates by using data from terminal sport fishery sampling and creel survey data.
	US Washington	Achieved sample rates of 9-30% on 4 major Puget Sound freshwater fisheries (Nisqually, Skagit, Skykomish, Skokomish). Conducted study to develop and provide guidance on the use of indirect methods for estimating the numbers harvested CWT'd Chinook in freshwater fisheries and/or reduced cost methods of direct sampling for CWTs in freshwater fisheries. This is a legacy project.
	Oregon	Sample rates of 34-40% in Elk River terminal sport areas are achieved over duration of CWTIT support.

Fishery Specific Issues		
SEAK Troll	AK	Increased sample rates in troll fishery from 29% in 2003-2007 to 34% from 2010-2013.
SEAK Sport	AK	Increased sample rates from 16% in 2008/09 to 24% in 2013.
SEAK Net	AK	Increased sample rates in seine and gillnet fisheries from 2009 mean of 19% to 2013 mean of 32%.
NCBC Troll	Canada	Improved representative freezer troll fleet sample acquisition meeting DFO quality control standards – increased sample rates from 8% in 2000-2003 period to 22% in 2010-2012 period.
NCBC Sport	Canada	Increased sample rates for Haida Gwaii (HG) / Queen Charlotte Islands (QCI) sport fishery from 13% in 2000-2004 period to 46% in 2010-2012 period.
WCVI Sport	Canada	Increased sample rates from 13% in 2000-2004 period to 24% in 2010-2012 period.
Georgia Strait Sport	Canada	Increased sample rates for Georgia Strait North sport fishery from 31% in 2000-2004 period to 37% in 2010-2012 period. Increased sample rates for Georgia Strait South sport fishery from 23% in 2000-2004 period to 27% in 2010-2012 period. Increased sample rates for Juan de Fuca sport fishery from 20% in 2000-2004 period to 22% in 2010-2012 period.
WA Ocean Troll	WA	Maintained a sample rate of 41-45% in non-Treaty troll fishery from 2010-2013.
WA Ocean Sport	WA	Maintained a sample rate of 33-45% in ocean sport fishery from 2010-2013.
Puget Sound Sport	WA	Achieved sample rates of 9-30% on 4 major Puget Sound freshwater fisheries Legacy project to develop guidance for using indirect estimation techniques to estimate the numbers of harvested CWT'd fish in freshwater fisheries.
OR Coastal Troll	OR	Maintained sample rates of 20% for all management areas from 2011-2013, except Tillamook in 2012 (18-66%).
OR Coastal Sport	OR	Maintained sample rates of 20% for all management areas from 2011-2013 (21-61%).

The following examples provide additional detail for 6 of the improvements listed in Table 2:



### *Increased CWT Application at Canadian Indicators*

The CWTIT program funded the increase in CWT application at several Canadian indicators, and has resulted in direct benefits in the estimation of fishery-specific exploitation rates for all indicator stocks. Direct improvements can be measured for all indicators, assuming that the proportional increase in tags released is reflected in the observed tag recoveries. Using the Cowichan River stock as an example, there were significant improvements in the rate of recovery of CWTs in fisheries and escapement in the return years from increased tagging. Given the conservation status of this stock, its relative abundance can effect significant changes to mixed stock fisheries, particularly on WCVI. In 2012 there were 20 and 31 observed Cowichan CWTs in the WCVI sport and troll fisheries, respectively. In the absence of increased tagging at Cowichan in brood years 2008-2012, it can be assumed that observed recoveries would have been approximately 7 and 10 in those respective fisheries, which fall below the criteria of 20 observed tags for all ages per fishery. This increase in observed tags resulted in increased precision of ER estimates for these fisheries, and can be directly attributed to the increase in CWT application. Increased CWT application for brood years 2008-2010 have directly resulted in 435 additional observed CWTs in fisheries for the Cowichan River stock.

Table 3 summarizes the additional observed CWTs in fisheries for all Canadian indicators that are directly attributable to the CWTIT increased tagging projects as of November 2013. It should be noted that the recoveries are tabulated by brood year, so increased CWT recoveries will be expected from returning cohorts until 2018. Results from 2008-2011 brood years are incomplete; as not all cohorts will have recruited to the fisheries and escapements (fewest returns from most recent brood years; significant increases will occur).

Table 3. Additional observed fishery CWTs attributable to expanded tagging at 10 Canadian indicators, by brood year, recovered in calendar years 2010-2013.

	Brood Year			
	2008	2009	2010	2011
Calendar Years for recovery	2010-2013	2011-2013	2012-2013	2013
Atnarko	137	227	42	1
Big Qualicum	-	28	17	2
Cowichan	183	137	115	1
Chilliwack (AFC only)	-	130	156	1
Harrison	31	15	16	0
Kitsumkalum	29	14	0	-
Lower Shuswap	32	153	206	0
Nicola	-	4	0	-
Quinsam	-	26	4	1
Robertson	132	23	14	0

### *Atnarko Indicator Stock*

The CWT expert panel report (TR 25) identified a lack of indicator stocks to represent BC central coast Chinook stocks (no indicator stocks on the BC mainland between the Skeena and Fraser rivers). This fund provided an opportunity to augment existing tagging and escapement monitoring programs on the Atnarko River (Snootli Hatchery). A comprehensive CWT tagging and recovery indicator program began in 2009 that involved releasing sufficient numbers of CWT fish from the Snootli hatchery and sampling for estimation of CWTs in the spawning escapement and terminal fisheries (First Nation, commercial gillnet, and sport). The majority of CWTIT resources were used to generate an accurate and precise (mean CV = 9%) estimate of escapement with high CWT sampling rates (mean = 19%). The spawning escapement ranged from 6,000-27,000 adult Chinook during 2009-2013. Terminal First Nation and commercial gillnet fisheries were sampled intensively, with respective mean sample rates of 86% and 45%. During the early years, CWTIT resources supported the estimation of the terminal sport fishery catch and CWT sampling, however extremely large floods in 2010 and 2011 caused major changes to the river and fishery access points rendering the creel survey method impractical. Subsequently, indirect catch monitoring methods have been used to estimate CWT recoveries in the terminal sport fishery.

### *Elk River Tagging and Terminal Sampling*

The Elk River CWT release group represents a large geographic Chinook production area gap which is not currently accounted for in PST management. At the far south end of the range of far-north migrating fall coastal Chinook, the Elk River stock is intercepted in troll fisheries in Southeast Alaska, Northern BC, Washington and Oregon troll fisheries, and to a lesser extent in troll fisheries off of the West Coast of Vancouver Island. Those CWT releases from the Elk River are used to model the potential impact of fisheries on naturally produced stock from the mid-Oregon coast. Those basins which are presumed to be represented by the Elk include the Umpqua, Coos-complex, Coquille and Sixes River basins. CWT releases and subsequent terminal recoveries have spanned from base-period years (1979-82) through recent years, but have been jeopardized by budget constraints. CWTIT support has allowed for a fully functional release group size (200k+) and appropriate terminal area sampling to occur in spite of recent management resource austerity.

