

**POST-SEASON REPORT FOR  
2009 CANADIAN TREATY LIMIT FISHERIES**

Report Prepared for the Pacific Salmon Commission  
By Fisheries and Oceans Canada  
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## TABLE OF CONTENTS

1	INTRODUCTION .....	6
2	TRANSBOUNDARY RIVERS.....	6
2.1	STIKINE RIVER.....	6
	Chinook Salmon.....	7
	Sockeye Salmon.....	9
	Coho Salmon.....	12
	Joint Sockeye Enhancement .....	12
2.2	TAKU RIVER .....	14
	Chinook Salmon.....	15
	Sockeye Salmon.....	16
	Coho Salmon.....	17
	Joint Sockeye Enhancement .....	18
2.3	ALSEK RIVER.....	18
3	NORTHERN BRITISH COLUMBIA .....	20
3.1	PINK SALMON .....	20
3.2	CHINOOK AABM FISHERIES .....	21
3.3	CHINOOK ISBM FISHERIES.....	21
3.4	OVERVIEW OF NORTHERN BC CHINOOK STOCK STATUS .....	22
4	FRASER RIVER SOCKEYE.....	22
4.1	OBJECTIVES AND OVERVIEW .....	22
4.2	PRE-SEASON ASSESSMENT .....	25

4.3	IN-SEASON ASSESSMENT .....	29
4.4	FISHERIES .....	35
4.5	POST-SEASON .....	39
5	SOUTHERN BC MAINLAND PINKS AND FRASER RIVER PINK .....	40
5.1	FRASER RIVER PINK .....	40
5.2	SOUTHERN BC MAINLAND PINKS .....	42
5.3	FIRST NATIONS .....	42
5.4	RECREATIONAL .....	42
5.5	COMMERCIAL .....	43
5.6	STOCK STATUS .....	43
6	SOUTHERN BC AABM CHINOOK .....	43
6.1	OBJECTIVES AND OVERVIEW .....	43
6.2	RECREATIONAL .....	44
6.3	FIRST NATIONS .....	46
6.4	COMMERCIAL .....	46
7	SOUTHERN BC ISBM CHINOOK .....	48
7.1	OBJECTIVES AND OVERVIEW .....	48
7.2	RECREATIONAL .....	49
7.3	FIRST NATIONS FISHERIES .....	52
7.4	COMMERCIAL FISHERIES .....	52
7.5	STOCK STATUS .....	53
8	SOUTHERN BC COHO .....	57
8.1	OBJECTIVES AND OVERVIEW .....	57
8.2	RECREATIONAL .....	58
8.3	NON-TIDAL RECREATIONAL FISHERIES .....	60

8.4	FIRST NATIONS FISHERIES .....	61
8.5	COMMERCIAL FISHERIES.....	61
8.6	STOCK STATUS .....	62
9	JOHNSTONE STRAIT CHUM .....	64
9.1	OBJECTIVES AND OVERVIEW .....	64
9.2	FIRST NATIONS .....	65
9.3	MARINE RECREATIONAL .....	65
9.4	NON-TIDAL RECREATIONAL .....	66
9.5	COMMERCIAL .....	66
9.6	STOCK STATUS .....	67
10	FRASER RIVER CHUM .....	68
10.1	OBJECTIVES AND OVERVIEW .....	68
10.2	GENERAL OVERVIEW OF FISHERIES.....	68
10.3	FIRST NATIONS .....	69
10.4	RECREATIONAL .....	69
10.5	COMMERCIAL .....	69
10.6	STOCK STATUS .....	70
11	STRAIT OF GEORGIA CHUM .....	70
11.1	OBJECTIVES AND OVERVIEW .....	70
11.2	FIRST NATIONS .....	72
11.3	RECREATIONAL .....	72
11.4	COMMERCIAL .....	73
11.5	STOCK STATUS .....	74
12	WEST COAST VANCOUVER ISLAND CHUM.....	75
12.1	OBJECTIVES AND OVERVIEW .....	75

12.2	FIRST NATIONS .....	76
12.3	RECREATIONAL .....	76
12.4	COMMERCIAL .....	76
12.5	STOCK STATUS .....	77
13	APPENDICES .....	78
	Appendix 1: Catches in Canadian Treaty Limit Fisheries, 1995 to 2009 (Preliminary).....	79
	Appendix 2: Preliminary 2009 South Coast Sockeye Catch By Fishery and Area .....	80
	Appendix 3: Preliminary 2009 South Coast Pink Catch by Fishery and Area .....	81
	Appendix 4: Preliminary 2009 South Coast AABM Chinook Catch By Fishery and Area.....	82
	Appendix 5: Preliminary 2009 South Coast ISBM Chinook Catch By Fishery and Area .....	83
	Appendix 6: Preliminary 2009 South Coast Coho Catch By Fishery and Area.....	84
	Appendix 7: Preliminary 2009 South Coast Chum Catch By Fishery and Area.....	85
	Appendix 8: Preliminary 2009 Southern BC Commercial Catch Totals By Gear and Area.....	86
	Appendix 9: 2009 Southern BC Recreational Catch Totals By Area.....	87
	Appendix 10: 2009 Southern BC First Nations Catch Estimates By Area .....	88
	Appendix 11: 2009 South Coast Test-Fishery Catches.....	89

## **1 INTRODUCTION**

Fisheries in 2009 were conducted according to Annex IV of the Pacific Salmon Treaty. The arrangements contained in Annex IV include those initially agreed to between Canada and the United States in June, 1999 as well as additional agreements reached by the Commission and/or Panels since that time (e.g. Transboundary, chinook, coho and chum arrangements). The conservation-based approach commits the two Parties to abundance-based management for all stocks covered by the Treaty.

Catches reported below provide the best information available to date, and may change once all catch information for 2009 has been reviewed. The catches are based on in-season estimates (hailed statistics), on-grounds counts by Fisheries and Oceans Canada management staff and independent observers, logbooks, dockside tallies, landing slips (First Nation fisheries), fish slip data (commercial troll and net), and creel surveys, logbooks and observers (sport and commercial).

Annex fisheries are reported in the order of the Chapters of Annex IV. Comments begin with expectations and management objectives, followed by catch results by species, and where available and appropriate, escapements. The expectations, management objectives, catches and escapements are only for those stocks and fisheries covered by the Pacific Salmon Treaty (PST); domestic catch allocations have been excluded. Appendix 1 summarizes 1995-2008 catches in Canadian fisheries that have at some time been under limits imposed by the Pacific Salmon Treaty.

## **2 TRANSBOUNDARY RIVERS**

### **2.1 STIKINE RIVER**

Canada developed a fishing plan for Stikine River salmon fisheries based on the catch sharing and management arrangements outlined in Annex IV, Chapter 1, Paragraph 3 of the Pacific Salmon Treaty (PST), including the new arrangements agreed to on 17 January, 2008 for the 2009 to 2018 period. Accordingly, the 2009 management plan was designed to meet agreed escapement targets and the following harvest objectives: to harvest 50% of the total allowable catch (TAC) of Stikine River sockeye salmon in existing fisheries; to allow additional harvesting opportunities in terminal areas for enhanced sockeye that were surplus to spawning requirements; to harvest up to 5,000 coho salmon in a directed coho fishery; and, to harvest approximately 5,800 to 7,500 large chinook salmon in a targeted fishery, based on the pre-season forecast, recognising this number could change once in-season run projections became available. The Canadian percentage of the chinook Allowable Catch (AC) fluctuates based on the terminal run size providing higher catch shares when abundance is low and lower catch shares in years of higher abundance.

The 2009 season opened on May 3<sup>rd</sup>, statistical week 19 (SW19), and ended September 10<sup>th</sup> (SW37). Commercial gear consisted of up to two, 135 metre (443 ft) gillnets per fisher. The maximum mesh size allowed was 204 mm (8") through June 20<sup>th</sup> after which time the maximum mesh size was restricted to 150 mm (6"). Only one of the two nets was permitted to be deployed as a drift net.

The lower Stikine commercial fishing grounds covered the area from the international border upstream to near the confluence of the Porcupine and Stikine rivers and also included the lower 10 km (6 mi.) of the Iskut River. The fishing area was extended upstream approximately 19 km (12 mi.) to the mouth of the Flood River during SW 29&30 in an attempt to increase the exploitation of sockeye salmon bound for Tahltan Lake and the Tuya River. The weak chinook return did not warrant a fishing ground extension in 2009. (Fishing ground extensions result in a slightly higher exploitation rate.)

In the upper Stikine commercial fishery, which is located upstream from the Chutine River, fishing periods generally mirrored those in the lower Stikine commercial fishery lagged by one week. Fishers were permitted two nets. Effort was low throughout the season, but slightly higher than the 2008 effort. Again in 2009, 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 test fishing opportunity on Tuya River bound sockeye, specifically at sites located upstream of the Tahltan River. The Tuya run, which consists entirely of sockeye produced from the Canada-US Stikine enhancement program, has no spawning escapement requirement since these fish cannot return to Tuya Lake due to several velocity barriers located in the lower reaches of the Tuya River. Tuya sockeye are released into Tuya Lake as young of the year juveniles.

The First Nation fishery located near the community of Telegraph Creek, B.C. was active from late May to mid August. There were no time or gear restrictions imposed on this fishery.

Most of the chinook sport fishing activity in the Stikine River watershed occurs in the lower reaches and at the mouth of the Tahltan River. Additional activity occurs less intensively in the Iskut River and other areas within the Stikine River drainage. Sport fishing activity commenced in late June and peaked in mid July. Fishing effort and catch was relatively low.

### **Chinook Salmon**

The pre-season forecast of Stikine chinook salmon, as provided by the Canada/U.S. Technical Committee for the Transboundary Rivers (TCTR), was for a below average terminal run size of 32,000 large chinook salmon, i.e. fish with a mid-eye to fork length >659mm (~26") or a fork length of >734mm (~29"). For comparison, the previous 7-year (2002-2008) average terminal run size was approximately 57,300

large chinook salmon.

The total combined gillnet catch of chinook salmon in the First Nation and commercial fisheries included 2,281 large chinook and 714 jacks compared to 1999-2008 averages of 6,788 large chinook and 1,233 jacks. The 2009 sport fishery yielded a total catch of 20 large chinook. For the first time in the history of the directed Stikine chinook fishery, fishers were requested to release live chinook caught after SW26 during the directed sockeye fishery. Totals of 339 large chinook and 154 jacks were voluntarily released. To account for mortality associated with the release of these fish, a mortality rate of 50% (based on post-release mortality studies in the Skeena River with steelhead) was used to provide preliminary estimates; the resulting estimated catch and release mortalities of 170 large, and 77 jack chinook are included in the total catch records.

In-season management was influenced significantly by run size projections derived from the Stikine Chinook Management Model (SCMM), a joint Canada-U.S. mark-recapture program, and other stock assessment tools such as the relationship between the commercial fishery CPUE and run size from 2005-2008. Harvest rate assessments by week were also used concurrently with the above-mentioned in-season run size estimation techniques. In-season estimates based on the average of the mark-capture and model estimates were calculated post SW22. Post SW24, the linear regression between commercial CPUE and run size and harvest rate estimates were incorporated with the SCMM and mark-recapture estimates. In-season terminal run size projections ranged from 25,500 fish in SW23 to 19,900 fish in SW28, the final in-season estimate. According to the in-season projections, the TAC for Canada ranged from approximately 5,500 to 2,300 (base level catch only) large chinook salmon. Unfortunately, in retrospect, the in-season projections over-estimated the run size according to the preliminary post-season estimate of run size as described below.

