



---

# **POST-SEASON REPORT FOR THE 2018 CANADIAN TREATY LIMIT FISHERIES**



# TABLE OF CONTENTS

---

<b>1</b>	<b>INTRODUCTION .....</b>	<b>7</b>
<b>2</b>	<b>TRANSBOUNDARY RIVERS .....</b>	<b>8</b>
2.1	Stikine River .....	8
2.1.1	Chinook Salmon .....	9
2.1.2	Sockeye Salmon .....	10
2.1.3	Coho Salmon .....	11
2.1.4	Joint Sockeye Salmon Enhancement Program .....	11
2.2	Taku River .....	11
2.2.1	Chinook Salmon .....	12
2.2.2	Sockeye Salmon .....	13
2.2.3	Coho Salmon .....	14
2.2.4	Joint Sockeye Enhancement .....	14
2.3	Alsek River .....	14
<b>3</b>	<b>NORTHERN BC CHINOOK AGGREGATE ABUNDANCE-BASED MANAGEMENT (AABM) FISHERIES .....</b>	<b>17</b>
3.1	Objectives and Overview .....	17
3.2	Stock Status .....	17
3.3	Recreational Fisheries .....	17
3.4	Commercial Fisheries .....	18
<b>4</b>	<b>NORTHERN BC CHINOOK INDIVIDUAL STOCK-BASED MANAGEMENT (ISBM) FISHERIES</b>	<b>20</b>
4.1	Objectives and Overview .....	20
4.2	Stock Status .....	20
4.3	First Nations FSC Fisheries .....	20
4.4	Recreational Fisheries .....	20
4.4.1	Recreational – Tidal .....	20
4.4.2	Recreational- Non-Tidal .....	21
4.5	Commercial Fisheries .....	21
<b>5</b>	<b>NORTHERN BC PINK SALMON FISHERIES .....</b>	<b>23</b>

5.1	Objectives and Overview .....	23
5.2	Areas 3-1 to 3-4 Pink Net Catch .....	23
5.3	Area 1 Pink Troll Catch .....	23
<b>6</b>	<b>SOUTHERN BC AGGREGATE ABUNDANCE-BASED MANAGEMENT (AABM) CHINOOK</b>	<b>25</b>
6.1	Objectives and Overview .....	25
6.2	Recreational Fisheries .....	26
6.3	Commercial Fisheries .....	27
6.3.1	Area G Troll Summary .....	27
6.3.1	First Nations Commercial Harvest .....	28
6.4	First Nations Domestic and FSC Fisheries .....	29
<b>7</b>	<b>SOUTHERN BC CHINOOK INDIVIDUAL STOCK BASED MANAGEMENT (ISBM) FISHERIES</b>	<b>31</b>
7.1	Objectives and Overview .....	31
7.2	Stock Status .....	32
7.2.1	West Coast Vancouver Island Chinook .....	32
7.2.2	Strait of Georgia Chinook .....	32
7.2.3	Johnstone Strait Mainland Inlet Chinook .....	33
7.2.4	Fraser River Chinook .....	34
7.3	First Nations Domestic and FSC Fisheries .....	35
7.4	Commercial Fisheries .....	35
7.4.1	First Nations Commercial Harvest .....	36
7.5	Excess Salmon to Spawning Requirements (ESSR) Fisheries .....	37
7.6	Recreational Fisheries .....	37
<b>8</b>	<b>FRASER RIVER SOCKEYE .....</b>	<b>45</b>
8.1	Objectives and Overview .....	45
8.2	Stock Status .....	46
8.2.1	Pre-Season Assessment .....	46
8.2.2	In-Season Assessment .....	50
8.2.3	Post-Season Assessment .....	50
8.3	First Nations FSC and Treaty Domestic Fisheries .....	52
8.4	Recreational Fisheries .....	52

8.5	Commercial Fisheries .....	53
8.6	Excess Salmon-to-Spawning Requirements (ESSR) Fisheries.....	53
<b>9</b>	<b>FRASER RIVER PINK SALMON.....</b>	<b>56</b>
<b>10</b>	<b>SOUTHERN BC COHO .....</b>	<b>57</b>
10.1	Objectives and Overview .....	57
10.2	Stock status.....	58
10.2.1	Stock Status- Upper Fraser River.....	58
10.2.2	STOCK STATUS – LOWER FRASER RIVER.....	58
10.2.3	STOCK STATUS- STRAIT OF GEORGIA .....	58
10.2.4	STOCK STATUS- WEST COAST VANCOUVER ISLAND .....	59
10.2.5	STOCK STATUS- JOHNSTONE STRAIT AND MAINLAND INLET .....	59
10.3	First nations.....	60
10.4	Recreational.....	60
10.4.1	Tidal Recreational Fisheries .....	60
10.4.2	Non-Tidal Recreational Fisheries .....	61
10.5	Commercial.....	63
10.5.1	Commercial .....	63
10.5.2	First Nations Commercial Harvest.....	63
10.6	Excess Salmon-to-Spawning Requirements (ESSR) Fisheries.....	64
<b>11</b>	<b>JOHNSTONE STRAIT CHUM SALMON.....</b>	<b>67</b>
11.1	Objectives and Overview .....	67
11.2	Stock status.....	67
11.3	First Nations FSC Fisheries.....	68
11.4	Recreational Fisheries.....	69
11.4.1	Tidal Recreational Fisheries .....	69
11.4.2	non-Tidal Recreational fisheries .....	69
11.5	Commercial Fisheries .....	69
11.5.1	Commercial .....	69
11.5.2	First Nations Commercial Harvest.....	70
11.6	Excess Salmon-to-Spawning Requirements (ESSR) Fisheries.....	71
<b>12</b>	<b>FRASER RIVER CHUM .....</b>	<b>73</b>

12.1	Objectives And Overview .....	73
12.2	Stock Status .....	73
12.3	First Nations fisheries.....	74
12.4	Recreational fisheries.....	74
12.5	Commercial Fisheries .....	75
12.5.1	Commercial .....	75
12.5.2	FIRST NATIONS COMMERCIAL HARVEST .....	75
12.6	Excess-To-Spawning Requirement (ESSR) Fisheries .....	76
<b>13</b>	<b>STRAIT OF GEORGIA CHUM.....</b>	<b>78</b>
13.1	Objectives And Overview .....	78
13.2	Stock Status .....	78
13.3	First Nations Fsc Fisheries .....	79
13.4	Recreational Fisheries.....	79
13.4.1	Tidal Recreational Fisheries .....	79
13.4.2	Non-Tidal Recreational Fisheries .....	79
13.5	Commercial Fisheries .....	80
13.5.1	Commercial .....	80
13.5.2	First Nations Commercial Harvest.....	82
13.6	Excess Salmon-to-Spawning Requirements (ESSR) Fishery .....	82
<b>14</b>	<b>WEST COAST VANCOUVER ISLAND CHUM.....</b>	<b>84</b>
14.1	Objectives and Overview .....	84
14.2	Stock Status .....	85
14.3	Excess salmon to spawning requirements (ESSR) fisheries .....	85
14.4	First Nations FSC Fisheries.....	85
14.5	Recreational Fisheries.....	85
14.5.1	Tidal Recreational.....	85
14.5.2	Non-Tidal Recreational.....	85
14.6	Commercial Fisheries .....	86
14.7	First Nations Commercial Harvest.....	86
<b>15</b>	<b>APPENDICES .....</b>	<b>88</b>
15.1	APPENDIX 1: CATCHES IN CANADIAN TREATY LIMIT FISHERIES, 1997 TO 2018	88

15.2	APPENDIX 2: 2018 SOUTH COAST TEST FISHERY CATCHES.....	89
15.3	APPENDIX 3: 2018 SOUTHERN BC COMMERCIAL CATCH TOTALS BY GEAR AND AREA 90	
15.4	APPENDIX 4: 2018 SOUTHERN BC RECREATIONAL CATCH TOTALS BY AREA	93
15.5	APPENDIX 5: 2018 SOUTHERN BC FIRST NATIONS (FSC AND TREATY) AND ESSR CATCH ESTIMATES BY AREA .....	94

# I INTRODUCTION

---

The chapters in Annex IV of the Pacific Salmon Treaty outline the joint conservation and harvest sharing arrangements between Canada and the United States of America (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 and remain in force until 2018. Chapter 4, which covers Fraser River Sockeye and Pink salmon, was revised in July 2014 and these revisions cover fisheries in 2014 through 2019. All management regimes under Annex IV continue to be implemented by Fisheries and Oceans Canada (DFO) for the 2018 season.

Annex fisheries are reported in the order of the Chapters of Annex IV. Comments begin with expectations and management objectives, escapements (where available and appropriate) and catch results by species. The expectations, management objectives, catches and escapements focus on those stocks and fisheries covered by the Pacific Salmon Treaty.

Annually, DFO releases a Salmon Outlook document which is referenced in various sections of this report; this document provides a categorical indication of salmon production (using a 4 point rating scale), and associated fishing opportunities by geographic area and species stock groups called an Outlook Unit for the coming season. Pre-season quantitative forecasts are documented where they are produced.

The catch information reported in this document provides the best information available to November 30, 2018. The catches are based on in-season estimates (hailed statistics); on-grounds counts by DFO, logbooks, dockside tallies, landing slips (First Nation fisheries), fish slip data (commercial troll and net), creel surveys and observers (recreational and commercial). Appendix 1 summarizes 1997-2018 catches in Canadian fisheries that have at some time been under limits imposed by the Pacific Salmon Treaty. All Southern commercial, recreational, First Nations, Excess Salmon to Spawning Requirements (ESSR) and test fisheries are reported in the tables at the end of each section.

NOTE: Some of the tables may be incomplete as all of the catch data is not available at this time. Final estimates will be submitted in October of the year following the fishery.

## **2      TRANSBOUNDARY RIVERS**

---

### **2.1    STIKINE RIVER**

Following the 2018 pre-season meeting of the Transboundary Panel, Canada developed its 2018 domestic fishing strategy for Stikine River salmon fisheries based on the catch sharing and management arrangements outlined in Annex IV, Chapter 1, and Paragraph 3 of the Pacific Salmon Treaty (PST). The 2018 Canadian Stikine River salmon fishery management approach was designed to achieve the spawning 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; and 3) to harvest up to 5,000 Coho salmon in a directed Coho fishery. A pre-season forecast of 6,900 Chinook was below the PST threshold run size of 28,100 which did not allow for a directed Chinook fishery in 2018. Due to concerns over run abundance and escapement, the Chinook assessment fishery was not prosecuted in 2018.

The 2018 Canadian Stikine River commercial fishing season opened on June 26 (statistical week 26) and ended September 13 (statistical week 37). From statistical weeks 26 through 34 a directed Sockeye fishery was prosecuted followed by a directed Coho fishery which ended in statistical week 37.

Fishing gear employed within the 2018 season was limited to one 135-metre (443 ft.) gill net per licence holder. The maximum mesh size allowed was 140 mm (5.5") through August 25, after which time the maximum mesh size was increased to 204 mm (8"). The lower Stikine commercial fishing zone 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.) reach of the Iskut River.

In the upper Stikine River commercial fishery, located upstream from the Chutine River, fishing periods generally mirrored those in the lower Stikine River commercial fishery, but lagged by one week. Each commercial fishery licence holder was permitted the use of one net. 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 enhanced Sockeye salmon, specifically at sites located upstream of the Tahltan River. For the tenth consecutive year, no commercial fishing activity occurred at this site. The Tuya run, which consists entirely of Sockeye salmon 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 reach of the Tuya River. Tuya Sockeye were released into Tuya Lake as young of the year juveniles.

The Canadian First Nation Food, Social, and Ceremonial (FSC) fishery located near the community of Telegraph Creek, British Columbia (BC) was active from the last week in May to the last week of July (the fishing season was shortened due to the forest fire evacuation of Telegraph Creek), with no time or gear restrictions imposed in 2018. Bilateral meetings with the Tahltan/Iskut First Nations and DFO were held which highlighted the need to conserve Chinook salmon. FSC fishery community buy-in was significant and efforts were implemented to minimize Chinook salmon harvest.



Canadian Recreational fishery effort was effectively non-existent in 2018 as area, retention, and size restrictions were in place for the entire Chinook season to prohibit the harvest of PST-defined “Treaty” Stikine River Chinook salmon >659 mm in 2018.

### **2.1.1 CHINOOK SALMON**

The pre-season forecast of 6,900 large i.e. fish with a mid-eye to fork length of >660mm (~26”) or a fork length of >735mm (~29”) Chinook salmon, as developed by the Canada / U.S. Technical Committee for the Transboundary Rivers (TCTR) did not allow for a directed Chinook fishery in 2018. A pre-season forecast run size of <28,100 precludes Canada or the U.S. from scheduling a directed fishery, whereas an in-season run size of >24,500 large Chinook is required to permit a targeted Chinook fishery. Specific management provisions were implemented within all Canadian fisheries to minimize the likelihood of interception of Chinook salmon in 2018.

The 2018 total gill net catch (First Nation only for 2018) of Chinook salmon was 165 large Chinook salmon and 456 jacks. This was well below the 10-year average of 3,000 large Chinook salmon and 1,050 jacks, while the Sockeye test fishery resulted in the interception (harvest) of 21 large Chinook and 37 jack Chinook salmon compared to the 10-year averages of 20 large Chinook salmon and 21 jack Chinook salmon. No Chinook salmon were harvested within the 2018 sport fishery as retention was prohibited. The 10-year average harvest of Chinook salmon in the Canadian Stikine River sport fishery is 41 large and 10 jack Chinook salmon.

The preliminary post-season estimate of the terminal run was approximately 8,800 large Chinook salmon, including an in river run size based on mark-recapture data of approximately 8,765 large Chinook salmon and a total U.S. catch estimate of approximately 35 large Chinook salmon. Accounting for the total Canadian catch of Chinook salmon (includes First Nation and test catches), the total system-wide spawning escapement was estimated at approximately 8,600 large Chinook salmon. The adult salmon migration barrier resulting from the 2014 Tahltan River rockslide is not believed to have had a detrimental effect on Chinook salmon escapement. The Chinook salmon escapement estimate of 8,600 is 51 % below the target  $S_{MSY}$  escapement goal of 17,400 large Chinook salmon and did not achieve the escapement goal range of 14,000 to 28,000 large Chinook salmon. The preliminary post-season run size of approximately 8,800 fish did not result in any allowable harvest allocations to Canadian or U.S. directed fisheries.

The 2018 Chinook salmon escapement enumerated at the Little Tahltan weir was 453 large and 413 jack Chinook salmon. The escapement of large Chinook salmon in the Little Tahltan River was well below both the  $S_{MSY}$  estimate of 3,300 fish and the lower end of the Canadian management escapement goal range of 2,700-5,300 large Chinook salmon. The contribution of the Little Tahltan Chinook salmon was only 5% of the total Stikine River escapement in 2018. Historically the contribution of this stock was approximately 14% of the total terminal abundance. 2018 is the twelfth consecutive year that the lower end of the Canadian management escapement objective was not achieved for Little Tahltan Chinook salmon.

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 incidentally caught in U.S. marine fisheries. These data were used to determine the total U.S. interception of Canadian-origin Stikine River Chinook salmon.

## 2.1.2 SOCKEYE SALMON

The forecast for Stikine River Sockeye salmon, as developed by TCTR, was for a terminal run size<sup>1</sup> of 160,900 fish including: 112,400 Tahltan Lake origin Sockeye salmon (46,300 wild and 66,100 enhanced); 12,900 enhanced Tuya Lake Sockeye; and 35,000 non-Tahltan wild Sockeye salmon, which constituted an average forecast. For comparison, the previous 10-year average terminal run size was approximately 159,000 fish.

The combined harvest of 2018 Stikine River Sockeye salmon in Canadian commercial and First Nation gill net fisheries was 22,737, which is below the 10-year average of 48,000 fish. The lower Stikine River commercial fishery harvested 16,915 Sockeye, while the upper Stikine River commercial and First Nation fisheries harvested a total of 407 and 5,415 Sockeye salmon respectively. The estimate of the total contribution of Sockeye salmon from the Canada/U.S. Stikine Sockeye enhancement program to the combined Canadian harvest was 9,819 fish (or 43 % of the total harvest). In addition 1,312 Sockeye salmon were harvested in the stock assessment test fishery located near the U.S/ Canada border.

A count of 9,854 Sockeye salmon was made at the Tahltan Lake weir in 2018, this represents only a partial enumeration as the crew was evacuated from the site for much of August. During this time, the weir was left open to allow the passage of fish into the lake. The 10-year average count is 25,933 and the escapement goal range is 18,000 to 30,000 fish. An estimated 5,223 of the fish counted (53%) originated from the bilateral Stikine Sockeye enhancement program, which was near the 55% contribution observed in smolts leaving the lake in 2015, the principal smolt year contributing to the 2018 return. A total of 1,878 Sockeye salmon were collected for broodstock to support the Stikine Sockeye enhancement program while no fish were removed for stock identification purposes (ESSR). Overall, it is not known how many Sockeye salmon successfully migrated into Tahltan Lake to spawn in 2018.

The preliminary total estimated run size of 48,293 Tahltan Lake Sockeye was approximately 57% below the pre-season expectation of 112,400 fish.

The spawning escapements for the non-Tahltan and the Tuya stock groups are calculated using stock identification, 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 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 2018 were 25,256 non-Tahltan and 1,000 Tuya Sockeye salmon. The non-Tahltan spawning escapement estimate was within the escapement goal range of 20,000 to 40,000 and was 5% above the 10 year average of 24,000 fish. The estimated return of Tuya Lake Sockeye salmon was below the recent 10 year average of 12,000 fish. These fish do not contribute to the natural production of Stikine River Sockeye salmon due to migration barriers that obstruct entry to Tuya Lake.

Based on the preliminary in-river run reconstruction of the Tahltan Lake run expanded by run timing and stock identification 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 salmon run size is approximately

---

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

83,260 fish. This estimate includes 48,293 Tahltan Lake origin fish, 2,112 Tuya Lake origin fish, and 32,855 Sockeye salmon of the non-Tahltan stock aggregate. The 2018 Stikine River Sockeye salmon run was below the 10-year average terminal run size of ~159,000 Sockeye salmon and is approximately 48% below the preseason forecast of 160,900 fish.

Based on the preliminary post-season run size estimate, Canada was allocated an allowable catch of 14,630 Stikine River Sockeye salmon. The total Canadian fishery harvest of Stikine River Sockeye salmon in 2018 was 22,737.

### **2.1.3 COHO SALMON**

The total Canadian fishery harvest of Coho salmon in 2018 was 3,685. 3,324 Coho salmon were harvested during the directed Coho salmon fishery in statistical weeks 35-37. The total Canadian fishery harvest was below the recent 10 year average of 5,420 fish.

A Coho salmon test fishery was not conducted in 2018. Incidental catches and CPUE taken in the Sockeye salmon test and commercial fisheries were near average. The CPUE observed in the targeted Coho salmon fishery was below average for statistical weeks 35 - 37. Aerial surveys of six index spawning sites yielded above average counts observed under excellent viewing conditions.

### **2.1.4 JOINT SOCKEYE SALMON ENHANCEMENT PROGRAM**

Joint Canada/U.S. enhancement activities continued from 2017 through 2018 with the collection of Sockeye salmon eggs from Tahltan Lake 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.

From May 30th to June 5<sup>th</sup>, 2018 approximately 2.6 million fry were out-planted into Tahltan Lake. No fry were released into Tuya Lake. The fry originated from the 2017 egg-take and were mass-marked at the Snettisham hatchery with thermally induced otolith marks. Green egg to released fry survival was approximately 67%. No fry reared at the Snettisham hatchery was lost due to Infectious Hematopoietic Necrosis virus (IHNV). Sockeye salmon enhancement programs have been subject to IHNV outbreaks before as the disease is naturally occurring in Stikine Sockeye salmon stocks.

In the fall of 2018, approximately 2.5 million Sockeye salmon eggs meeting the target of 2.5 million were collected at Tahltan Lake and transported to Snettisham Hatchery in Alaska. Canada determined the egg take target based on escapement evaluation results in season. As in previous years additional efforts beyond beach seining were employed to acquire brood stock including angling and temporarily holding female brood stock to mature in floating net pens in the lake.

## **2.2 TAKU RIVER**

Following the 2018 pre-season meeting of the Transboundary Panel, Canada developed its 2018 domestic fishing strategy for Taku River salmon fisheries based on the catch sharing and management arrangements outlined in Annex IV, Chapter 1, and Paragraph 3 of the Pacific Salmon Treaty (PST). Accordingly, the

Canadian strategy incorporated specific conservation considerations and contained the following harvest objectives: 1) harvest 21% 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; 3) to harvest 5,000, plus any excess over the escapement target of 70,000 Coho salmon in a directed Coho salmon fishery, dependent on in-river run size projections; and 4) to consider a directed Chinook salmon fishery, dependent on in-river run size projections.

The 2018 commercial fishing season on the Taku River opened on June 26 (statistical week 26), and closed on September 17 (statistical week 38). Fishing area and gear restrictions were as per recent years, and incorporated the maximum gill net length of 36.6 metres, 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 miles), 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 FSC fishery is primarily located in the lower Taku River in the same area as the Canadian commercial. Small numbers of fish are also harvested on the lower Nakina River and at the outlet of Kuthai and King salmon lakes. There were no time or gear restrictions imposed on the First Nation fishery in 2018.

Canadian Recreational fishery effort was effectively non-existent in 2018 as area, retention, and size restrictions were in place for the entire Chinook season to prohibit the harvest of PST-defined “Treaty” Taku River Chinook salmon >659 mm in 2018.

### **2.2.1 CHINOOK SALMON**

The bilateral pre-season forecast was for a terminal run of 4,700 large Chinook salmon, approximately 82% below the previous 10-year average of 26,000 fish. The forecast generated by the Taku River Chinook salmon model was 7,100 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 34%. A run size of 4,700 fish was well below the SMSY escapement goal of 25,500 fish (below the lower end of the escapement goal range of 19,000 – 36,000), and as a result, there was no allowable catch (AC) for either the U.S. or Canada and therefore, neither country prosecuted a directed Chinook salmon fishery. Additionally, significant efforts were made in all other fisheries to avoid the incidental harvest of Chinook salmon. For 2018, the Chinook assessment fishery, which has an allocation of 1,400 large Chinook, was not conducted to allow for the maximum number of Chinook salmon to pass to the spawning grounds.

The catches of large Chinook salmon in the Canadian fisheries were: 0 in the test/assessment fishery; 0 large Chinook salmon were harvested in the directed commercial Sockeye and Coho salmon fisheries; 7 large Chinook salmon in the First Nation FSC fishery; and 0 large Chinook salmon in the recreational fishery. The total base level and test/assessment fishery harvest of 7 large Chinook salmon was well below the allowance of 2,900 fish.

The preliminary Taku River large Chinook spawning escapement estimate for 2018 was approximately 7,300 fish which was well below the SMSY target of 25,500 and the goal range of 19,000 to 36,000. The previous 10-year average spawning escapement was 22,000 large Chinook (which was associated with a higher target until 2009). During aerial surveys of five index areas, a total of 1,719 large Chinook salmon were observed; this was 47% below the average of 3,241.

The Canadian catch of large Chinook was 100% below the 10-year average of approximately 2,200 fish (excluding test/assessment fisheries). The 2018 harvest of small Chinook was 19 fish (First Nation FSC), 96% below the 10-year average of 511 fish.

### **2.2.2 SOCKEYE SALMON**

The Canadian pre-season run outlook for wild Sockeye salmon was 160,000 fish, approximately 11% below the previous 10-year average total run size of 180,000 fish. In addition, approximately 5,400 adult Sockeye salmon of Tatsamenie Lake origin were expected to return from fry out plants associated with the Canada/U.S. joint Taku Sockeye salmon enhancement program. The forecasted return of enhanced Tatsamenie Lake origin Sockeye salmon was 46% above the average return of 10,000 fish.

The Canadian Sockeye salmon catch was 17,988 fish, of which 17,974 were taken in the commercial fishery, 14 in the First Nation FSC fishery, and 0 in assessment/test fisheries. This harvest was 24% below the 10-year average total of 23,700 fish, with the contribution of Sockeye salmon from the bilateral enhancement program estimated at 951 fish (5% of the total Canadian catch).