### *Lower Fraser Area First Nations Fisheries Sampling*

The CWT expert panel report (TR 25) recommended that terminal native fisheries in British Columbia should be sampled to produce statistically valid and representative CWT recoveries to improve precision of estimates of fishery impacts and cohort size. CWTIT program funding from 2011-2013 supported collaborative work with the Lower Fraser Fisheries Alliance (LFFA) and DFO to hire seasonal technicians to provide education and technical support to 29 First Nation communities in the Lower Fraser Area (LFA). Funds were used to build the relationship between DFO and the LFFA and to support communication strategies to engage LFA First Nations communities in increasing knowledge and awareness of the importance of CWT program and CWT sampling. Additionally, funding was used to aid First Nations monitoring organizations to implement changes and build tools to support CWT random and representative sampling and data collection to increase the number of head samples collected.

As displayed in Tables 4 and 5 below, both the total number of samples and the temporal and spatial distribution of the samples collected for Chinook salmon, continued to improve through the funding period. In addition, DFO and First Nations staff on the fisheries observed an increased awareness of the program this season including multiple incidences of fishers having samples ready for collection by the sampler in advance of a prompt.

Table 4: Summary of Chinook head submissions by area from Lower Fraser First Nations Food, Social and Ceremonial fisheries, 2010-2013.

Area	Chinook							
	2010		2011		2012		2013	
	#	%	#	%	#	%	#	%
Below Port Mann	-	0%	-	0%	2	9%	11	24%
Port Mann to Mission	-	0%	1	6%	2	9%	11	24%
Mission to Harrison	-	0%	1	6%	3	14%	7	16%
Harrison to Hope	7	88%	8	50%	5	23%	5	11%
Hope to Sawmill	1	13%	6	38%	10	45%	11	24%
<b>Total :</b>	<b>8</b>		<b>16</b>		<b>22</b>		<b>45</b>	

Table 5: Summary of Chinook head submissions by month from Lower Fraser First Nations Food, Social and Ceremonial fisheries, 2010-2013.

Month	Chinook							
	2010		2011		2012		2013	
	#	%	#	%	#	%	#	%
April	-	0%	-	0%	-	0%	-	0%
May	-	0%	-	0%	-	0%	-	0%
June	8	100%	3	19%	1	5%	5	11%
July	-	0%	2	13%	14	64%	10	22%
August	-	0%	9	56%	7	32%	25	56%
September	-	0%	2	13%	-	0%	5	11%
October	-	0%	-	0%	-	0%	-	0%
<b>Total :</b>	<b>8</b>		<b>16</b>		<b>22</b>		<b>45</b>	

### *Haida Gwaii Sport Fishery*

The CWTIT program improved the quality and quantity of data for the Haida Gwaii (HG) sport fishery, which is the second largest sport fishery in Canada and part of the NBC AABM fishery. First the quantity was increased by working with more fishing lodges to collect heads from adipose fin clipped Chinook and to ship them either to established Mark Recovery Program locations on HG or to Vancouver at the end of the fishing season. Also, the network of Head Depots and servicing was expanded to make it

more convenient for non-lodge fishers to provide heads from adipose fin clipped Chinook. These efforts and the support by the lodges were extremely successful, with the submission rates increasing from an average of 11% during 2000-2004 to 43% during 2009-2012 and CWT recoveries also quadrupled from an average of 142 per year (2000-2004) to 546 per year (2009-2012; Figure 3). About two thirds of the NCBC sport fishery catch is by HG sport fishery and the remainder is by ISBM sport fisheries in the North Coast, Central Cast and Johnstone Strait. The cells in Figure 4-2 will change from red to yellow or green, depending on the results from the ISBM fisheries. Education about the CWT program with the Haida Fisheries Program Creel Survey managers resulted in many more Chinook being examined for adipose fin clips and the mark rate data being reported regularly via in-season bulletins. Lastly, all the creel and lodge logbook data were reviewed from 1995 onward and then used to directly estimate CWT recoveries, whereas previously the average sample rates were used from South Coast ocean sport fisheries. The CWTIT funding was timely and coincided with the recent increase of mass marked far north migrating Chinook from Washington and Oregon based on the trends in adipose fin clipped Chinook with and without a CWT. Continued mass marking of Chinook and higher submission rates will contribute to financial challenges after the Canadian CWTIT program sunsets in 2013.

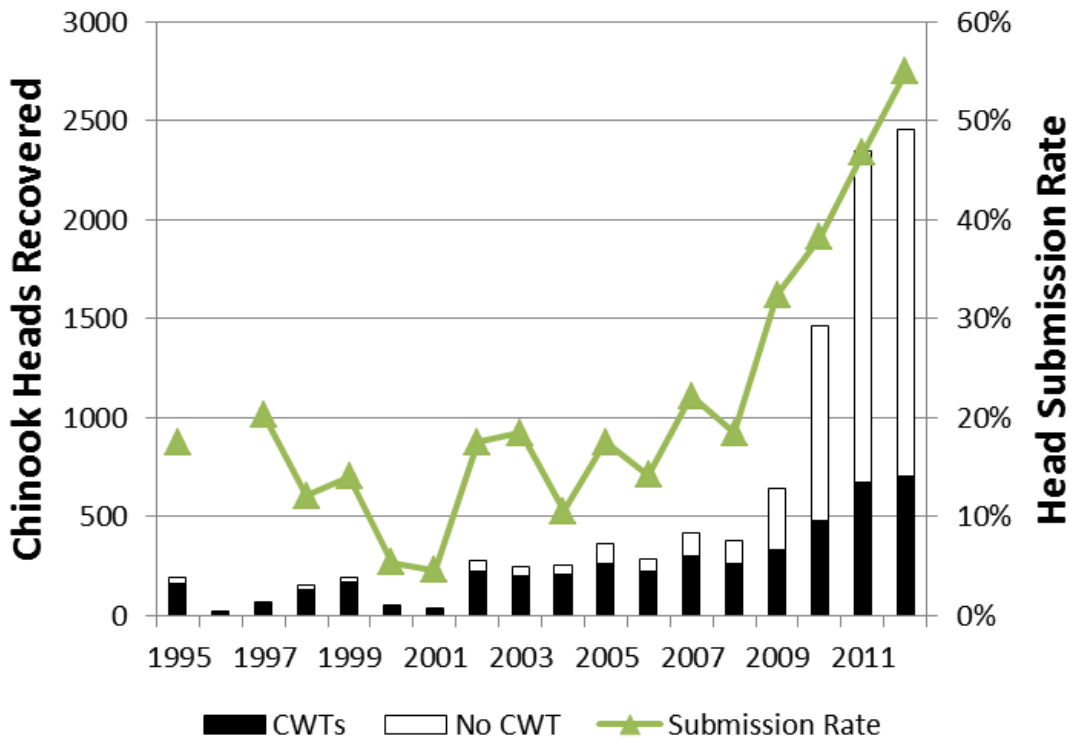


Figure 3. The number of Chinook heads and CWTs recovered from adipose-clipped fish and head submission rates for the Haida Gwaii sport fishery in the NBC AABM fishery, 1995-2012.