To honour Annex IV, Chapter 1, Paragraph 3(a)(3)(vii) which identifies the will of both Parties to spread the chinook harvest over the season, the duration of weekly fishery openings was based on weekly guideline harvests developed from the current in-season run size projection (or from the pre-season forecast before in-season projections were available) apportioned by historical run timing data. Overall, catches were below the weekly guideline harvest for the first four weeks of the fishery when the run size estimates were based on the preseason forecast. When the in-season run size projections started to decrease post SW22, the fifth week of the fishery, the weekly catches were close to, or exceeded, the guideline harvests. Fishing time was drastically reduced in reaction to the decreasing estimates of abundance in order to deliver fish to the spawning grounds. For example, the fishing time in SW24 was for a 12 hour period; no fishing was permitted the following week, when on average, the run strength is usually peaking. The first week of the targeted sockeye fishery, which commenced in SW26, was held at two days and a maximum mesh size restriction of 150 mm (~6") was imposed; these actions were aimed at protecting what had become a weak run of large chinook salmon. In addition, the normal Sunday noon start day

was delayed to Tuesday noon in SW27 with the objective of providing additional time for the latter part of the chinook return to clear the commercial fishing grounds.

The preliminary post-season estimate of the terminal run is 15,000 large chinook salmon, including an in river run size based on mark-recapture data of 13,419 large chinook and a total U.S. catch estimate of 1,581 large chinook. Accounting for the total Canadian catch of 2,333 large chinook salmon (includes commercial, First Nation, sport and test catches and an estimate of release mortality), the total system-wide spawning escapement is estimated to be approximately 11,086 large chinook salmon. This escapement estimate is 69% below the recent 10 year average of 34,800 large chinook and well below both the target  $S_{MSY}$  escapement goal of 17,400 large chinook salmon and the escapement goal range of 14,000 to 28,000 large chinook salmon. A run size of 15,000 large chinook translates into an Allowable Harvest of zero(0) fish and insufficient numbers of chinook to have any base level harvest in either Canada or the U.S.

The 2009 chinook salmon escapement enumerated at the Little Tahltan weir included 2,245 large fish and 99 jack chinook salmon. The escapement of large chinook salmon in the Little Tahltan River was 66% below the recent 10 year average of 6,578 fish and 32% below the point ( $S_{MSY}$ ) estimate of 3,300 spawners; it was also below the escapement goal range of 2,700-5,300 large chinook. The Little Tahltan River escapement of large chinook represented approximately 20% of the estimated total Stikine River escapement compared to an average contribution of approximately 18% (1999-2008).

Escapement counts in Verrett Creek (a tributary to the Iskut River) were also weak, but better than the 2008 return, as reported by the carcass pitch crew stationed at the creek from 05-09 August. A weak chinook salmon return to Shakes Creek (near Telegraph Creek) was reported by residents living at the creek mouth.

At this time, Stikine River chinook run timing to the lower Stikine commercial fishing cannot be reasonably assessed due to the paucity of fishing effort. However, timing at the Little Tahltan River weir was approximately 7-10 days late.

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

### **Sockeye Salmon**

The pre-season forecast for Stikine sockeye salmon, as provided by the TCTR, was for a terminal run size<sup>1</sup> of 274,400 fish including: 143,700 Tahltan Lake origin sockeye

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

salmon (118,300 wild and 25,400 planted); 72,600 planted Tuya Lake sockeye; and 58,100 non-Tahltan wild sockeye salmon. This outlook constituted an above average run; for comparison, the previous 10-year average (1999-2008) terminal run size was approximately 179,600 fish.

Preliminary combined catches from the Canadian commercial and First Nation (food, social, ceremonial (FSC)) gillnet fisheries in the Stikine River totaled 45,904 sockeye in 2009, which was below the 1999-2008 average of 53,400 fish. The lower Stikine commercial fishery harvested 39,405 sockeye, while the upper Stikine commercial and First Nation fisheries harvested a total of 1,351 and 5,148 sockeye, respectively. The preliminary estimate of the total contribution of sockeye salmon from the Canada/U.S. Stikine sockeye enhancement (i.e. the fry-planting program) to the combined Canadian First Nation and commercial catches was 19,157 fish, or 42% of the catch.

In addition to these catches, 1,342 sockeye salmon were taken in the traditional stock assessment test fishery located near the international border. For the second year, a test fishery designed to target Tuya-bound sockeye operated in the mainstem Stikine River upstream of the mouth of the Tahltan River and succeeded in harvesting 2,145 sockeye salmon. An additional 214 sockeye was harvested and sampled in the Tuya River.

A total of 30,673 sockeye salmon was counted through the Tahltan Lake weir in 2009, 15% above the 1999-2008 average of 26,700 fish. The 2009 count was slightly above the escapement goal range of 18,000 to 30,000 fish and well above the point target of 24,000 sockeye salmon. An estimated 4,300 fish (14%) originated from the fry-planting program, which was below the 19% contribution observed in smolts leaving the lake in 2006, the principal smolt year contributing to the 2009 return. A total of 350 sockeye salmon was sacrificed at the weir for stock composition analysis. In addition, 3,011 sockeye salmon were collected for broodstock, resulting in a spawning escapement of 27,312 sockeye salmon in Tahltan Lake.

The bulk of Tahltan Lake sockeye entered the lake approximately 7-10 days earlier than normal; the earliest run timing since 1977. Early run timing of this stock was also apparent in the approach waters of the Stikine River and in the lower river; for example, run timing in the US District 106 fishery was at least one week earlier than normal. The near record low Stikine River flows registered during the sockeye migration period likely contributed to an accelerated in-river migration rate resulting in these fish transiting the in-river commercial fishing grounds earlier and faster than normal. This contributed to a lower than normal exploitation rate on Tahltan Lake sockeye salmon in 2009. In addition, some fishing opportunities on Tahltan Lake and Tuya River bound sockeye were missed due to early summer fishery closures designed to protect Stikine River chinook salmon. In an attempt to increase exploitation of the Tahltan and Tuya sockeye during the latter part of their in-river migration, the commercial fishery was extended upstream to the confluence of the Flood and Stikine rivers during SW29-30. The total estimated run size of 88,900 Tahltan Lake sockeye was approximately 38% below preseason expectation of 143,700 fish.

The spawning escapements for the non-Tahltan and the Tuya stock groups are calculated using stock ID, test fishery and in-river commercial catch and effort data. The test fishery, however, did not cover the full duration of the sockeye run. Therefore, the commercial fishery catch-per-unit of effort (CPUE), which operated over the full duration of the run, was used as the principal tool in assessing the spawning ground escapements of non-Tahltan Lake and the Tuya sockeye stock groupings. The test fishery data were used to complement and/or compare run size and escapement estimates generated from the commercial data. The test fishery data set, however, did require the calculation of proxy estimates of CPUE for weeks when the test fishery did not operate. These estimates were based on the historical linear relationship between commercial and test fishery CPUE from 1986-2004. All of the weekly data sets were significantly correlated. Calculated weekly test fishery CPUE values were generated for SW26&27 and SW35 in 2009. Based on the run reconstructions generated from the commercial fishery CPUE, the preliminary escapement estimates for 2009 are 23,300 non-Tahltan and 11,500 Tuya sockeye salmon. The non-Tahltan spawning escapement estimate was within the escapement goal range of 20,000 to 40,000 fish but was 13% below the recent 10 year average of 26,800 fish and below the point target of 30,000 fish. However, surveys of the spawning grounds suggested the non-Tahltan sockeye escapement was much worse than this. Aerial surveys of six index sites resulted in a total of only 113 fish being counted, 87% below average. The estimated escapement of 11,400 Tuya Lake sockeye was approximately 58% above the recent 10 year average of 7,200 fish. These fish do not contribute significantly to the natural production of Stikine River sockeye salmon due to migration barriers that obstruct entry to their nursery lake and potential spawning gravels.

Based on the in-river run reconstruction of the Tahltan Lake run expanded by run timing and stock ID data in the lower river and estimated harvests of Stikine sockeye in U.S. terminal gillnet fisheries, the preliminary post-season estimate of the terminal sockeye run size is approximately 179,100 fish. This estimate includes 88,900 Tahltan Lake sockeye, 42,100 Tuya Lake sockeye, and 48,100 sockeye of the non-Tahltan stock aggregate. A Stikine run size of this magnitude is close to the 1999-2008 average terminal run size of 179,600 sockeye salmon and is approximately 35% below the preseason forecast of 274,400 fish.

Similar to 2008, Canada relied more heavily on other in-season abundance estimates than those derived from the Stikine sockeye management model (SMM), which was updated and refined by the TCTR prior to the season. The SMM was used exclusively in SW27 by Canada and was used in concert with other in-river assessment estimates from SW28 through SW33. It was felt that the model was over-estimating the run size, particularly the Tahltan Lake component. As a result, most of the in-season run projections used in management of the Canadian fisheries were based on the average of the SMM and run reconstruction analyses or the average of the SMM model and an in-river regression model as the season progressed. The run size projections ranged from 235,500 fish in SW27 to 133,400 fish in SW31. The final in-season run size estimate was 160,500 fish, based on the run reconstruction approach, while the final

estimate based solely on the SMM was 181,800 fish. The preliminary post-season estimate was 179,100 with a Canadian allowable harvest of 56,200 fish. The actual catch was 48,000 fish or 15% below the allowable harvest.

### **Coho Salmon**

For the second consecutive year, several boats remained in the fishery to harvest coho salmon resulting in a total catch of 5,959 coho salmon. A total catch of 5,061 coho salmon was taken during the targeted coho fishery from SW35-39, well above the recent 10 year average catch of 405 fish.

The cumulative weekly CPUE index of 5.1 observed in the coho test fishery was 6% below the recent 10 year average cumulative CPUE of 5.4. Aerial surveys of four index spawning sites did not follow suit with a combined count of 2,700 fish, approximately 31% below the recent 10 year average of 3,900 fish.

### **Joint Sockeye Enhancement**

Joint Canada/U.S. enhancement activities continued with approximately 4.5 million sockeye eggs collected at Tahltan Lake in the fall of 2009; this was below the target of 6.0 million. The failure to reach the egg take goal was due to the behaviour and distribution of the sockeye in the lake that resulted in fewer fish utilizing the principal spawning and brood collection sites. Another constraining factor was the egg-take protocol developed by the Enhancement Sub-committee of the TCTR which has been in place for a few years. The protocol requires the brood stock collection activities to occur by 25 September in order to provide for a natural spawning period which is free from the disruption caused by the egg take. Brood stock is typically collected every other day by seining mature adults from the main spawning ground in Tahltan Lake. The final egg take occurred on September 24<sup>th</sup> with these eggs being flown to the Snettisham hatchery on September 25<sup>th</sup>. In an attempt to increase the egg take numbers in 2009, the crew net-penned green, i.e. immature, fish which were caught simultaneously with the ripe fish. These fish were held until mature and the egg yield from the penned fish accounted for approximately 25% of the total egg take in 2009.

Approximately 1.4 million fry were out-planted into Tahltan Lake in late May and early June of 2009. The fry originated from the 2008 egg-take and were mass-marked in the hatchery with thermally induced otolith marks. The balance of 0.830 million fry originating from the 2008 Tahltan Lake egg take was released into Tuya Lake in mid June, 2009. This group also had a unique, thermally induced otolith mark. Green egg-to-released fry survival was 84.2% for the eggs designated for Tuya Lake and 58.2% for those designated for Tahltan Lake. A total of 548,000 fry destined for Tahltan Lake held at the Snettisham hatchery was destroyed due to an outbreak of IHNV.

Approximately 0.746 million sockeye salmon smolts were estimated to have emigrated from Tahltan Lake in 2009, well below the 1999-2008 average of approximately 1.44 million smolts and roughly 50% of the expected number for the 2009 season. The contribution of hatchery origin fish was approximately 0.287 million smolts

representing approximately 38% of the emigration. Both wild and enhanced sockeye smolt survivals were well below average.