To reduce incidental harvest of Chinook salmon, the directed Sockeye salmon fishery commenced 10 days late on June 26 (SW 26). Additionally, the use of set nets was not permitted for the first opening and fishers were not permitted to retain incidentally caught Chinook salmon in the directed sockeye fishery. The maximum permissible mesh size in the first four weeks of the directed Sockeye salmon fishery was 140 mm (5.5") which was intended to reduce the gilling of large Chinook and permit release. Projections of the total wild Sockeye salmon run size, TAC, and total escapement were made weekly throughout the fishing season. As in past years, projections were based on the joint mark-recapture program, the estimated catch of Taku River Sockeye salmon in U.S. fisheries, the catch in the Canadian fishery, and historical run timing information. Projections in 2018 ranged from 83,000 in statistical week 27 (July 1-7) to 166,000 in statistical week 31 (July 29-August 4). The preliminary post-season estimate of run size is 164,100 fish (comprising 155,300 wild Sockeye and 8,800 enhanced Sockeye). Subtracting the escapement target of 75,000 from the wild run of 155,000 fish resulted in a TAC of approximately 80,000 wild fish. The Canadian allowable catch, based on a 21% harvest share (which in turn is associated with an enhanced return of 5,001 to 15,000 fish), was 16,800 wild fish; the actual catch was 17,037, representing 21% of the TAC.

The estimated spawning escapement of wild Sockeye salmon in the Canadian section of the Taku River was 112,700 fish which was above the target range of 71,000 to 80,000 fish. The escapement is 9% above the 10-year average of 103,000 fish. Based on weir counts, escapements to the Kuthai, Little Trapper, Tatsamenie and King Salmon lakes were 13, 8,249, 4,936, and 3,180 Sockeye salmon, respectively. Escapements to Kuthai and Tatsamenie lakes were below average in 2018 while Little Trapper and King Salmon lakes were above average.

It is felt that the return to Kuthai Lake was impeded by partial barriers to migration that were exacerbated by extremely low water levels in 2018.

### **2.2.3 COHO SALMON**

The catch of 9,505 Coho salmon (9,503 commercial and 2 First Nation FSC) was 6% above the 10-year average of 9,000 fish. The catch during the directed commercial/assessment Coho salmon fishery, i.e. after statistical week 33, was 7,245 fish. A live-release assessment fishery was implemented in 2018 after Canada's AC (5,000) was exhausted, catching and releasing a total of 244 Coho salmon. Based on mark-recapture data, the bilateral estimate of the run into the Canadian section of the drainage is 61,113 fish. In accordance with PST harvest arrangements for the 2018 Taku River Coho salmon season, at a run size of this magnitude, 5,000 Coho salmon were harvested for assessment purposes starting in statistical week 34. The post-season spawning escapement estimate is 51,608 fish, 40% below the previous 10-year average of 86,600 fish. The 2018 escapement was below the target of 70,000 but within the goal range of 50,000 to 90,000 fish.

### **2.2.4 JOINT SOCKEYE ENHANCEMENT**

Joint Canada/U.S. enhancement activities continued from 2017 through 2018 with Sockeye salmon fry hatched at Snettisham Hatchery in Alaska transported back to Tatsamenie Lake, British Columbia (where these fish were collected as eggs in 2017). Between May 29-31, 2018, approximately 1.5 million emergent Sockeye salmon fry were out-planted into Tatsamenie Lake from the 2.0 million eggs collected in 2017. No losses were experienced from Infectious Hematopoietic Necrosis virus (IHNV) for the eggs collected in 2017. In addition, as part of an extended rearing project, approximately 214,000 fed fry were released into net pens for rearing. Net pen reared fry were released at 2.1 grams on June 28. Smolt production for 2018 was above average with an estimate of 1.3 million coming off a strong brood year. A breakdown of the origin of the smolts to evaluate annual release strategies is underway pending otolith results.

No eggs were collected from King Salmon Lake in 2018 for enhancement purposes.

For 2018, the agreed bilateral Taku River enhancement production plan (TEPP) identified collection of up to 2.5 million Sockeye salmon eggs from Tatsamenie Lake and 500,000 eggs from Little Trapper lake for transport to Snettisham Hatchery in Alaska for incubation and thermal marking. Approximately 2.5 million Sockeye salmon eggs were collected from Tatsamenie Lake. Eggs were not collected from Little Trapper due to a shortage of females in the escapement. The resulting fry were intended to be released to Trapper Lake, upstream of a barrier, to establish a small escapement of salmon (approximated at 500 adults) for barrier passage evaluation beginning in 2020. Barrier removal project plans were established in 2016 and are ongoing in support of a potential Sockeye enhancement program for Trapper Lake.

## **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. In 2013, escapement goal ranges for Alsek River Chinook and Sockeye salmon were recommended by the

Transboundary Panel, these are: 3,500 to 5,300 Chinook and 24,000 to 33,500 Sockeye salmon. Additionally, the escapement targets were revised for Klukshu River Chinook and Sockeye salmon, these are: 800 to 1,200 Chinook and 7,500 to 11,000 Sockeye. 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 collaboration with the Champagne-Aishihik First Nation (CAFN).

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 Klukshu River using video enumeration techniques. Current escapement monitoring programs include the Klukshu River, Village Creek Sockeye enumeration, and post-season run reconstructions using genetic stock identification analyses 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 count.

The harvest estimate for the 2018 Canadian First Nation FSC fishery was 0 Chinook, 0 Sockeye and 0 Coho salmon. In July of 2018, the Champagne and Aishihik First Nations passed a resolution that prohibited any salmon fishing in their traditional territory in response to the poor pre-season forecasts for Chinook and Sockeye salmon. The 10-year average harvest in the Canadian First Nation FSC fishery is 61 Chinook, 1,034 Sockeye, and 18 Coho salmon. Catch estimates for the Alsek River recreational fishery were 0 Chinook salmon retained, and 0 Sockeye salmon retained. Retention of Chinook and Sockeye salmon was not permitted in 2018 in light of the forecasts and in-season run abundance information. Approximately 20 Coho salmon were harvested in the recreational fishery.

The 2018 count and escapement estimate for Klukshu River Sockeye salmon was 7,035 fish (no harvest in the Klukshu River). The count and escapement estimate were both below the 10-year average of 10,600 and 10,300, respectively. The total escapement was below the lower end of the escapement goal range of 7,500 to 11,000 fish. The Sockeye salmon count at Village Creek was 97 fish; the average is 1,800 fish.

The most reliable comparative Chinook salmon escapement index for the Alsek River drainage is considered to be the Klukshu River count. The Chinook salmon count and escapement estimate in 2018 was 1,078 fish, near the average of 1,140 fish. The 2018 escapement estimate was within the escapement goal range of 800 to 1,200 Klukshu Chinook salmon.

The Klukshu River Coho salmon count was 870. The 2018 count, as in past years, is not considered a complete indicator of run strength as the project is finished prior to the end of the Coho salmon return to the Klukshu River.

## Table 2. Transboundary Rivers Fisheries (Treaty Harvest)

Licence Group	Fishing Area	Chinook Kept	Chinook Released	Sockeye Kept	Sockeye Released	Pink Kept	Pink Released	Coho Kept	Coho Released	Chum Kept	Chum Released
First Nations FSC											
	Stikine River	165		5,415				-			
	Taku River	7		14				2			
	Alsek River	-		-				-			
Total First Nations FSC Catch		172	-	5,429	-	-	-	2	-	-	-
First Nations Commercial											
	Stikine River										
	Taku River										
	Alsek River										
Total First Nations Commercial Catch		-	-	-	-	-	-	-	-	-	-
Commercial											
	Stikine River	-		17,322				3,685			
	Taku River	-		17,974				9,503			
	Alsek River										
Total Commercial Catch		-	-	35,296	-	-	-	13,188	-	-	-
Recreational											
	Stikine River	-						-			
	Taku River	-						-			
	Alsek River	-		-	-			20			
Total Recreational Catch		-		-	-	-	-	20	-	-	-
<b>TOTALS</b>		<b>172</b>	<b>-</b>	<b>40,725</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>13,210</b>	<b>-</b>	<b>-</b>	<b>-</b>

: not applicable



# **3 NORTHERN BC CHINOOK AGGREGATE ABUNDANCE-BASED MANAGEMENT (AABM) FISHERIES**

---

## **3.1 OBJECTIVES AND OVERVIEW**

Escapement of northern Chinook salmon has declined dramatically in recent years. Reduced survival rates, and productivity, have been observed across British Columbia and South East Alaska. This has led to unprecedented declines of northern Chinook and the need for conservation measures to be implemented in 2018 salmon fisheries. The Department developed management measures to achieve 25% to 35% reductions on specific stocks of concern after consultations with First Nations and stakeholders. Chinook salmon fisheries implemented under the PST AABM management regime include three mixed-stock fisheries:

- Southeast Alaska recreational, net and troll (SEAK)
- Northern British Columbia troll and Haida Gwaii (Queen Charlotte Islands) recreational (NBC); and
- West Coast of Vancouver Island troll and outside recreational (WCVI).

These fisheries are managed to an annual total allowable catch (TAC) based on the forecast abundance of the aggregate of stocks that contribute to each fishery. In Canada, conservation is the first priority in fisheries management. Once conservation obligations are met, priority access is given to First Nations for food, social, ceremonial, and treaty requirements. Once those obligations are met, priority access to Chinook salmon is provided to the recreational fishery, with commercial fisheries next in priority. Management constraints to the fishery include management for stocks of conservation concern, minimizing encounters of undersized Chinook salmon and non-target species and minimizing fisheries where legal and sublegal-sized Chinook salmon have to be released.

## **3.2 STOCK STATUS**

The pre-season abundance index for North Coast BC troll and Haida Gwaii sport fisheries in 2018 was 1.01, which permitted a total allowable catch of 131,300 Chinook salmon in these fisheries. The total Chinook catch in the Area F Troll fishery and recreational fishery can be found in Table 3.

## **3.3 RECREATIONAL FISHERIES**

Estimates for tidal sport catches near the mainland coast of Northern BC were obtained from creel surveys and lodge catch reports from lodges operating on Haida Gwaii. Concerns for northern British Columbia Chinook stocks resulted in management actions across northern fisheries to reduce overall harvest rates by 25% to 35%. For recreational fisheries, the daily limit was reduced from two Chinook per day to one per day and the possession limit was reduced from four to two in possession from June 1st to July 9<sup>th</sup>. Limits returned to two Chinook per day with four in possession on July 10th, after the majority of northern Chinook had migrated out of the area. A minimum size limit of 45 cm was in effect and barbless hooks were mandatory in the sport fishery. Virtually all sport releases in AABM areas are legal sized.

### **3.4 COMMERCIAL FISHERIES**

The North Coast BC troll fishery was opened for Chinook fishing from July 10 to August 6 and from August 20 to September 30. The entire 2018 Northern BC troll fishery was conducted under a system of individual transferable quotas. The size limit was 67 cm and barbless hooks and revival boxes were mandatory. No troll test fisheries were conducted in the North Coast of BC in 2018.

### Table 3. North Coast AABM Chinook Directed Fisheries

Licence Group	Fishing Area	Chinook Kept	Chinook Released	Sockeye Kept	Sockeye Released	Pink Kept	Pink Released	Coho Kept	Coho Released	Chum Kept	Chum Released
Commercial											
	Haida Gwaii	70,276	22,455	0	11,244	30,630	8,613	176,200	144	3,175	5,012
Total Commercial Catch		70,276	22,455	0	11,244	30,630	8,613	176,200	144	3,175	5,012
Recreational											
	Haida Gwaii	36,700	40,564	170		1,950		34,200	7,795	950	
Total Recreational Catch		36,700	40,564	170	0	1,950	0	34,200	7,795	950	0
<b>TOTALS</b>		<b>106,976</b>	<b>63,019</b>	<b>170</b>	<b>11,244</b>	<b>32,580</b>	<b>8,613</b>	<b>210,400</b>	<b>7,939</b>	<b>4,125</b>	<b>5,012</b>

Notes:

- Released Catch for Recreational is estimated for Areas 1 and 2W based on Creel data.
- FSC in Area 1,2 is not part of the AABM fisheries.

## **4 NORTHERN BC CHINOOK INDIVIDUAL STOCK-BASED MANAGEMENT (ISBM) FISHERIES**

---

### **4.1 OBJECTIVES AND OVERVIEW**

Fisheries included in this category are commercial net fisheries throughout north and central BC, marine sport fisheries along the mainland coast and freshwater sport, and First Nations FSC fisheries in both marine and freshwater areas. 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.

### **4.2 STOCK STATUS**

Since assessments of the ISBM fisheries are relative to the escapements achieved in the Chinook indicator stocks, a brief overview of the 2018 returns is provided. Chinook escapements to the upper Nass River are 13,262 (based on mark-recapture data). Skeena River Chinook escapements were greater than 2017 at approximately 33,802. The Bella Coola/Atnarko River Chinook escapements were up from 2017, with an estimated total of 15,000.

Expectations for 2019 are for an average or above average return if ocean conditions are favourable.

The total Chinook catch in the Test fishery on the Skeena River was 677. Since 1984, the lowest Chinook catches at the Tyee Test Fishery have been in 1995 and 2017. ISBM catch data can be found in table 4.

### **4.3 FIRST NATIONS FSC FISHERIES**

Catches by First Nations in Areas 6 and 7 of the Central Coast were not available at the time of this report. No Chinook catches were reported by First Nations in Rivers Inlet or Smith Inlet (Areas 9 and 10).

### **4.4 RECREATIONAL FISHERIES**

#### **4.4.1 RECREATIONAL – TIDAL**

Estimates for tidal sport catches near the mainland coast of Northern BC were obtained from a creel survey conducted in Areas 3 and 4 in 2018. Due to predicted low returns of Northern Chinook salmon, the Department implemented Northern Chinook salmon conservation measures which reduced the Chinook daily limits in Areas 3 to 5 as follows:

June 1, 2018 to June 15, 2018 – Daily limit of one (1) Chinook per day.

June 16, 2018 to July 9, 2018 – Zero (0) retention of Chinook.

July 10, 2018 to July 31, 2018 – Daily limit of one (1) Chinook per day.

Area 6 also had the daily limit reduced to one per day June 1st to July 31st, 2018.

The 2018 catches in the mainland sport fishery in Areas 5 and 6 were not available at the time of writing.

Tidal sport catch from lodges operating in the Smiths Inlet, Rivers Inlet, Hakai Pass and Bella Bella areas were estimated using log books.

#### **4.4.2 RECREATIONAL- NON-TIDAL**

Non-tidal management actions included zero Chinook retention for recreational fisheries in all north coast watersheds on May 9, 2018. Additional restrictions were implemented in the Skeena River that included full recreational closure of all salmon species from May 9, 2018 to Aug 6, 2018 due to predicted low returns of Skeena River Chinook salmon in 2018.

Recreational fishing for Skeena River Coho and Pink reopened on Aug 7, 2018 while recreational fishing for Chinook and Chum remained closed in the entire Skeena River watershed, including tributaries and lakes. Additional management measures were implemented for North Coast Chinook which included:

1. The Skeena River mainstem upstream of the Sustut River and at the Kitsumkalum, Kitwanga and Kispiox River mouths was closed to fishing for salmon.
2. Kispiox River and Babine River remained no fishing for salmon during the 2018 season.
3. Gitnadoix River upstream of confluence with Magar Creek remained no fishing for salmon during the 2018 season.
4. Morice River upstream of confluence with Lamprey Creek remained no fishing for salmon during the 2018 season.
5. There was non-retention of Chinook salmon in all rivers draining into PFMAs 1 to 6, excluding the Kitimat River which opened to Chinook retention (1 per day under 80cm) on July 1, 2018.
6. On July 5, 2018 Chinook salmon fishing was closed in the waters of the Kitlope Lake, and tributaries, including the waters flowing from Kitlope Lake to the confluence with the Kitlope River.
7. The Nass River was closed to recreational fishing for Chinook during the 2018 season

#### **4.5 COMMERCIAL FISHERIES**

North and Central Coast commercial catches includes gill net catches from Areas 3 to 8 (from hailed catch data). 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%.

Chinook commercial fisheries were closed in the North Coast (Areas 3-10), except for Area 8. In this area, the gillnet fishery opened on June 4, 2018. Opportunities were generally limited to one fishing day a week until August, where the final two weeks were open two days each week. During July average gill net fleet size was 166 vessels, which were distributed almost evenly between the Bella Coola Gill Net Area and Fisher/Fitz Hugh Net Area. The last commercial opening occurred on August 18. Refer to table 4 for chinook catch totals.

**Table 4. North Coast ISBM Chinook Fisheries**

Licence Group	Fishing Area	Chinook Kept	Chinook Released	Sockeye Kept	Sockeye Released	Pink Kept	Pink Released	Coho Kept	Coho Released	Chum Kept	Chum Released
First Nations FSC											
	Skeena River	5,888		74,726		2,785		2,754		745	
	Nass River	4,735		46,615		1,002		2,691		89	
	Atnarko River	1,567		119		108		358		779	
Total First Nations FSC Catch		12,190	0	121,460	0	3,895	0	5,803	0	1,613	0
Commercial											
	Bella Coola	5,162	0	3,563	243	5,464	0	0	1,218	263,850	0
Total Commercial Catch		5,162	0	3,563	243	5,464	0	0	1,218	263,850	0
Recreational											
	Area 3-4										
	Area 5	Not yet available									
	Area 6	Not yet available									
	Area 7	3,484		0		39		3,639		62	
	Area 8	869		0		119		1,225		6	
	Area 9	2,438		0		171		7,535		35	
	Area 10	218		0		1		73		1	
Total Recreational Catch		7,009	0	0	0	330	0	12,472	0	104	0
<b>TOTALS</b>		<b>24,361</b>	<b>0</b>	<b>125,023</b>	<b>243</b>	<b>9,689</b>	<b>0</b>	<b>18,275</b>	<b>1,218</b>	<b>265,567</b>	<b>0</b>

Note: No released catch data available.

## **5 NORTHERN BC PINK SALMON FISHERIES**

---

### **5.1 OBJECTIVES AND OVERVIEW**

In 2018, Canada was to manage the Area 3-1 to 3-4 net fisheries to achieve an annual catch share of 2.49% of the annual allowable harvest (AAH) of Alaskan Districts 101, 102 and 103 Pink salmon. The total return of Pink salmon to Alaskan Districts 101, 102 and 103 was not available at the time of publication.

Canada was also 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.

### **5.2 AREAS 3-1 TO 3-4 PINK NET CATCH**

In the Canadian northern boundary area, Pink salmon returns were anticipated to be average to below average for Areas 3 and 4, based on brood year return strength. Actual returns to Area 3 were higher than anticipated, while the Area 4 returns were below average.

### **5.3 AREA 1 PINK TROLL CATCH**

The Canadian commercial troll fishery targeting Coho salmon with retention of Pink salmon was open in the northern portion of Area 1 (Dixon Entrance AB Line) from July 1 to July 10, and then expanded to the rest of Area 1 until it was closed on September 30. Pink retention was also permitted during the Chinook directed fishery in parts of Area 1 which opened from July 10 to August 6 and again from August 20 to September 30. Area 1 Pink salmon directed effort was very minimal and the total Pink catch in the Area F Troll fishery and recreational fishery can be found in Table 5.

## Table 5. Northern BC Pink Directed Fisheries

Licence Group	Fishing Area	Chinook Kept	Chinook Released	Sockeye Kept	Sockeye Released	Pink Kept	Pink Released	Coho Kept	Coho Released	Chum Kept	Chum Released
First Nations FSC											
	Area 1										
	Area 3										
	Area 4										
Total First Nations FSC Catch		0	0	0	0	0	0	0	0	0	0
First Nations Commercial											
	Area 1										
	Area 3										
	Area 4										
Total First Nations Commercial Catch		0	0	0	0	0	0	0	0	0	0
Commercial											
	Haida Gwaii*										
	Area 1	0	146	0	4	266	0	714	6	0	14
	Area 3	0	694	159	4,125	101,267	0	635	17	38,368	0
	Area 4	0	343	103,595	0	16,857	257	0	1,503	0	1,605
Total Commercial Catch		0	1,183	103,754	4,129	118,390	257	1,349	1,526	38,368	1,619
Recreational											
	Area 1										
	Area 3,4	5,822		32		1,391		10,438		176	
	Area 8	684		0		291		3,670		21	
Total Recreational Catch		6,506	0	32	0	1,682	0	14,108	0	197	0
<b>TOTALS</b>		<b>6,506</b>	<b>1,183</b>	<b>103,786</b>	<b>4,129</b>	<b>120,072</b>	<b>257</b>	<b>15,457</b>	<b>1,526</b>	<b>38,565</b>	<b>1,619</b>

Note: All available First Nations catch reported in Tables 3 and 4.



## 6 SOUTHERN BC AGGREGATE ABUNDANCE-BASED MANAGEMENT (AABM) CHINOOK

### 6.1 OBJECTIVES AND OVERVIEW

Chinook fisheries are managed by either an aggregate abundance-based management (AABM) or individual stock-based management (ISBM) 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 BC, all AABM Chinook fisheries are located off the West Coast Vancouver Island (WCVI), including components of the recreational fishery, First Nations fisheries, and the Area G troll fishery.

For the period October 2017 through September 2018, the forecast Chinook abundance index was 0.59 of the PST base period. Therefore, under Treaty provisions, the maximum allowable catch was 88,300 Chinook for WCVI AABM fisheries; which includes a 30% reduction consistent with the treaty provisions that came into effect in January 2009.

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), Fraser River Chinook, and Interior Fraser Coho populations.

Several ocean fisheries in Canada intercept WCVI origin Chinook, including northern troll, Haida Gwaii recreational, WCVI troll and WCVI recreational. Ocean fisheries in Canada 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 2018 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.

The pre-season planning distribution of the total WCVI AABM TAC amongst fisheries is shown in Table 6.1 below.

AABM Chinook catch and release information from all fisheries can be found in Table 6.

Table 6-1 Pre-Season Total Allowable Catch Estimate for October 2017-September 2018 WCVI AABM Chinook

	Pre-Season
WCVI AABM Abundance Index	0.59
WCVI AABM Chinook TAC*	88,300
AABM Recreational Harvest Projection	50,000
First Nations Harvest Projection (FSC)	5,000
Maa-nulth First Nations Domestic Allocation (FSC)	3,447
T'aaq-wiihak Allocation	9,721
Area G Troll Allocation	20,132
Total AABM	88,300

## 6.2 RECREATIONAL FISHERIES

The WCVI AABM recreational Chinook fishery primarily takes place in offshore Areas 121-127 from June to September. Chinook catch from inshore Areas 21-27 in June and Areas 21-24 in July are also included in the AABM estimate. Catch and effort are largely driven by abundance and weather, and together both have impacts on annual harvest. Previous sampling has indicated that there is minimal AABM catch and effort outside of this period.

Chinook management measures are in place in the near-shore AABM areas to protect migrating WCVI origin Chinook. In 2018, management measures included increasing the finfish closures in several areas, increasing terminal Chinook non-retention areas, and focussing recreational opportunities in areas where DNA samples indicate that WCVI Chinook presence is lower.

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 information (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 estimates 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. Logbook effort is removed from effort estimates where there is overlap. 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.

The total Chinook recreational catch in the 2018 WCVI AABM fishery is provided in Table 6.

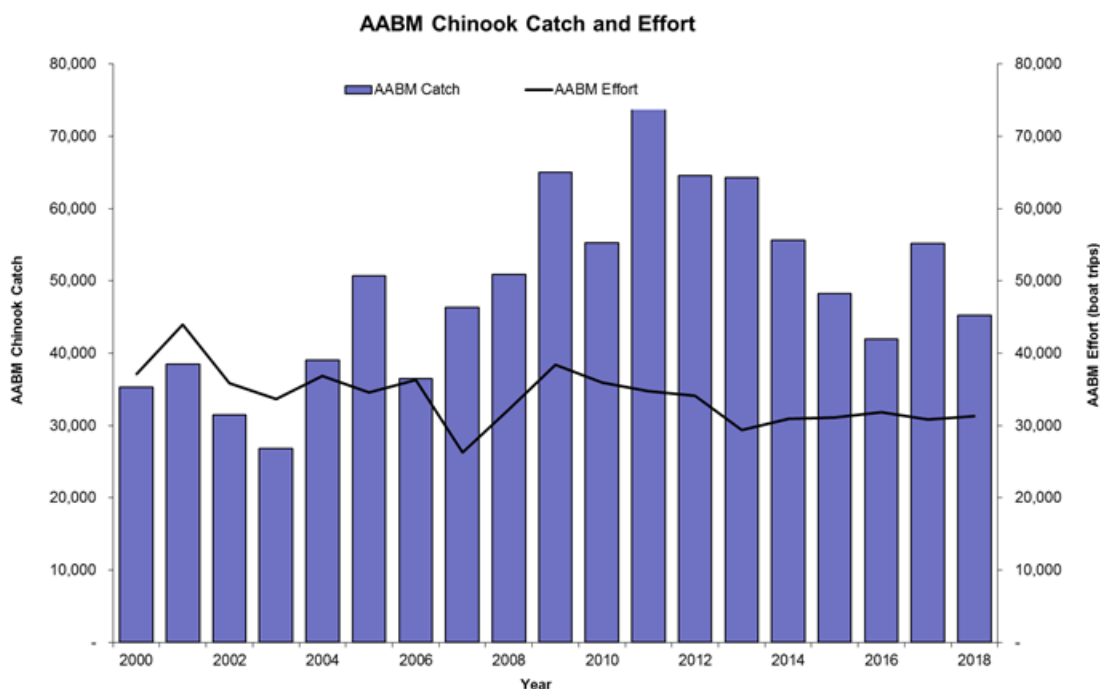


Figure 6-I WCVI Recreational AABM Catch and Effort- Chinook, 2000-2018

## 6.3 COMMERCIAL FISHERIES

For the 2017/2018 Chinook year (October 1, 2017 to September 30, 2018), fisheries continued to be shaped by conservation concerns for the following domestic stocks: Fraser River Chinook, Interior Fraser River Coho, WCVI origin Chinook salmon, and LGS Chinook.