### *Oregon Ocean Troll and Sport Electronic Sampling*

Beginning in 2011, full electronic sampling has been successfully instituted in Oregon's oceanic sport and commercial Chinook fishery sampling programs. Troll sampling rates exceeding the 20% target have been maintained throughout all sampled strata (save one exception in the Tillamook area in 2012), with sampling rates commonly exceeding 40%. Hundreds of unmarked CWT'd Chinook have been sampled annually in both sport and commercial sectors which were previously not being electronically sampled. Unmarked Chinook have accounted for 8% of CWT recoveries from all ocean caught Chinook coast wide in 2013, compared to 7% in 2012 and 13% in 2011. In the Columbia River catch area, 23% of those Chinook caught in 2013 would have gone unsampled, compared to 13% of the catch in 2012 and 26% in 2011. Funding available through Anadromous Fish Act grants that used to sustain ocean salmon fishery sampling programs in the US was discontinued in 2009. As a result, ocean sampling programs in both Washington and Oregon were left with programmatic deficiencies. With the support of CWTIT in lieu of the Anadromous Fish Act grants, these fisheries are now being sampled appropriately in both Oregon and Washington.

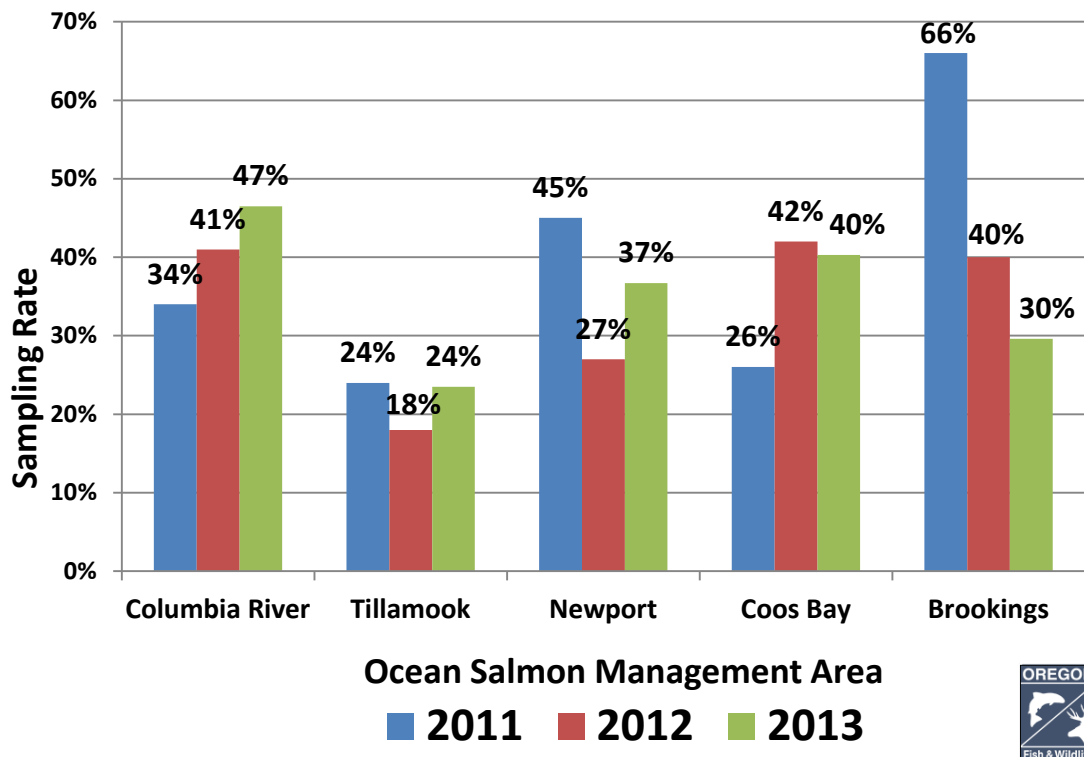


Figure 4. The sampling rates for Oregon Ocean Troll, 2011-2013.

### **Legacy Items:**

Since the CWT was first widely employed as a primary tool for salmon management in the 1970's, technology has changed dramatically. Yet many agencies still struggle to try to make do with equipment

that has long their passed useful life and processing/reporting systems that were built piecemeal using equipment and computing platforms that are no longer in common use. Efficiencies have been improved and cost reduced for the current CWT system by investing in new equipment and integrating or updating CWT processing/reporting processes. Legacy projects involve investments in improving the infrastructure of the CWT system. They are expected to provide lasting improvements to the CWT System by reducing costs and/or improving efficiencies. In addition to the direct improvements from physical improvements, these types of projects can also produce benefits that improve agency understanding, societal acceptance, and public cooperation in data collection processes. Examples of legacy projects are summarized below in three main categories: (1) Equipment acquisition; (2) Improvement in data reporting systems; (3) data collection; and (4) Project Planning.

### Equipment Purchase



CWTIT funds were utilized to purchase new or replace existing equipment utilized in the CWT system. This equipment will provide improvements to the CWT system for several years beyond the end of the CWTIT program until replacement is eventually required.

*ADFG estimated that the use of wand detectors would save about \$700,000 by not having to process and ship no pin heads over the next 10 years while increasing sampling efficiency and rates and reducing handling of fish in processing facilities. ADFG reports that the detectors eliminated the need to remove approximately 5600 heads from no pin fish in the SEAK Troll fishery in 2013 (56%, in a year of lower than average catches). In addition to cost savings, this technology has improved relations with fish processors by reducing the need to handle fish and incur economic losses suffered in lucrative head-on markets.*

CWTIT funds have purchased hundreds of new T-wand detectors. These wands have improved the efficiency and reliability of CWT recovery efforts while reducing costs for processing and transportation. The number of fish heads removed can be substantial. ADFG reported (<http://tagotoweb.adfg.state.ak.us/CWT/>) that "Since 1976, 128 million salmon were sampled in commercial, cost recovery, and sport fisheries and spawning grounds at 216 locations throughout Alaska. To date, 310,513 individual sampling events have been recorded on forms and entered into the database. 1.17 million heads weighing approximately 906.7 tons were removed from adipose clipped salmon and sent to the lab in Juneau for tag removal and decoding."

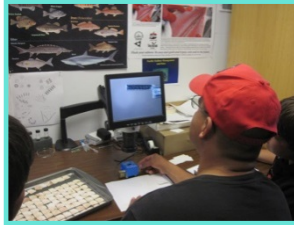
Mass marking has increased the number of ad-clipped fish which do not contain a CWT (no pins), requiring the removal and processing of fish heads that do not contain CWTs. The use of wands has eliminated the need to take heads from no pin fish, reducing costs for processing and transportation.



CWTIT funds have supported the purchase of equipment to increase the efficiency of field operations. Field samplers can enter sampling and CST recovery data into small field computers called data loggers for later electronic transmission (usually via internet) for validation and processing. Formerly, samplers reported data on paper forms then shipped them for electronic conversion. Data loggers speed up sampling, reduce data transcription errors, and provide users with faster access to CWT information for harvest

management decisions.