Although the Stikine enhancement program has been successful in producing significant numbers of sockeye salmon, the inability to harvest these fish in terminal areas continues to be a challenge. Returning adults from the Tuya Lake out-plants unsuccessfully attempt to ascend the impassable barriers in the lower reaches of the Tuya River until they either perish or back out of the system. Some of these drop outs end up in nets fished in the Telegraph Creek area raising concerns over poor quality, injured and battered up fish. Others stray<sup>2</sup> into Stikine River tributaries raising concerns over potential impacts on wild salmon stocks.

Various attempts have been made to date to address these concerns many of which were made possible by support from the Northern Fund. Fishing with gillnets and dip nets has occurred at various sites in the Tuya River with mixed results. To improve fish capture in the lower Tuya River, a fishway/trapping apparatus was designed and constructed in Vancouver during the spring of 2006 and transported to Whitehorse. However, full operation of the apparatus was cancelled because of a major rock slide at the Tuya River fishing site that occurred sometime in June 2006. The rockslide rendered the fishing site, which the fish trap was designed for, unusable due to changes in river hydrology and unsafe working conditions. In 2007, additional rock slide activity occurred in the lower reaches of the Tuya River. A steering committee, consisting of Canadian and U.S. engineers and other technical advisors, visited the site in August 2007 to re-assess the conditions and to consider other options. The committee decided to proceed the following year with plans to strategically blast the rock obstruction at the location of the 2006 rock slide to provide fish passage to a potentially favourable harvest site located approximately 800 metres (1/2 mi.) further upstream. In the late fall of 2008, a blasting crew succeeded in removing approximately 100 m<sup>3</sup> (~130 cubic yards) of rock from the blockage. A visual and test fish assessment conducted in late July 2009 at locations below and above the blast site indicated that the majority of the fish, including chinook salmon, succeeded in ascending the river to points above the rock slide site. The committee plans to contract an engineering firm to design a fish harvest structure for the new site. The firm will provide both design detail and cost estimates for the structure as well as the routing and costs of an access trail to the site. The initial road survey was conducted in May 2009, but a detailed onsite survey is still required to better assess road grade and ground type.

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<sup>2</sup> Straying of Tuya sockeye has been confirmed using radio telemetry and sampling for thermal marks. In a report completed in February 2006, funded by the Northern Fund, which investigated potential impacts and risks of the straying of enhanced Tuya sockeye salmon, the authors concluded that ...*“given the results of the literature review and the data collected to date in the Stikine River, the probability of genetic risk of Tuya River blocked fish appears to be extremely low. However, it is prudent to suppose, that given a long enough period of time and a large enough number of fish, that some successful straying and interaction of Tuya River fall back fish could take place”*.

For the second consecutive year, an experimental test fishery designed to target Tuya River sockeye at fishing sites located in the lower Grand Canyon of the Stikine River upstream from the mouth of the Tahltan River was conducted. The project design changed from its initial 2008 design in that the majority of nets were fished further upstream in the Stikine River and closer to the mouth of the Tuya River than what occurred in 2008. This change was prompted by the stock identification results from 2008 which indicated that less than 50% of the catch was Tuya River origin sockeye in 2008. *(note: the 2008 stock identification results will be re-analyzed to ascertain the validity of a specific otolith thermal mark from brood year 2004.)* The 2009 Tuya test fishery yielded a total catch of 2,145 sockeye and 37 chinook salmon over a nine day period from 22 to 30 July. The sockeye catch consisted of Tuya (71%), Tahltan (22%), and mainstem (7%) stocks/stock aggregates. The estimated catch of 1,520 Tuya sockeye translates into an estimated exploitation rate of approximately 12% on this stock. Most of the catch was distributed to elders of the Tahltan/Iskut First Nations, most of whom were residents of communities located within the Stikine River drainage.

## 2.2 TAKU RIVER

As with the Stikine River, the fishing plan developed by Canada for the Taku River was based on the new arrangements in Annex IV, Chapter 1, Paragraph 3 of the PST in effect for 2009 through 2018. Accordingly, the plan addressed conservation requirements and contained the following harvest objectives: to harvest approximately 8,500 large chinook salmon in a directed chinook salmon fishery, adjusted as necessary according to in-season run projections; to harvest 20% 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 escapement in excess of 1.6 times the spawning escapement goal; to harvest enhanced Taku River sockeye incidentally to wild sockeye salmon; and, to harvest 3,000 to 10,000 coho salmon in a directed coho fishery, depending on in-river run size projections, plus projected escapement in excess of the spawning escapement goal.

The 2009 commercial fishing season on the Taku River opened on Wednesday, April 29 (SW18) and ended on Friday, October 9 (SW41). However, little fishing activity occurred after Saturday, September 12 (SW37) due to market and transport conditions. Fishing area and gear restrictions were as per recent years with the exception of the allowable length of set gill nets which was liberalised from 30.5 metres (100 feet) to 36.6 metres (120 feet) to match the increase permitted for drift gill nets in 2008 in order to increase efficiency.

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

The First Nation fishery is primarily located in the lower Taku River in the same area as the commercial fishery as described above. However, small numbers of fish are also harvested on the lower Nakina River and at the outlet of Kuthai Lake. There were no time or gear restrictions imposed on this fishery in 2009.

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

### **Chinook Salmon**

The bilateral pre-season forecast was for a terminal run of 50,164 large chinook, approximately 7% above the previous 10-year average of 46,700 fish. At a run size of this magnitude and factoring in the new interim  $S_{MSY}$  escapement point goal of 25,500 large fish, the allowable catch (AC) was 18,264 large chinook, with 8,537 fish (47% of total) allocated to Canada and 9,727 fish (53% of total) allocated to the US. Adding the base level catches (BLC's) of 1,500 fish for Canada and 3,500 fish for the US meant that that total allowable catch (TAC) was 23,264 fish.

In-season projections of the terminal run size of large chinook salmon, allowable catch (AC), and escapement were made starting in SW21 (May 17-23). The estimates were based on the bilateral mark-recapture program, the estimated catch of Taku River chinook in U.S. fisheries, the catch in the Canadian in-river fishery, and historical run timing information. Run size projections ranged from 47,500 fish in SW21 to 36,000 fish in SW26 (June 21-27). The last projection made during the directed fishery indicated a terminal run size of approximately 37,400 large chinook, well below the pre-season forecast. According to these estimates, the AC for Canada dropped from 8,357 fish at the start of the directed fishery to 5,123 fish just prior to its close. In order to honour Annex IV, Chapter 1, Paragraph 3(b)(3)(v) which identifies the need for both Parties to spread the chinook harvest over the season, the duration of weekly fishery openings were based on weekly guideline harvests developed initially from the pre-season forecast and then from in-season run projections apportioned by historical run timing data. Catches were below weekly guidelines in six of the seven openings during the season. High water levels affected the ability to meet weekly targets in some weeks. As with the Stikine, in-season chinook run size projections over-estimated the run size according to the preliminary post-season estimate.

The total directed chinook fishery catch was 5,961 fish, 838 fish above the final in-season projection of the AC as noted above. Management emphasis switched to sockeye salmon in SW26 (June 21-27); at this point, the maximum permissible mesh size was reduced from 204 mm (8.0") to 140 mm (5.5") in order to conserve chinook salmon. Additional catches occurred in what constitutes the Canadian chinook base level fisheries: 798 large chinook were taken incidentally during the directed

commercial sockeye gillnet fishery; 172 large chinook were harvested in the First Nation fishery; and an estimated 100 large chinook were taken in the recreational fishery. The total harvest in the base level fisheries amounted to 1,070 fish, which was 430 fish less than the base level allowance of 1,500 fish.

The preliminary post-season estimate of terminal run size is 33,915 large chinook, 32% below the pre-season forecast and also below in-season projections. A terminal run size of this magnitude is associated with an AC of 2,015 fish (allocated to Canada) plus base level catches (BLC) of 5,000 fish (1,500 Canada; 3,500 U.S.). This equates to TACs of 3,515 fish for Canada and 3,500 fish for the U.S.; actual catches were 7,031 and 6,122 fish, respectively.

The total Canadian catch of 7,031 large chinook (including 6,759 commercial, 172 First Nation and 100 recreational) was 2.6 times the 1999-2008 average of 2,694 fish, (i.e. excluding test fisheries); however, it should be noted that only two other targeted chinook fisheries occurred during this period, in 2005 and 2006 with catches of 7,399 and 7,377 large chinook, respectively. The 2009 total harvest of small chinook was 1,183 fish (including 1,153 commercial and 30 First Nation), 3.3 times the 1999-2008 average of 347 fish.

The preliminary estimate of the spawning escapement of large chinook is approximately 20,800 fish. This is below the new interim point target of 25,500 large chinook but within the overall escapement range of 19,000 to 36,000 fish. The 2009 estimate is 45% below the 1999-2008 average spawning escapement of 37,586 large chinook (which is associated with a higher target). During aerial surveys of six index areas, a total of 4,189 large chinook was observed; this was 28% below the 1999-2008 average. Survey conditions were rated as normal.

Tissue samples were collected on a weekly basis from chinook salmon caught in the Canadian commercial fishery as part of the development of the genetic stock ID program identified in Annex IV, Chapter 1, Paragraph 3(b)(3)(vi); funding has not yet been secured to process these samples.

### **Sockeye Salmon**

The Canadian pre-season run outlook for wild sockeye was 213,028 fish, approximately 9% below the previous 10-year average total run size of 233,500 fish. In addition, approximately 3,800 adult sockeye were expected to return from Tatsamenie Lake fry outplants associated with the Canada/U.S. joint Taku sockeye enhancement program; this was 30% below the average enhanced run size of 5,400 fish.

The Canadian sockeye catch was 11,057 fish, of which 10,951 were taken in the commercial fishery and 106 in the First Nation fishery. An additional 174 sockeye was taken in the coho test fishery. The commercial catch was 58% below the 1999-2008 average of 25,900 fish, and the lowest catch since 1982. The contribution of

sockeye salmon from the bilateral enhancement program is estimated at 81 fish, (plus 6 in the test fishery) comprising less than 1% of the total Canadian catch.

Projections of the total wild sockeye run size, TAC, and total escapement were made frequently throughout the fishing season. The estimates were based on the bilateral mark-recapture program, the estimated catch of Taku River sockeye in U.S. fisheries, the catch in the Canadian in-river fishery, and historical run timing information. These estimates ranged from 174,800 in SW29 (July 12-18) to 125,900 in SW34 (August 16-22). The preliminary post-season estimate of run size is approximately 124,255 fish comprising 123,479 wild sockeye and 777 enhanced sockeye. The wild and enhanced run sizes were 42% and 80% below the preseason forecasts, respectively. Subtracting the escapement target of 75,000 from the wild run of 123,479 leaves a TAC of 48,479 wild fish. The Canadian allowable catch, based on a 20% harvest share (associated with an enhanced return of 1-5,000 fish), was 9,696 wild fish; the actual catch was 10,976 wild fish representing 22.6% of the TAC. Likewise, the U.S. allowable catch of wild fish, based on an 80% harvest share, was 38,783 fish; the actual catch was 40,924 wild fish representing 84.4% of the TAC.

The estimated spawning escapement of sockeye salmon in the Canadian section of the Taku River, was 71,840 fish which was below the point target of 75,000 but within the target range of 71,000 to 80,000 fish. The 2009 escapement is approximately 35% below the 1999-2008 average of 111,000 fish. Based on weir counts, escapements to the Kuthai, Little Trapper, and Tatsamenie lakes were 1,442, 5,552, 2,032 sockeye, respectively. The Kuthai Lake escapement was 9% below the primary brood year escapement and 65% below the 1999-2008 average; it was the third lowest count in the data time series which begins in 1992. The Little Trapper weir count, the third lowest since 1983 when the program started, was 58% below the primary brood year escapement and 56% below average. The Tatsamenie count was close to the primary brood year escapement, but was 77% below average and was the second lowest in data records dating back to 1985. The escapement target of 6,600 Tatsamenie sockeye salmon in 2009, established in order to achieve the egg-take goal of 4.0 million eggs, was not achieved. Although an exact count is not available, the escapement to King Salmon Lake was also believed to have been below average.