The distribution of the WCVI AABM TAC between fisheries is shown above in Table 6.1. Two commercial fisheries occurred during the 2017/2018 chinook year which were the Area G troll fishery and the T'aaq-wiihak First Nations Demonstration fishery.

### 6.3.1 AREA G TROLL SUMMARY

The Area G Troll annual management plan is designed to maintain exploitation rates on stocks of concern within established limits through 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 when required to address specific conservation concerns. For the 2018 fishing season, the following changes to annual fishing plan were implemented:

- Additional conservation to address to further protect low returns of Fraser River Spring 4<sub>2</sub>, Spring 5<sub>2</sub>, and Summer 5<sub>2</sub> Chinook were implemented. For Area G troll this includes a fishery closure for June and July and the use of additional time/area closures.
- To avoid exceeding the overall WCVI AABM TAC, 5,000 Chinook of the Area G TAC was allocated to September fisheries. If AABM catch estimates indicate the overall WCVI AABM TAC may be exceeded, the Area G TAC for September would be used to assist Canada with staying within its overall WCVI Chinook TAC.
- The retention of hatchery marked Coho was not permitted in fisheries after September 15 which has been permitted in recent years

#### Area G Troll Fishing Periods Generalized Fishing Plan

##### *October to March:*

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:*

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

##### *Late April/ mid-June:*

During the period from April 19 to June 15, a harvest of approximately 40% of the Area G annual TAC is permitted, based on the PST Chinook model calibration and assigned harvest levels for the outer WCVI area. In addition, total effort (boat-days) was limited and areas of southwest Vancouver Island were closed until May 7

(partial openings from May 2 to 7), in order to avoid interception of Fraser River Spring 4<sub>2</sub>, Spring 5<sub>2</sub>, and Summer 5<sub>2</sub> Chinook.

*June 16 to July 23:*

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 Fraser River Spring 4<sub>2</sub>, Spring 5<sub>2</sub>, and Summer 5<sub>2</sub> Chinook.

*July 24 through early August:*

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

*September:*

During the September period, a harvest of approximately 20% of the Area G annual TAC is permitted based on the PST Chinook model calibration and assigned harvest levels for the WCVI AABM 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 sectors catches are larger than projected, the available commercial TAC is reduced. During harvest opportunities between September 15 and December 31 retention of marked Coho by-catch may be permitted.

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 2017/2018.

### **6.3.1 FIRST NATIONS COMMERCIAL HARVEST**

In 2018, the Department authorized an AABM Chinook salmon demonstration fishery for the T'aaq-wiihak Nations (five Nuuchahnulth First Nations located on the West Coast of Vancouver Island - Ahousaht, Ehatesaht, Hesquiaht, Mowachaht/Muchalaht, and Tla-o-qui-aht) with a TAC of 9,721 pieces. The fishery was carried out in portions of Areas 24, 25, 26, 124, 125 and 126 on the west coast of Vancouver Island over two openings: May 14 – 31, and June 12 – August 28. A 100% independent dockside monitoring program was in place for the entire season. Sale of Chum and Pink were permitted during these openings. In the second opening hatchery-marked Coho could be retained for sale, and sale of Sockeye was also permitted from August 3 – 28. Several groundfish species were could be retained for sale, and additional salmon and groundfish were retained for FSC under dual fishing provisions. Total catch reported to date for the AABM Chinook salmon demonstration fishery can be found in Table 6.

## **6.4 FIRST NATIONS DOMESTIC AND FSC FISHERIES**

The 2018 WCVI AABM FSC Chinook reported catch (to date) can be found in table 6 (this includes fish retained for food, social and ceremonial purposes from the T'aaq-wiihak salmon demonstration fishery); catch from Maa-nulth Nations Domestic fisheries can be found in Table 6. Total AABM Chinook reported to date for First Nations FSC and domestic fisheries can be found in Table 6.

## Table 6. Southern BC - AABM Chinook Directed Fisheries

Licence Group	Fishing Area	Chinook Kept	Chinook Released	Fraser Sockeye Kept	Non-Fraser Sockeye Kept	Unknown Sockeye Kept	Sockeye Released	Pink Kept	Pink Released	Coho Kept	Coho Released	Chum Kept	Chum Released
First Nations FSC													
	West Coast Vancouver Island	1,018	100	445						5,033		2	
Total First Nations FSC Catch		1,018	100	445	0	0	0	0	0	5,033	0	2	0
First Nations Commercial													
T'aaq-wiihak	WCVI AABM (24-26, 124-126)	9,667	499	15,493	43		9			899	2,145	2	0
T'aaq-wiihak <sup>2</sup>	Fraser River Sockeye (124-126)	17	41	14,185	43					1	49	1	0
Total First Nations Commercial Catch		9,684	540	29,678	86	0	9	0	0	900	2,194	3	0
Treaty													
Maa-nulth Treaty	WCVI Areas 123-1 to 8, and Portions of Areas 21, 121-1, 123-9, 124-1, 124-3, 126-1 to 4	1,752											
Total Treaty Catch		1,752	0	0	0	0	0	0	0	0	0	0	0
Commercial													
Area G Troll	WCVI	19,156	2,209	0	0	0	50	0	0	0	3,739	31	7
Total Commercial Catch		19,156	2,209	0	0	0	50	0	0	0	3,739	31	7
Recreational													
	WCVI - Inshore (20W-27)	13,213	34,950						2				
	WCVI - Offshore (121-127)	32,020	17,771					26	100				
Total Recreational Catch		45,233	52,721	0	0	0	0	26	102	0	0	0	0
<b>TOTALS</b>		<b>76,843</b>	<b>55,570</b>	<b>30,123</b>	<b>86</b>	<b>0</b>	<b>59</b>	<b>26</b>	<b>102</b>	<b>5,933</b>	<b>5,933</b>	<b>36</b>	<b>7</b>

Notes:

- West Coast Vancouver Island FSC catch includes catch from all FSC fisheries reported in those areas. FSC fisheries in these areas do not generally 'target' one species. 'Target' and 'non-target' catch retained for FSC are included for T'aaq-wiihak fisheries where appropriate.
- Catch from the T'aaq-wiihak Fraser Sockeye directed fishery

## **7 SOUTHERN BC CHINOOK INDIVIDUAL STOCK BASED MANAGEMENT (ISBM) FISHERIES**

---

### **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 2018 in First Nations FSC, recreational and commercial Chinook fisheries to protect West Coast Vancouver Island (WCVI), Lower Strait of Georgia (LGS), and Fraser River Chinook stocks. FSC management actions included time and area closures and reduced fishing times. Recreational measures included barbless hooks, time/area closures, reductions to daily/possession limits, 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 and mandatory logbooks.

Specific management actions were taken to protect WCVI origin Chinook in Canadian ocean fisheries (not including enhanced terminal areas), the harvest of which is managed to an exploitation rate of 10%. Fisheries to which this limit applies are the northern troll, Haida Gwaii recreational, WCVI troll and WCVI recreational. Most Southern BC fisheries were managed such that impacts on WCVI wild Chinook stocks were minimized, with the exception of terminal recreational, commercial and First Nations FSC fisheries.

LGS Chinook stocks are improving from historic lows seen in 2009 and are rebuilding. Significant management measures in recreational and commercial fisheries continued to be in place to protect these stocks. Some LGS Chinook stocks are seeing a gradual increase in terminal returns, particularly in the Cowichan River.

Fraser River Spring 4<sub>2</sub>, Spring 5<sub>2</sub>, and Summer 5<sub>2</sub> Chinook stocks have had specific management measures in place to reduce exploitation in FSC, recreational and commercial fisheries.

For 2018, the Department also implemented a precautionary 25% to 35% reduction in exploitation rates for all Fraser River Chinook populations to support conservation and promote rebuilding.

First Nations FSC management actions in the Fraser River included time and area closures, and reduced fishing times.

Recreational fisheries in Juan de Fuca Strait, the lower 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.

ISBM Chinook catch and release information from all fisheries can be found in the individual Tables.

In 2018, commercial fisheries in Barkley and Nootka sounds targeted ISBM Chinook. Chinook non-retention was in place for other southern BC commercial fisheries (excluding AABM chinook).

## **7.2 STOCK STATUS**

### **7.2.1 WEST COAST VANCOUVER ISLAND CHINOOK**

Wild WCVI Chinook are a stock of concern. While stocks are low and stable, they are below target and have not rebuilt from low abundances that resulted from a decline in productivity observed during the early to mid-1990s. Of particular concern are those stocks that originate from the SWVI area conservation unit (i.e. Clayoquot Sound).

Hatchery production supports terminal fisheries directed at surplus production with extensive management measures in place to reduce impacts on wild origin stocks. For WCVI hatchery stocks, the terminal return is defined as total catch (First Nation FSC, sport and commercial) in the near approach areas of the hatchery plus escapement (brood collection plus natural spawners, and ESSR if applicable). 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.

A small assessment fishery near the Mquq<sup>win</sup> / Brooks Peninsula occurred in 2018 in order to improve the precision and accuracy of annual WCVI Chinook return estimates. The sample size was approximately 1,000 Chinook.

### **7.2.2 STRAIT OF GEORGIA CHINOOK**

#### *Fall Season*

Returns of fall Chinook to SEP facilities south of Campbell River were average to above average in 2018. Puntledge River had another strong showing with an estimate of over 10,600 fish compared to the 12 year average of 7,174. Further south, the Big Qualicum River escapement was closer to the 4 year average of 6,700 at 6,507. Counts in the Little Qualicum River were also average based on preliminary swim results.

Chinook escapement to mid-island streams was variable. The peak count in the Englishman River (411) was less than half of 2017 and below average. Nanaimo River counts were about 10% below the four year average at 3,651 fish.

Cowichan River Chinook (a wild Chinook indicator stock) declined from a high of 16,982 adults in 1995 to 1,260 in 2009. The declining trends after 1990 in various southern Strait of Georgia Rivers are attributed to high exploitation rates, a decline in marine survival, and habitat issues. Exploitation rates on CWT hatchery fish were estimated at 80-90% in the early 1990s but declined to an average of 56% for the period 2006-2012 as a result of various harvest restrictions implemented over the last 20 years. 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 have substantially reduced harvests of Chinook in the Cowichan River in recent years.

The Cowichan River counting fence was operational from September 7 to October 26<sup>th</sup>, 2018 following significant repairs in 2017 and further modifications in 2018. Over this time, a total of 8,993 Chinook were enumerated before the fence was removed due to a large number of fish still holding downstream. Based on fence counts alone it appears that the escapement target of 6,500 naturally spawning adults was met. Data is



currently being reviewed and counts will be expanded using PIT tag detections in returning fish tagged as juveniles. Preliminary expansions suggest the total return (jacks and adults) of 20K but will be adjusted with dead pitch data as well as further video review.

Abundance has been steadily improving since 2009 with estimates for 2018 comparable to the 1990's. The ratio of jacks in the population based on video analysis is estimated at 25% which is about half of what was observed in 2018. The proportion of hatchery fish in the population was estimated at less than 10% using adipose clips (95% mark rate) suggesting wild production is high. The number of Chinook caught in local First Nation FSC fisheries has not yet been reported. Hatchery brood removals total 490 fish (460 adults) and are in addition to fence counts.

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 BC 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.

#### *Spring/Summer:*

The Puntledge, Nanaimo and more recently the Cowichan system have identified early runs of Chinook in the Strait of Georgia. Cowichan Summer run Chinook were monitored again this year with a DIDSON and results show approximately 100 targets moving upstream in the mid-river. Efforts to recover Puntledge summers to viable levels have resulted in improved returns to the river since 1999. The estimate for 2018 escapement to Puntledge is approximately 820 adults which is close to the four year average of 860. Monitoring of Nanaimo spring and summer Chinook escapement was confined to one swim survey in 2018. Although no spring run surveys were conducted, a count of 288 summer run Chinook was achieved which is below the 4 year average of 810. Two swim surveys of the Chemainus River revealed a peak count of just five summer Chinook. Recent counts in this system have been very low and a rock slide in the lower canyon now limits access to a significant portion of the system.

### **7.2.3 JOHNSTONE STRAIT MAINLAND INLET CHINOOK**

Currently only three systems are monitored consistently. In Area 12, the Nimpkish River is assessed using standardized swim surveys and stream walks by hatchery staff. In Area 13, the Campbell/Quinsam and Phillips rivers are assessed by intensive mark-recapture programs. The Campbell/Quinsam is a long-term Chinook indicator, assessed yearly since 1984 (program carried out by Quinsam Hatchery). The Phillips program has been in development over the past few years with the plan to eventually establish it as a Chinook indicator for the mainland inlet area. Other systems are covered using intermittent visual surveys.

#### *Nimpkish River*

In 2018, the general observations of Chinook were down relative to recent years and below brood. Low water conditions during October constrained fish migration and Chinook staged and spawned in atypical locations. At the time of this report Hatchery staff were in the process of trying to secure brood stock, but low Chinook

abundance and water conditions had impacted those efforts to date. Many of the fish that have been encountered for brood collection have been post spawn. Preliminary estimate of 857 (peak count 518) Chinook is 54% of the last 4 year average of 1,600 and is approximately 35% of the 2014 brood year.

#### *Campbell/Quinsam System*

The 2018 program has the combined system preliminary Chinook estimate at approximately 7,300 adults; down from the 2017 estimate of 9,500 adults but similar to the 7,500 that returned in 2016. The 2014 parental brood year for returning age-4s was approximately 2,600. In 2018, program precision for each river was below 9%. The Quinsam Hatchery attained their Chinook brood target.

#### *Phillips River*

Preliminary results for the Phillips River program indicate the Chinook escapement is in the range of 1,200, a marked decrease in the consistent trend of the past few years; the 5-year historic average is approximately 2,400.

### **7.2.4 FRASER RIVER CHINOOK**

Escapements of spring and summer stream type stocks have been at low levels during the 2009 Agreement, and in 2018 fisheries were restricted further in the Canadian marine fisheries and Fraser River to address concerns about poor status for all Fraser Chinook stock groups. Relative to the parental brood escapements, the 2018 escapement decreased approximately as follows to the Spring 4<sub>2</sub> (-88%), Spring 5<sub>2</sub> (-50%) and Summer -5<sub>2</sub> (-60%) stock groups. Escapement estimates are still being developed for some stocks following the summer wildfires, so the aggregate totals are currently unavailable.

Status has declined for the Summer 4<sub>1</sub> stock group. In 2018, the escapement of the Summer 4<sub>1</sub> aggregate declined by approximately 50% from the brood escapement levels.

Annual Fraser River fall-run Chinook stock group escapements are, on average, large (~100,000 during the 2009 Agreement). Historically, 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 Hatchery. 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.

#### *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.

## 7.3 FIRST NATIONS DOMESTIC AND FSC FISHERIES

### *WCVI FSC Fisheries and Treaty Domestic Fisheries*

Somass First Nations caught Chinook by gill net, rod and reel and as by catch during other salmon fisheries in Area 23. Catch reports for Maa-nulth domestic harvest, the WCVI NTC non-treaty First Nations harvest, the remaining non-NTC First Nations harvest, and the total combined catch for WCVI First Nations can be found in Table 7.

### *Strait of Georgia FSC Fisheries and Treaty Domestic Fisheries*

First Nations catches in the Strait of Georgia can be found in Table 7

### *Johnstone Strait FSC Fisheries*

First Nations catches in Johnstone Strait can be found in Table 7

### *Fraser River FSC Fisheries*

FSC fisheries took place in the Lower Fraser River between the mouth and Sawmill Creek from April through November 2018. A total number of Chinook harvested, including from Chinook-directed fisheries, and the remaining Chinook harvested as bycatch in Sockeye and Chum-directed FSC openings or limited participation openings, can be found in Tables 7,8,10, and 12. Sockeye, Coho, and Chum bycatch that occurred during Chinook-targeted FSC openings is also listed in those Tables.

Chinook directed FSC fisheries took place in the Fraser River and some tributaries above Sawmill Creek from May through October 2018. A preliminary total of Chinook harvested, as well as bycatch estimates can be found in Tables 7, 8, 10, and 12.

## 7.4 COMMERCIAL FISHERIES

### *Area B Seine*

Due to a relatively large forecast of 83,000 Chinook for Robertson Creek Hatchery, Area B Seine fisheries were initiated in Area 23. The fisheries occurred in Subarea 23-1, upper Alberni Inlet, targeting Chinook with a bycatch of Coho permitted. The fisheries were operated using a pool system with only designated vessels permitted to fish. The fishery opened daily on September 4-7. The Area B in-season TAC was 4,877 Chinook. There was also additional quota reallocated to Area B from uncaught catch in the recreational sector. The fisheries were very successful and a total Chinook catch and Coho by-catch can be found in Table 7.

### *Area D Gill Net*

Area D gill net fisheries were initiated in Area 23. The fisheries occurred in Subarea 23-1, upper Alberni Inlet, targeting Chinook with a bycatch of Coho allowed. The fisheries were opened one day a week for night-time only fisheries in late August. After Labour Day there were multiple openings nightly in early and mid-September. The fisheries occurred on August 22, 26 and September 3,4,5,7,8,10,11,12,13. The Area D in season TAC was 9,768 Chinook. There was also additional quota reallocated to Area D from uncaught catch in the recreational sector. The fisheries were successful and a total Chinook catch and Coho bycatch can be found in Table 7.

In 2018, gill net fisheries occurred in Tlupana Inlet targeting Chinook returns to the Conuma River hatchery. Fisheries occurred discontinuously from Aug 12 to September 12. The total estimated catch during the Chinook directed fishery can be found in Table 7.

#### *Area E Gill Net*

There were no Area E gill net fisheries for ISBM Chinook in 2018.

There were no chinook directed Area E gill net commercial openings in the Fraser River (Area 29) during the 2018 season and retention of chinook in sockeye directed fisheries was not permitted as part of the 25% to 35% coast wide reductions for Fraser chinook stocks.

### **7.4.1 FIRST NATIONS COMMERCIAL HARVEST**

In 2018, an agreement was reached with the Hupacasath and Tseshaht First Nations for an Economic Opportunity fishery. The fisheries occurred in Subarea 23-1 Upper Alberni Inlet including the tidal portion of the Somass River. The target species was Chinook with a bycatch of Coho allowed. There were commercial Chinook openings on August 24, 28, September 6th, 9th, and 20th. The in-season Economic Opportunity TAC for Chinook was 14,645. There was also additional quota reallocated to the Somass Economic Opportunity fishery from uncaught catch in the recreational sector. There was also a small amount of Chinook bycatch in an October 15 Economic Opportunity Coho fishery. The fisheries were successful and a total Chinook and Coho bycatch can be found in Table 7

The Department authorized an ISBM Chinook commercial salmon demonstration fishery in Area 25 for the T'aaq-wiihak Nations in 2018. This fishery targeted both the Conuma River and Burman River enhanced Chinook returns using troll and gill net. Fishery openings occurred between July 12 and September 4. The total Chinook catch from the Conuma-targeted fishery and the Burman-targeted fishery can be found in Table 7. Chum bycatch was also permitted to be sold. Dual fishing was permitted and catch reported retained for FSC purposes can be found in Table 7.

#### *Fraser River Economic Opportunity and Inland Demonstration Fisheries*

Economic opportunity or inland demonstration fisheries did not occur in 2018 for ISBM Chinook in either the upper or lower reaches of the Fraser River as part of the 25% to 35% coast wide reductions for Fraser Chinook Stocks.

In 2018, Fraser Sockeye economic opportunity and demonstration fisheries took place in the lower Fraser River with the Musqueam First Nation, Harrison Fisheries Authority, and 18 communities from Port Mann Bridge to Sawmill Creek; retention of Chinook was not permitted.

In 2018, no economic opportunity fisheries for Fraser Chum occurred in the Lower Fraser River Area due to poor in-season chum escapement. There is currently one Inland Commercial Fishing Enterprises (CFE) operating in the Lower Fraser: Harrison Fisheries Authority was authorized a demonstration fishery on sockeye using gill nets in the Harrison River; however, no fishing occurred as the group was concerned the Harrison River Sockeye return was not sufficient to sustain a fishery. Therefore there were no incidental impacts on Chinook from these fisheries.

There are currently three Inland Commercial Fishing Enterprises (CFE) operating in the BC Interior: Okanagan Nation Alliance, Upper Fraser Commercial Fishing Enterprise and Riverfresh (Secwepemc Fisheries Commission). Riverfresh is the only CFE that receives allocation for Chinook (S. Thompson, Summer 4-1 chinook). In 2018, Riverfresh did not retain Chinook for sale during the sockeye directed purse seine fishery as part of the 25% to 35% coast wide reductions for Fraser chinook stocks. Dual Fishing was in place for any non-target species that could not be released alive in vigorous condition or were dead.

The total Chinook harvested in sockeye economic opportunity/demonstration fisheries can be found in Tables 7, 8, 10, 12.

## **7.5 EXCESS SALMON TO SPAWNING REQUIREMENTS (ESSR) FISHERIES**

The Tseshaht and Hupacasath First Nations were issued a joint Excess Salmon to Spawning Requirements (ESSR) Licence for Chinook at the Robertson Creek Hatchery facility.

The Ditidaht First Nation was issued an ESSR Licence for Chinook at Nitinat Lake and the Nitinat Hatchery.

The Mowachaht/Muchalaht First Nation was issued an ESSR licence to harvest Chinook, hatchery-marked Coho, and Chum from the Conuma River and hatchery, and the Burman River. Due to challenging environmental conditions and no surplus of salmon available, no ESSR fishery occurred in 2018.

The Ucluelet First Nation was issued an ESSR licence to harvest Chinook at the Thornton Creek hatchery.

An ESSR for the Qualicum First Nation for chum, coho and chinook was issued October 3, 2018 UFN at the Big Qualicum hatchery. See Table 7 for catch.

There were ESSR fisheries at the Capilano hatchery in 2018 that included Chinook salmon.

There were ESSR fisheries at the Chilliwack hatchery in 2018 that included Chinook salmon.

There were ESSR fisheries permitted at the Inch Creek and Chehalis hatcheries in 2018

There were no Johnstone Strait ESSR opportunities on Chinook in 2018

There were no Interior ESSR opportunities on Chinook in 2018

All ESSR harvest information can be found in the individual tables.

## **7.6 RECREATIONAL FISHERIES**

ISBM Chinook catch and release information from all fisheries can be found in Table 7.

### *West Coast Vancouver Island*

In 2018, a good return of 4 year old Chinook was expected to the WCVI. Actual returns were slightly above forecast, and provided good recreational fishing opportunities in many areas.