### *Old to New Dissecting microscope*



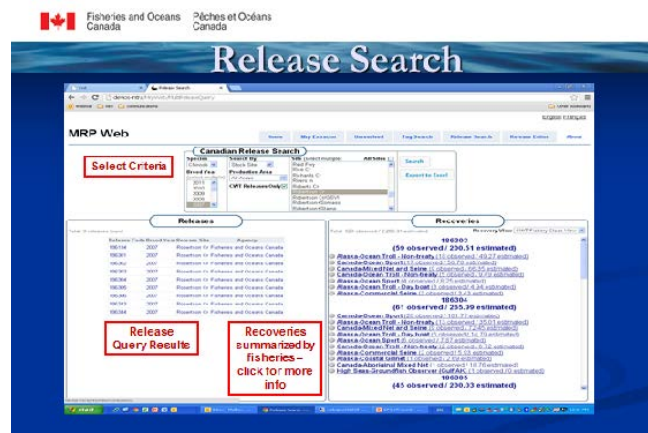
*An electronic microscope purchased by the Makah Tribe has greatly increased the number of tags that can be read per shift and made the data available more quickly.*

CWTIT funds have purchased digital imaging system (DIS), consisting of a dissecting microscope equipped with a digital video camera and hi-resolution monitor for viewing and reading CWTs. Electronic microscopes have substantially reduced error rates and the time to decode CWTs while improving working conditions.

### *Data reporting systems*

CWTIT Projects have supported several major programs to update and improve reporting and access to CWT data. As with hardware and equipment projects, the useful life of CWT software is limited by changes in technology and computing platforms. In addition, there is concern regarding the potential future loss of agency expertise for future program/system maintenance and development. CWTIT-funded legacy projects of this type include:

- DFO Salmonid Enhancement Program (SEP) database improvements improve CWT data coordination and reporting procedures, and develop a formal set of Best Practices for the coordination (collection, transfer and management) of CWT heads and data at all DFO escapement projects. Archived escapement data from DFO enhancement programs are being reviewed to ensure that standardized analytical techniques and data verification procedures have been employed.





- DFO has undertaken the review of legacy FORTRAN system and data, converting to current technology and improving interfaces within DFO reporting systems (hatcheries system, catch monitoring system, and escapement systems). A new web-based query interface provides faster, easier access to CWT data with many new features for all users, from beginner to advanced. These projects will provide lasting benefits for access to information and timeliness of data exchange to the Regional Mark Information Centre (RMIS). Projects include validation/correction of data and historical algorithms.

*In addition to increasing operational efficiency and reducing time lags and errors in data reporting, these projects have enhanced agency staff understanding and coordination in the various components of the CWT system and identified opportunities for future improvements. Coupled with investments in equipment upgrades, investments in data management have substantially reduced the time required for data entry. For example, the use of data loggers in ODFW's data reporting systems improvement project has reduced staff time required for coastal monitoring projects by 9 weeks compared to previous methods. Additionally, within ODFW's ocean monitoring program, the institution of the new CWT reporting system has reduced staff time for report preparation from over a month to three days.*

- Improvements to the DFO Fisheries Operating System (FOS) commercial database establish standard protocols for commercial catch (including test-fishing data) reporting which will improve timeliness of reporting and availability of final commercial catch estimates.
- Updating and integration of Oregon's computer programs to improve the consistency, timeliness, and accuracy of CWT data reporting.
- Updating several aspects of Washington's CWT reporting system to improve the consistency, timeliness, data retrieval and accuracy of CWT data reporting.

### **Data Collection Improvements**

The collection of CWT recoveries from freshwater sport fisheries and escapement can be an expensive process. CWTIT funds have been employed to develop more cost-effective approaches to provide data for CWT analysis. For example, in Puget Sound, a 3-year study was supported to develop indirect methods to estimate CWT recoveries by age and stock in freshwater sport fisheries. Data from the study will provide the basis to correct past estimates and provide estimates in the future.

*These projects have improved the accuracy and completeness of historical CWT data as long ago as the 1970's and provided tools to increase knowledge of information and the efficient access and use of CWT data for stock and fishery assessment. For example, the availability of historical data on recovery locations of CWTs within tagged fish has revealed an emerging problem with tagging. The size of CWT releases is increasing to compensate for reduced survivals and lower fishery harvest rates; inconsistency in tag placement within fish will affect the efficiency and suitability of equipment (e.g., tag detection procedures and equipment, corers) of future CWT recovery efforts.*

### **CWT Project planning**

CWTIT funding was employed to develop a PC-based Decision-Theoretic Tool (PlanIt!) to facilitate planning of individual or multiple CWT improvement projects. PlanIt! provides a consistent framework for evaluating the impacts of projects on CWT statistics. Changes in survivals and fishery harvest rates



have increased the complexity and difficulty of planning CWT experiments and programs. The CTC relies heavily on CWT-based statistics for modeling, stock/fishery assessments, and evaluation of fishery regimes. The precision of CWT-based statistics (as reflected by coefficients of variation) depends on the number of CWTs recovered, which depend on factors such as release size, sampling rates, and estimates of catch/escapement estimation. PlanIt! enables a variety of questions to be addressed, such as:

- How many tags should be released to provide a desired level of precision about an estimate of stock-age-fishery exploitation rates?
- How will increasing the release size be expected to affect the uncertainty surrounding estimates of total exploitation rates?
- How will changes in a fishery sampling rate be expected to alter the precision about estimates of stock-age exploitation rates of CWT groups harvested by that fishery and CWT processing costs?
- How would improved estimates of catches or escapements affect the precision about estimates of exploitation rates?



### 3. Summary & Discussion

The coded-wire tag is the primary tool that the PSC Chinook and Coho Technical Committees rely upon for regional modeling and stock/fishery assessments. The CWT system provides data that are exact to stock and age and coastwide agreements provide standards for sampling and reporting. A memorandum of understanding to the 1985 Pacific Salmon Treaty commits the parties to maintain a VIABLE coast wide CWT system, where viability is defined as the confidence managers have in using parameter estimates based on CWTs from the indicator stock programs to make inferences for associated natural stocks.

No other technology has been demonstrated to be capable of providing the coastwide data needed for PST and regional management. Although methods such as PBT (parental based tagging) are being explored, replacement of CWTs would require a whole new system to be developed, implemented, agreed to and coordinated. It is clear that any alternative would cost more than the CWT system on an annual basis, most of the necessary components for an alternative are not in place, and a parallel process would have to be run for at least 4 years. In a time of increasing budgetary concerns, investigation of new technological approaches to provide data for salmon fishery management diverts monies that can be used to maintain the existing CWT program at necessary levels of tagging and recovery.