### **Coho Salmon**

The total commercial catch of 5,649 coho salmon was 14% above the 1999-2008 average of 4,610 fish; the First Nation catch of 154 coho salmon was 57% below the average of 355 fish. The catch during the directed coho salmon fishery, i.e. after SW33, was 3,423 fish; this excludes the catch from the test fishery which took place from SW35-41 (August 23 – October 8) and landed 3,963 fish. Based on bilateral mark-recapture data, the preliminary estimate of the run into the Canadian section of the drainage is 113,716 fish, 8% above the preseason forecast of 104,900 fish which was predicated upon average exploitation rates in U.S. fisheries. According to the PST harvest arrangements for Taku coho salmon, at a run size of this magnitude, Canadian fishers were entitled to harvest up to 10,000 coho salmon in a directed fishery starting in SW34, plus projected surplus escapement. The preliminary post-

season spawning escapement estimate is 103,950 fish; this is 68,950 above the top end of the interim escapement goal range of 27,500 to 35,000 fish. Compared to the previous 10-year average spawning escapement of 109,568 coho salmon, the 2009 escapement was 5% below average.

### **Joint Sockeye Enhancement**

Joint Canada/US enhancement activities continued in 2009. Approximately 79% of the eggs collected in 2008 from Tatsamenie Lake survived to the fry stage at the Snettisham Hatchery in Alaska; one incubator containing approximately 260,000 fry was lost to IHNV. In late May and early June 2009, approximately 3.8 million sockeye fry were outplanted into Tatsamenie Lake. In addition, as part of an onshore extended rearing trial, 116,000 fry which had been reared to 0.4 grams in the hatchery were released into two onshore rearing tanks located near the north end of the lake. These fish were released in July, ahead of schedule due to concerns regarding IHNV. They were approximately 2.5 grams in weight at release, and appeared to out-migrate almost immediately, rather than remaining in the lake to rear.

It is estimated that, in addition to the extended-rearing pre-smolts, approximately 418,000 sockeye smolts out-migrated from Tatsamenie Lake in the spring and summer of 2009; this was about 18% above average; however smolt size was slightly below average. The contribution of enhanced smolt to this out-migration was estimated to be 24% based on preliminary thermal mark analysis.

As part of the feasibility study associated with removal of a migration barrier near the outlet of Trapper Lake, eggs were again collected in 2009, from sockeye spawning a short distance downstream. It had been proposed that a total of 1.0 million eggs be taken, with 0.8 million of these to be incubated at Snettisham Hatchery and the remainder placed in Tunjony Creek, a tributary to Trapper Lake. However due the low adult sockeye return to Little Trapper Lake in 2009, only 140,000 eggs were collected, all of which were planted into Tunjony Creek.

In September and October 2009, an estimated 1.2 million viable eggs were delivered from Tatsamenie Lake to the Snettisham Hatchery for incubation and thermal marking. This was below the target of 4.0 million due to the low adult return and a protocol which limits broodstock removals to  $\leq 30\%$  of the escapement.

Additional enhancement-related activities undertaken in 2009 included evaluation of Trapper Lake outplants, as well as disease screening of King Salmon fish populations for evaluation of sockeye enhancement potential.

## **2.3 ALSEK RIVER**

Although catch sharing of Alsek salmon stocks between Canada and the U.S. has not been specified, Annex IV of the PST does call for co-operative development of abundance-based management regimes for Alsek chinook, sockeye and coho stocks.

Instead of managing to system-wide goals, which for the most part have been as yet unverifiable, the TCTR has established index goals for the Klukshu River stocks. Historically, the principal escapement-monitoring tool for chinook, sockeye and coho salmon stocks in the Alsek drainage has been the Klukshu River weir, operated by Fisheries and Oceans Canada in co-operation with the Champagne-Aishihik First Nation. The Klukshu River is a tributary to the Tatshenshini River, which is the major salmon producing river system of the Alsek drainage.

Based on joint stock-recruitment analyses conducted on Klukshu chinook and sockeye salmon, Canadian and U.S. managers agreed to a minimum escapement goal of 1,100 Klukshu Chinook salmon and an escapement goal range of 7,500 to 15,000 for Klukshu sockeye salmon for the 2009 season. An escapement goal for Klukshu coho salmon has not yet been developed.

The 2009 season was marked by an average run of chinook salmon and a well below average sockeye salmon run; it was the third year in the last five in which the Klukshu escapement goal for sockeye has not been met. In 2009, the estimated catches in the First Nation fishery included 105 chinook, 715 sockeye, and 3 coho salmon compared to recent 10 year average recorded catches of 83 chinook, 1,271 sockeye, and 11 coho salmon. As a result of the poor returns of sockeye salmon, discussions with DFO and the Champagne and Aishihik First Nations (CAFN) resulted in a two week sockeye closure commencing September 24<sup>th</sup> in the Klukshu River.

Preliminary catch estimates for the Alsek/Tatshenshini River recreational fishery were well below average for chinook salmon, with an estimated 20 fish retained. Only two sockeye salmon were harvested and no catches were recorded for coho salmon. These represented 22% of average catch for chinook and 5% of the average sockeye catch. On September 23<sup>rd</sup>, the daily and possession limits for sockeye salmon were reduced to zero for the remainder of the year due to the run projection which fell below the lower end of the escapement goal.

The Klukshu weir count of 1,571 chinook salmon was 7% above the previous 10-year (1999-2008) average of 1,467 fish. The estimated spawning escapement of 1,518 chinook salmon was above the minimum escapement goal of 1,100 Klukshu chinook salmon. Aerial survey counts of chinook salmon, typically conducted by ADF&G for the Takhanne and Blanchard rivers and Goat Creek, were not conducted in 2009.

The weir count and spawning escapement of Klukshu River sockeye salmon were 5,712 and 5,509 fish, respectively. The early-run weir count of 1,247 sockeye was 52% of the previous 10-year average of 2,398 fish. The late-run count of 4,465 fish was 44% of the previous 10-year average of 10,119 sockeye salmon. The overall spawning escapement of 5,509 sockeye salmon in the Klukshu River was below the lower end of the escapement goal range (7,500 to 15,000 sockeye). The Klukshu weir was removed October 01, approximately 10 days earlier than previous years due to budget constraints. Historically, approximately 94% of the sockeye weir count occurs by October 01; the 2009 count includes 200 sockeye which were observed

downstream of the weir site on October 02. In the neighbouring tributary of Village Creek, malfunctions with the electronic counter prevented an accurate count on this system. An aerial survey of the headwater lake, Nesketaheen Lake, indicated that approximately 4,000 to 5,000 spawners had made it to the lake (above average).

The Klukshu weir count of 424 coho salmon was 15% of the previous 10-year average 2,815 fish. However, this should be considered to be only a partial count since the weir was removed just as the coho numbers were starting to increase; on average, less than 20-25% of the total weir count is accounted for by October 1.

As in recent years, the well below average return of sockeye salmon to the Klukshu River was unexpected. Based on the primary brood year escapement of 13,700 which fell in the upper end of the goal range, it was expected that the 2009 return would be above average; this was not the case. Near pristine habitat and minimal exploitation of the Klukshu stock would suggest that poor marine survivals may have played a role. However, the numbers of sockeye observed in aerial surveys of Nesketaheen Lake and some other Alsek tributaries appeared to be average to above average. It may be prudent to assume that the same marine conditions would have been faced by these other stocks, suggesting that poor marine survivals may not have been the only factor contributing to the poor run of Klukshu sockeye.

### **3 NORTHERN BRITISH COLUMBIA**

#### **3.1 PINK SALMON**

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

For the year 2009, Canada was to manage the 3-1 to 3-4 net fishery to achieve an annual catch share of 2.49 percent of the annual allowable harvest (AAH) of Alaskan Districts 101, 102 and 103 pink salmon. With a Total Return of approximately 39.05 million pinks, the Alaskan Districts 101, 102 and 103 AAH was 28.30 million pinks. The resulting Area 3-1 to 3-4 Canadian commercial net total allowable catch of this AAH was approximately 702,933 pinks of Alaskan Districts 101, 102 and 103 origin. In the Canadian northern boundary area, pink salmon returns were anticipated to be average to above average for both Area 3 and Area 4, based on brood year return strength. Returns to Area 3 streams were below expectations while as anticipated for Area 4 streams in 2009. The 2009 Canadian pink salmon catch in Sub-areas 3-1 to 3-4 was 404,460 and a preliminary estimate of the Alaska stock component of this catch is estimated to be 271,910, or 0.96 % of the AAH, well below the allotted 2.49 % of the AAH of 702,933 pieces.

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

For the year 2009, Canada was to manage the Area 1 troll fishery to achieve an annual catch share of 2.57 percent of the annual allowable harvest (AAH) of Alaskan Districts 101, 102 and 103 pink salmon. With a Total Return of approximately 39.05 million

pinks, the Alaskan Districts 101, 102 and 103 AAH was 28.30 million pinks. The resulting Area 1 Canadian commercial troll total allowable catch of this AAH was approximately 581,601 pinks of Alaskan Districts 101, 102 and 103 origin.

The Canadian commercial troll fishery in Area 1 was open in the northern portion of the Area from July 1 to September 30, with the directed pink fishery along the A-B line strip being open for that time period. Pink salmon directed effort was very minimal and the fishery harvested a total of 60,402 pink salmon, with an estimated 50,839, or 84.2 %, being of Alaskan origin. This equates to 0.18 % of the Alaskan District 101, 102 and 103 pink AAH, well below the annex agreement for 2.57 percent of the Alaskan Districts 101, 102 and 103 pink salmon AAH.

### **3.2 CHINOOK AABM FISHERIES**

The pre-season abundance index for North Coast B.C. troll and Q.C.I. Sport fisheries in 2009 was 1.10, which allowed a total catch of 143,000 chinook salmon in these fisheries. Preliminary estimates indicate a total catch of 109,470 chinook salmon; 75,470 caught in commercial troll fisheries and 34,000 caught in sport fisheries.

The North Coast B.C. troll fishery was opened for chinook fishing from June 15 to August 3 and from August 22 to September 30, 2009. The entire 2009 NBC Troll fishery was conducted under a system of individual transferable quotas. The size limit was 67 cm. Barbless hooks and revival boxes were mandatory in the troll fishery. No troll test fisheries were conducted in the North Coast of B.C. in 2009.

Sport fishing was open with a daily limit of 2 chinook and a possession limit of 4 chinook. An estimated 34,000 chinook were caught in the Queen Charlotte Islands sport fishery. A minimum size limit of 45 cm was in effect and barbless hooks were mandatory in the sport fishery.

### **3.3 CHINOOK ISBM FISHERIES**

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 Native fisheries in both marine and freshwater areas. Under the PST, obligations in these fisheries are for a general harvest rate reduction (estimated in aggregate across fisheries) for ocean mixed-stock fisheries and for stock-specific objectives (i.e., achieving the escapement goal) in terminal areas.

North Coast commercial gillnet catches totalled 4,628 chinook from Areas 3 to 6 (from fish slip catch data). Chinook catch in Areas 3 and 4 were 1,541 and 3,083 chinook respectively. Only 4 chinook were reported caught with gillnets from Area 6. No chinook were reported caught in Area 5. These preliminary estimates of gillnet catches exclude 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 gillnet catches. In addition, a total of 1,189 large chinook and 133 jacks were caught in the Tye Test fishery on the Skeena River.