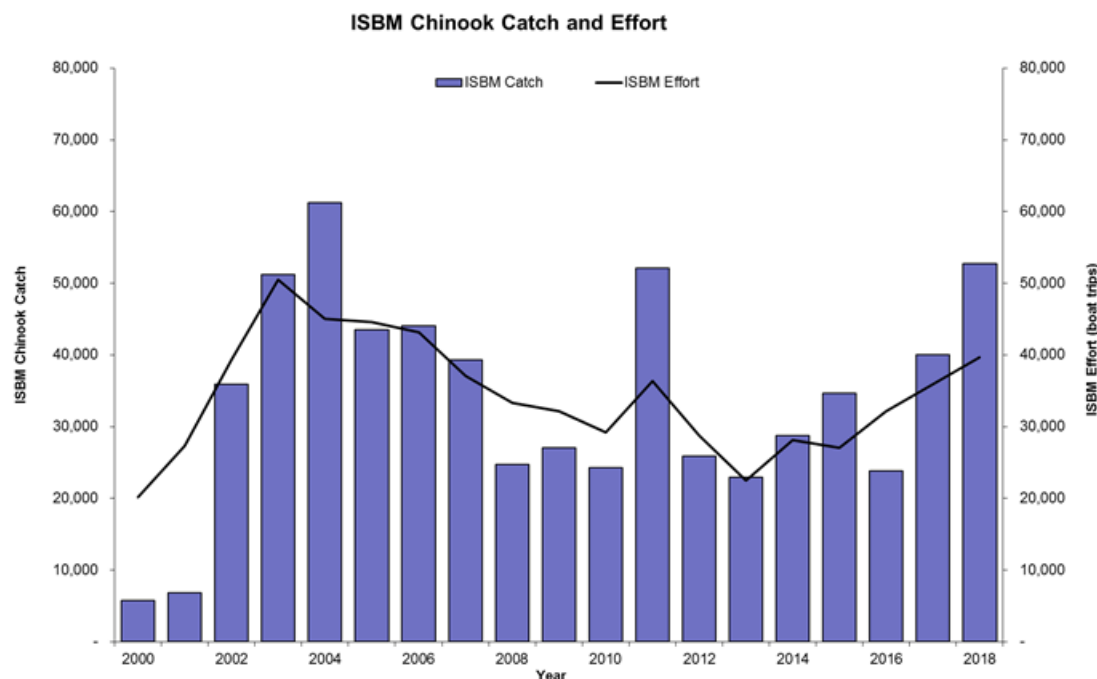


Figure 7-1 Recreational WCVI Chinook ISBM Catch and Effort, 2000 to 2018

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

The 2018 recreational fisheries in the Inside Areas were further restricted this year to minimize impacts on returning Fraser River Chinook. Significant management measures were implemented to provide additional protection for these stocks and included mark selective fisheries, size limits in specific areas/times, reductions in daily limits in portions of the Strait of Georgia. Closures were also implemented in portions of the Fraser approach waters, Southern Gulf Islands and Juan de Fuca Strait to support recovery of Southern Resident Killer Whales.

Areas 13 to 18, 28 and 29 and Subareas 19-1 to 19-6 (except those portions listed below):

June 1, 2018 until September 30, 2018, the daily limit for Chinook Salmon was one (1) per day in in Areas 13 to 17, 28 and 29 with the exception of those areas listed below where additional actions were in place for Southern Resident Killer Whales (SRKW).

October 1, 2018 until further notice, the daily limit for Chinook Salmon was two (2) per day in in Areas 13 to 19, 28 and 29.

Exceptions:

Strait of Georgia:

May 7, 2018 until June 28, 2018 the daily limit for Chinook salmon was two (2) per day, of which only one may be greater than 67 cm in Subareas 18-1, 18-3, 18-6, 18-11, and 19-5.

June 29, 2018 to July 31, 2018 the daily limit was two (2) Chinook salmon per day between both of which must be less than 85 cm in Subareas 18-1, 18-3, 18-6, 18-11, and 19-5.

Chinook salmon retained in these waters must have a fork length of at least 62 cm.

Juan de Fuca (Subareas 19-1 to 19-4 and Area 20):

June 1, 2018 until June 28, 2018 the daily limit for Chinook salmon was two (2) per day which may be wild or hatchery marked between 45 and 67 cm fork length or hatchery marked greater than 67 cm in Subareas 19-1 to 19-4 and 20-6 and 20-7 and that portion of Subarea 20-5 that lies east of 123 degrees 49.30 minutes west longitude (Otter Point).

June 29, 2018 until July 31, 2018, the daily limit for Chinook salmon was two (2) Chinook per day which may be wild or hatchery marked between 45 and 85 cm or hatchery marked greater than 85 cm in Subareas 19-1 to 19-4 and 20-6 and 20-7 and that portion of Subarea 20-5 that lies east of 123 degrees 49.30 minutes west longitude (Otter Point).

Fraser River tidal and non-tidal sport fisheries had delayed starting dates, implemented to protect Fraser Chinook stocks.

Finfish Closures were also implemented from June 1- September 30 in the following portions of the Southern Gulf Islands and Juan de Fuca to support SRKW:

- Subareas 18-2, 18-4, 18-5 and 18-9.
- Subareas 20-3, 20-4 and that portion of Subarea 20-5 that lies west of 123 degrees 49.30 minutes west longitude (Otter Point)
- Subareas 29-7, 29-9, 29-10
- Subarea 29-6 was closed to salmon fishing from June 1 – July 31 and was a chinook non-retention area from August 1 – September 30.

For the Johnstone Strait and the other areas of the Strait of Georgia not described above, Chinook management measures included an annual limit of 15 Chinook, a daily limit of two Chinook and a minimum size limit of 62 cm. For the Canadian portion of Juan de Fuca Strait south of Cadboro Point, regulations include an annual limit of 20 Chinook, a daily limit of two Chinook and a minimum size limit of 45 cm.

In 2018, marine sport 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 Subareas 20-1; 2) Portions of the Strait of Georgia including Areas 14 through 18, that portion of Area 19 north of Cadboro Point, Areas 28 and 29; and 3) Johnstone Strait including Areas 11 to 13. Creel survey monitoring of these fisheries includes 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 sport catch by fishing guides during guided trips, were conducted in the Campbell River and Victoria Areas in 2018. Electronic survey estimates from the iREC program will also be used to produce catch estimates for those areas where creel surveys did not take place.

The Johnstone Strait creel survey for Areas 11 and 12 was conducted from June through August.

The Strait of Georgia creel survey for Areas 13 and 14 was conducted from May to October. Areas 15 and 16 did not have a creel survey in 2018. Creel surveys were conducted in Areas 17 and 18 from May to July. Creel surveys were conducted for Areas 19 and the SOG portion of Area 20 from March to October.

Effort, catch and release information from marine fisheries are summarized in Table 7.

### *Region 1 Vancouver Island Tributaries-*

River conditions in most tributaries on Vancouver Island were improved in 2018 compared to previous years due to an adequate snowpack, cooler temperatures over the summer and more precipitation during portions of the summer months. All systems in Region 1 that are typically open remained open in 2018. The Qualicum Nitinat, Somass and Conuma Rivers provided some recreational opportunities to harvest enhanced Chinook stocks during this time period.

#### *Qualicum River*

Qualicum River opened for Chinook on August 1 for four per day less than 62 cm. On October 16 the regulation changed to four Chinook per day of which 2 could be greater than 62 cm. The Qualicum River was not monitored by creel survey during 2018.

#### *Somass/ Stamp*

During 2018 there was a non-tidal opening on the Somass/Stamp River (Area 23) with Chinook retention. The fishery opened from August 25th until December 31, 2018, and the daily limit was one Chinook salmon greater than 77cm and one less than 77 cm. The Somass/Stamp Rivers were not monitored by creel survey during 2018.

#### *Nitinat*

During 2018 there was a non-tidal opening for the Nitinat River (Area 22) from August 25, 2018 to September 30, 2018. The daily limit was two with only one greater than 77 cm. The salmon fishery was closed for retention of Chinook from October 1 until October 14 to protect Chinook salmon during the peak spawning period. The salmon fishery re-opened from October 16 until December 31 with non-retention of Chinook salmon. The Nitinat River was not monitored by creel survey during 2018.

#### *Conuma*

During 2018 there was a non-tidal opening for the Conuma River from August 25, 2018 to December 31, 2018. The daily limit was two with only one greater than 77 cm.

### *Fraser River and Tributaries*

Fraser River Chinook stocks required additional management measures again in 2018 due to continued concerns about poor stock status.

In Subareas 29-6, 29-7, 29-9 and 29-10, the 2018 fishing regulations were as follows:

- January to May 31, 2018, fishing for chinook was not permitted.
- June 1 to October 24, 2018, fishing for salmon was not permitted in Subareas 29-7, 29-9 and 29-10.
- June 1 to July 31, 2018, fishing for salmon was not permitted in Subarea 29-6.



- August 1 to September 27, 2018, the daily limit for chinook salmon was zero per day in Subarea 29-6.
- September 28 to October 24, 2018, fishing for salmon was not permitted in Subarea 29-6.
- October 25 to December 31, 2018, the daily limit for Chinook salmon was two (wild or hatchery marked) with a minimum size limit of 62 cm in Subareas 29-6, 29-7, 29-9 and 29-10.

#### *Tidal Fraser and Region 2 Fraser River:*

In the tidal waters of the Fraser River and in that portion of the Fraser River in Region 2 the following regulations were in place for 2018:

- January 1 to August 6, no fishing for salmon.
- August 7 to September 3, the daily limit for chinook was four (wild or hatchery marked) with only one over 50 cm allowed to be retained.
- September 4 to September 27, the daily limit for chinook was four (wild or hatchery marked) with only one over 62 cm allowed to be retained.
- September 28 to October 24, fishing for salmon was not permitted.
- October 25 to December 31 the daily limit for chinook was four (wild or hatchery marked) with only one over 62 cm allowed to be retained.

#### *Fraser River Tributaries:*

There were several tributaries to the Fraser River in which Chinook retention was permitted. These included:

- Alouette River: daily limit of one Chinook from September 1 to December 31;
- Chehalis River: daily limit of four with only one over 50 cm from June 1 until August 31 and a daily limit of four Chinook with only one over 62 cm from September 1 until December 31;
- Chilliwack/Vedder River: daily limit of four with only one over 62 cm from July 1 until August 31, daily limit of four with two over 62 cm from September 1 to December 31;
- Coquitlam River: daily limit of one Chinook from September 1 to December 31;
- Harrison River, there was no Chinook fishery on the Harrison River in 2018 due to a low forecast of terminal abundance.

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

#### *Region 3 - Fraser River Tributaries*

Kamloops Lake and Thompson River from the outlet of Kamloops Lake, downstream to fishing boundary signs located just downstream of Gold Pan Provincial Park:

- August 22 to September 22, daily limit of four Chinook, only one over 50 cm.

South Thompson River from the green can buoy near outlet of Little River, including Little Shuswap Lake, to the fishing boundary sign approximately 100 m downstream of Campbell Creek

- August 16 to September 22, daily limit of four Chinook, only two greater than 50 cm. There is a monthly quota of six Chinook from the South Thompson River.

#### *Region 5 – Fraser Watershed*

There were no recreational Chinook fisheries in 2018.

### *Region 7*

There were no recreational Chinook fisheries in 2018.

### *Region 8*

Note: there is a monthly limit of four Chinook in Region 8.

That portion of Mabel Lake that is both northerly of a line drawn from a white triangular fishing boundary sign situated at the northern edge of Mabel Lake Provincial Park to the prominent point of land on the western shore; and southerly of a line drawn between two white triangular fishing boundary signs located on opposite shores approximately 1 km from Wap Creek.

- August 16 to September 12, daily limit of four chinooks, only two over 50 cm.

Middle Shuswap River: No fishing for salmon.

Lower Shuswap River upstream from white triangular fishing boundary signs upstream of the Mara Bridge to Mable Lake

August 16 to September 12, daily limit of four chinooks, only two over 50 cm.

**Table 7. Southern BC - ISBM Chinook Directed Fisheries\***

Licence Group	Fishing Area	Chinook Kept	Chinook Released	Fraser Sockeye Kept	Non-Fraser Sockeye Kept	Unknown Sockeye Kept	Sockeye Released	Pink Kept	Pink Released	Coho Kept	Coho Released	Chum Kept	Chum Released
First Nations FSC													
	Johnstone Strait	507	0										
	Strait of Georgia	1,033	0										
	WCVI	1,837	120	0	0	0	0	0	0	0	0	0	0
	Fraser River*	17,687	463										
Total First Nations FSC Catch		21,064	583	0	0	0	0	0	0	0	0	0	0
First Nations Commercial													
T'aaq-wiihak	WCVI ISBM (25)	2,850											
Maa-nulth HA	Henderson (23)												
Harvest Agreement	Fraser River*	22	8										
EO	WCVI	19,899	0	0	0	0	0	0	0	783	0	0	0
EO	Fraser River*	435	1,068										
Demo	Fraser River*	0	3,344										
Total First Nations Commercial Catch		23,206	4,420	0	0	0	0	0	0	783	0	0	0
Commercial													
Area B Seine	Nitinat (21, 121)	0	0	0	0	0	0	0	0	0	0	0	0
Area B Seine	Somass (23)	6,403	235	0	0	0	66	0	58	2,606	0	0	5
Area D Gillnet	Tlupana (25)	3,307	0	0	0	0	0	0	0	0	2	36	0
Total Commercial Catch		9,710	235	0	0	0	66	0	58	2,606	2	36	5
Recreational													
	Juan de Fuca (19,20)	25,519	48,794					252	0				
	Strait of Georgia (13-19,28,29)	38,762	62,029					2,602	2,265				
	Johnstone Strait (11-12)	13,147	15,218					1,904	1,973				
	WCVI - Inshore (20-27)	37,804	22,623					77	76				
	Fraser River*	7,323	198										
Total Recreational Catch		122,555	148,862	0	0	0	0	4,835	4,314	0	0	0	0

ESSR													
	Johnstone Strait												
	Strait of Georgia	3,336											
	WCVI	28,762											
	Fraser River*	13,593	0										
Total ESSR Catch		45,691	0	0	0	0	0	0	0	0	0	0	0
<b>TOTALS</b>		<b>222,226</b>	<b>154,100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>66</b>	<b>4,835</b>	<b>4,372</b>	<b>3,389</b>	<b>2</b>	<b>36</b>	<b>5</b>

Notes:

\*Fraser River Data includes Chinook CATCH from all fisheries, not just "directed" Chinook fisheries. Fraser River catch estimates are incomplete; not all of the assessed fisheries had available catch estimates to include in this report.

Johnstone Strait, West Coast Vancouver Island and Strait of Georgia FSC catch includes catch from all FSC fisheries reported in those areas. FSC fisheries in these areas do not generally 'target' one species. 'Target' and 'non-target' catch retained for FSC are included for T'aaq-wiihak and Somass fisheries where appropriate.

## 8 FRASER RIVER SOCKEYE

---

### 8.1 OBJECTIVES AND OVERVIEW

In 2018 the Fraser River Panel (FRP) adopted the p50 probability run size forecast for all run timing groups (13.9M Fraser Sockeye) for pre-season planning purposes. At the p50 and p25 run size forecasts TAC for international sharing was available and pre-season plans took this into consideration. All fishery planning focused on staying within constraints to minimize impacts on less abundant stock groups and species of concern. Actual in-season harvest opportunities were dependent on in-season stock assessments.

Fishing plans incorporate provisions to meet escapement objectives and meet conservation objectives for stocks of concern while considering other international and domestic objectives. Fishing plans include the following assumptions and guiding principles in no particular order:

- The FRP operated in accordance with Chapter 4, Annex IV of the Pacific Salmon Treaty;
- 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 FRP 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 by a small but acceptable amount 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% (maximum 80,000) 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 to by the Fraser River Panel;
- It was anticipated that 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 the Birkenhead and Birkenhead-type miscellaneous stocks), caught seaward of the confluence of the Fraser and the Harrison Rivers;
- The four run timing 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 differ substantially from the other stocks in their respective historical run timing groups. Fisheries and Oceans Canada continues 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;

- The Total Allowable Mortality (TAM) cap describes the upper range of the total mortality (including management adjustments and exploitation rate). The TAM cap was 60% for all run timing/management groups;
- At low abundances, low abundance exploitation rates (LAERs) are implemented to protect 80-90% of the run timing aggregate (10-20% LAER) while allowing for fisheries on more abundant co-migrating run timing groups and/or other species. In 2018 Canada's escapement plan permitted up to a 20% LAER for all stock groups with the exception of Early Stuart sockeye which permitted up to a 10% LAER. If the Late Run reached the p75 level abundance in-season the LAER for this group increases to 30%;
- The allowable harvest in a LAER situation is not a target and in most circumstances would be considered incidental harvest or bycatch only; however, in some circumstances limited directed harvest in terminal areas may be considered;
- In 2018, 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 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. The stocks and species of concern in 2018 were: Cultus Lake Sockeye, Nimpkish River Sockeye, Sakinaw Lake Sockeye, Interior Fraser River Coho, Southern B.C Chinook including Fraser River Chinook, and Interior Fraser River Steelhead.

## 8.2 STOCK STATUS

Please Note: With the exceptions of Tables 8-1, 8-3 and 8-5, all tables and figures are adapted from or courtesy of the Pacific Salmon Commission.

### 8.2.1 PRE-SEASON ASSESSMENT

Pre-season expectations were for a median run size (p50 level) of 13,981,000 Fraser River Sockeye salmon with a one in two chance that the run size would be between 8,423,000 (p25 level) and 22,937,000 (p75 level).

Table 8-1 Pre-season run size abundance forecast range by management group for Fraser Sockeye

Management Group	Probability that the Return will be at or below specified Run Size				
	p10	p25	p50	p75	p90
<b>Early Stuart</b>	37,000	54,000	84,000	133,000	199,000
<b>Early Summer</b>	584,000	1,102,000	2,155,000	3,765,000	6,587,000
<b>Summer</b>	1,470,000	2,473,000	4,344,000	7,669,000	13,173,000
<b>Late</b>	3,174,000	4,794,000	7,398,000	11,370,000	16,934,000
<b>Total</b>	5,265,000	8,423,000	13,981,000	22,937,000	36,893,000

The pre-season diversion rate forecast for Fraser River Sockeye through Johnstone Strait was 56%. Given the recent high diversion rates on this cycle line through Johnstone Strait the Panel chose to adopt the 1990-2017 median diversion rate of 63% for pre-season planning purposes. Expected Area 20 50% migration timing dates

were July 2 for Early Stuart, August 8 for Early Summer, August 11 for Summer, and August 17 for Late-run Sockeye.

Pre-season spawning escapement goals at the p50 run size forecasts were 84,000 Early Stuart, 862,000 Early Summer, 1,737,600 Summer and 2,959,200 Late-run Sockeye for a total of 5,642,800 Sockeye spawners (Table 8-2).

Table 8-2. Pre-season (top) and Post-Season (bottom) Values for TAC and Other Management Parameters.

Management Group Total Abundance			TAC*										
			Spaw ning Escapement			Manage-ment		Aboriginal Test Fishery Ex emption		Total Deductions	Total Allow able Catch (includes AFE)**	50% Migration Date (A20)	JS Diversion Rate
			Target	TAM	pMA	Adjust.	Fishing						
June	Pre-season	Early Stuart	84,000	84,000	0.00	0.69	58,000	800	7,500	84,000	7,500***	2-Jul	
		Early Summer	2,155,000	862,000	0.60	0.23	198,300	19,700	74,900	1,154,900	1,075,000	8-Aug	
		Summer	4,344,000	1,737,600	0.60	0.10	173,800	37,800	153,200	2,102,400	2,394,800	11-Aug	
		Late	7,398,000	2,959,200	0.60	0.43	1,272,500	45,700	164,400	4,441,800	3,120,600	17-Aug	
		Sockeye	13,981,000	5,642,800			1,702,600	104,000	400,000	7,783,100	6,597,900		63%
October 12	In-season	Early Stuart	125,000	108,000	0.14	0.69	74,500	1,070	6,850	125,000	6,850***	4-Jul	
		Early Summer	1,800,000	720,000	0.60	0.23	165,600	24,000	75,077	984,677	890,400	6-Aug	
		Summer	4,100,000	1,640,000	0.60	0.10	164,000	51,600	153,442	2,009,042	2,244,400	10-Aug	
		Late	4,700,000	1,880,000	0.60	0.04	75,200	34,330	164,631	2,154,161	2,710,500	17-Aug	
		Sockeye	10,725,000	4,348,000			479,300	111,000	400,000	5,272,880	5,852,150		33%

\* The TAC is determined by the run sizes and TAC deductions (spaw ning escapement targets, management adjustments, projected test fishing catches and AF Exemptions) that were in effect when the Panel control of the last U.S. fishery area was relinquished.

\*\* In a no TAC situation, the allow able harvest is the maximum harvest allowed under LAER management as identified in Canada's Escapement Plan. The allow able harvest (LAER) is not a target and is usually by-catch in fisheries directed at other stocks or species with some limited directed terminal harvest.

\*\*\* The expected allow able Early Stuart Catch.

The goals for each Sockeye management group were established by applying Canada's Spawning Escapement Plan to the forecasted pre-season run size. For pre-season planning purposes, the harvest rule for Early Stuart Sockeye was constrained by a Low Abundance Exploitation Rate (LAER) limit of up to 10%, while the Early Summer and Summer run Sockeye LAER limit was up to 20%, and the Late run Sockeye LAER limit was 20-30%. Harvest rules were further constrained by a 60% Total Allowable Mortality (TAM) rate for all management groups (Table 8-3).

Table 8-3 Fraser River Sockeye Salmon Escapement Plan and Application of the Plan to each Management Group across a Range of Forecast Abundances

Management Unit	Harvest Rule Parameters		Lower Fishery Reference Point	Upper Fishery Reference Point
	Low Abundance ER (LAER)	TAM Cap		
Early Stuart	10%	60%	108,000	270,000
Early Summer (w/o misc)	20%	60%	180,000	450,000
Summer (w/o misc)	20%	60%	1,020,000	2,550,000
Late (w/o misc)	20-30%	60%	1,100,000	2,750,000

Management Unit		Pre-season Forecast Return				
		p10	p25	p50	p75	p90
Early Stuart	forecast	37,000	54,000	84,000	133,000	199,000
	TAM Rule (%)	0%	0%	0%	19%	46%
	Escapement Target	37,000	54,000	84,000	108,000	108,000
	MA	25,500	37,300	58,000	74,500	74,500
	Esc. Target + MA	62,500	91,300	142,000	182,500	182,500
	LAER	10%	10%	10%	10%	10%
	Available ER at Return	0%	0%	0%	0%	8%
	Allowable ER	10%	10%	10%	10%	10%
	Allowable Harvest	3,700	5,400	8,400	13,300	19,900
	<u>2018 Performance</u>					
	Projected S (after MA)	19,600	28,700	44,600	70,600	105,700
	BY Spawners	68,613	68,613	68,613	68,613	68,613
	Proj. S as % BY S	29%	42%	65%	103%	154%
	cycle avg S	33,275	33,275	33,275	33,275	33,275
	Proj. S as % cycle S	59%	86%	134%	212%	318%
Management Unit		Pre-season Forecast Return				
		p10	p25	p50	p75	p90
Early Summer (w/o RNT)	lower ref. pt. (w misc)	267,500	294,300	330,100	312,600	316,200
	upper ref. pt. (w misc)	668,700	735,800	825,300	781,500	790,400
	forecast (incl. misc)	584,000	1,102,000	2,155,000	3,765,000	6,587,000
	TAM Rule (%)	54%	60%	60%	60%	60%
	Escapement Target	267,500	440,800	862,000	1,506,000	2,634,800
	MA	61,500	101,400	198,300	346,400	606,000
	Esc. Target + MA	329,000	542,200	1,060,300	1,852,400	3,240,800
	LAER	20%	20%	20%	20%	20%
	Available ER at Return	44%	51%	51%	51%	51%
	Allowable ER	44%	51%	51%	51%	51%
	Allowable Harvest	255,000	559,800	1,094,700	1,912,600	3,346,200
	<u>2018 Performance</u>					
	Projected S (after MA)	266,500	439,200	858,800	1,500,400	2,625,000
	BY Spawners	647,784	647,784	647,784	647,784	647,784
	Proj. S as % BY S	41%	68%	133%	232%	405%
	cycle avg S	330,355	330,355	330,355	330,355	330,355
	Proj. S as % cycle S	81%	133%	260%	454%	795%
Management Unit		Pre-season Forecast Return				
		p10	p25	p50	p75	p90
Summer (w. RNT & Har)	lower ref. pt. (w misc)	1,064,300	1,064,300	1,064,300	1,064,300	1,064,300
	upper ref. pt. (w misc)	2,660,900	2,660,900	2,660,900	2,660,900	2,660,900
	forecast	1,470,000	2,473,000	4,344,000	7,669,000	13,173,000
	TAM Rule (%)	28%	57%	60%	60%	60%
	Escapement Target	1,064,300	1,064,300	1,737,600	3,067,600	5,269,200
	MA	106,400	106,400	173,800	306,800	526,900
	Esc. Target + MA	1,170,700	1,170,700	1,911,400	3,374,400	5,796,100
	LAER	20%	20%	20%	20%	20%
	Available ER at Return	20%	53%	56%	56%	56%
	Allowable ER	20%	53%	56%	56%	56%
	Allowable Harvest	299,300	1,302,300	2,432,600	4,294,600	7,376,900
	<u>2018 Performance</u>					
	Projected S (after MA)	1,065,300	1,065,300	1,739,400	3,070,700	5,274,500
	BY Spawners	2,837,275	2,837,275	2,837,275	2,837,275	2,837,275
	Proj. S as % BY S	38%	38%	61%	108%	186%
	cycle avg S	815,485	815,485	815,485	815,485	815,485
	Proj. S as % cycle S	131%	131%	213%	377%	647%
Management Unit		Pre-season Forecast Return				
		p10	p25	p50	p75	p90
Late (w/o Har)	lower ref. pt. (w misc)	1,105,200	1,105,200	1,105,200	1,105,200	1,105,200
	upper ref. pt. (w misc)	2,763,100	2,763,100	2,763,100	2,763,100	2,763,100
	forecast	3,174,000	4,794,000	7,398,000	11,370,000	16,934,000
	TAM Rule (%)	60%	60%	60%	60%	60%
	Escapement Target	1,269,600	1,917,600	2,959,200	4,548,000	6,773,600
	MA	545,900	824,600	1,272,500	1,955,600	2,912,600
	Esc. Target + MA	1,815,500	2,742,200	4,231,700	6,503,600	9,686,200
	LAER	20%	20%	20%	30%	30%
	Available ER at Return	43%	43%	43%	43%	43%
	Allowable ER	43%	43%	43%	43%	43%
	Allowable Harvest	1,358,500	2,051,800	3,166,300	4,866,400	7,247,800
	<u>2018 Performance</u>					
	Projected S (after MA)	1,270,900	1,919,500	2,962,200	4,552,500	6,780,300
	BY Spawners	2,303,384	2,303,384	2,303,384	2,303,384	2,303,384
	Proj. S as % BY S	55%	83%	129%	198%	294%
	cycle avg S	2,652,186	2,652,186	2,652,186	2,652,186	2,652,186
	Proj. S as % cycle S	48%	72%	112%	172%	256%
Allowable Harvest (TF, US, CDN)		1,916,500	3,919,300	6,702,000	11,086,900	17,990,800
Total projected spawners		2,622,300	3,452,700	5,605,000	9,194,200	14,785,500