The CWTIT program has enabled many improvements to the CWT system over the last 5 years, with short-term, long-term and legacy benefits. In addition, the availability of funding to support CWTIT has enabled valuable CWT recovery programs to continue which would otherwise have not been possible

due to the loss of funding support (e.g., Anadromous Fish Conservation Act grants in the U.S.). The CWTIT recommends that funding continue to maintain improvements and provide for completion of key projects beyond the 5-year sunset of the CWT Improvement program. Although a detailed plan for continuation has not been developed, the cost of this continuation is estimated to be approximately \$1 to \$1.5 million per year for both parties combined. Long-term and legacy elements already funded are expected to improve efficiencies and reduce costs for other elements of the CWT system. The CWTIT recommends that the PSC directly support efforts to fund some of these elements through the northern and southern endowment funds of the PSC, the US LOA, and appropriations processes. The CWTIT is concerned that fiscal pressures are seriously eroding the capacity of management agencies in both the U.S. and Canada to perform basic stock and fishery assessments. Agency proposals to CWTIT covering a wide range of measures and activities normally attributed to standard assessment programs have surfaced in recent months. These have included projects designed to respond to the reduction or elimination of tagging, catch and escapement sampling and estimation programs, processing and reporting systems. The CWTIT recommends that the PSC charge the PSC Technical Committees with the task of evaluating the ability to provide the information required for implementation of PSC fishery regimes and to support future negotiations in light of agency-proposed measures and actions to address budgetary constraints.

CWTIT provides an annual review to monitor and evaluate the status of the CWT program. Although not project related, the CWTIT program has improved communication and collaboration among agencies. CWTIT workshops have provided opportunities for agency staff involved in all aspects of the CWT program (tagging, monitoring, analysis, data management, etc.) to share information and expertise to improve the CWT program through the exchange of information, discussion of issues, and experience. For these reasons, the CWTIT recommends that arrangements be made to continue annual reporting by CWTIT or another body with expertise within the PSC family.

The CWTIT plans on completing a report by February of 2015 that will synthesize and document the results of the CWT Improvement Program's five years specified in the 2009 PST Agreement. The report will be published in the PSC technical report series.

## References

Pacific Salmon Commission 2008, An Action Plan in Response to Coded Wire Tag (CWT) Expert Panel Recommendations. A Report of the Pacific Salmon Commission CWT Workgroup. 171 p. [PSC Tech. Rep. No. 25, March 2008](#).

STOCK INFORMATION		REGIONAL MARINE FISHERIES																								
Region	Stock	Key Issues						Fishery Specific Key Issues																		
		Release	Escapement (Hatchery)	Escapement (Sp Grounds)	Term Com	Term Native	Term Spt	SEAK Troll	SEAK SPT	SEAK Net	NCBC Troll	NCBC Sport	NCBC Net	WCVI Troll	WCVI Sport	Geo Strait Troll	Geo Strait Spt	SBC Net	WAOcn Troll	WA Ocn Sport	PS Sport	WA Net	Col Riv Sport	Col Riv Net	OR Coast Troll	OR Coastal Sport
Alaska	Alaska Central Inside	1	1	1				1	1																	
	Little Port Walter	1	1	1				1																		
	Alaska Southern Inside	1	1	1	1			1	1																	
Canada	Big Qualicum	1	1		2	2	2	1			2						2									
	Chilliwack (Harrison Fall Stock)	1		1		2								1	2		1		1							
	Cowichan	1	1			2	3							2	2							2				
	Kitsumkalum	1				2	2	1					2	2												
	Puntledge	1	1			2	3	3	1				2				2									
	Quinsam	1	1	1	2	3	3	1				2														
	Robertson Creek	1	1	1	1	1	2	1				2			2											
Washington	Atnarko / Snootli	1			1	1	1	1			2	2	2													
	George Adams Fall Fingerling	1	1	2	2		3							1	2				1		1	2				
	Green River Fall Fingerling	1	1	2	1									1	2		2		1		1	1				
	Grovers Creek Fall Fingerling	1	1											1	2				1		1	1				
	Hoko Fall Fingerling	1	1	2				1			2															
	Nisqually Fall Fingerling	1	1		1		3							1							1					
	Nooksack Spring Fingerling	1	1	1				2						1	2		2									
	Queets Fall Fingerling	1		2	1			1			1	2														
	Samish Fall Fingerling	1	1				3							1	2		2		1		2	1				
	Skagit Spring Fingerling	1	1											1	2						2					
	Skagit Spring Yearling	1	1											1	2						1					
	Sooes Fall Fingerling	1	1		2			2			2	2														
	South Puget Sound Fall Yearling	1	2		2										2						2	2				
	Skagit Summer Fingerling	1						1				2		2	2		2									
Stillaguamish Fall Fingerling	1	1	2										2	2		2				2						
White River Spring Yearling	1	1																		2						
Oregon	Salmon River	1		1			2	1			1															
Columbia River	Cowlitz Tule	1	1	1				2						2	2				1	1				1	1	
	Hanford Wild	1		1				1			2													1		
	Columbia Lower River Hatchery	1	1											1	2				1	1				1	1	
	Lewis River Wild	1						2			2			2	2				1					1	1	
	Lyons Ferry	1												2					1	1				1	1	
	Spring Creek Tule	1	1											1	2				1	1				1	1	
	Columbia Summers	1	1					1			1	2		1	2				1						1	
	Upriver Bright	1	1					1			2													1		
Willamette Spring	1	1					2	1															1			

Revised Figure 4-2 (from Tech Report 25), qualitative assessment of change based on CWTIT and other CWT improvements since Tech Report 25 was published in 2008, by McPherson, January 14, 2014.