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

Tidal sport catch from lodges operating in the Rivers Inlet, Hakai Pass and Bella Bella areas were estimated using log books. Approximately 3,239 chinook were retained at lodges in these areas in 2009. Detailed surveys of non-lodge (independent) anglers were not conducted in 2009 but catches by independent anglers are generally less than the lodge component. Creel surveys used to estimate catches of chinook in Rivers Inlet by independent anglers averaged 334 chinook between 2003 and 2005.

Tidal sport catches near the mainland coast of Northern BC were estimated at 9,177 by a creel survey conducted in Areas 3 and 4 in 2009. The 2009 catches in the mainland sport fishery in Areas 5 and 6 were unknown. No freshwater creel surveys were conducted in the North Coast in 2009. The sport catch from the Skeena River fishery (downstream of Terrace, B.C.) included 6280 chinook in 2003. Although catches were not measured in 2009, effort appears to be similar to 2003.

Catches by First Nations in the North Coast exceeded 13,083 chinook. Nisga'a and Gitanyow catches from the Nass River were 5,531 chinook. Haida catches on the Queen Charlotte Islands were estimated at 1,200 chinook. Only a portion of catches from Native fisheries in the Skeena have been reported but current estimates exceed 6,352 chinook. Chinook catch by First Nations on the Skeena appear to be slightly less than 2008 estimates.

Catches by First Nations in the tidal portion of the Central Coast were reported as 248 chinook while the non-tidal catch of terminal Atnarko River chinook was 3,763 chinook (jacks excluded).

### **3.4 OVERVIEW OF NORTHERN BC CHINOOK STOCK STATUS**

Since assessments of the ISBM fisheries are relative to the escapements achieved in the chinook indicator stocks, a brief overview of the 2009 returns is provided. Northern BC terminal runs were similar to 2007 and 2008. Preliminary estimates of Nass River escapements increased to 28,710. Skeena River chinook escapements increased slightly with recent estimates at approximately 38,014.

## **4 FRASER RIVER SOCKEYE**

### **4.1 OBJECTIVES AND OVERVIEW**

The 2009 sockeye run-size forecast at the 50% probability level of abundance was approximately 10.5 million. A majority of the total return (~82%) was expected to be Summer-run sockeye. Pre-season planning indicated harvest opportunities would be available for all fishery sectors if the pre-season run size forecasts materialized.

Pre-season planning incorporated provisions to meet escapement objectives and meet conservation objectives for stocks of concern while considering international and domestic objectives. Although there was significant effort put into developing a pre-season plan for anticipated fisheries there was no bilaterally agreed upon pre-season plan in 2009. Pre-season modelling indicated that achieving each county's share would be difficult considering pre-season model inputs (aggregate run sizes, timing overlaps and diversion rate) as well as escapement and conservation objectives. It was decided that more discussion was needed to occur bilaterally in order to agree on a final plan prior to the initiation of fisheries. Although there was no bilaterally agreed to plan, pre-season planning models included the following assumptions and guiding principles in no particular order:

- In March 1985, the United States and Canada agreed to co-operate in the management, research and enhancement of Pacific salmon stocks of mutual concern by ratifying the Pacific Salmon Treaty (PST). 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% as per the PST Annex IV Chapter IV agreement. There were no catch overages of Fraser River sockeye from previous years to address in 2009.
- For computing TAC by stock management groupings, the Aboriginal Fishery Exemption (AFE), shall be allocated to management groups as follows: The Early Stuart sockeye exemption shall be up to 20% of the Fraser River AFE, and the remaining balance of the latter exemption shall be based on the average proportional distribution for the most recent three cycles and modified annually as required to address concerns for Fraser River sockeye stocks and other species and as otherwise agreed by the Fraser River Panel.
- To the extent practicable, the Fraser River Panel (FRP) shall manage the United States fishery to spread the United States harvest proportionately to the TACs across all Fraser River sockeye stock management groupings (Early Stuart, Early Summer, Mid-Summer, and Late Run).
- For 2009 pre-season planning purposes, the FRP agreed to use the 75% probability level of abundance forecast for Early Stuart sockeye and the 50% probability level of abundance forecasts for the other run timings groups;
- That although the capability to assess in-season run size and migration timing would be good for Summer-run and Late-run sockeye, an in-season run size estimate for Cultus Lake sockeye would not be possible due to low abundance relative to co-migrating sockeye stocks. As a result the harvest impacts on

Cultus Lake sockeye would be assessed using other Late-run stocks (excluding Birkenhead and Harrison) as a proxy;

- Birkenhead sockeye do not endure the same migratory conditions as other Late-run sockeye and will therefore be managed to the same ER as the Summer-run with no MA;
- Canada's escapement plan implements escapement requirements that vary with run size for the Early Stuart, Early Summer, and Summer run aggregates, while a 20% minimum exploitation rate limit for Late-run and Cultus sockeye would be implemented; and
- Under 2009 harvest rules for Late-run sockeye, the Total Allowable Catch (TAC) would be incidentally accessed while harvesting other sockeye run timing groups that had surplus returns (e.g. Summer-run TAC).

In past years, Fraser River sockeye spawning targets were based upon a Rebuilding Strategy which was developed in 1987. Due to some shortcomings in this approach, in 2005 the Department adopted a new escapement strategy for Fraser River sockeye known as the Fraser River Sockeye Spawning Initiative (FRSSI). This annual escapement strategy seeks a balance between long-term objectives and short-term practical considerations, and combines technical analyses with qualitative judgment. The annual exploitation rate targets are adjusted based on expected run sizes and environmental conditions. This escapement strategy has been modified as a result of a series of yearly consultation workshops beginning in the spring of 2006 which continued through 2009. The Department is continuing to seek feedback on this approach and plans are in the works to review model changes and updates via the Pacific Advice Review Committee process (PSARC) as soon as May 2010.

Late-run sockeye have historically delayed in the Strait of Georgia for 4-8 weeks prior to entering the Fraser River. Beginning in 1996, this behaviour has changed to one where there has been a shorter delay and occasionally immediate river entry. Concerns for Late-run early entry and the associated elevated rates of en-route and pre-spawn mortality continue. Management objectives and actions implemented in 2009 placed priority on conserving Fraser River Late-run sockeye (which include Cultus Lake sockeye) by permitting a low exploitation rate (20%) on Late-run stocks while providing anticipated opportunities to harvest expected surplus Summer-run sockeye.

Conservation concerns for other sockeye stocks and species may impact sockeye fisheries in 2009. The following are a list of relevant conservation concerns where specific action may be taken in fisheries to meet conservation objectives: Early Stuart sockeye, Cultus Lake sockeye, Late-run sockeye, Nimpkish sockeye, Sakinaw Lake sockeye, Interior Fraser River coho and Interior Fraser River Steelhead.

## 4.2 PRE-SEASON ASSESSMENT

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

### Run Size Forecasts Used For Planning

Fraser sockeye forecasts are uncertain. Sockeye forecast tables express this uncertainty by providing probability distributions of the forecast ranging between the 10% probability level of abundance and the 90% probability level of abundance. Forecast uncertainty for sockeye has been compounded in recent years due to low and variable observations of marine survival (smolt-to-adult) relative to average. Chilko smolt-to-adult survival rates are used as a proxy for marine survival in Fraser sockeye. This measurement includes a freshwater downstream migration component encompassing the movement of smolts downstream from a counting fence at Chilko Lake to the mouth of the Fraser River. In the 2008 return (2004 brood year) marine survival was estimated to be ~1.8% which is the lowest observation since 1952. Trends in average marine survival are the following: 1948-2008 ~9%, 1990-2008 ~6%. The smolt-to-adult survival in which would be required to produce the 2009 pre-season forecast for Chilko was well below the historical average and below the recent average (~5%).

As outlined in the Pacific Salmon Treaty (PST), the mid-point of the forecast provided by Canada will be used for management purposes unless the Panel adopts a more precautionary or optimistic forecast until in-season updates of run size are available. In 2009, as recommended by the Department of Fisheries Oceans (DFO) science staff, the FRP elected to adopt the 75% probability level of abundance for the Early Stuart run timing group and the 50% probability level for the other aggregates and stocks for planning purposes. The 2009 75% probability forecast for Early Stuart and the 50% probability forecasts for the other three management aggregates including Birkenhead were as follows: Early Stuart 165,000; Early Summer 739,000; Summer-run 8,677,000; and Late-run 907,000, of which 334,000 were Birkenhead type, for a total of 10,488,000 Fraser sockeye. Comparing forecasted stocks with the historic cycle line run sizes averages (1980-2005), the Early Stuart forecast was 32% of average, Early Summers (excluding miscellaneous stocks) 140% of average, Summers 78% of average, Lates (excluding Birkenhead and miscellaneous stocks) 102% of average, and Birkenhead 65% of average. Overall, the 2009 forecasted stocks were 77% of the cycle line average (excluding miscellaneous stocks).

### Diversion Rate

The pre-season forecast of the proportion of Fraser sockeye diverting through Johnstone Strait was 32%. The estimate is based on the relationship between the average daily sea surface temperature measured at the Kains Island (Quatsino) lighthouse in May and June and the estimated post-season northern diversion for 1977-2008. The median water temperature at Kains Island for May & June 2009 was 11.0°C, which is very close to the time series median (11.3°C).

### Timing Forecasts

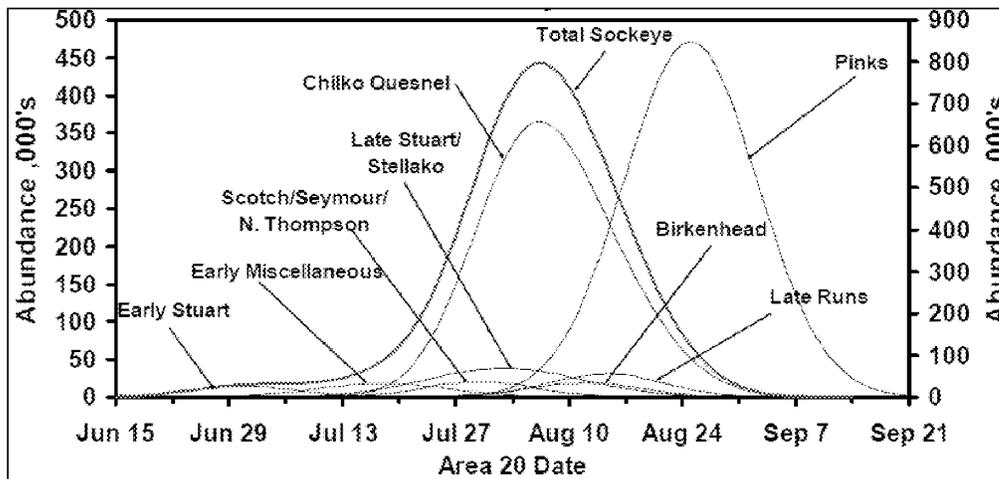
The forecast of the 50% date (peak timing) for Early Stuart and Chilko sockeye arriving to the Fraser River (A20) is July 2<sup>nd</sup> and August 3<sup>rd</sup> respectively. Forecasting methods use a linear multiple regression model with two predictor variables: 1) Gulf of Alaska eastward current speed (OSCURS) in May, and 2) Gulf of Alaska mean sea surface temperature (SST) in the previous November and December (2008). The primary predictor of timing is the May OSCURS sea current index. The following are the pre-season estimates of timing in Area 20.

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

	<b>2009 Area 20 Timing</b>
<b>Early Stuart</b>	July 2
<b>Early Summers</b>	July 26
<b>Summer-run</b>	August 5
<b>Birkenhead</b>	August 5
<b>True Lates</b>	August 11

The following figure graphically illustrates the relative run size forecasts and run timing overlaps expected in 2009.