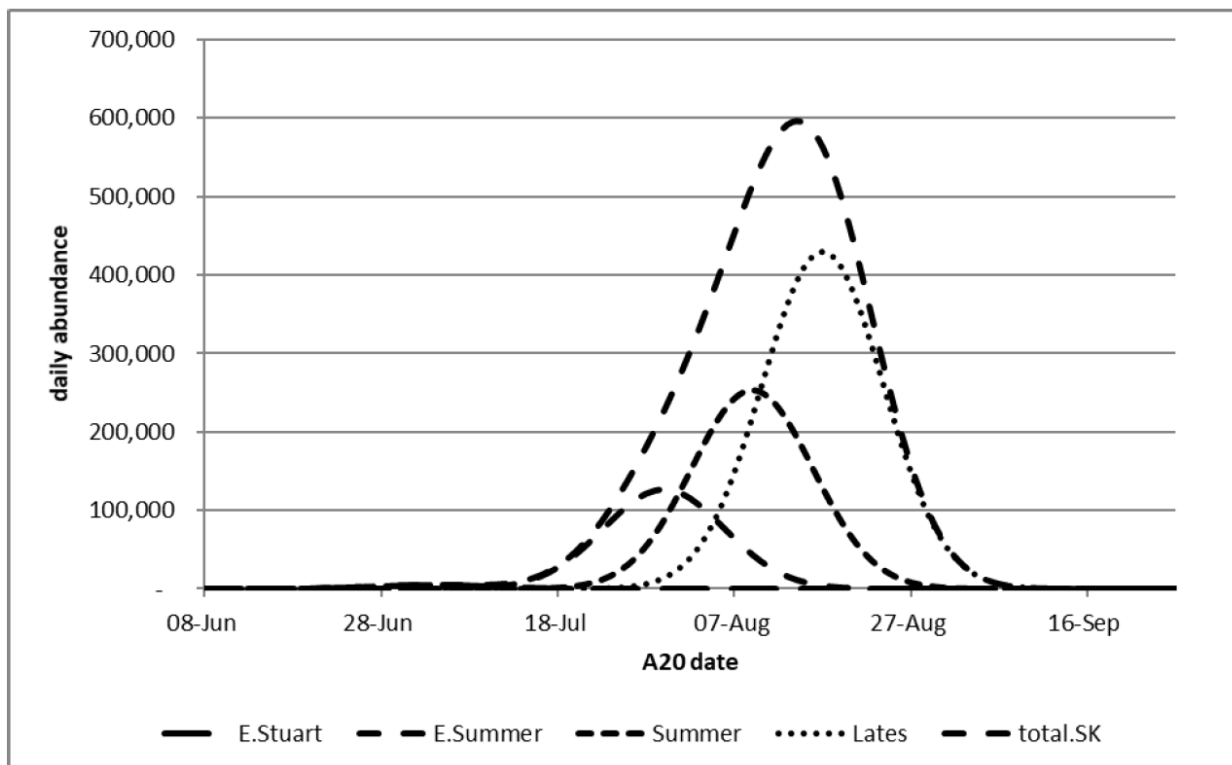


Management Adjustments (MAs) of 58,000 Early Stuart, 198,300 Early Summer, 173,800 Summer-run and 1,272,500 Late-run Sockeye were added to the spawning escapement targets to increase the likelihood of achieving the escapement targets. The application of a LAER for any management group indicates that spawning escapement targets are unlikely to be reached and therefore obviates the need for MAs. In 2018 this was the case pre-season for Early Stuart, as it was apparent that for the entire range of pre-season run size forecasts LAER management was necessary. For Summer run Sockeye, a return abundance at the lower level of the forecast range (p10) would necessitate LAER management.

The preseason MAs were derived from historical proportional differences between estimates (pDBEs). For the Early Stuart and Summer run aggregates the pre-season pDBEs were historical medians from all cycle years and for Early Summers from the dominant cycle only. For Late run the Panel agreed to use the historical median from the dominant cycle if the upstream timing was earlier than September 15<sup>th</sup> or the all years timing model estimate if the timing was after September 15<sup>th</sup>.

The projected Total Allowable Catch (TAC) of Fraser River Sockeye for international sharing based on the median forecasted abundances and bilaterally agreed deductions was 6,197,900 Sockeye, of which 16.5% were allocated to the United States (U.S.).

Pre-season model runs indicated that if the in-season return was less than the median forecast and similar to the p10 forecast there would be some international TAC. In Canada, commercial and recreational fisheries directed on Sockeye were unlikely at the p10 forecast and limited harvest opportunities would be available for First Nations FSC fisheries due to constraints (e.g. Cultus) required to achieve spawning escapement targets. Pre-season model runs also indicated it was unlikely the Early Summer run TAC could be fully harvested due to the overlap in timing and predicted larger abundances of Summer run and Late run stocks (Figure 8-1).



## **8.2.2 IN-SEASON ASSESSMENT**

Overall the marine migration timing was similar to pre-season expectations for all management groups: 2 days later for Early Stuart, 2 days earlier for Early Summer, 1 day earlier for Summer and no difference to the preseason timing for Late run Sockeye. Although the Late run timing through Area 20 was close to expectations the delay off the mouth of the Fraser River was one of the longest observed since pre-1995 (~23 days).

The Johnstone Strait diversion rate was 33% compared to a pre-season adopted value of 63%.

Returns for all but the Early Stuart management group were below median pre-season forecast levels (Early Stuart run: 125,000, 49% above median forecast; Early Summer run: 1,800,000, 16% below median forecast; Summer-run: 4,100,000, 6% below median forecast; and Late-run: 4,700,000, 36% below median forecast) (Table 8-2). In context to the pre-season forecast range, the Early Stuart return was similar to the p75 forecast and the Early Summer and Summer returns were slightly below the p50 forecast and the Late run return was similar to the p25 forecast.

Fraser River discharge was slightly above the mean discharge at the beginning of the season, but apart from one early season increase back to the mean, remained at or near one standard deviation below the mean for the entire season. After beginning the season around the mean, the Fraser River daily water temperatures fluctuated a few degrees above the historical mean reaching historical maximum observations at the mid-point of the season, and slowly dropped to around the mean for the latter half of the season. In-season 19 day model estimates of DBEs that take into account environmental conditions in the Fraser River were larger than pre-season medians adopted by the Panel with the exception of the Early Stuart sockeye model estimate which was smaller. The timing based model DBE estimate for Late Runs was lower than the pre-season DBE but higher than the adopted provisional DBE used for management purposes. The low in-season run size of Early Stuart sockeye resulted in LAER management and did not require changes to the pre-season proportional management adjustment (no management implications). The Panel did not make any adjustments to the preseason DBEs for the Early Summer and Summer run sockeye given the uncertainty in the modelled estimates and there were no indications or reports of significant migration issues, disease or mortalities observed in the river.

## **8.2.3 POST-SEASON ASSESSMENT**

The preliminary post season return of adult Fraser Sockeye was estimated to be 10,725,000, 23% below the pre-season median forecast (Table 8-4). The run size was 46% below the brood year run size (20M) and 18% below the cycle line average (13M).

There was 5,452,150 Fraser Sockeye Total Allowable Catch (TAC) for international sharing, based on the calculation method set out in Annex IV, Chapter 4 of the Pacific Salmon Treaty. The U.S. share (16.5%) of the TAC, including payback (-2,400) was 897,200 sockeye (Table 8-4). The Canadian share of the TAC, including AFE, was 4,954, 950 sockeye (Table 8-4).

#### 8-4 Preliminary Post- Season Total Allowable Catch

	Fraser Sockeye				
	Early Stuart	Early Summer	Summer	Lates	Total
<b>RUN STATUS, ESCAPEMENT NEEDS &amp; AVAILABLE SURPLUS</b>					
Pre-season or <b>Adopted In-season</b> Run Size	125,000	1,800,000	4,100,000	4,700,000	10,725,000
Adult Spawning Escapement Target (SET)	108,000	720,000	1,640,000	1,880,000	4,348,000
Management Adjustment (MA)*	74,500	165,600	164,000	75,200	479,300
Test Fishing (TF)	1,100	24,000	51,600	34,300	111,000
<b>DEDUCTIONS &amp; TAC FOR INTERNATIONAL SHARING</b>					
Aboriginal Fishery Exemption (AFE)	6,850	75,077	153,442	164,631	400,000
Available TAC for International Sharing	0	815,323	2,090,958	2,545,869	5,452,150
<b>UNITED STATES (Washington) TAC</b>					
Proportionally Distributed TAC ***	16.5%	0	134,500	345,000	420,100
U.S. Payback ***	0.0%	0	-400	-900	-1,100
<b>Proportionally Distributed TAC + Payback</b>		<b>0</b>	<b>134,100</b>	<b>344,100</b>	<b>419,000</b>
Treaty Indian Share **	67.7%	0	90,700	232,700	283,300
All Citizen Share	32.3%	0	43,400	111,400	135,700
<b>CANADA TAC</b>					
Proportionally Distributed TAC	83.5%	0	681,223	1,746,858	2,126,869
Aboriginal Fishery Exemption (AFE)		6,850	75,077	153,442	164,631
<b>Canadian TAC + AFE</b>		<b>6,850</b>	<b>756,300</b>	<b>1,900,300</b>	<b>2,291,500</b>
First Nations Catch (including AFE)		0	0	0	0
Planned Charter & Recreational		0	0	0	0
Total Commercial (including FN EO/Demo****)		6,850	756,300	1,900,300	2,291,500

Fraser sockeye were caught in U.S. and Canadian fisheries. In Washington, harvest occurred in both Treaty Indian and All Citizens fisheries. In Canada, Fraser sockeye were harvested in First Nations Food, Social and Ceremonial fisheries, as well as commercial (including First Nations demonstration and economic opportunity) fisheries, and recreational fisheries. The total Fraser sockeye catch (either directed or by-catch) can be found in Table 7, Table 8, Table 10, and Table 12, as well as Appendix 1 and Appendix 2. Note that current estimates exclude anticipated bycatch of Fraser Sockeye in Alaskan fisheries directed at other species. A small amount of Fraser Sockeye by-catch in fisheries directed at other species has yet to be included as the stock of origin is uncertain. The preliminary post season exploitation rate is estimated to be 54.4%. See Table 8-5 for preliminary post season exploitation rates relative to allowable exploitation rates.

8-5 Preliminary Post-Season Exploitation Rate Estimates for All Catch by Management Group

Run Size	Early Stuart 125,000	Early Summer 1,800,000	Summer 4,100,000	Late 4,700,000	Total 10,725,000
<b>Projected Exploitation Rate</b>	6.8%	44.4%	56.8%	57.3%	54.4%
<b>Allowable Exploitation Rate</b>	10.0%	50.8%	56.0%	58.4%	55.6%

DFO's near-final estimates of spawning escapements to streams in the Fraser River watershed are as follows:

Table 8-4: Near-final Sockeye Salmon Escapement Summary by Management Unit.

Management Unit	Near-final Estimate of Adult Spawners	% Spawning Success	Effective Female Spawners
-----------------	---------------------------------------	--------------------	---------------------------

Early Stuart	48,489	81.9%	21,450
Early Summer	786,223	79.9%	322,288
Summer	<i>Not yet available</i>		
Late	<i>Not yet available</i>		
TOTAL			

Complete near final spawning escapements estimates should be available February, 2019.

### 8.3 FIRST NATIONS FSC AND TREATY DOMESTIC FISHERIES

There were directed Fraser Sockeye FSC harvest opportunities for Treaty and non-Treaty First Nations in 2018. Sockeye retention remained closed for portions of the Johnstone Straits North of Lewis Point until the end of July to conserve Nimpkish bound sockeye. The remainder of marine area FSC fisheries opened to Fraser Sockeye retention on July 19, with fisheries restricted to gill net, troll and hook and line gear. This opening date was 4 days later than the opening anticipated based on the pre-season Early Stuart rolling window closure date of July 15. The delay was a result of uncertainty in the Early Summer run size at the time and an additional concern for some early timed Early Summer stocks. The use of purse seine gear in marine FSC fisheries targeting Fraser Sockeye was not permitted until July 25 in the Johnstone Straits and August 15 in the northern Strait of Georgia to provide additional protection to Sakinaw sockeye. In the Fraser River, sockeye directed FSC fisheries began on July 25 in the lower river with openings in the mid and upper river as the Early Stuart window closure dates were lifted. Similar to the marine area, the lower and mid-river sockeye directed fisheries were delayed slightly from the anticipated pre-season opening dates.

### 8.4 RECREATIONAL FISHERIES

Recreational fisheries directed on Fraser River Sockeye occurred in 2018. The marine recreational fishery was opened to Fraser Sockeye retention in South Coast marine waters from August 1 until December 31 with a daily limit of four. In the tidal portion of the Fraser River downstream of the Mission Bridge retention of sockeye in recreational fisheries took place from August 7 to September 3 with a daily limit of four.

Non-tidal sockeye directed fisheries also took place in the following areas:

- Fraser River from Mission Bridge to Sawmill Creek from August 7 to September 5. Daily limit of two.
- Fraser River near Lillooet from August 15 to September 15. Daily limit of two
- Horsefly Bay on Quesnel Lake from August 23 to September 15. Daily limit of two.
- Nechako River downstream of the Foothills Bridge from August 27 to September 15. Daily limit of two.
- Kamloops Lake and Thompson River downstream of Kamloops Lake from August 22 to September 30. Daily limit of two.

## **8.5 COMMERCIAL FISHERIES**

There were directed commercial fisheries on Fraser River Sockeye in Canada and the United States in 2018. In Canada, commercial fisheries targeting Fraser River Sockeye began in early August (Area D gill net) and continued until mid-October (Kamloops Lake Demonstration fishery). The commercial harvest of Fraser Sockeye occurred in Area D gill net, Area B seine, Area H troll, Area G troll, Area E gill net fisheries as well as First Nations economic opportunity, Treaty and demonstration fisheries.

## **8.6 EXCESS SALMON-TO-SPAWNING REQUIREMENTS (ESSR) FISHERIES**

There were no ESSR opportunities directed on Fraser River Sockeye in 2018.

**Table 8. Fraser River Sockeye Catch and Directed Fisheries\***

Licence Group	Fishing Area	Chinook Kept	Chinook Released	Fraser Sockeye Kept	Non-Fraser Sockeye Kept	Unknown Sockeye Kept	Sockeye Released	Pink Kept	Pink Released	Coho Kept	Coho Released	Chum Kept	Chum Released
First Nations FSC													
	Johnstone Strait (FSC and Domestic Harvest)			193,658	3,359	256	-						
	Strait of Georgia (FSC)			55,988	2	681	-	3,819	54				
	WCVI (FSC and Domestic Harvest)	174		14,757	2,242	523	-			109		1	
	Fraser River*			608,966			3,934						
	Total First Nations FSC and Domestic Catch	174	0	873,369	5,603	1,460	3,934	3,819	54	109	0	1	0
First Nations Commercial													
T'aaq-wiihak	Fraser River Sockeye (124-126)	17	41	14,185	43	-	-	0	0	1	49	1	0
T'aaq-wiihak <sup>3</sup>	WCVI AABM (24-26, 124-126)	9,667	499	15,493	43		9	0	0	899	2,145	2	0
Harvest Agreement	Fraser River*			37,094			-						
EO	Fraser River*			216,274			31						
Demo	Fraser River*			228,744			-						
	Total First Nations Commercial Catch	9,684	540	511,790	86	0	40	0	0	900	2,194	3	0
Commercial													
Area G Troll	WCVI (11, 12, 111, 123 to 127)	0	643	29,400	-	-	4	107	37	0	587	6	9
Area H Troll	Johnstone Strait (12, 13)	0	609	63,219	115	-	36	764	444	0	299	58	56
Area H Troll	Fraser (29)	0	656	118,705	1	-	-	1	18	0	321	5	11
Area H Troll	MVI (14-19)	0	0	-	-	-	-	0	0	0	0	0	0
Area B Seine	Johnstone Strait (12, 13)	243	3,168	1,271,998	7,616	-	8,557	56,044	6	621	4,996	13,084	53
Area B Seine	Fraser (29)	11	76	627,503	11	-	1	0	0	29	158	35	2
Area D Gillnet	Johnstone Strait (11,12,13,14)	6	1,069	475,287	3,719	0	308	34,046	326	0	5,668	10,307	56
Area E Gillnet	Fraser (29)	24	2,402	600,942			0	20	12	0	62	2	4

Total Commercial Catch		284	8,623	3,187,054	11,462	0	8,906	90,982	843	650	12,091	23,497	191
Recreational													
	Juan de Fuca (19,20)			13,218	135		766						
	Strait of Georgia (13-19,28,29)			43,303	-		702						
	Johnstone Strait (11-12)			6,166	58		320						
	WCVI - Inshore (20W-27)				5,608 <sup>2</sup>	4,731	520						
	WCVI - Offshore (121-127)					815	26						
	Fraser River <sup>1</sup>			88,601			6,153						
Total Recreational Catch		0	0	151,288	5,801	5,546	8,487	0	0	0	0	0	0
ESSR													
	Fraser River <sup>1</sup>			0			0						
Total ESSR Catch		0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTALS</b>		<b>10,142</b>	<b>9,163</b>	<b>4,723,501</b>	<b>22,952</b>	<b>7,006</b>	<b>21,367</b>	<b>94,801</b>	<b>897</b>	<b>1,659</b>	<b>14,285</b>	<b>23,501</b>	<b>191</b>

1. Fraser River Data includes Fraser River Sockeye catch from all fisheries, not just "directed" fisheries. Fraser River catch estimates are incomplete; not all of the assessed fisheries had available catch estimates to include in this report.
2. Somass Sockeye Recreational Catch
3. Catch of Fraser sockeye during T'aaq-wiihak AABM Chinook Fishery

- Johnstone Strait, West Coast Vancouver Island and Strait of Georgia FSC catch includes catch from all FSC fisheries reported to date in those areas. FSC fisheries in these areas do not generally 'target' one species. Pink salmon is included here as it is typically non-targeted catch in sockeye directed fisheries. 'Target' and 'non-target' catch retained for FSC are included for T'aaq-wiihak and Somass fisheries where appropriate.

## **9 FRASER RIVER PINK SALMON**

---

Pink salmon return to the Fraser River in significant numbers on odd years only; negligible numbers of pink salmon returned to the Fraser River in 2018.



## 10 SOUTHERN BC COHO

---

### 10.1 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 dependent on abundance, and it is 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, Strait of Georgia, Johnstone Strait and West Coast Vancouver Island (WCVI) Coho stocks or MUs.

In 2018 an exploitation rate of up to 10% was permitted in Canadian fisheries with an additional 10% permitted in U.S. fisheries as per the Pacific Salmon Treaty management regime. Coho management measures varied in Southern BC in 2018, depending on the area of harvest and impact on specific Coho stocks.

The Canadian objective for Interior Fraser River (IFR) Coho (including Thompson River Coho) was to manage Canadian fisheries in a highly precautionary manner with fisheries management measures similar to those in place prior to 2014. This approach was expected to achieve an overall exploitation rate in Canadian waters within the 3 to 5 % range.

Assessments of Interior Fraser River Coho salmon stocks in the mid-1990s revealed that alarming declines in spawning populations were occurring in many spawning sites. Low marine survival rates in combination with excessive fishery impacts were identified as key factors in this decline. Beginning in 1997, DFO implemented a number of fishery management measures to reduce the harvest impacts on these stocks, with more severe measures being implemented beginning in 1998. In most years since that time, Canadian fisheries impacting these stocks have been curtailed to limit the exploitation rate to 3% or less, with an additional 10% permitted in U.S. fisheries (as per the Pacific Salmon Treaty management regime).

Currently, there is no evidence that IFR Coho has departed from the 'low' productivity regime that has persisted since the 1994 return year. Current productivity is still well below that in the relatively high productivity period of 1978-1993. However, there have been improved returns of Coho in Northern B.C., WCVI, and inside Strait of Georgia stocks in recent years.

No specific management measures were in place in 2018 to protect Strait of Georgia Coho stocks beyond measures put in place for IFR Coho.

Management measures in place for WCVI Coho provided opportunities for recreational and commercial fisheries harvest in WCVI areas where IFR Coho were not considered to be impacted. These were largely terminal opportunities in portions of Area 23-27, where stock composition information showed that IFR Coho were not found.

In WCVI areas/times where IFR Coho are known to be prevalent, non-retention of unmarked Coho remained in effect.

Coho catch and release information from all fisheries can be found in the individual tables.

## **10.2 STOCK STATUS**

### **10.2.1 STOCK STATUS- UPPER FRASER RIVER**

#### *Interior Fraser*

Escapement surveys to estimate returns of Coho to the Interior Fraser are currently underway, and preliminary escapement estimates will not be available until mid-January 2019 at the earliest.

### **10.2.2 STOCK STATUS – LOWER FRASER RIVER**

Currently there is no whole system escapement estimate available for Lower Fraser River (LFR) Coho.

A hatchery Coho indicator stock at Inch Creek hatchery provides estimated rates of survival and minimum estimates of exploitation on marked LFR Coho. Catch monitoring and escapement work in support of the Inch Creek indicator program are currently underway, however, preliminary survival information for the 2015 brood is not expected to be available until March 2019.

### **10.2.3 STOCK STATUS- STRAIT OF GEORGIA**

Coho salmon production within the Strait of Georgia has declined dramatically since the early 1990s. Marine survivals have been fluctuating near replacement levels with recent estimates in the 1-4% range. Preliminary 2018 escapement estimates were higher than pre-season expectations based on recent returns and poor ocean conditions throughout the SOG, but still below target in some systems.

#### *Hatchery stocks*

Coho returns to facilities north of Nanaimo were above average in 2018. Escapement to the Puntledge River was 35% higher than the 12 year average at 7,600 and up from 2017 (2,756). The Big Qualicum River had another strong return in 2018 of over 10,000 fish which is near the 12 year average of 9,914. Swim surveys of the Little Qualicum River suggest abundance for this system was above average at 2,700 fish observed. Nanaimo River returns are showing a modest abundance of Coho with close to 2,000 to the end of October and will be updated as more data becomes available.

Escapements to southern Strait of Georgia stocks were variable with 121 estimated in the Goldstream River (15% of the 4 year average). 2,029 fish were counted in Shawnigan Creek which was above the four year average of 1,559.

#### *Wild stocks*

In the past, both Black Creek and Myrtle Creek have served as indicators of Strait of Georgia Coho. Myrtle Creek was discontinued as an indicator in 2014. Counts on the Englishman River were near the 4 year average in 2018 and higher than the previous two years. Camera operations in the Millstone River bypass channel are

ongoing but the return so far has been well below expectations of 100-200. Returns to the Colquitz River (near Victoria) were reported to be 25% of average at 210 fish.

#### *Black Creek (DFO Wild Indicator for SOG)*

2018 Black Creek adult assessments are ongoing, but fence operations are complete. Limited fall rains allowed crews to operate the counting fence continuously through the coho migration window without the fence being topped by high flows. A count to date of 2,371 adult Coho and 509 jacks were counted through the fence with further review of time periods covered by video required.