Stock(s)						Requested		Objectives/Methods:
	2009	2010	2011	2012	2013	Total thru 2013	2014	
	(as of 2 December)							
Nass	\$62.3	\$97.9	\$105.5	\$108.6	\$112.6	\$486.9	Yes	Augment existing mark-recapture study to estimate escapement by boosting number inspected for marks.
	Est=29,969/CV=13%	Est=18,264/CV=25%	Est=11,573/CV=9%	Est=10,962/CV=6%	Est=8,407/CV=8%			
Skeena (annual)	\$29.3	\$35.8	\$35.8	\$35.8	\$35.8	\$172.5	Yes	Estimate passage lower river by expanding estimated passage Kitsumkalum River using genetic composition catches Tyee Test Fishery.
	Est=80,867/CV=17%	Est=93,121/CV=20%	Est=48,125/CV=21%	Est=29,236/CV=16%	Est=10,934/CV=9%			
Skeena (distribution)	\$417.2					\$417.2	—	Estimate distribution spawners in watershed with radiotelemetry.
	451 radio tags used							
Skeena (retrospective)	\$125.0					\$316.0	—	Estimate past passage lower river expanding estimated past passage Kitsumkalum River w/ genetic composition archived scales from Tyee Test Fishery.
	Subset of years done Years 1984-5 done							
Chilko	\$264.7	\$226.1	\$224.0	\$221.0		\$935.8	Yes	Estimate escapement with standard mark-recapture study.
	Est=6,100/CV=4%	Est=8,396/CV=5%	Est=4,100/CV=5%	Est=4,343/CV=5%				
S. Thompson	\$101.5	\$133.1	\$169.0	\$106.8	\$157.8	\$668.2	Yes	Estimate terminal run size with GSI and on CWTs recovered in NBC troll and terminal area for exploitation-rate indicator stock.
	Est=164,000/CV=17%	Est=213,000/CV=16%	Est=146,000/CV=18%	Est=72,500/CV=45%	TBD			
Harrison	\$51.5					\$51.5	—	Determine closure population ongoing mark-recapture study with radiotelemetry.
	Population Closed							
Burman	\$142.6	\$75.4	\$104.4	\$197.1	\$122.3	\$641.8	—	Estimate escapement standard mark-recapture study (all years), AUC estimate w/ radiotelemetry (2012).
	Est=2,363/CV=6%	Est=3,543/CV=15%	Est=5,384/CV=14%	Est=4,286/CV=8%	Est=9,593/CV=14%			
Kaouk	\$321.8	\$209.1	\$225.0			\$755.9	—	Estimate escapement counting through a weir (2009), standard mark-recapture study (2010, 2011).
	0 caught	Est=150/CV=17%	0 recaptures					
Moyeha		\$172.3	\$0.0			\$172.3	—	Estimate escapement standard mark-recapture study (2010), demonstrate ability to catch salmon (2011).
		Est=89/CV=21%	2 caught					
Marble/Leiner/Tahsis	\$219.0					\$219.0	—	Estimate escapement AUC snorkel surveys by estimating survey life/observer efficiency with radiotelemetry.
	Defective radio tags							
Marble/Sarita/Tranquil	\$180.8					\$180.8	—	Estimate escapement AUC snorkel surveys by estimating survey life/observer efficiency with radiotelemetry.
	TBD							
WCVI Framework	\$30.0					\$30.0		Stock/assessment framework for treaty and domestic management (project completion delayed into 2014).
	TBD							
Skagit	\$46.2					\$46.2	—	Demonstrate ability to catch salmon.
	0 caught							
Green	\$128.4	\$139.6	\$141.9	\$153.0		\$562.9	—	Estimate escapement standard mark-recapture study (2010), PBT mark-recapture 2011-2013 (2011 used to salvage 2010).
	Est=4,541/CV=10%	Est=3,382/CV=4%	Est=4,528/CV=8%	TBD				
Snohomish	\$220.6		\$217.8	\$239.1		\$677.5	Yes	Estimate escapement all runs standard mark-recapture study (2009), study PBT mark-recapture study (2011 back calculated, 2012, 2013).
	1 recaptured		Est=12,306/CV=13%	Est=7,763/CV=9%	TBD			
Stillaguamish		\$117.3	\$71.5	\$85.0		\$273.8	Yes	Estimate current/past escapement PBT mark-recapture study (2011-2013, 2007-2010 back-calculated).
	Est=1,061/CV=5%	Est=1,381/CV=15%	Est=1,345/CV=6%	Est=1,493/CV=9%	TBD			
Nehalem	\$269.4	\$279.4	\$305.3	\$301.1	\$236.6	\$1,391.8	—	Estimate escapement w/ standard mark-recapture study and in-river creel survey.
	Est=5,332/CV=18%	Est=4,070/CV=18%	Est=11,084/CV=14%	Est=14,238/CV=12%	TBD			
Siletz	\$252.0	\$286.4	\$223.6	\$228.9	\$204.6	\$1,195.5	—	Estimate escapement w/ standard mark-recapture study and in-river creel survey.
	Est=2,270/CV=13%	Est=10,985/CV=43%	Est=4,985/CV=7%	Est=8,738/CV=19%	TBD			
Driver Stock	\$154.0					\$154.0	Yes	Estimate aggregate terminal run size for WCVI, NOC, WAC stock groups with GSI/CWT data from SEAK/NBC fisheries.
	TBD							
Conuma							Yes	Estimate abundance with standard mark-recapture study.
Siuslaw							Yes	Estimate escapement w/ standard mark-recapture study and in-river creel survey.
Nooksack							Yes	Estimate escapement PBT mark-recapture study.
Total CAN	\$657.5	\$1,405.5	\$990.8	\$1,163.8	\$830.3	\$5,047.9		
Total USA	\$788.2	\$694.2	\$785.8	\$961.2	\$1,072.3	\$4,301.7		

Sentinel Stocks Committee

**Summary Accomplishments of the Sentinel Stocks Program 2009-2013**

Report to the Pacific Salmon Commission during their Post-Season Meeting, 2014

13-17 January, 2014

Portland, OR USA

The Sentinel Stocks Program (SSP) has funded development and application of three techniques that incorporate genetic analysis to cost-effectively estimate 1) escapements into select Puget Sound rivers, 2) terminal run sizes of major stock groups, and 3) run sizes from test fisheries in rivers:

Mark-recapture methods based on identifying individual parent Chinook salmon and their offspring through genotyping (tGMR) were used to estimate spawning abundance in the Stillaguamish River (estimates from 2007-2013), the Green River (from 2010-2013), and the Snohomish River (from 2011-2013). Costs have been approximately 50 to 100% of conventional capture-recapture studies; precision of tGMR estimates met the CTC standard; and results are that estimates of normative methods based on redd surveys are 25 to 100% of tGMR estimates depending on the river.

Genetic stock identification (GSI) to stock of origin for Chinook salmon landed in fisheries of Southeast Alaska (SEAK) and Northern British Columbia (NBC) along with information from the coast-wide coded-wire tag (CWT) program were used to estimate terminal run size of stock groups in aggregate for the South Thompson River (2010-2013), the West Coast of Vancouver Island (WCVI, 2011-2013), the Washington Coast (WAC, 2011-2013), and the North Oregon Coast (NOC, 2011-2013). The US-LOA in part supported work on the last three stock groups. Annual estimates completed to date have been cost-effective in that on-going CWT and GSI programs have supplied much of the required information. Approximately \$100,000 annually would fund estimating terminal run size for all stock groups listed above. While some of the estimates with this method have not met the CTC precision standard, some have. Improving precision such that all estimates would meet that standard requires a single analysis of information from SEAK and NBC fisheries. In the past there have been two analyses, each based on information from a different fishery.