**Figure 4-1: Relative Run Size Forecasts and Run Timing Overlaps Expected in 2009**



### Environmental Conditions and Management Adjustments

Management Adjustments (MAs) are the addition of fish above the spawning escapement targets for the purpose of increasing the likelihood of achieving the spawning escapement targets. The general concept is that extra fish are allowed to escape upriver of Mission to account for anticipated differences between in-season versus post-season estimates of catch plus spawning escapement which may be due to a number of factors, including (but not limited to): critically high temperatures and/or discharge in the Fraser River, bias in estimates at Mission hydroacoustics and/or spawning ground escapement estimates, unreported catch, escapes from fishing gear, natural mortality, and/or predation. While all of these factors are included in the difference between estimates, the inputs used to estimate MAs are temperature and discharge for Early Stuarts, Early Summer and Summer-run sockeye and the 50% migration timing at Mission for Late-run sockeye.

For the Early Stuart, Early Summer and Summer-runs, MA estimates can be updated in-season as river conditions become known for management purposes. The pre-season MA expressed as a percentage of the spawning escapement goal and the number of sockeye this represents for 2009 pre-season run sizes are outlined below.

**Table 4-2: MA Estimates used for Pre-Season Planning in 2009**

	<b>Pre-season Run Size</b>	<b>MA (%)</b>	<b>MA</b>
<b>Early Stuarts</b>	165,000	59%	92,000
<b>Early Summers</b>	739,000	42%	123,000
<b>Summers</b>	8,677,000	7%	243,000

<b>Birkenhead Type</b>	334,000	0%	0
<b>True Lates (excl. Bi)</b>	573,000	604%	2,535,000

### 2009 Escapement Plan

The *Fraser River Sockeye Spawning Initiative* has been a multi-year collaborative planning process to develop a long-term escapement strategy. The annual escapement strategy seeks a balance between long-term objectives and short-term practical considerations, and combines technical analyses with qualitative judgment. A plan is developed every year and is vetted through consultative processes prior to the fishing season. In general the annual exploitation rate targets are adjusted based on expected run size and environmental conditions. The table below outlines the final pre-season escapement plan for 2009.

**Table 4-3: 2009 Fraser River Sockeye Escapement Plan – Pre-Season Run Estimates**

**2009 Fraser River sockeye escapement plan using pre-season run size estimates (in thousands of fish).**

Stock Group	Run Size Estimate of forecasted stocks	Run Size Reference Points		Total Mortality Rate Guideline	Total Allowable Mortality at Run Size	Escapement Target at Run Size	Management Adjustment (a)		Exploitation Rate after MA
Early Stuart	165	-	156	0%	5%	156	59%	92	0%
		156	390	0 - 60%					
		390		60%					
Early Summer	739	-	200	0%	60%	296	42%	123	43%
		200	500	0 - 60%					
		500		60%					
Summer	8,677	-	520	0%	60%	3,471	7%	243	57%
		520	1,300	0 - 60%					
		1,300		60%					
Birkenhead and Birkenhead-type Lates (b)	334			0%	60%	134			60%
				0 - 60%					
				60%					
true-Late (excl. Birk. Type)	573	-	420	20%	27%	420	604%	2535	20 - 60%
		420	1,049	20 - 60%					
		1,049		60%					
Cultus									20%
Sockeye Totals	10,488					4,476		2,993	
	<i>Est. Return</i>								

### 4.3 IN-SEASON ASSESSMENT

The main challenges facing the FRP in 2009 was the extremely low levels of returning sockeye from all stock groups, with the exception of Harrison River sockeye, compared to pre-season expectations. Also determining the peak of the Early Summer and Summer-runs was difficult due to a protracted multimodal migration in Early Summers and a very flat migration in the Summer-run return. Additional challenges were the delay of Late-run sockeye in the Gulf of Georgia co-migrating with a very large pink return. In addition to the much lower than expected returns of sockeye, near record high temperatures in the Fraser River during the Early Summer and Summer-run migration heightened the concern of not meeting escapement objectives for some stock groups.

#### Migration and Timing

Determining the peak of the run is important. Timing is informative to models used to estimate run size and is also key to in-season estimates of MA. The following graphs illustrate the protracted multimodal migration for Early Summer-run sockeye and the small flat migration of Summer-runs which made it difficult to estimate the peak of the runs in-season.

Figure 4-2: 2009 Early Summer Sockeye Migration Graph

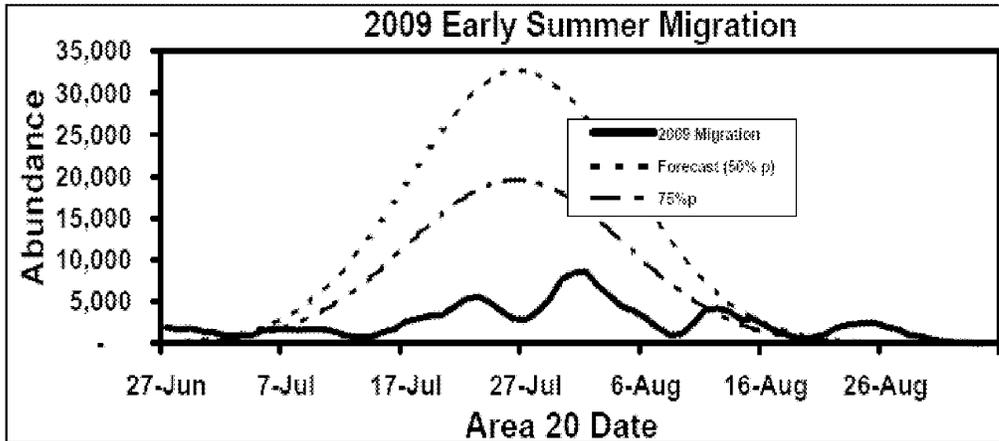
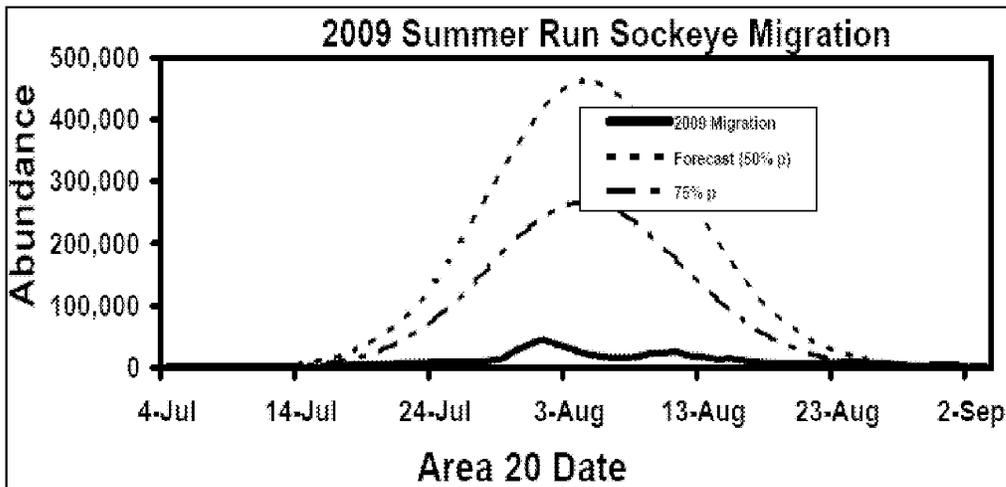


Figure 4-3: 2009 Summer Run Sockeye Migration Graph



As in-season information was made available, it appeared that some runs were either very late or not materializing. In 2005 (the 2009 brood year) the timing was very late and returns that appeared to be very weak relative to expectations early in the season materialized much later on. However, in 2009 there were no indications that the runs were late. The age composition and the expected vs. observed relative stock contributions in test fishery samples were consistent with a weak return, not a late return. The table below illustrates expected age contributions compared to in-season observations. It was fairly clear that the 4<sub>2</sub> component of the return was much lower than expected, and due to the poor return of sockeye in 2008, it was highly unlikely

that the low percentage of 4 year olds was due to a higher than expected return of 5 year olds.

**Table 4-4: Expected vs. Observed Age Contributions**

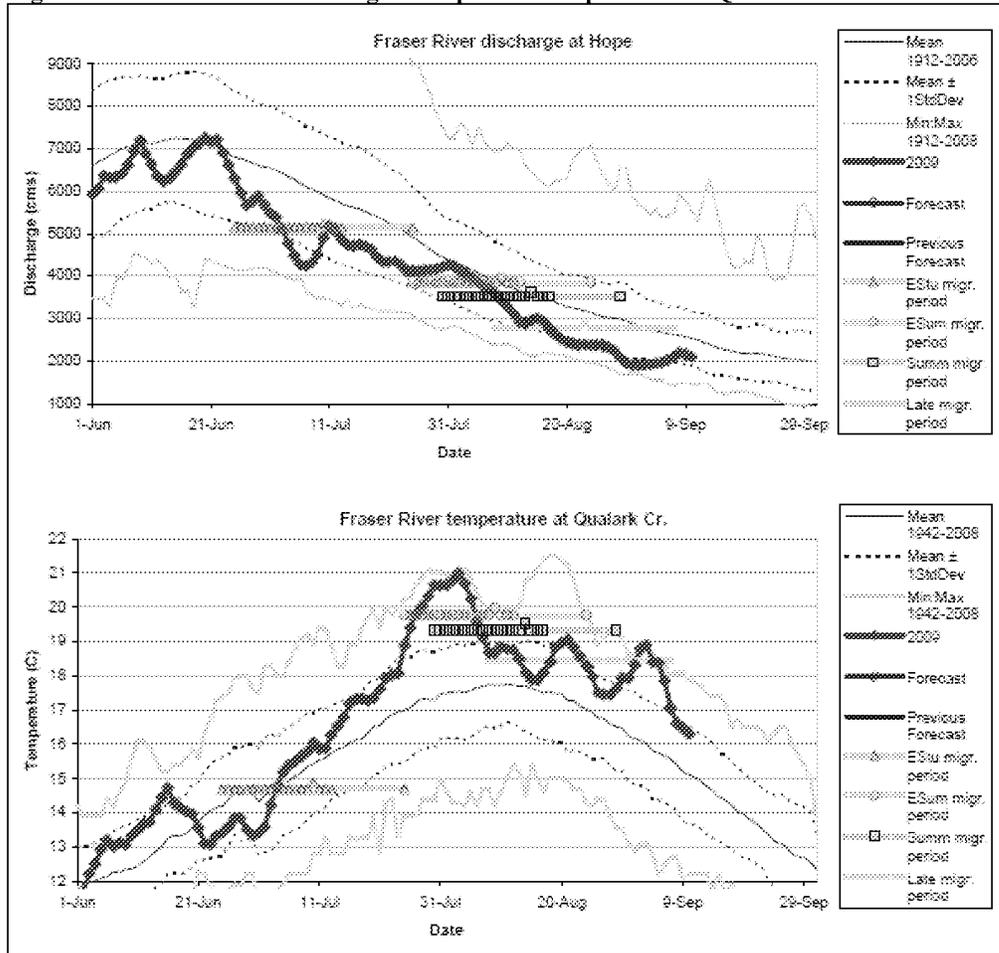
	<b>Expected</b>	<b>Observed In-season <sup>a</sup></b>
<b>Early Stuart</b>	99%	93%
<b>Early Summers</b>	75%	43%
<b>Summers</b>	97%	81%
<b>Birkenhead</b>	67%	36%
<b>Lates</b>	79%	49%
<b>Total</b>	<b>94%</b>	<b>63%</b>

<sup>a</sup> Samples collected in gillnet test fisheries may underestimate 4<sub>2</sub> contributions due to gear selectivity. Also the observed samples are not weighted for passage.