The smolt production contributing to 2018 brood year was 34,473. This was below the 23 year average smolt production of 51,300 smolts. The parental brood year estimate was 2,623 (2015) adults. The 2018 return was better than expected and similar to brood. Smolt production in 2018 was estimated at 40,322 was also below average but hopefully improved marine conditions will result in improved returns in 2019.

### **10.2.4 STOCK STATUS- WEST COAST VANCOUVER ISLAND**

In most recent years, spawning abundances for wild WCVI Coho populations are near historic levels. However, the overall production of WCVI Coho is likely much lower than historic levels – i.e. less fish are caught in fisheries because of low fishery impacts maintain spawning levels. Hatchery production has also been reduced. Results suggest escapement near or slightly above recent year averages.

### **10.2.5 STOCK STATUS- JOHNSTONE STRAIT AND MAINLAND INLET**

The Keogh River plays an important role as the wild Coho indicator stock for the upper Johnstone Strait area. The declining trend observed since 2015 appears to have reversed with a preliminary estimate for 2018 of 1,240 adult Coho, a doubling of the brood year return (650 Coho adults in 2015). Juvenile recruitment in 2018 of 62,213 smolts is close to the long term average but showing a reduction compared to the strong freshwater productivity observed 2011-2017 (average 62,323 smolts (1977-2010) to average 94,152 smolts (2011-2017)). Coho tend to be extremely productive at low abundance, and individual productivity has increased dramatically in recent years, peaking with the 2016 brood year at 270 smolts per spawner (average 38 smolts/spawner, brood years 1998-2015). Expectations in 2019 are for below average returns but with the hope that marine conditions improve resulting in a positive trend in Coho returns.

The marine survival indicator for Area 13 is the Quinsam River Hatchery. The 2018 Quinsam Coho return of ~6,000 (preliminary) is similar to the 4 and 12 year averages of escapement. The 2018 adult return was higher than expected based on anticipated low marine survival. 2019 expectations are for below average returns with low survival conditions continuing.

Village Bay Creek on Quadra Island continued with video monitoring of Coho. A total of 744 adults and 24 jacks were counted through the fence, which is nearly double the 2014 escapement. This escapement was also higher than expected, and exceeds the 4 and 12 year escapement averages.

Extensive escapement reports for Coho in many systems are indicating average, to slightly above average escapements in 2018. It appears Coho marine survivals over the past year were better than anticipated, but poor marine survivals are expected to continue through 2019. The trend of low abundance is anticipated to continue through 2019.

## 10.3 FIRST NATIONS

### *WCVI FSC and Treaty Fisheries*

FSC gill net and hook and line had openings during the summer and fall seasons. The Somass First Nations harvest was 587 Coho. The Maa-nulth domestic harvest was 1,219 Coho. The WCVI NTC non-treaty First Nations' reported catch was 5,392 Coho. The remaining non-NTC First Nations harvest reported 1,907 Coho. The total combined harvest was 8,489 Coho.

### *Lower Fraser*

There were no Coho-directed fisheries in the Lower Fraser in 2018. Both hatchery-marked and wild Coho were authorized to be retained in FSC fisheries before and after the Interior Fraser Coho window closure. The total hatchery-marked and wild Coho harvested and released during Sockeye and Chum FSC fisheries can be found in Tables 7, 8, 10, 12.

In 2018, Fraser Sockeye economic opportunity and demonstration fisheries took place in the Fraser River with the Musqueam First Nation, Harrison Fisheries Authority, and 18 communities from Port Mann Bridge to Sawmill Creek; retention of hatchery-marked and wild Coho was not permitted in these fisheries. The total hatchery-marked and wild Coho encountered and released in sockeye economic opportunity/demonstration fisheries can be found in Tables 7, 8, 10, and 12.

### *BC Interior*

There were no Economic Opportunity (EO), demonstration or ESSR fisheries in the BC Interior (Fraser River above Sawmill Creek) targeting Coho in 2018.

FSC fisheries in the area target Sockeye, Chinook or Pink salmon. This year, First Nations harvesters were requested to release unharmed any Coho incidentally caught. Directed opportunities were permitted subject to abundance, at the fence on McKinley Creek, a tributary of the Quesnel River; The total Coho catch (either directed or by-catch) in First Nations fisheries can be found in Table 7, Table 8, Table 10, and Table 12.

### *Strait of Georgia FSC Fisheries and Treaty Domestic Fisheries*

First Nations Coho catch reports are preliminary at this time; estimates for the Strait of Georgia are found in Table 10.

### *Johnstone Strait*

First Nations Coho catch reports are preliminary; estimates for the Johnstone Strait are found in Table 10.

## 10.4 RECREATIONAL

### 10.4.1 TIDAL RECREATIONAL FISHERIES

Tidal recreational fisheries can be categorized as occurring in: mixed stock areas, where multiple stocks are found concurrently in the same fishing area, and in terminal areas where local stocks dominate the catch. Areas where mixed stocks occur typically have more restrictive management measures in place that are designed to

protect Interior Fraser Coho stocks. In terminal areas, opportunities may be permitted based on abundance forecasts. The table below outlines the areas in Southern BC and the general Coho regulations pertaining to them.

Table 10-1 Southern BC Coho Fishery Regulations in 2018

Mixed stock fishing area	Daily Limit (marked or unmarked)	Size Limit	Coho Season
Johnstone Strait	2, 1 may be unmarked	30 cm.	June 1 – Jul 31
Johnstone Strait	2 marked	30 cm.	Aug 1 – Dec 31
Northern Georgia Strait	2 marked	30 cm.	June 1 – Dec 31
Southern Georgia Strait	2 marked	30 cm.	June 1 – Dec 31
Southern Georgia Strait (19)	2, 1 may be unmarked	30 cm.	Oct 1 – Dec 31
Juan de Fuca Strait	2 marked	30 cm.	Jun 1 – Dec 31
Juan de Fuca Strait (20-5 to 20-7)	4, 1 may be unmarked	30 cm.	Oct 1 – Dec 31
WCVI - Inshore	2	30 cm.	June 1 – Dec 31
WCVI - Offshore	2 marked	30 cm.	June 1 – Dec 31

\* for specific management measures in specific areas refer to the information provided in the Fishery Notices.

Catch and release information for coho can be found in Table 10.

## 10.4.2 NON-TIDAL RECREATIONAL FISHERIES

### *Region 1 Vancouver Island Tributaries*

Fresh water conditions were improved in 2018 compared to past years and no additional restrictions were in effect on Vancouver Island due to drought like conditions.

### *Northern Vancouver Island*

Typical non-tidal openings for Coho were available on:

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

Anglers were restricted to the use of barbless hooks. Catch is not estimated in these fresh water fisheries.

### *Strait of Georgia*

Due to increased coho returns in 2018 coho openings were provided on:

- Cowichan River from November 1 – December 31 for one coho per day, min. size limit of 25 cm.
- Nanaimo River from November 1 – December 31 for 2 hatchery-marked only coho per day, min. size limit of 25 cm.
- Puntledge River from September 24-December 31 for 1 hatchery-marked only coho per day, min. size limit of 25 cm.

Typical Non-tidal openings for Coho are available on:

- Qualicum River from October 16 to December 31 for four per day, two of which could be over 35 cm;
- Chemainus River from October 15 to March 31 for one per day, maximum size limit of 35 cm;
- Nanaimo River from October 15 to March 31 for one per day, maximum size limit of 35 cm; and

Catch is not estimated in these fresh water fisheries.

### *West Coast Vancouver Island*

Typical Non-tidal openings for Coho were available on:

- Somass/Stamp River from August 25 to December 31 the daily limit was two, marked or unmarked. A single, barbless hook restriction is in effect all year and there is a bait restriction in the Upper Somass and Stamp from May 1 to October 31.
- Nitinat River from October 15 to December 31 the daily limit for Coho was two, marked or unmarked. The 2 week closure between October 1 and October 14 provides protection to Chinook salmon during the peak spawning period. The area above Parker Creek is closed to fishing. A single barbless hook restriction is in effect all year and there is also a bait restriction in effect.
- Conuma River opened August 25 with a daily limit of two Coho, marked or unmarked and was reduced to one per day from September 26 to December 31 in response to observations of a lower than expected abundance in-river.
- Washlawlis River and Waukwass River and other west coast 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 and Leiner. The quota for all west coast streams unless identified above is zero (0).

Catch is not estimated in these fresh water fisheries.

### *Fraser River and Tributaries*

During 2018, the retention of two hatchery-marked Coho per day was permitted once the majority of the Interior Fraser wild Coho population was through the area. The dates by area were as follows:

- From the CPR Bridge at Mission, BC upstream to the Highway #1 Bridge at Hope - October 26 to December 31.

- There are no directed Coho openings in the Fraser River or tributaries upstream of the Highway #1 Bridge at Hope, BC.

The following tributaries to the Fraser River were open during the dates stated below:

- Alouette River and De Boville Slough from October 1 to December 31 for one per day.
- Coquitlam River from September 1 to December 31 for one per day.
- Kanaka Creek from November 1 to November 30 for one per day.
- Chilliwack River/Vedder for four per day from January 1 to March 31 and from July 1 to December 31.
- Chehalis River from January 1 to December 31 for four per day.
- Harrison River for four per day from January 1 to March 31 and from September 1 to December 31.
- Nicomen Slough, Norrish Creek and the Stave River for four per day from January 1 to December 31 with only two over 35 cm.

During 2018, there were limited non-tidal openings for hatchery marked Coho on the following systems which enter Boundary Bay:

- Little Campbell River, Nicomekl River and the Serpentine River one per day from September 1 to December 31.

## **10.5 COMMERCIAL**

In 2018, Southern BC commercial fisheries were regulated so that impacts on Coho, in particular Interior Fraser Coho stocks, were minimized. Retention of Coho by-catch in most of these fisheries was not permitted, including the Fraser River, with the exception of a few terminal seine and gill net fisheries targeting Chinook and Sockeye where Interior Fraser River Coho were not prevalent.

There was no Area G fishery directed on Coho in 2018. During harvest opportunities between September 15 and December 31 non-retention of all Coho by-catch was in place and no coho was landed in the Area G fishery in the 2017/2018 (October 1, 2017 to September 30, 2018) AABM Chinook fishing year.

### *WCVI Terminal Area Coho*

In 2018, in Area 23 there was one targeted Area D Coho commercial net fishery, this fishery was planned in mid-October and no vessels participated. There were also commercial gill net and Seine fisheries in Alberni Inlet targeting Chinook, which permitted Coho by-catch retention. Retention of both hatchery and wild Coho were permitted. The by catch fisheries were the most successful and a total Coho bycatch can be found in Table 10.

Coho retention in other terminal WCVI commercial fisheries was not permitted in 2018. The total WCVI Coho by-catch in commercial terminal fisheries can be found in Table 10.

### **10.5.1 COMMERCIAL**

### **10.5.2 FIRST NATIONS COMMERCIAL HARVEST**

### *WCVI Economic Opportunity (EO)*

In 2018, DFO with Hupacasath and Tseshaht First Nations reached an agreement for an Economic Opportunity fishery targeting Coho in Subarea 23-1 and 23-2. The fishery took place in upper Alberni Inlet in the tidal portions of the Somass River south to Hocking point. The TAC for Coho was 3,000 pieces. Most of the Coho catch was retained as by-catch in EO-directed Chinook fisheries in late August and September. There was two directed Coho EO fishery on Sept 20 and October 13-14. The catch in these fisheries were poor. The total Coho catch in these fisheries can be found in Table 10.

#### *T'aaq-wiihak Salmon Demonstration Fishery*

In addition to fishing opportunities for FSC purposes, DFO provided commercial demonstration fishery opportunities for five Nuu-chah-nulth First Nations located on the West Coast of Vancouver Island - Ahousaht, Ehattesaht, Hesquiaht, Mowachaht/Muchalaht, and Tla-o-qui-aht.

There was no directed Coho T'aaq-wiihak salmon demonstration fishery in 2018; however, hatchery-marked Coho retention for sale was permitted in the AABM Chinook fishery, Fraser River Sockeye fishery, and ISBM Chinook fisheries. Total Coho catch in these fisheries can be found in Table 10.

#### *Lower Fraser*

There were no directed Coho fisheries authorized in the Lower Fraser in 2018.

## **10.6 EXCESS SALMON-TO-SPAWNING REQUIREMENTS (ESSR) FISHERIES**

#### *WCVI ESSR Fisheries*

The Tseshaht and Hupacasath First Nations were issued a joint ESSR Licence for Coho at the Robertson Creek Hatchery facility. The total catch was 9,274 Coho which includes 1193 jacks. The Ditidaht First Nation was issued an ESSR Licence for Nitinat Lake and the Nitinat Hatchery, and 305 Coho were sold under the licence.

The total catch WCVI for the ESSR fisheries was 9,579 Coho.

#### *Lower Fraser ESSR Fisheries*

There were ESSR fisheries at the Capilano hatchery in 2018 that included Coho salmon.

There were ESSR fisheries at the Chilliwack hatchery in 2018 that included Coho salmon.

There were ESSR fisheries permitted at the Inch Creek and Chehalis hatcheries in 2018 that included Coho salmon.

All ESSR harvest information can be found in Tables 7, 8, 10, and 12

#### *Strait of Georgia ESSR Fisheries*

An ESSR for chum, coho and chinook salmon was issued to the Qualicum First Nation on October 3, 2018 UFN at the Big Qualicum Hatchery. See Table 10 for preliminary catch numbers.

#### *Johnstone Strait ESSR Fisheries*

For 2018, there were no ESSR opportunities on Coho in Johnstone Strait.



**Table 10. Southern BC - Coho Directed Fisheries\***

Licence Group	Fishing Area	Chinook Kept	Chinook Released	Fraser Sockeye Kept	Non-Fraser Sockeye Kept	Unknown Sockeye Kept	Sockeye Released	Pink Kept	Pink Released	Coho Kept	Coho Released	Chum Kept	Chum Released
First Nations FSC													
	Johnstone Strait									118	1		
	Strait of Georgia									498	0		
	WCVI	0	0	0	0	0	0	0	0	5,204	528	225	0
	Fraser River*									742	1,212		
Total First Nations FSC Catch		0	0	0	0	0	0	0	0	6,562	1,741	225	0
First Nations Commercial													
Harvest Agreement	Fraser River*									0	0		
EO	WCVI	0	0	0	0	0	0	0	0	12	0	0	0
EO	Fraser River*									1,099	1,212		
Demo	Fraser River*									0	2,677		
Total First Nations Commercial Catch		0	0	0	0	0	0	0	0	1,111	3,889	0	0
Commercial													
Area G Troll	WCVI			0	0	0	0	0	0	0	0	0	0
Area B Seine	Barkley (23)	0	0	0	0	0	0	0	0	0	0	0	0
Area D Gillnet	Somass (23)	0	0	0	0	0	0	0	0	0	0	0	0
Area E Gillnet	Nitinat (21, 121)	0	0	0	0	0	0	0	0	0	0	0	0
Total Commercial Catch		0	0	0	0	0	0	0	0	0	0	0	0
Recreational													
	Juan de Fuca (19,20)									5,495	18,566		
	Strait of Georgia (13-19,28,29)									19,247	65,210		
	Johnstone Strait (11-12)									3,592	4,402		
	WCVI ISBM - Inshore (20W-27)									20,056	9,891		
	WCVI AABM - Inshore (20W-27)									2,780	2,539		
	WCVI AABM- Offshore (121-127)									21,369	40,096		
	Fraser River *									0	382		

Total Recreational Catch		0	0	0	0	0	0	0	0	72,539	141,086	0	0
ESSR													
	Johnstone Strait**												
	Strait of Georgia**												
	WCVI**												
	Fraser River*										0		
Total ESSR Catch		0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTALS</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>80,212</b>	<b>146,716</b>	<b>225</b>	<b>0</b>

\*Fraser River Data includes Coho CATCH from all fisheries, not just "directed" Coho fisheries. Fraser River catch estimates are incomplete; not all of the assessed fisheries had available catch estimates to include in this report.

- Johnstone Strait, West Coast Vancouver Island and Strait of Georgia FSC/domestic catch includes catch from all FSC fisheries reported in those areas. FSC fisheries in these areas do not generally 'target' one species. 'Target' and 'non-target' catch retained for FSC are included for T'aaq-wiihak and Somass fisheries where appropriate.

# II JOHNSTONE STRAIT CHUM SALMON

---

## II.1 OBJECTIVES AND OVERVIEW

The Johnstone Strait Chum salmon fisheries primarily target Chum that spawn in Johnstone Strait, the Strait of Georgia, and the Fraser River areas. In order to improve the management of Johnstone Strait Chum fisheries and to ensure adequate escapement, a 20% fixed exploitation rate strategy was implemented in 2002. Of the 20% exploitation rate, 15% is allocated to the commercial fisheries and the remaining 5% is set aside for test fisheries, First Nations FSC, sport harvesters, and to also 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 was modeled at October 8). 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, and are typically based on effort and weather.

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 expected. Early indications from the test fishery were that Inner South Coast Chum abundance was tracking at or below the 1 million critical threshold. Troll fisheries had been initiated as per the preseason plan but on September 30<sup>th</sup> those fisheries and the other planned fisheries were suspended and the US was notified as per the treaty language. On October 10<sup>th</sup>, with an improvement to the test fishery CPUE indicating that the abundance would be over 1.0 million, the US was notified and a modified fishing plan was initiated. This year, the Area B (seine) and Area D (gill net) were competitive (derby style) fisheries, and the Area H (troll) fleet was managed using an effort-based individual transferable effort (ITE) demonstration fishery.

Chum catch and release information from all fisheries can be found in Table 11.

## II.2 STOCK STATUS

### *Mixed Stocks*

The main components of the Inside South Coast (ISC) Chum return were expected to be both Fraser and non-Fraser stocks. These stocks are typically dominated by four year old fish which were from an average 2014 brood return that out-migrated in 2015. Other salmon species that out-migrated in 2015 encountered poor survival conditions (i.e. local Pink and Coho returns in 2016 were poor). The pre-season expectation for ISC Chum suggested below to near target returns to the area but was highly uncertain.

The Johnstone Strait test fishery, which ran from September 12th through October 27th, provided timing and abundance information for the 2018 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). Initially, Chum catch per unit effort (CPUE) in the test fishery was at or below what was encountered in the low 2010 return and it was determined on October 1st that the ISC index of abundance was likely below the 1.0

million critical level (Figure 11-1). As the season progressed, test fishery CPUE improved and on October 10<sup>th</sup>, indicated abundance was now at or above the 1.0 million threshold for ISC Chum and timing appeared to be slightly later. The test fishery CPUE demonstrated that the front end of the return in 2018 was similar to that in 2010 but the back end of the run was stronger than 2010 (Figure 11-1). The age composition derived from the test fishery and commercial samples exhibited a lower than average contribution of 4 year olds throughout the season confirming the reduced survival of the 2014 brood.

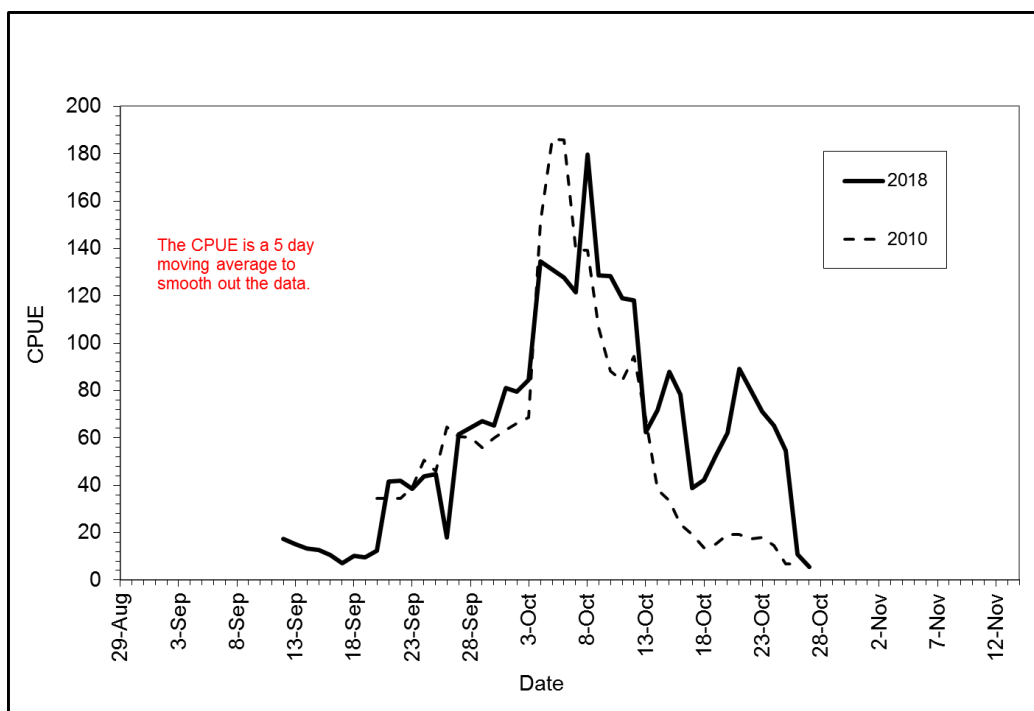


Figure 11-1 2018 Johnstone Strait Chum Test Fishery Catch per Unit Effort (CPUE) compared to 2010, the lowest Chum return in recent years.

### *Terminal returns*

Although escapement monitoring is limited, Summer Chum catch per unit effort (CPUE) in the 2018 Fraser Sockeye directed test fisheries was down from the previous historic high observed in 2017 through July and August. Status of summer run Chum in the Johnstone Strait area is unknown but the test fishing CPUE and some terminal assessments indicated low returns. Assessments of terminal fall Chum, such as the Nimpkish, are ongoing but information suggests another poor return to that system.

Information on escapements and catches suggest ISC Chum aggregate returns (Johnstone Strait, Strait of Georgia and Fraser combined) were below average but highly variable with some populations well below goal and others well above goal throughout the ISC area (see next Sections 12 and 13).

## **11.3 FIRST NATIONS FSC FISHERIES**

First Nations fisheries for Chum were not restricted. The total Chum salmon catch in the Johnstone Strait FSC fishery can be found in Table 11.

## **11.4 RECREATIONAL FISHERIES**

### **11.4.1 TIDAL RECREATIONAL FISHERIES**

The marine recreational daily limits for Chum are four (4) with a possession limit of eight salmon (8). Chum opportunities are typically opened at full limits in the Johnstone Strait area, but may be reduced if Chum returns are low. Peak participation in the recreational Chum fishery typically occurs over the Thanksgiving weekend in mid-October, and activity is usually driven by abundance. There was no creel survey during the month of October in Areas 11 to 13, but recreational catches were reported as fair, but lower than recent years due to the lower abundance of Chum available in these areas in 2018. The majority of the sport Chum salmon fishing effort occurs in Area 13 which is included in the Strait of Georgia catch estimate.

### **11.4.2 NON-TIDAL RECREATIONAL FISHERIES**

There are no Chum retention fisheries in non-tidal waters in the Johnstone Strait area. Some catch and release fisheries do take place, and are considered to very minimal.

## **11.5 COMMERCIAL FISHERIES**

Commercial Chum fisheries in 2018 were planned as per the Pacific Salmon Treaty. Fisheries were scheduled to not exceed a 20% fixed harvest rate on Inner South Coast (ISC) Chum stocks passing through Johnstone Strait with 15% exploitation rate for Commercial and 5% exploitation rate for Test, FSC, Recreational and a commercial buffer. Shares of the 15% commercial exploitation rate were to be share among the Area B seine (11.55%), Area D gill net (2.55%), and Area H troll fleets (0.9%). The total commercial Chum catch from Johnstone Strait during Chum directed fisheries can be found in Table 11. 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. Time and area closures were also implemented in 2018 to protect co-migrating Interior Fraser Steelhead.

### **11.5.1 COMMERCIAL**

#### *Area B Seine*

In 2018 the pre-season plan was to have two commercial seine openings for Chum salmon in portions of Areas 12 and 13. The two openings were scheduled pre-season to occur October 1 and October 15, for 12 hours and 10 hours respectively. The first opening that was scheduled to take place on October 1 did not occur since the Southern Chum return was tracking below the 1.0 million threshold identified in the Pacific Salmon Treaty. By mid-October the Southern Chum return was tracking above the 1.0 Million threshold, and an Area B seine opening was scheduled on October 15 for 10 hours, and extended by 1 hours due to lower than expected effort.

The estimated catches from the 2018 Area B Seine Johnstone Strait chum directed fisheries can be found in Table 11. The peak effort on the October 15 opening was 65 vessels.