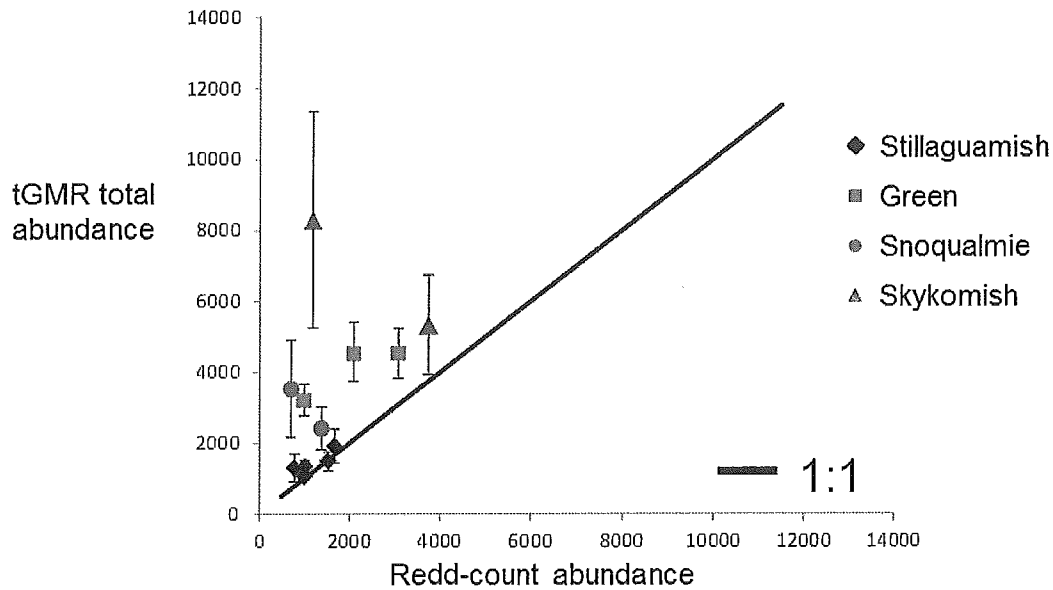
Genetic analysis of catches in a test fishery at the mouth of the Skeena River along with an on-going mark-recapture study on a tributary was used to estimate passage of Chinook salmon by the test fishery (1984-2013). As implied in the years of estimates produced, the technique was used retrospectively by genotyping scales taken from past catches in the test fishery. The precision standard was met in some years, but not others, largely due to the precision of the passage estimate into the tributary. Going forward, each estimate of run size to the ~~Stikine~~ Skeena River based on this method would cost approximately \$35,000.

Other work funded through the SSP produced escapement estimates for specific stocks or populations:

Stock	Stock Group	Estimates for:		Stock	Stock Group	Estimates for:
Nass River	NBC	2009-2013		Nehalem River	NOC	2009-2013
Chilko River	Fraser River	2010-2013		Siletz River	NOC	2009-2013
Burman River	WCVI	2009-2013				

With a few minor exceptions the estimates referenced above meet the CTC precision standards. Escapement estimates funded wholly or in part through the SSP on other populations—Chinook salmon in the Kaouk, Moyeha, Marble, Tranquil, Sarita, Leiner, and Tahsis rivers of WCVI—did not meet CTC standards for either accuracy or precision. However, results of these SSP funded studies showed escapements to consist to a large degree of hatchery strays and to be small (a few hundred fish each). Analysis of these estimates against available habitat suggest that natural spawning abundance in these streams has always been low.

## Redd-counts vs. tGMR



## Green River

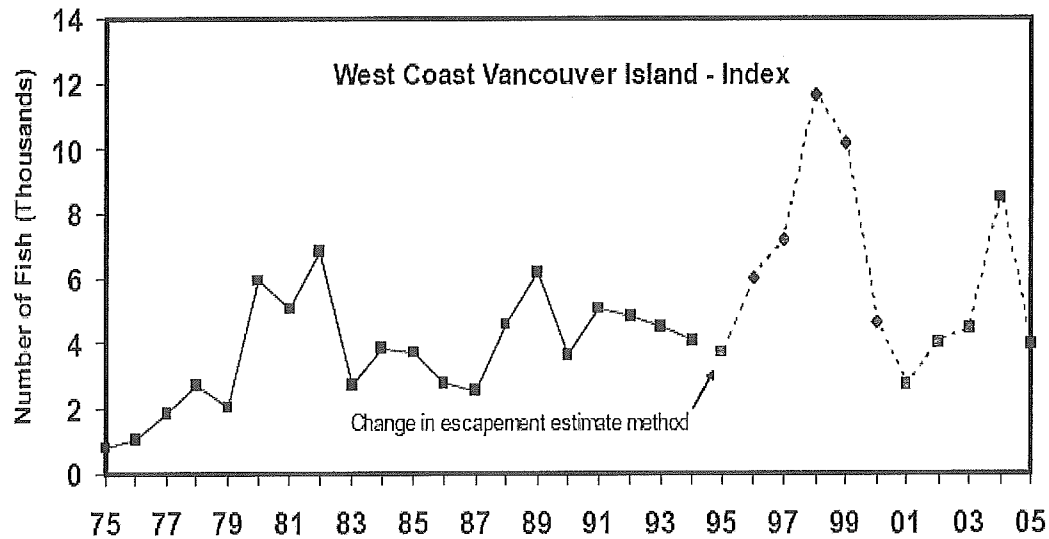
Brood Year	MR Estimate	tGMR CV	Redd estimates
2000 <sup>a</sup>	13,940	14.3%	4,942
2001 <sup>a</sup>	23,470	7.4%	6,905
2002 <sup>a</sup>	17,840	8.5%	7,960
2010 <sup>b</sup>	4,525	9.4%	2,092
2011 <sup>c</sup>	3,201	7.1%	993
2012 <sup>d</sup>	4,528	8.0%	3,090

<sup>a</sup> Traditional Mark-Recapture methods, Hahn and Thompson 2007

<sup>b</sup> tGMR, binomial, from COLONY results, Seamons et al. 2012

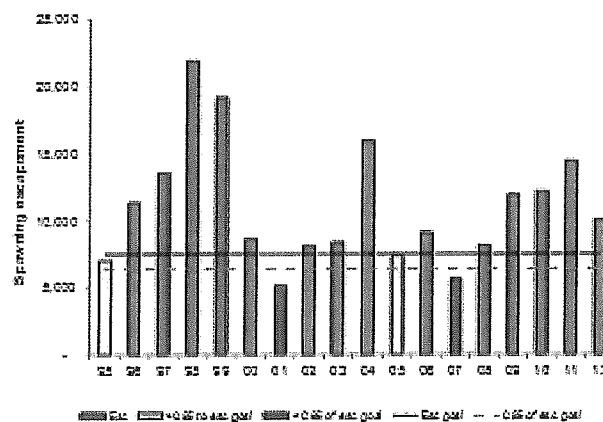
<sup>c</sup> tGMR, binomial, from COLONY results, Seamons et al. 2013

<sup>d</sup> Preliminary tGMR, binomial, from COLONY results



**Commentary:** The WCVI index represents the sum of escapements for six rivers (Marble, Tahsis, Burman, Artlish, Kaouk, and Tahsish), which were chosen to provide an 'index' of escapement for wild WCVI stocks in general. These stocks were chosen based on historical consistency of data quality. CDFO has developed a 14 stream expanded index which includes escapements to the six stream index plus the following WCVI streams: Colonial/Cayegle Creeks (Area 26), Leiner (Area 25), Megin, Bedwell/Ursus, Moyeha (Area 24) and Sarita, Nahmint (Area 23), and San Juan (Area 21). In 2005, the Colonial/Cayegle escapement was not available, and was therefore not included in the 14 stream index.

### WCVI 6-stream Index



Estimated annual non-terminal exploitation rate averaged over 1999 – 2010 is 32%.

Escapement Goal is the sum of goals from individual streams as estimated with the habitat model of Parken et al. (2006).

Spawning escapement is expansion of AUC estimates and precise estimates off from mark-recapture and mark-resight studies.