#### **Fraser River Environmental Conditions and MA**

In 2009 the Fraser River water temperature was above average for most of the sockeye migration while discharge was lower than average. Temperatures were extreme and near historical maximum observations for significant portions of the Early Summer and Summer-run migration. High water temperatures can cause serious adverse effects on resident and migratory fish, including: increased energy expenditure; reduced swimming performance; increased susceptibility to disease; reduced reproductive success; and mortality. The figures below illustrate observed Fraser River temperatures at Qualark Creek and discharge at Hope as well as the corresponding estimated stock aggregate migration periods.

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



Management Adjustment models use both environmental conditions as well as adjustments to run timing as inputs. The in-season MA for Summer-run sockeye was very sensitive to changes in timing due to the addition or removal of observed data (used to inform the MA models) in the period of extreme high temperature. If the Summer run timing shifted later by one day, one extreme temperature day on the front end was replaced by a moderate temperature day on the back end and vice versa (See above). In addition, due to the small flat migration observed, the run size and the migration peak of Summer run was highly uncertain in-season. This resulted in MA estimates that were uncertain and sensitive to change in-season.

**Late-run Delay**

Prior to 1995 a three to six week delay in Late-run migration into the Fraser River was a regular occurrence. Since 1995 Late-run sockeye have been observed entering the

Fraser River with little or no delay in most years resulting in large difference between estimates in most years and was associated with elevated levels of pre-spawn mortality in some of the earlier years. In 2009, it was apparent there may be some delay in Late-run migration as escapement projections for Late-run sockeye generated from approach area test fisheries were not being observed at Mission while other stock groups using similar projection methods were being observed at Mission. To confirm the presence of a delay a non-retention Gulf of Georgia troll test fishery was implemented. The in-season estimate of delaying True Late-run sockeye was 100,000. This unexpected pattern of marine delay may result in increased en-route survival of Late-run sockeye in 2009.

### Run Size

As the season progressed the FRP considered technical advice provided by the Pacific Salmon Commission and Fraser River Panel Technical Committee members and bilaterally adopted run sizes that reflected in-season assessment information. The following table highlights a timeline of run size changes that were adopted by the FRP. Changes in run size are bolded.

**Table 4-5: Timeline of Run Size Changes Adopted by FRP in 2009**

	Pre-season	Jul-17	Jul-24	Jul-28	Aug-11	Aug-18	Aug-25	Aug-28
<b>E. Stuart</b>	165,000	<b>110,000</b>	<b>85,000</b>	85,000	85,000	85,000	85,000	85,000
<b>E. Summer</b>	739,000	739,000	<b>264,000</b>	<b>150,000</b>	<b>175,000</b>	175,000	175,000	175,000
<b>Summer</b>	8,677,000	8,677,000	8,677,000	8,677,000	<b>600,000</b>	<b>700,000</b>	<b>650,000</b>	650,000
<b>Birkenhead</b>	334,000	334,000	334,000	334,000	334,000	<b>100,000</b>	<b>60,000</b>	60,000
<b>Harrison</b>	69,000	69,000	69,000	69,000	69,000	<b>200,000</b>	200,000	200,000
<b>L. Lates</b>	573,000	573,000	573,000	573,000	573,000	<b>450,000</b>	450,000	<b>400,000</b>

It should be noted that the significant decreases in in-season run sizes eliminated any Total Allowable Catch (TAC) that was identified pre-season for most groups with the exception of a small amount of TAC available for a short period of time between August 21<sup>st</sup> and August 25<sup>th</sup> for Summer-run sockeye. During this time an estimated 52,800 Summer-run sockeye TAC was identified as a result of a change to the Summer-run proportional Management Adjustment (pMA) from .32 to .21. There was a great deal of uncertainty with the Summer-run run size, timing and the MA at this time and as more information became available in the coming days the run size was downgraded from 700,000 to 650,000 and the pMA increased to .28 from .21 which eliminated the Summer-run TAC on August 25<sup>th</sup>.

The final 2009 in-season estimates of run size were much lower than the pre-season forecasts for the management aggregates and Birkenhead. All aggregates were well below the 90% probability abundance forecast with the exception of the Late-run (excluding Birkenhead) which was estimated to be higher than the 75% probability abundance forecast. This can mostly be attributed to the good return of Harrison River sockeye which was estimated to have returned above the 25% probability abundance forecast. Preliminary results from the 2009 Harrison return indicate that

the 3 year old age class (2007 ocean entry year) is strong relative to expectations and the 4 year old age class returned poorly relative to expectations. Harrison River sockeye are unique in that they have a different life history (they are immediate migrants and do not reside in a freshwater lake for 1 year or more) relative to other Fraser sockeye stocks.

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

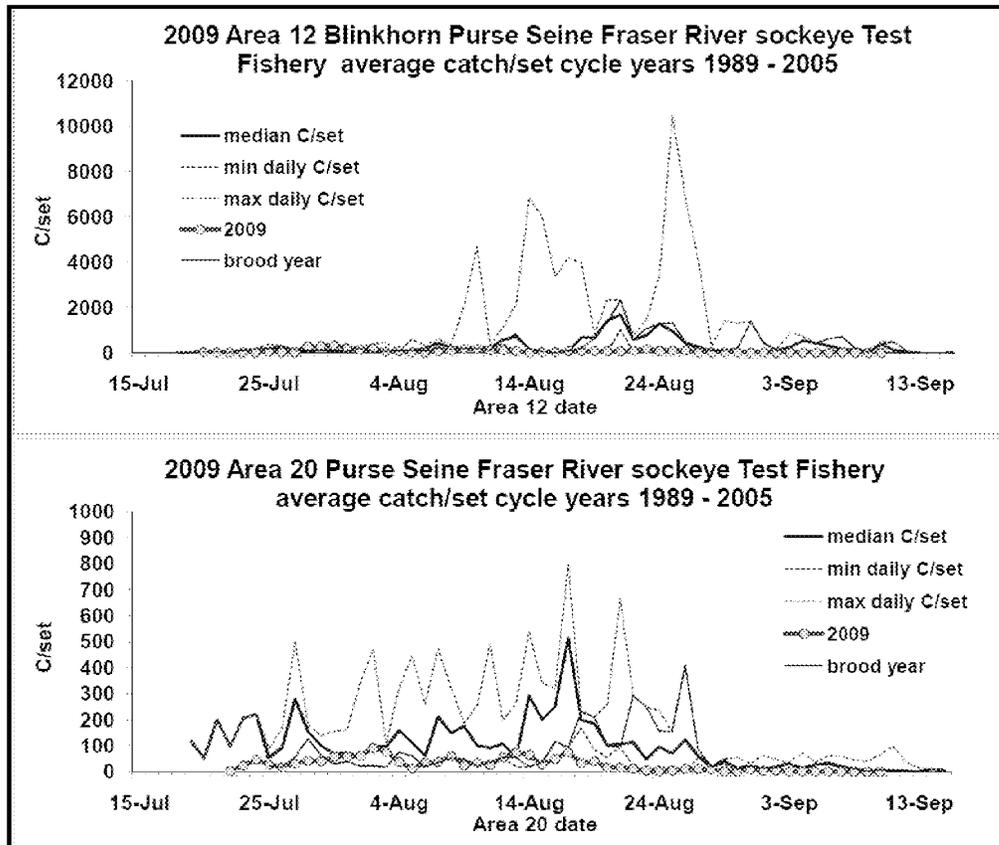
Run	Pre-Season Forecast			Final In-Season Estimate <small>(Sep 23)</small>
	50% Probability	75% Probability	90% Probability	
Early Stuart	255,000	165,000	107,000	85,000
Early Summer	739,000	443,000	264,000	175,000
Summer	8,677,000	4,914,000	2,858,000	650,000
Birkenhead	334,000	194,000	130,000	60,000
Harrison	69,000	46,000	33,000	200,000
L.Late*	504,000	277,000	164,000	200,000
<b>Total</b>	<b>10,578,000</b>	<b>6,039,000</b>	<b>3,556,000</b>	<b>1,370,000</b>

\*Excluding Birkenhead (which includes Big Silver, Cogburn, Poole, Samson, Railroad, Green R., Douglas) and Harrison

#### **Diversion Rate**

The diversion rate of sockeye through Johnstone Strait was higher than forecast and was estimated to be ~44% in 2009. Diversion rate can have significant impacts on harvest opportunities of marine fisheries. The figure below describes 2009 test-fishery CPUE compared to historical CPUE in both approach areas over time.

Figure 4-5: Test Fishery Average Catches in Area 12 and Area 20



#### 4.4 FISHERIES

There were no directed sockeye openings for commercial or recreational fisheries in Canada or the United States in 2009. In Canada, a significant proportion of Fraser sockeye were captured as by-catch in FSC fisheries directed at other species. As well, there were limited FSC fisheries directed on Fraser sockeye, during a short period of time. A small number of sockeye were retained in US Treaty Indian ceremonial and subsistence (C&S) fisheries.

The table below outlines final in-season estimates of Fraser River sockeye catch in Canada and the US. Not included in the table is by-catch mortality associated with releases of sockeye in FSC, commercial and recreational fisheries directed at other species.

**Table 4-7: Final In-Season Estimates of Fraser River Sockeye Catch in Canada & US**

<b>Total Fraser Sockeye Caught *</b>	<b>107,080</b>
Test fisheries (incl. Albion and Qualark)	34,033
<b>Canadian Catch</b>	<b>68,850</b>
Canadian First Nation FSC fisheries- Marine	9,920
Canadian First Nation FSC fisheries- Fraser	58,930
Canadian commercial fisheries (includes commercial selective & FN economic)	0
Canadian recreational fisheries	0
<b>United States Catch</b>	<b>4,200</b>
U.S. non-Treaty Indian fisheries	0
U.S. Treaty Indian ceremonial fisheries	4,200

\* Catch as of November 4<sup>th</sup>, 2009.

#### **Total Allowable Catch**

Pre-season TAC for sockeye was calculated using pre-season information such as pre-season run size forecasts and escapement goals. International sharing also took into account the Fraser River Aboriginal Fisheries Exemption (AFE), anticipated test fish catch as well as expected Management Adjustments (MA) for the run timing groups. Fisheries would not likely be initiated until in-season assessments provided updates to the pre-season information used to determine the TAC for each country. It should be noted that the TAC available for Late-run would not be accessed directly. In 2009 the Late-run TAC would be caught incidentally when fisheries were to be directed at other run timing groups that would have available TAC, such as the Summer-run. Unfortunately, in-season information indicated that there was no TAC available for the other run timing groups early on in the migration so the Late-run TAC could not be accessed. The following table describes changes to the anticipated TAC as in-season information was made available as well as the final in-season catch by aggregate.

**Table 4-8: Final In-season Estimates of Fraser River Sockeye Catch in Canada and US**

	<b>Pre-season TAC</b>	<b>Final In-season TAC</b>	<b>Final In-season Catch</b>
<b>Early Stuart</b>	10,000	0	8,590
<b>Early Summer</b>	316,800	0	18,840
<b>Summer-run</b>	5,155,600	0	59,340
<b>Birkenhead</b>	198,500	10,500*	3,970
<b>Late Lates</b>	112,600	74,000*	16,370
<b>Total</b>	<b>5,793,500</b>	<b>84,500*</b>	<b>107,100</b>

\* note: BK & LL TAC are identified for the purpose of pursuing fisheries on more abundant Summer run stocks, and not for fisheries targeted on BK or LL

The following table outlines the final in-season TAC and catch for each country as of September 23, 2009. Note the table does not include release mortalities associated with fisheries directed at other species.