#### *Area D Gill net*

Pre-season, three (3) Area D gill net openings were planned for 41 hours in duration each but these openings were subject to change based on in-season assessment information, weather constraints, and effort information. The first gill net opening, that was planned pre-season to occur October 9 to 11, did not occur since the Southern Chum return was tracking below the 1.0 million threshold identified in the Pacific Salmon Treaty. In 2018, a new window closure to provide protection for migrating Interior Fraser River Steelhead was implemented in Areas 12 and 13. Details on the management approach for Interior Fraser River Steelhead in South Coast fisheries can be found in the 2018-19 South Coast Salmon IFMP. The window closure restricted gill net fisheries from September 12 to October 8 in Area 12 and from September 17 to October 13 in Area 13. Gill net fisheries were planned pre-season to occur outside these window closure dates. The first gill net fishery planned pre-season (as mentioned above) was to only occur in Area 12.

By mid-October the Southern Chum return was tracking above the 1.0 Million thresholds, and two commercial gill net openings for Chum salmon in portions of Areas 12 and 13 were planned. The first opening was for 41 hours from 16:00 hours on October 18 to 09:00 hours on October 20. The second opening was initially scheduled for 41 hours from 16:00 hours on October 26 to 09:00 hours on October 28, but due to poor weather conditions that hampered fishing on October 27, the opening was extended to 09:00 on October 29.

The estimated catches from the 2018 Area D gill net Johnstone Strait chum directed fisheries can be found in Table 11. The peak effort on the October 18 to 20 opening was 110 vessels and 58 vessels on the October 26 to 29 opening.

#### *Area H Troll*

In 2018 the pre-season plan for Area H troll Individual Transferable Effort (ITE) demonstration fishery was divided into two fishing periods: September 28 to October 14 (Period 1) and October 16 to October 31 (Period 2); with a one day closure during the Area B Seine which aligned to be between the two periods on October 15, and a closures during the Area B seine fishery on October 1 (except a portion of Subarea 13-3). Each licence was initially 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 not between fishing periods. The first period was initially opened on September 28, however it closed shortly after on September 30 since Southern Chum return was tracking below the 1.0 million threshold identified in the Pacific Salmon Treaty. No fishing effort occurred during this period.

By mid-October the Southern Chum return was tracking above the 1.0 Million threshold, and the fishing plan was altered. The fishery was divided into two fishing periods. Period One (October 12, 2018 to October 14, 2018) and Period Two (October 16, 2018 to October 31, 2018). Each licence was assigned an allocation of one boat day in fishing Period One and two boat days in fishing Period Two. There was a one day closure between fishing periods during the Area B seine fishery on October 15, 2018. Boat-days could be fished at any time within each fishing period. Boat-days in each fishing period could be transferred between eligible licence holders within each fishing period but not between fishing periods. Total effort for the Johnstone strait fishery was 57 boat days, 22 in Period One, and 35 in Period Two. The estimated catches from the 2018 Area H troll (ITE) Johnstone Strait chum directed fisheries can be found in Table 11.

### **11.5.2 FIRST NATIONS COMMERCIAL HARVEST**

There was no First Nations commercial harvest of Johnstone Strait Chum in 2018

## **11.6 EXCESS SALMON-TO-SPAWNING REQUIREMENTS (ESSR) FISHERIES**

For 2018, there were no ESSR opportunities on Chum salmon in Johnstone Strait.

**Table 11. Johnstone Strait - Chum Directed Fisheries**

Licence Group	Fishing Area	Chinook Kept	Chinook Released	Fraser Sockeye Kept	Non-Fraser Sockeye Kept	Unknown Sockeye Kept	Sockeye Released	Pink Kept	Pink Released	Coho Kept	Coho Released	Chum Kept	Chum Released
First Nations FSC													
	Johnstone Strait											1,027	117
Total First Nations FSC Catch		0	0	0	0	0	0	0	0	0	0	1,027	117
Commercial													
Area H Troll	JST (12,13)	0	4	0	0	0	3	0	1	0	14	1,976	0
Area B Seine	JST (12,13)	0	6	0	0	1	12	2	0	3	58	37,773	11
Area D Gillnet	JST (12,13)	0	2	0	0	0	0	0	0	0	44	12,390	4
Total Commercial Catch		0	12	0	0	1	15	2	1	3	116	52,139	15
Recreational													
	Johnstone Strait (11-12)*											67	46
Total Recreational Catch		0	0	0	0	0	0	0	0	0	0	67	46
ESSR													
	Johnstone Strait												
Total ESSR Catch		0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTALS</b>		<b>0</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>15</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>116</b>	<b>53,233</b>	<b>178</b>



## **12 FRASER RIVER CHUM**

---

### **12.1 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, BC, 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 Hell's Gate.

The escapement objective for Fraser River Chum is 800,000. Since 2001, this objective has been achieved in all but three years; escapement to spawning grounds in 2009, 2010, and 2017 did not meet the escapement goal, with approximately 460,000, 590,000, and 660,000 returning to spawn in those years, respectively.

Fraser River Chum are typically harvested in Johnstone Strait, the Strait of Georgia, U.S. waters of Area 7 and 7A, and 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 to protect co-migrating stocks of concern (including Interior Fraser River (IFR) Coho and IFR Steelhead). Depending on the fishery, these measures have included both time and area closures, and gear restrictions. These conservation measures have restricted Fraser River commercial Chum fishing opportunities in recent years.

To address conservation concerns for Interior Fraser River (Thompson and Chilcotin) Steelhead, DFO implemented management measures for 2018 to reduce the incidental impacts of Chum fisheries on co-migrating IFR Steelhead. In the marine approach areas, a rolling window closure of nearly 4 weeks duration was in place in for commercial gillnet fisheries in Areas 12, 13 and 29. Modifications were also applied to the boundaries of the Nitinat Chum gillnet fishery to avoid areas of steelhead interception. Within the Fraser River, the window closure applied to all commercial, recreational, and FSC salmon fisheries within the window closure period. Limited Chum FSC harvests using gill nets and beach seine gear were permitted in lower Fraser River during the closure.

Catch data from all Chum fisheries can be found in Tables 7, 8, 10, 12

### **12.2 STOCK STATUS**

The number of adult Chum Salmon returning to the Fraser River each fall (terminal return) is estimated in-season with a Bayesian model based on Albion test fishing catch.

The Fraser River Chum test fishery at Albion operated every other day from September 1 until October 19, alternating days with the Albion Chinook test fishery. From October 21 until November 16, the Chum net fished every day, and then every other day from November 17 until November 23. Total Chum catch for the Albion test fishery can be found in Appendix 2.

For fishery planning purposes, DFO provided a provisional in-season terminal return estimate on October 17 of 793,000 Chum Salmon. This estimate assumed that the peak date of the run was no later than October 17.

A subsequent estimate of Fraser River Chum terminal return was provided on October 22. The estimated terminal return on that date was 769,000 (80% probability interval of 659,000 to 894,000), with a 50% migration date through the lower river of October 18th. This peak date is consistent with timing in recent years (average peak date from 1997-2017 is October 17).

Additional in-season terminal return estimates were not provided, as subsequent test fishing information was consistent with a run size of 769,000.

Fraser River Chum Salmon return to numerous spawning locations in the lower Fraser River and its tributaries. The escapement goal for Fraser Chum is 800,000. Spawning escapement for Fraser River Chum Salmon is currently assessed for five of the largest Chum producing systems, as well as for a number of smaller tributaries. The largest observed escapement of Fraser River Chum (greater than 3 million fish), was seen in 1998. From 1999 to 2010, Fraser Chum Salmon escapement (for the annually assessed systems) trended downward. The escapement decline was then halted and reversed with an estimated 1.1 million spawners reported in 2011. Spawning escapement had remained stable through 2016 and achieved the escapement goal in each year (2011-2016 estimated escapement averaged 1.3 million spawners).

The estimate of escapement for 2017 is 660,000 Chum Salmon. This is below the escapement goal of 800,000 for Fraser Chum. An estimate of the escapement in 2018 is not yet available as assessments are ongoing and preliminary data analysis will not be complete until January 2019.

## **12.3 FIRST NATIONS FISHERIES**

First Nations Food, Social and Ceremonial (FSC) gill net fisheries commenced October 10 (below Port Mann Bridge) and October 13 (above Port Mann Bridge), following closures to protect co-migrating Interior Fraser Coho (IFC). Chum directed FSC fisheries were also further reduced due to the Interior Fraser Steelhead window closure that overlapped with the end of the IFC window closure but was extended through to 23:59 October 24 below Mission and 23:59 October 25 above Mission Bridge.

The total Chum catch (either directed or by-catch) in First Nations FSC fisheries can be found in Table 7, Table 8, Table 10, and Table 12.

## **12.4 RECREATIONAL FISHERIES**

In 2018 two of the major Fraser River watershed recreational salmon fisheries impacting Chum salmon were assessed, these were the lower Fraser River mainstem sport fishery and a significant salmon fishery occurring in 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 September 4 to September 27 downstream of Mission Bridge with a daily limit of four and from September 5 to September 28 upstream of Mission Bridge with a daily limit of two. In 2018 the Fraser mainstem was closed to fishing for salmon during the Interior Fraser River Steelhead window closure (downstream of Mission Bridge from September 28 to October 24 and upstream of Mission Bridge from September 29 to October 25).

Following the IFR Steelhead window closure period, chum non-retention was in place in the Fraser mainstem downstream of Mission Bridge from October 25 to December 31 and upstream of Mission Bridge from October

26 to December 31. In 2018, this mainstem fishery was assessed in the period opened to the retention of Chum. Estimates of kept and released Chum salmon are not yet available. The Chilliwack River sport fishery was open to the retention of Chum salmon from July 1 to December 31 (with a daily limit of one). Similar to past years, this Chilliwack River fishery was assessed from September 15 to November 15 in 2018. Estimates of kept and released Chum salmon are not yet available.

The Harrison River, Stave River and Nicomen Slough/Norrish Creek sport fisheries were open to the retention of Chum salmon year round (daily limit of two) until October 28 and closed to retention of chum from October 29 to December 31 this year. In 2018, no assessment was conducted on the Harrison River or Stave River fisheries; however, the Nicomen Slough/Norrish Creek fishery was assessed from October 6 to November 30. Estimates of kept and released Chum salmon are not yet available.

## **12.5 COMMERCIAL FISHERIES**

### **12.5.1 COMMERCIAL**

#### *Area B*

Area B seine fisheries in Area 29 (Fraser River) for Fraser Sockeye took place from September 12 to 17 and September 21 to 27. There were no Area B fisheries in Area 29 for Chum in 2018 and therefore no catch of Chum salmon to report.

#### *Area E*

There were four Area E gill net openings in the Fraser River (Area 29) during the 2018 Fraser Sockeye season, consisting of a 24 hour fishery on August 8, a 16 hour fishery on August 15, a 16 hour fishery on August 16, and an 8 hour fishery on August 21.

Commercial salmon fisheries in the lower Fraser River (below Mission) remained closed during the Interior Fraser River Coho window closure, and further closures were in place until later in October to meet the Interior Fraser Steelhead management objectives. There were no Area E fisheries in the Fraser River for Fraser Chum in 2018 and therefore no catch of Chum salmon to report.

#### *Area H*

Area H troll was provided an opportunity in Area 29 that took place from October 25 to November 3.

The total Chum catch (either directed or by-catch) in Commercial A-H Fisheries can be found in Table 7, Table 8, Table 10, and Table 12.

### **12.5.2 FIRST NATIONS COMMERCIAL HARVEST**

In 2018, there were no Chum directed economic opportunity or demonstration fisheries in the Lower Fraser due to a poor in-season chum escapement estimate. However, during the Sockeye economic opportunity beach seine fishery for the Harrison Fisheries Authority and the 18 signatory communities on September 23-28, retention and sale of chum was permitted.

Musqueam and Tsawwassen First Nations Sockeye directed economic opportunities concluded August 25, 2018 prior to chum entering the Fraser river and therefore no chum were permitted for retention or sale.

The total Fraser River Chum catch (either directed or by-catch) in First Nations Commercial fisheries can be found in Table 7, Table 8, Table 10, and Table 12.

## **12.6 EXCESS-TO-SPAWNING REQUIREMENT (ESSR) FISHERIES**

There were ESSR fisheries at the Chilliwack hatchery in 2018 that included Chum salmon.

There were ESSR fisheries permitted at the Inch Creek and Chehalis hatcheries in 2018 that included Chum salmon.

All ESSR harvest information can be found in Tables 7, 8, 10, 12.

**Table 12. Fraser River - Chum Catch and Directed Fisheries\***

Licence Group	Fishing Area	Chinook Kept	Chinook Released	Fraser Sockeye Kept	Non-Fraser Sockeye Kept	Unknown Sockeye Kept	Sockeye Released	Pink Kept	Pink Released	Coho Kept	Coho Released	Chum Kept	Chum Released
First Nations FSC													
	Fraser River											65,706	435
Total First Nations FSC Catch		0	0	0	0	0	0	0	0	0	0	65,706	435
First Nations Commercial													
Harvest Agreement	Fraser River											2	0
EO	Fraser River											1,421	188
Demo	Fraser River											0	0
Total First Nations Commercial Catch		0	0	0	0	0	0	0	0	0	0	1,423	188
Commercial													
Area H Troll	Fraser (29)												
Area B Seine	Fraser (29)												
Area E Gillnet	Fraser (29)												
Total Commercial Catch		0	0	0	0	0	0	0	0	0	0	0	0
Recreational													
	Fraser River											25	0
Total Recreational Catch		0	0	0	0	0	0	0	0	0	0	25	0
ESSR													
	Fraser River											9,353	0
Total ESSR Catch		0	0	0	0	0	0	0	0	0	0	9,353	0
<b>TOTALS</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>76,507</b>	<b>623</b>

\*Fraser River Data includes Fraser River Chum catch from all fisheries, not just "directed" fisheries. Fraser River catch estimates are incomplete; not all of the assessed fisheries had available catch estimates to include in this report.

## **13 STRAIT OF GEORGIA CHUM**

---

### **13.1 OBJECTIVES AND OVERVIEW**

Strait of Georgia Chum fisheries consist of terminal opportunities for Chum returning to their natal spawning streams. Many of the terminal fishing areas have enhancement facilities and/or spawning channels associated with adjacent river systems. 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 including swim surveys, stream walks, channel entry counts, fence counts, Sonar (DIDSON) counts and over flights. In some areas where stocks receive considerable enhancement or where stocks have above average productivity, limited fishing may occur prior to escapement objectives being reached.

### **13.2 STOCK STATUS**

Historically, Chum returns have been highly variable relative to brood year escapements. For 2018, the forecasts were as follows:

- Jervis/Narrows Inlet Chum abundance was expected to be below the target level,
- Mid-Vancouver Island systems were expected to vary from well below to above the target level,
- Nanaimo was forecasted to be well above target levels,
- Cowichan was forecasted to be slightly below to well above target level, and,
- Goldstream Chum abundance was forecasted to be above to well above the target levels.

All of these forecasted expectations are highly uncertain and a review of the procedures and data used for forecasting these systems will be conducted in the future.

Conditions for returning Chum migration and spawning in October began with an early bump of rain followed by a three week stretch with little to no precipitation. Rains arrived in late October during the peak of migration and spawning providing suitable conditions in most systems. In late November, water levels increased significantly signaling an end to enumeration programs. By this time it is believed that the majority of spawning had occurred.

Monitoring spawning escapements of Chum are nearly complete and data are currently being reviewed. Returns for the Jervis/Narrows Inlet aggregate (which includes Brittain River, Skwawka River, Deserted River, Vancouver River and Tzoonie River) were particularly poor with several record-low counts. Returns came in at or below forecast for mid-Vancouver Island systems and escapement targets were not met. Puntledge River counts were modest while the Big and Little Qualicum escapements were very poor. South Island systems fared better with Nanaimo River and Cowichan River at or above the expected range and reached escapement targets (Table 13-1). Goldstream River escapement also tracked the forecast with spawning targets met early into the run.

Table 13-1 Strait of Georgia Chum Spawning Escapements

System	Target Escapement Target	2018 forecast Expected range	Preliminary 2018 Escapement	% of target
Jervis Inlet	110K	37K – 55K	3K	3%
Mid-Island	230K	95K – 142K	53K	23%
Puntledge	60K		33K	55%
Little Qualicum	85K		9K	10%
Big Qualicum	85K		11K	13%
Nanaimo	40K	60K – 90K	85K	212%
Cowichan	160K	170K – 255K	178K	111%
Goldstream	15K	31K – 47K	55K	367%

### 13.3 FIRST NATIONS FSC FISHERIES

The total FSC Chum salmon catch by First Nations in the Strait of Georgia can be found in Table 13.

### 13.4 RECREATIONAL FISHERIES

#### 13.4.1 TIDAL RECREATIONAL FISHERIES

Marine recreational Chum fisheries are subject to the normal salmon daily and possession limits (limit of four per day and possession of eight), and are typically open throughout the area. The majority of the recreational effort directed at Chum salmon in the Strait of Georgia occurs in the lower portions of the Discovery Passage area, particularly in the waters around Campbell River. The annual Brown's Bay Charity Chum derby which took place on the weekend of October 13-14 is usually the most active Chum recreational fishery in the area. Catches in the derby were reported to be modest, likely based on the lower abundances of Chum observed in 2018. There was no creel survey during the months of October and November in the Strait of Georgia.

Marine Chum fisheries also occur in the approach waters of the Puntledge, Qualicum, Little Qualicum, Nanaimo and Cowichan Rivers on Vancouver Island, as well as in Howe Sound. Catch estimates for chum in the marine recreational fisheries can be found in Table 13.

#### 13.4.2 NON-TIDAL RECREATIONAL FISHERIES

Chum retention fisheries in Region 1 took place in 2018 in the Courtenay, Cowichan, Nanaimo, Puntledge and Qualicum Rivers on Vancouver Island. Recreational freshwater retention opportunities are typically based on

escapement estimates from hatchery operations, and where escapement goals are expected to be met, opportunities are provided.

Catch is not estimated in these freshwater fisheries.

## **13.5 COMMERCIAL FISHERIES**

Strait of Georgia commercial Chum fisheries for troll, gill net and seine were conducted in Areas 17, 18 and 19 between October 24 and November 21. Escapement to Area 14 streams was insufficient to permit commercial fisheries in that area. Commercial Chum catch from the Strait of Georgia can be found in Table 13.

### **13.5.1 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.

The Area 14 Chum 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, 85,000 for Little Qualicum River, and 85,000 for Qualicum River, adding up to an overall interim escapement goal of 230,000 Chum, not including enhancement facility requirements (about 10,000 Chum, bringing the total escapement goal to 240,000).

Area 14 commercial Chum fisheries are managed based on forecasted abundance. In-season, the management strategy for considering fishery openings falls under one of two categories; Area 14 Pre-Season Forecast greater than or less than 340,000 Chum. When pre-season forecast is greater than 340,000 early Chum openings would target up to 65% of the anticipated surplus above 340,000. When pre-season forecast is less than 340,000 an early timed small fleet gillnet fishery may be used to evaluate the MVI aggregate abundance.

In 2018 the Mid-Vancouver Island aggregate was managed based on the pre-season forecast of less than 340,000 Chum. This was considered to be too low to sustain an assessment fishery because it was less than the 240,000 escapement target. No commercial chum fisheries occurred in Area 14 for 2018. Escapement targets were not met, total returns to the Puntledge, Qualicum, and little Qualicum, as of November 28, was 57,902.

#### *Area 16*

This fishery targets wild Chum stocks returning to river systems in the Jervis Inlet area. The main systems are Tzoonie, Deserter and Skwawka Rivers. The overall escapement goal for rivers in Jervis/Narrows Inlet is 85,000. 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 2018.

#### *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 40,000.

Nanaimo River assessments include swims by Nanaimo River Hatchery staff, a sonar counting system (DIDSON) and spot counts or helicopter counts by DFO during the peak of the return when possible. The DIDSON was installed and operational on October 4.

In 2018 there were Area E Gill Net and Area B Seine openings for Nanaimo River Chum. The Area E Gill Net fishery opened October 24 and the Area B Seine fishery opened on October 30. The escapement target of 40,000 chums was reached on Oct 30 and the Area E gill net and Area B Seine fishery opened daily from November 1 until the fisheries closed for the season on November 15. The catches in the fisheries can be found in Table 13.

### *Area 18*

This fishery is directed primarily at Cowichan River stocks; however incidental catches of Goldstream bound 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. Management is also guided by advice from the Cowichan Fisheries 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 passing by the DIDSON counter.

A bi-weekly conference call was held with the Cowichan Fisheries Roundtable to discuss stock status and potential fishing opportunities in Area 18. In 2018, the Cowichan Tribes demonstration fishery was triggered on October 24 when the Didson Chum count was approximately 40,000 chums. The Cowichan Tribes demonstration fishery was licenced to fish for 5,000 chum on October 24 daily until December 31 but was not active after November 6. An Area H Troll fishery was triggered when the Didson Chum count was approximately 60,000 Chum. The Area 18 troll fishery was to fish for 3000 Chum on November 1 daily until the TAC was caught. No Area H vessels participated in the fishery. Area E and Area B fished in Area 18 daily from October 24 until November 21.

### *Area 19*

This fishery is directed primarily at Goldstream River stocks, although some Cowichan River Chum salmon are also harvested. Fisheries are planned in-season based on escapement estimates. Area 19 falls under the same management regime as Area 18. The overall escapement goal for the Goldstream River is 15,000. Weekly (or bi-weekly in 2018) stream walks are conducted on Goldstream River by Goldstream Hatchery staff to estimate Chum escapement. In 2018, enumerations began on October 10.

In 2018, the Saanich Tribes demonstration fishery was triggered on November 5 when the Goldstream escapement estimate count was approximately 10,000 Chum. The Saanich Tribes demonstration fishery was licenced to fish for 5,000 Chum on November 6 daily until December 31 but was not active after November 7.

Area E and Area B commercial fisheries began on November 9 and continued until November 19. Chum catch and release information from all fisheries can be found in Table 13.

### **13.5.2 FIRST NATIONS COMMERCIAL HARVEST**

#### *Area 18*

A bi-weekly conference call was held with the Cowichan Fisheries Harvest Roundtable to discuss stock status and potential fishing opportunities in Area 18. In 2018, a commercial opportunity was triggered on October 23 when the Didson Chum count was near 40,000 of the escapement target of 160,000 Chum. The Cowichan Tribes commercial demonstration fishery began October 24 and was licensed to fish from October 24 daily until December 31. The Cowichan Tribes Commercial Demonstration catch is approximately 5,644 Chum. No other species were reported to be encountered in the fishery.

#### *Area 19*

At pre-season meetings with Saanich Tribes potential triggers and fishing plans were made to harvest surplus Goldstream Chum. In 2018, a commercial opportunity was triggered in Area 19 on November 5 when the in-river chum estimate to Goldstream River was near 10,000 of the escapement target of 15,000 Chum. The Saanich Tribes demonstration fishery began on November 6 and was licensed to fish from November 6 daily until December 31. The Saanich Tribes Commercial Demonstration catch is approximately 1,500 chums. No other species were reported to be encountered in the fishery.

## **13.6 EXCESS SALMON-TO-SPAWNING REQUIREMENTS (ESSR) FISHERY**

The Cowichan Tribes First Nation had an ESSR harvest of chum from the Cowichan River. The license was issued on Nov 6 and harvest took place between November 7<sup>th</sup> and 12<sup>th</sup>. Total catch is reported in Table 13.

The Qualicum First Nation was issued an ESSR Licence for chum, coho and chinook on October 3, 2018 at the Big Qualicum Hatchery. No chum ESSR was executed.

The Snuneymuxw First Nation was issued an ESSR licence in portions of the Nanaimo River for chum. The license was issued on October 26 until further notice.

The K'ómoks First Nation was issued an ESSR licence for chinook and chum salmon for the Puntledge River, the non-tidal portion of the Courtenay River, and PFMA 14-14 valid Oct 3, 2018 until further notice. No harvest to-date.

There were ESSR fisheries at the Capilano hatchery in 2018 that included Chum salmon.