# MEMORANDUM

TO: Pacific Salmon Commission

cc: John Field, PSC Executive Director  
National Correspondents

FR: Joint Technical Committee Co-Chairs

RE: Eroding capacity to perform stock and fishery assessments to support PSC Fishery Regimes

Date: January 10, 2014

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PSC fishing agreements depend critically on data and information provided by agency programs for stock and fishery assessments. Fiscal pressures are seriously eroding the capacity of management agencies in both the U.S. and Canada to provide the basic data and other vital information for implementation of PSC fishing regimes.

We are growing increasingly concerned for the ability to maintain the viability of the Coded Wire Tag (CWT) system, the performance of catch and escapement sampling and monitoring, and sustaining exploitation rate and escapement indicator stock programs. Proposals that will adversely affect the ability to provide a wide range of critical metrics needed for the management, assessment and performance of PSC fishery agreements have surfaced in recent months in response to coastwide management agency austerity demands. PSC grant assessment and administration programs including CWTIT, Sentinel Stocks, US CTC-LOA, Northern and Southern Endowment Funds have been increasingly relied upon to enable agencies to conduct work that would previously have been considered part and parcel of basic stock and fishery management and assessment programs.

- For example: In the U.S., funding available through Anadromous Fish Act grants to sustain ocean fishery sampling programs was discontinued in 2009 and alternative funding sources, such as endowment funds and CWTIT, have been tapped to sustain catch sampling and monitoring programs. The capacity of agencies to support these programs is growing more uncertain and funding sources such as CWTIT and Sentinel Stocks are due to expire next year.
- The Bonneville Power Administration recently announced its intention to phase out \$2.5 million in funding support for CWT release and recovery programs in the Columbia River and Oregon coast over the next three years (2014-2016). For ODFW, this represents a 90% cut in funding (\$1,080,741) by 2016. These crippling cuts will have far-reaching impacts, including:
  - Severe impacts for ODFW's sampling programs in ocean coastal areas and the Columbia River (~ 2/3 reduction in coverage)
  - A reduction in ODFW's CWT tag lab capabilities (BPA funding reduced 90% from \$187,940 to \$22,912) will reduce the timeliness of CWT recoveries for lower Columbia River in-season management, post-season assessments, and fishery planning processes of the PFMC and PSC. This will equally impact WDFW's ability to comanage the Columbia River mainstem fisheries as ODFW's tag lab processes all of WDFW's CWT snout samples taken in their lower Columbia River mainstem fisheries.

# MEMORANDUM

- Reduction or elimination of CWT releases from Columbia River PSC indicator stocks over the next 3 years
- The Pacific Coastal Salmon Recovery Fund was created with the 1999 PST agreement and served as a principal source of funding for PST implementation programs in the U.S. until 2008 when NOAA language narrowing use of the funds to ESA listed stocks was included in the annual authorization. This narrowing of the acceptable use of these funds has hamstrung fishery agencies in using these funds for fishery sampling and other fishery management purposes.
- In Canada, DFO is facing significant budget pressures anticipated to impact catch monitoring, CWT sampling, and CWT and escapement indicator stock programs. As these pressures have increased since 2009, alternative funding sources such as CWTIT have been used increasingly to maintain the basic data collected from First Nation, sport, and commercial fisheries. The anticipated cuts will reduce the extent of fishery monitoring and indicator stocks to levels much less than those that led the PSC to convene the CWT Expert Panel in 2004. The Sentinel Stocks Program that is addressing ongoing escapement enumeration challenges and providing information that could prove pivotal to informing the next cycle of Chinook Chapter negotiations is sun-setting. Similarly, the CWTIT program that has enabled agencies to address deficiencies in the CWT system will end this year in Canada, and in the coming year in the U.S. Prospects for securing the resources needed maintain the previous base level of CWT monitoring and reporting systems let alone sustaining improvements.

The outlook for the ability to collect and analyze data vital to the PSC is becoming increasingly dire. If implemented, measures being considered to address budget constraints will increase uncertainty in management and undermine the capacity to implement PSC fishery regimes and support future bilateral treaty negotiations.

We strongly urge the PSC to proactively address these emerging problems by: (1) notifying agencies of the vital importance of stock and fishery assessments for implementation of Pacific Salmon Treaty agreements; and (2) Initiate a multi-PSC Technical Committee process to evaluate and recommend priorities for the information required for implementation of PSC fishery regimes and to support future negotiations in light of agency-proposed measures and actions to address budgetary constraints. We anticipate that such a review and recommendations would help inform project selection processes for the endowment funds, U.S. LOA, and future initiatives.

Respectfully,

# MEMORANDUM

Marianna Alexandersdottir  
U.S. Co-Chair, Sentinel Stocks Committee

David Bernard  
U.S. Co-Chair, Sentinel Stocks Committee

John Carlile  
U.S. Co-Chair, Chinook Technical Committee

Scott Kelley  
U.S. Co-Chair, Transboundary Technical Committee

Robert Kope  
U.S. Co-Chair, Chinook Technical Committee

Scott McPherson  
U.S. Co-Chair, Coded Wite Tag Implementation Team

Gary Morishima  
U.S. Co-Chair, Coho Technical Committee, Selective Fishery Evaluation Committee

George Nandor  
U.S. Co-Chair, Data Sharing Committee

Chuck Parken  
Canadian Co-Chair, Chinook Technical Committee, Data Sharing Committee, Sentinel Stocks Committee

Andrew Piston  
U.S. Co-Chair, Northern Boundary Technical Committee

Arlene Tompkins  
Canadian Co-Chair, Coho Technical Committee, Coded Wire Tag Implementation Team

### **Fraser River Hydro-Acoustics Strategic Review – Instructions to Fraser River Panel**

- 1) Considering fisheries management objectives for Fraser River sockeye and pink salmon as defined in Chapter 4 of the Pacific Salmon Treaty, the Fraser River Panel is to inform a review of the current Hydro-acoustics programs at Mission and Qualark.
- 2) This review would address questions such as (but not limited to) the following:
  - a. What data/information from Mission and Qualark is critical to informing decisions such that agreed-upon fisheries management objectives can be met?
  - b. What additional considerations are there with respect to providing this data/information to inform fisheries management decisions (e.g. precision, accuracy, timeliness etc.)?
  - c. What are the most cost-effective ways of collecting the required information without incurring unacceptable impacts on data quality and timeliness?
  - d. Are there other opportunities or potential sources of data that could improve the quality and/or timeliness of data/information to inform fisheries management decisions that should be considered as part of the overall program to obtain data regarding fish numbers, species, etc.?
  - e. Are there alternate approaches to managing and administering the hydro-acoustics program(s), and data from these programs, that would reduce overall costs (e.g. an integrated approach managed by the PSC)?
  - f. Considering the risks of NOT having some/all of the data components from the Mission and Qualark hydro-acoustics program, what are the recommendations for the overall program?
- 3) The Fraser Panel is awaiting instructions on timelines and procedures for completing this work in cooperation with the Strategic Review Committee.