**Table 13. Strait of Georgia - Chum Directed Fisheries**

Licence Group	Fishing Area	Chinook Kept	Chinook Released	Fraser Sockeye Kept	Non-Fraser Sockeye Kept	Unknown Sockeye Kept	Sockeye Released	Pink Kept	Pink Released	Coho Kept	Coho Released	Chum Kept	Chum Released
First Nations FSC													
	Strait of Georgia											92	0
Total First Nations FSC Catch		0	0	0	0	0	0	0	0	0	0	92	0
First Nations Commercial													
EO	Strait of Georgia												
Demo	Strait of Georgia	0	0	0	0	0	0	0	0	0	0	7,144	0
Total First Nations Commercial Catch		0	0	0	0	0	0	0	0	0	0	7,144	0
Commercial													
Area H Troll	MVI (14-19)	0	0	0	0	0	0	0	0	0	32	19,616	0
Area B Seine	MVI (14-19)	0	0	0	0	0	0	0	0	0	0	0	0
Area D Gillnet	MVI (14)	0	0	0	0	0	0	0	0	0	0	0	0
Area E Gillnet	MVI (Area 17-19)	0	3	0	0	0	0	0	0	0	105	115,245	0
Total Commercial Catch		0	3	0	0	0	0	0	0	0	137	134,861	0
Recreational													
	Strait of Georgia (13-19,28,29)											378	61
Total Recreational Catch		0	0	0	0	0	0	0	0	0	0	378	61
ESSR													
ESSR	Strait of Georgia									37		4,793	
Total ESSR Catch		0	0	0	0	0	0	0	0	37	0	4,793	0
<b>TOTALS</b>		<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>37</b>	<b>137</b>	<b>147,268</b>	<b>61</b>

## 14 WEST COAST VANCOUVER ISLAND CHUM

---

### 14.1 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 Inlets (Area 25). In some 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) and Kyuquot Sound (Area 26).

Commercial fisheries for WCVI Chum employ a two-tiered strategy for controlling removals; either a constant harvest rate strategy or a surplus-to-escapement goal strategy.

1. Fixed Harvest Rate Strategy (fisheries targeting natural origin stocks, hatchery stocks at low abundance):

For those fisheries where a significant component of the target stock is from naturally spawning populations, a constant harvest rate strategy of 10-20% is implemented. The maximum harvest rate is set at a precautionary level relative to stock-recruit derived optimal exploitation rates for WCVI Chum; which are in the order of 30-40%. This approach allows limited harvest while protecting the biodiversity of Chum stocks and permitting rebuilding when the population is low. In areas of low quality data or only naturally spawning stocks, including Barkley (Area 23), Clayoquot Sound (Area 24), Esperanza Inlet (Area 25) and Kyuquot Sound (Area 26), the maximum allowable harvest rate is 10 to 15%. In Nootka Sound, up to 20% harvest is permitted given the prevalence of hatchery stock in the area. The harvest rate is controlled by limiting effort (i.e. number and duration of openings and, in some areas, the number of permitted vessels) and limiting fishing areas to approach areas only (i.e. to those areas where fish are migrating not holding).

Since 2013, a fixed harvest rate strategy has also been used to harvest Nitinat Hatchery Chum when the stock abundance is considered above the lower fishery reference point but below the target fishery reference point. The maximum harvest rate for the Nitinat stock is 25% when it is below the target fishery reference point.

2. Surplus-to-Escapement Goal Strategy (fisheries targeting hatchery stocks at high abundance):

For fisheries that target primarily hatchery surpluses, the allowable harvest rate is determined by the escapement goal when it is determined the stock is forecasted in-season to be above the Upper Fishery Reference Point and broodstock capture targets have been or will be met. These fisheries occur only in 'terminal areas', defined as an area in close proximity to the origin watershed of the target stock where little or no interception of other stocks occurs. Surplus to escapement goal fisheries for Conuma Hatchery stock have occurred within the Tlupana Inlet portion of Area 25. Surplus to escapement goal fisheries for Nitinat Hatchery stock have occurred in Area 21 near the mouth of Nitinat Lake or in Area 22 in Nitinat Lake. All Nitinat and Conuma hatchery Chum are thermally marked, which allows for assessment of the hatchery contribution to fisheries and spawning.

## **14.2 STOCK STATUS**

The current stock status is considered poor. Over the last three brood cycles, naturally spawning populations have been below target abundance in many years despite the precautionary harvest regime. In addition, hatchery production levels have declined in recent years partially as a result of low abundance (i.e. hatcheries have not been able to achieve brood-stock targets in some years.) In recent years, overall catches have declined relative to historic levels. There was some improvement observed for the Nitinat Hatchery stock in 2016 and 2017 but returns in 2018 were again low.

## **14.3 EXCESS SALMON TO SPAWNING REQUIREMENTS (ESSR) FISHERIES**

The Ditidaht First Nation was issued an ESSR Licence for Chum at Nitinat Lake and Nitinat hatchery. There was gill net and seine broodstock capture in the lake. The total Chum catch can be found in Table 14.

The Mowachaht/Muchalaht First Nation was issued an ESSR licence to harvest Chinook, hatchery-marked Coho, and Chum from the Conuma River and hatchery, and the Burman River. Due to challenging environmental conditions and no surplus of salmon available, no ESSR fishery occurred in 2018.

There were no other Chum ESSR fisheries on the WCVI in 2018.

## **14.4 FIRST NATIONS FSC FISHERIES**

The 2018 WCVI FSC chum reported catch (to date) can be found in Table 14, (this includes fish retained for food, social and ceremonial purposes from Tsu-ma-uss (Somass) First Nations economic opportunity fisheries and T'aaq-wiihak salmon demonstration fishery); catch from Maa-nulth Nations Domestic harvest can be found in Table 14. Total chum reported to date for First Nations FSC and domestic fisheries can be found in Table 14.

## **14.5 RECREATIONAL FISHERIES**

### **14.5.1 TIDAL RECREATIONAL**

The WCVI recreational fishery is open year-round with a daily limit of four (4) and possession of eight (8) Chums. 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, sport catch of Chum is very low (estimated at less than 200 for all areas combined).

### **14.5.2 NON-TIDAL RECREATIONAL**

Chum retention fisheries took place in the Nitinat River on Vancouver Island from October 15-Dec 31, with a limit of two (2) /day and four (4) in possession. Recreational freshwater opportunities are typically based on escapement estimates from hatchery operations, and where escapement goals are expected to be met, opportunities are provided. Chum returns to the WCVI were low to moderate in most systems in 2018. Daily and possession limits are typically half of those provided in marine waters, with daily limits on most rivers

being 2/day and 4 in possession. Catch is not estimated in these freshwater fisheries. Chum catch and effort from this fishery is expected to be marginal.

## **14.6 COMMERCIAL FISHERIES**

Commercial fisheries on the WCVI targeted three Chum stocks in 2018: Nitinat (Area 21/121), Esperanza (Area 25) and Kyuquot (Area 26).

### *Nitinat (Area 21/121)*

In 2018, the preseason forecast of 178,000 precluded regular commercial fisheries for both gill net and seine fisheries.

A one day Area E gillnet fishery occurred on October 1st. The catch per unit effort (CPUE) was used to predict an in season run size reforecast. The fishery was poor and the low CPUE precluded any further fishery for two weeks. On October 19 and 20<sup>th</sup>, because the weekly escapement targets for the Nitinat System were met, a regular gillnet fishery occurred. This fishery also had low catches. No further fisheries occurred and the run size ended up at approximately 160,000. The fisheries were poor and the total Chum catch can be found in Table 14.

### *Esperanza Inlet (Area 25)*

Based on pre-season forecasts, a limited effort gill net Chum fishery opened in Esperanza Inlet on September 25, 2018. Effort was limited to a maximum of 5 vessels fishing, of which 4 were for Area D vessels and 1 was for a local First Nation with an Area D licence. Four Area D vessels participated in the 2018 fishery. The fishery was open for 1.5 days per week during daylight hours for 4 weeks. The total catch for the Esperanza Inlet Area D gill nets can be found in Table 14.

### *Kyuquot Sound (Area 26)*

Based on pre-season forecasts, a limited effort gill net Chum fishery opened in Kyuquot Sound on September 25, 2018. Effort was limited to a maximum of 4 vessels fishing, of which 3 were for Area D vessels and 1 was for a local First Nation with an Area D licence. Three Area D vessels and 1 Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations Area D vessel participated in the 2018 fishery. The fishery was open for 2 days per week during daylight hours for 4 weeks. The total catch for the Kyuquot Sound Area D gill nets can be found in Table 14.

## **14.7 FIRST NATIONS COMMERCIAL HARVEST**

In 2018, an agreement was reached with the Hupacasath and Tseshaht First Nations (Somass First Nations) for an Economic Opportunity fishery targeting Chum (Area 23). The pre-season forecast was 14,000, which was below the lower reference point of 48,000 and no commercial surplus was identified in-season, therefore there was no EO fishery for Chum in 2018.

There were no Chum directed fisheries during the 2018 T'aaq-wiihak salmon demonstration fishery.

**Table 14. West Coast Vancouver Island - Chum Directed Fisheries**

Licence Group	Fishing Area	Chinook Kept	Chinook Released	Fraser Sockeye Kept	Non-Fraser Sockeye Kept	Unknown Sockeye Kept	Sockeye Released	Pink Kept	Pink Released	Coho Kept	Coho Released	Chum Kept	Chum Released
First Nations FSC													
	WCVI											1,067	0
Total First Nations FSC Catch		0	0	0	0	0	0	0	0	0	0	1,067	0
First Nations Commercial													
T'aaq-wiihak	WCVI ISBM (25)												
Maa-nulth HA	Henderson (23)												
EO	WCVI	0	0	0	0	0	0	0	0	0	0	0	0
Demo	WCVI												
Total First Nations Commercial Catch		0	0	0	0	0	0	0	0	0	0	0	0
Commercial													
Area B Seine	Nitinat (21, 121)	0	0	0	0	0	0	0	0	0	0	0	0
Area D Gillnet	Esperanza (25)	0	12	0	0	0	0	0	0	0	82	7,670	0
Area D Gillnet	Kyuquot (26)	0	5	0	0	0	0	0	0	0	83	8,278	0
Area E Gillnet	Nitinat (21, 121)	0	1	0	0	0	0	0	0	0	20	11,467	1
Total Commercial Catch		0	18	0	0	0	0	0	0	0	185	27,415	1
Recreational													
	Juan de Fuca (19,20)											0	23
	WCVI - Inshore (20W-27)											28	0
Total Recreational Catch		0	0	0	0	0	0	0	0	0	0	28	23
ESSR													
	WCVI											40,359	
Total ESSR Catch		0	0	0	0	0	0	0	0	0	0	40,359	0
<b>TOTALS</b>		<b>0</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>185</b>	<b>68,869</b>	<b>24</b>

FSC catch includes catch from all FSC fisheries reported in those areas. FSC fisheries in these areas do not generally 'target' one species.

# 15 APPENDICES

## 15.1 APPENDIX I: CATCHES IN CANADIAN TREATY LIMIT FISHERIES, 1997 TO 2018

Fisheries/Stocks	Species	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996
Stikine River (all gears)	Sockeye	17,322	41,749	86,729	60,046	42,800	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	3,685	5,502	5,346	5,619	4,992	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-1g	-	593	2,731	4,157	3,308	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	-	788	794	1,537	759	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	17,974	30,209	37,624	19,747	17,872	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	9,503	7,726	9,513	7,886	14,568	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-1g	-	246	1,021	868	2,472	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	-	88	205	-	657	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	-	644	815	1,084	1,140	508	1,786	2,110	1,716	717	-	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	-	71	127	192	289	99	52	28	112	5	65
	Chinook	-	74	10	87	39	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)****	Pink	101,267	704,450	430,435	80,266	450,671	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	266	38,763	32,343	41,551	31,775	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	-	261,000	732,000
North Coast** (troll + sport)	Chinook	106,976	143,330	190,180	158,903	221,001	115,914	120,305	122,660	136,613	109,470	95,647	144,235	215,985	243,606	241,508	191,657	150,137	43,500	32,048	70,701	144,650	145,568	26,900
		70,276 + 36,700	97,730 + 45,600	147,381 + 42,800	106,703 + 52,200	172,001 + 49,000	69,264 + 46,650	80,256 + 40,050	74,660 + 48,000	90,213 + 46,400	75,470 + 34,000	52,147 + 43,500	83,235 + 61,000	151,485 + 64,500	174,806 + 68,800	167,508 + 74,000	137,357 + 54,300	103,037 + 47,100						
West Coast Vancouver Island (troll + sport + FN)	Chinook	77,017	103,260	93,294	113,293	178,558	108,710	130,719	206,569	137,660	125,488	143,817	139,150	145,970	195,791	210,875	179,706	165,824	102,266	89,139	28,540	10,855	59,796	3,677
		28,840 + 45,233 + 2,944	54,411 + 46,707 + 2143	55,168 + 37,809 + 317	60,572 + 48,775 + 3,946	127,177 + 48,365 + 3,655	43,043 + 61,712 + 3,955	62,573 + 61,822 + 4,300	123,930 + 78,350 + 4,289	79,123 + 52,698 + 5,000	53,191 + 68,775 + 3,381	89,704 + 50,319 + 3,794	87,921 + 46,229 + 5,000	103,978 + 36,992 + 5,000	143,614 + 52,177	168,837 + 42,038	152,677 + 27,029	134,308 + 31,516	78,302 + 23,964	64,216 + 24,923	6,906 + 21,634	6,678 + 4177	53,396 + 6,400	4 + 3673
Fraser River Canadian Commercial Catch	Sockeye	3,683,351	-	-	-	7,945,474	2,124	-	443,000	9,305,104	-	16,942	-	4,633,623	137,000	1,993,800	1,042,986	2,182,700	295,000	953,000	54,000	1,295,000	8,737,000	1,019,000
	Pink	90,982	-	-	452	-	2,855,441	-	4,751,800	-	1,442,840	-	333,300	68,325	338,000	-	1,149,189	-	579,000	-	3,000	-	3,660,000	-
	Sockeye	989,459	-	-	44,100	691,000	4,609	105,100	266,000	1,970,000	-	49,800	3,900	701,300	-	192,200	244,000	434,600	240,000	494,000	41,000	707,000	1,578,000	257,000
Fraser River U.S. Commercial Catch	Pink	-	105,930	-	334,700	-	3,057,222	-	2,893,400	-	2,726,230	-	377,600	-	-	-	773,000	-	427,000	-	3,000	-	1,565,000	-
West Coast Vancouver Island (commercial troll)	Coho	-	331	774	18,126	32,992	5,499	1,988	-	458	-	369	1,424	2,399	5,989	-	-	-	-	-	-	-	-	761,000
Johnstone Strait (commercial catch)***	Chum	53,166	401,957	1,333,478	492,841	318,984	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 A																								
*** 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.																								



## 15.2 APPENDIX 2: 2018 SOUTH COAST TEST FISHERY CATCHES

Test-Fisheries	Start Date	End Date	Boat Days	Sockeye kept	Sockeye released	Coho kept	Coho released	Pink kept	Pink released	Chum kept	Chum released	Chinook kept	Chinook released	Steelhead kept	Steelhead released	GRAND TOTAL
Albion Chinook Gillnet	22-Apr-18	20-Oct-18	153	1,679	0	15	0	0	0	1,346	0	1,679	0	0	1	4,720
Albion Chum Gillnet	1-Sep-18	23-Nov-18	56	798	0	97	0	0	0	5,370	0	187	0	0	5	6,457
Mquqwin / Brooks Chinook Troll	12-Jul-18	5-Aug-18	17	0	11	251	113	0	0	0	0	473	17	0	0	865
Juan De Fuca Chum Seine	24-Sep-18	9-Nov-18	24	0	0	0	71	0	0	1,940	6,740	0	69	0	0	8,820
Area 12 Chum Seine	12-Sep-18	27-Oct-18	69	137	517	0	547	252	51	20,517	2,999	0	26	0	3	25,049
Area 13 Sockeye Seine	26-Sep-18	31-Aug-18	37	8,921	19,458	0	89	391	2,585	13	286	0	146	0	0	31,889
Area 23 Sockeye Seine	11-Jun-18	17-Jul-18	14	4,951	171	0	1	0	0	0	0	0	381	0	25	5,529
Blinkhorn Sockeye Seine	24-Jul-18	11-Sep-18	48	31,243	37,527	0	410	5,036	2,832	836	630	0	412	0	11	78,937
Round Island Sockeye Gillnet	12-Jul-18	14-Aug-18	34	1,691	11	47	22	296	2	19	0	21	26	0	3	2,138
San Juan Sockeye Seine	25-Sep-18	4-Sep-18	42	37,822	51,795	0	1,500	0	2	0	14	0	1,067	0	1	92,201
San Juan Sockeye Gillnet	10-Jul-18	16-Aug-18	75	9,845	1	32	169	3	0	42	0	70	69	0	11	10,242
Whonnock Gillnet	22-Jun-18	12-Oct-18	109	5,716	0	160	0	0	0	923	0	406	0	0	3	7,208
Cottonwood Gillnet	12-Jul-18	26-Sep-18	73	7,945	0	0	291	0	0	81	0	349	0	0	2	8,668
Gulf Sockeye Troll	21-Aug-18	6-Oct-18	42	3,288	2,229	62	62	0	0	19	16	0	21	0	0	5,697
Qualark Gillnet	2-Jul-18	10-Oct-18	100	4,318	2	6	27	0	0	0	3	289	7	0	0	4,652
<b>Grand Total</b>				<b>118,354</b>	<b>111,722</b>	<b>670</b>	<b>3,302</b>	<b>5,978</b>	<b>5,472</b>	<b>31,106</b>	<b>10,688</b>	<b>3,474</b>	<b>2,241</b>	<b>0</b>	<b>65</b>	<b>293,072</b>
All test fish catches include assessment and non-assessment sets Note: Jacks included in the above test fishing catches if encountered																

## 15.3 APPENDIX 3: 2018 SOUTHERN BC 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	50	0	3,739	0	0	31	7	19,156	2,209
Area G Troll	WCVI Sockeye (11,12,111,123 to 127)	29,400	4	0	587	107	37	6	9	0	643
Area H Troll	Fraser Sockeye (12,13)	63,334	36	0	299	764	444	58	56	0	609
Area H Troll	Fraser Sockeye (29)	118,706	0	0	321	1	18	5	11	0	656
Area H Troll	Fraser Pink (12, 13, 29)										
Area H Troll	JST Chum (12,13)	0	3	0	14	0	1	1,976	0	0	4
Area H Troll	Fraser Chum (29)										
Area H Troll	MVI Chum (14)	0	0	0	32	0	0	19,616	0	0	0
Area B Seine	Barkley Sockeye (23)										
Area B Seine	Fraser Sockeye (12,13)	1,279,614	8,557	621	4,996	56,044	6	13,084	53	243	3,168
Area B Seine	Fraser Sockeye (16)	0	0	0	0	0	0	0	0	0	0
Area B Seine	Fraser Sockeye (29)	627,514	1	29	158	0	0	35	2	11	76
Area B Seine	Mainland Pinks (12, 13, 16)	0	0	0	0	0	0	0	0	0	0
Area B Seine	Howe Sound Pink (28)	0	0	0	0	0	0	0	0	0	0
Area B Seine	Fraser Pink (12, 13, 29)	0	0	0	0	0	0	0	0	0	0
Area B Seine	Nitinat Chum (21, 121)										

Area B Seine	JST Chum (12,13)	1	12	3	58	2	0	37,773	11	0	6
Area B Seine	Fraser Chum (29)										
Area B Seine	MVI Chum (14-19)										
Area B Seine	Somass Chinook (23)	0	66	2,606	0	0	58	0	5	6,403	235
Area D Gillnet	Barkley Sockeye (23)										
Area D Gillnet	Barkley Chum (23)										
Area D Gillnet	Somass Chinook (23)										
Area D Gillnet	Clayoquot Chum (24)										
Area D Gillnet	Esperanza (25)	0	0	0	82	0	0	7,670	0	0	12
Area D Gillnet	Tlupana Chinook (25)	0	0	0	2	0	0	36	0	3,307	0
Area D Gillnet	Nootka Chum (25)										
Area D Gillnet	Kyuquot Chum (26)	0	0	0	83	0	0	8,278	0	0	5
Area D Gillnet	Fraser Sockeye (11,12,13,14)	479,006	308	0	5,668	34,046	326	10,307	56	6	1,069
Area D Gillnet	JST Chum (12,13)	0	0	0	44	0	0	12,390	4	0	2
Area D Gillnet	MVI Chum (14)										
Area E Gillnet	Fraser Sockeye (29)	600,942	0	0	62	20	12	2	4	24	2,402
Area E Gillnet	Fraser Chum (29)										
Area E Gillnet	Nitinat Chum (21, 121)	0	0	0	20	0	0	11,467	1	0	1
Area E Gillnet	MVI Chum (Area 14-19)	0	0	0	105	0	0	115,245	0	0	3
T'aaq-wiihak	WCVI AABM Chinook (24-26,124-126)	15,536	9	899	2,145	0	0	2	0	9,667	499
T'aaq-wiihak	WCVI ISBM Chinook (25)	0	0	0	0	0	0	0	0	2,850	0

T'aaq-wiihak	Fraser River Sockeye (124- 126)	14,228	0	1	49	0	0	1	0	17	41
Maa-nulth HA	Henderson Sockeye (23)										
Harvest Agreement	Fraser	37,094	0	0	0	0	0	2	0	22	8
EO	Johnstone Strait										
EO	Strait of Georgia										
EO	WCVI	0	0	795	0	0	0	0	0	19,899	0
EO	Fraser River	216,274	31	1,099	1,212	0	0	1,421	188	435	1,068
Demo	Johnstone Strait										
Demo	Strait of Georgia	0	0	0	0	0	0	7,144	0	0	0
Demo	WCVI										
Demo	Fraser River	228,744	0	0	2,677	0	0	0	0	0	3,344
<b>TOTALS</b>		<b>3,696,154</b>	<b>9,077</b>	<b>6,052</b>	<b>22,304</b>	<b>90,984</b>	<b>902</b>	<b>246,551</b>	<b>407</b>	<b>62,023</b>	<b>16,019</b>

## 15.4 APPENDIX 4: 2018 SOUTHERN BC RECREATIONAL CATCH TOTALS BY AREA

Fishing Area	Sockeye Kept	Sockeye Released	Coho Kept	Coho Released	Pink Kept	Pink Released	Chum Kept	Chum Released	Chinook Kept	Chinook Released
Juan de Fuca (19,20)	13,353	766	5,495	18,566	252	-	-	23	25,519	48,794
Strait of Georgia (13-19,28,29)	43,303	702	19,247	65,210	2,602	2,265	378	61	38,762	62,029
Johnstone Strait (11-12)	6,224	320	3,592	4,402	1,904	1,973	67	46	13,147	15,218
WCVI ISBM - Inshore (20W-27)	5,608**	335	20,056	9,891	77	76	28	-	37,804	22,623
WCVI AABM - Inshore (20W-27)	4,731	185	2,780	2,539	-	2	28	-	13,213	34,950
WCVI AABM - Offshore (121-127)	815	26	21,369	40,096	26	100	-	-	32,020	17,771
Fraser River *	88,601	6,153	-	382	-	-	25	-	7,323	198
<b>TOTAL</b>	<b>157,187</b>	<b>8,677</b>	<b>86,492</b>	<b>164,514</b>	<b>6,622</b>	<b>5,176</b>	<b>535</b>	<b>154</b>	<b>167,788</b>	<b>201,792</b>
**Reported Somass Sockeye Recreational catch										

## 15.5 APPENDIX 5: 2018 SOUTHERN BC FIRST NATIONS (FSC AND TREATY) AND ESSR CATCH ESTIMATES BY AREA

Fisher y type	Fishing Area	Sockey e Kept	Sockeye Release d	Coho Kept	Coho Release d	Pink Kept	Pink Release d	Chum Kept	Chum Release d	Chinoo k ISBM Kept	Chinook ISBM Released	Chinoo k AABM Kept	Chinook AABM Released
<b>First Nation s FSC and Treaty</b>	Johnstone Strait	197,273		118	1			1,027	117	507	0		
	Strait of Georgia	56,671		498	0	3,819	54	92	0	1,033	0		
	WCVI	17,967		10,346	528			1,295	0	2,011	120	1,018	100
	Fraser River	608,966	3,934	742	1,212			65,706	435	17,687	463		
<b>TOTAL</b>		<b>880,877</b>	<b>3,934</b>	<b>11,704</b>	<b>1,741</b>	<b>3,819</b>	<b>54</b>	<b>68,120</b>	<b>552</b>	<b>21,238</b>	<b>583</b>	<b>1,018</b>	<b>100</b>

Fisher y type	Fishing Area	Sockey e Kept	Sockeye Release d	Coho Kept	Coho Release d	Pink Kept	Pink Release d	Chum Kept	Chum Release d	Chinoo k ISBM Kept	Chinook ISBM Release d	Chinoo k AABM Kept	Chinook AABM Release d
<b>ESSR</b>	Johnstone Strait												
	Strait of Georgia			37	0			4,793	0	3,336	0		
	WCVI							40,359	0	28,762	0		
	Fraser River							9,353	0	13,593	0		
<b>TOTAL</b>		<b>0</b>	<b>0</b>	<b>37</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>54,505</b>	<b>0</b>	<b>45,691</b>	<b>0</b>	<b>0</b>	<b>0</b>