**Table 4-9: Final In-Season TAC and Catch as of September 23, 2009**

	<b>Early Stuart</b>	<b>Early Summer</b>	<b>Summer- run</b>	<b>Birken- head</b>	<b>Late Lates</b>	<b>Total</b>
<b>Test Fisheries <sup>a</sup></b>	<b>1,940</b>	<b>5,520</b>	<b>15,760</b>	<b>1,580</b>	<b>7,340</b>	<b>32,140</b>
<b>US Catch</b>						
Commercial	0	0	0	0	0	0
C&S	0	480	2,080	660	990	4,210
<b>US Total</b>	<b>0</b>	<b>480</b>	<b>2,080</b>	<b>660</b>	<b>990</b>	<b>4,210</b>
<b>US TAC</b>	0	0	0	0	0	0
<b>CDN Catch</b>						
Commercial	0	0	0	0	0	0
Recreational	0	0	0	0	0	0
Other <sup>b</sup>	60	260	1,260	60	260	1,900
FSC	6,590	12,580	40,230	1,670	7,780	68,850
<b>CDN Total</b>	<b>6,650</b>	<b>12,840</b>	<b>41,490</b>	<b>1,730</b>	<b>8,040</b>	<b>70,750</b>
<b>CDN TAC <sup>c</sup></b>	0	0	0	10,500	74,000	84,500

<sup>a</sup> Panel approved test fisheries

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

<sup>c</sup> BK & LL TAC are identified for the purpose of pursuing fisheries on more abundant Summer run stocks, and not for fisheries targeted on BK or LL

### Fraser Sockeye Exploitation Rates

Due to the low return of Fraser sockeye in 2009, considerable efforts were made in-season to reduce fishing impacts on migrating sockeye while providing some opportunity for First Nations to harvest other salmon species, and in some cases, sockeye for FSC or C&S purposes. Although the return of sockeye was unexpectedly low, a considerable proportion of the total sockeye return migrated to terminal spawning areas. The in-season estimate of exploitation rate was the lowest recorded in the recent historical record (1952-2009) for Fraser sockeye and is estimated to be ~8% in 2009.

The table below outlines potential exploitation rates based on 2009 TAM rules and pre-season and in-season information as well as the actual observed preliminary post-season estimate of exploitation rates by aggregate and in some cases stock.

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

	pre-season *	in-season TAM+MA **	prelim. post-season
E. Stuart	0%	0%	10%
E. Summer	43%	0%	11%
Summer	57%	0%	9%
Birkenhead ***	60%	20%	7%
Late Lates ***	20%	20%	4%
Cultus ***	20%	20%	< 3%

\* Pre-season allowable exploitation rates are based on the 2009 Total Allowable Mortality (TAM) rules developed in the FRSSI process

\*\* In-season allowable exploitation rates are based on the final in-season run size, MA and the 2009 TAM rules

\*\*\* Birkenhead, Late Lates and Cultus exploitation rates for the purpose of catching available Early Summers and Summer-run sockeye- not for targeting fisheries on Late-run groups

## 4.5 POST-SEASON

### Sockeye Migration and Escapement Estimates

Fraser River water temperatures were extreme for much of the Early Summer and Summer-run migration while Fraser River discharge was below the historical mean for most of the sockeye migration. Fraser River temperatures exceeded levels that are thought to have impacts on fish health and migration (>18.0 C) and approached levels that are thought to be lethal to sockeye (~ 21.0 C) for a short time period at the end of July. Conditions on the spawning grounds were reported as good with the exception of some low water conditions observed in the South Thompson and Quesnel watersheds. Low water levels were reported to be restricting or limiting access to the spawning grounds in some cases; however, there were no reports of any significant delay to any of the major tributaries that experienced low water conditions in 2009. Other reports from stock assessment staff indicated that fish health on the spawning grounds was good and there were no reports of significant pre-spawn mortality observed in any systems in 2009. The table below outlines preliminary escapement information to date relative to the escapement goals at the final in-season run sizes. A summary of preliminary spawning ground assessments for Summer-run, Birkenhead and Late-run sockeye will be available in January, 2010.

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

Management Group	Escapement Goal at final in-season run size	Potential Spawning Escapement Target <sup>a</sup>	Projected Escapement <sup>b</sup>	Preliminary Spawning Escapement <sup>c</sup>	Pre-Spawn Mortality (PSM) <sup>c</sup>
Early Stuart	85,000	76,410	55,370	45,327	5.0%
Early Summer	175,000	156,160	97,600	103,716	4.6%
Summer-run	520,000	590,660	461,450	<b>482,819</b>	<b>0.7%</b>
Birkenhead <sup>d</sup>	48,000	56,030	56,030	–	–
Late-run	320,000	383,630	<sup>e</sup>	–	–
<b>Total</b>	<b>1,148,000</b>	<b>1,262,890</b>	–	–	–

<sup>a</sup> Potential spawning escapement = total run size minus catch-to-date.

<sup>b</sup> Projected Escapements = (run size- catch)\*(1-projected DBE)

<sup>c</sup> As of December 1<sup>st</sup> 2009

<sup>d</sup> Includes other Birkenhead type stocks

<sup>e</sup> pMA and DBE estimates are available only for non-Harrison component of Late run, and so are unavailable for Late-run aggregate.

## Payback

The U.S. share shall be adjusted annually for harvest overages and underages in accordance with annual guidance provided by the Commission.

## 5 SOUTHERN BC MAINLAND PINKS AND FRASER RIVER PINK

### 5.1 FRASER RIVER PINK

The 2009 50% probability forecast and escapement goal for Fraser pink salmon was 17,535,000 and 6,000,000, respectively. The final in-season run size estimate for Fraser River pink salmon was 19,500,000 which is near the 25% probability level of abundance forecast.

The U.S. share of the annual Fraser River pink salmon TAC, harvested in the waters of Washington State is set at 25.7% as per the PST Annex IV Chapter IV agreement.

In 2009 there were concerns expressed by Canada and the US around sockeye by-catch in directed pink fisheries as there was no TAC available for sockeye when pink fisheries were anticipated. The Parties were unable to come to agreement on a single method for determining when Pink directed fisheries could begin. As such, the Parties both stated their rule for starting Pink fisheries and the PSC assessed their fishing plans against each Party's stated rules. The US proposed a 5% stock composition rule, that is, that their fisheries could begin when the abundance of Fraser sockeye in the area where the Pink fisheries would occur was below 5%. Canada proposed a 1% mortality rule in order to implement directed pink fisheries, that is sockeye stock composition and sockeye by-catch release mortality rates were assessed to ensure overall mortality was <1%. The rule was calculated by gear type and area and can be described by the following:

$$\text{Release Mortality}_{\text{gear}} \times \text{Sockeye/Pink Ratio}_{\text{area}} < 1\% \text{ Mortality}_{\text{sockeye, gear, area}}$$

The sockeye/pink ratio can be defined as sockeye/(sockeye+pink) and was generally determined by taking the most recent three day average of the ratio by area observed in test fisheries. The following outlines the sockeye release mortality by gear type used in 2009.

**Table 5-1: Sockeye Release Mortality by Gear Type Used in 2009**

Seine	25%
Troll	10%
Gillnet	60%
Reefnet	.5%
Beach Seine	5%

For the Parties to work towards achieving their share of pink salmon in directed pink fisheries, all commercial fishers were required to release all sockeye with the least possible harm. The exception was the US Treaty Indian Fisheries where harvesters were allowed to keep sockeye by-catch for C&S purposes. Due to these special circumstances, this fishery required timely reporting of catch in order to confirm sockeye impacts were at expected low levels.

Although the shares by both parties were not achieved, effort and catch was high in comparison to recent years due to the lack of sockeye opportunities, new directed pink opportunities, a high abundance Fraser pinks, and an unusually high abundance of non- Fraser pinks in 2009. However, concerns for by-catch, market conditions and a low diversion rate through the northern entry in late August reduced additional harvest opportunities. The table below outlines preliminary Fraser pink catch estimates in Canada and the United States in 2009.

**Table 5-2: Preliminary Fraser Pink Catch Estimates in Canada and US in 2009**

<b>Total Fraser Pink Caught *</b>	<b>4,302,150</b>
Test fisheries (incl. Albion and Qualark)	19,440
<b>Canadian Catch</b>	<b>1,556,480</b>
Canadian commercial fisheries (includes commercial selective & FN economic and demonstration fisheries)	1,442,840
Canadian First Nation FSC fisheries	11,860
Canadian recreational fisheries	101,780
<b>United States Catch</b>	<b>2,726,230</b>

\* Fraser pink catch as of January 5<sup>th</sup>, 2010.

The final estimate of escapement in recent years is calculated as the final run size minus catch (spawning ground estimates for pink salmon have not been undertaken since 2001). The net escapement for the 2009 return was 15,225,000 pink salmon. The next odd year pink run forecast will be based on a fry estimate assessment program that will be conducted in the spring of 2010.

## **5.2 SOUTHERN BC MAINLAND PINKS**

This was the off cycle year for Mainland Inlet pink salmon. Expectations for 2009 were highly uncertain due to extremely variable returns throughout the historic time series. The survival trend for the 2007 returns was up slightly from the previous brood year in 2005. However, preliminary assessments in 2009 are showing some significant improving trends in off-cycle pink salmon returns in some areas. The better than expected returns to the Glendale River allowed for a small directed pink salmon gill net fishery in lower Knight Inlet in the Glendale River area.

The objective for managing these stocks was to meet target escapement levels. If surpluses were identified, then fisheries could be conducted terminally. The fisheries that occurred were structured to minimize the by-catch of non-target species and following the domestic sharing arrangements set out in the IFMP.

As in 2008, the assessment plan entailed extensive visual coverage of the key Area 12 Mainland Pink systems with a focus on improved escapement and smolt studies. Flights over the Phillips River in Area 13 were also conducted in 2009.

Pink catch and release information from all fisheries can be found in Appendix 3.

## **5.3 FIRST NATIONS**

First Nations fishing opportunities for pink salmon were not restricted; however, there was little to no directed pink harvest in terminal areas this year. There is normally very little effort on Mainland Inlet pinks in terminal areas due to the availability of fishing opportunities in other more desirable locations such as Johnstone Strait.

## **5.4 RECREATIONAL**

Recreational effort on Mainland Inlet pink stocks in the terminal areas is traditionally very low. Pinks are open year round at 4 per day, minimum 30 cm in size. In 2009, there are no mainland pink catch estimates due to budgetary constraints but catches in this area are typically low. The recreational catch of pink salmon in Johnstone Strait on mixed pink stocks is 13,960.

### **Non-Tidal Sport**

There were no targeted pink fisheries in non-tidal waters on Mainland Inlet pink stocks.

## **5.5 COMMERCIAL**

The Glendale River area (12-27 to 12-29) was open to commercial gill net, seine and troll beginning Monday August 31. There was no seine or troll interest in the opportunity; only three gill net vessels participated for a catch of 746 pinks. The area closed on Friday September 4. No further commercial opportunities occurred.

## **5.6 STOCK STATUS**

A fairly cautious approach to the in-season management was employed for 2009 due to the high variability in the returns encountered over the recent years for these stocks. In keeping with plans for this year, there were very limited commercial fisheries on Mainland Inlet pinks. Preliminary assessments of the pink returns to the Mainland Inlet systems demonstrated generally higher returns in relation to the 2007 brood year. Preliminary 2009 pink escapement estimates for some key systems in the Area 12 Mainland Inlets are: Kakweiken -270,000 (36,850 brood), Glendale -297,000 (264,227 brood), Ahnuhati -9,200 (4,926 brood), Kingcome (index clear tributaries) - 350 (175 brood) and Wakeman (index clear tributaries) - 1,400 (739 brood). These estimates are preliminary and are subject to change pending further post season analyses.

In 2009, better than expected pink returns were seen in a number of areas including the Mainland Inlets.

## **6 SOUTHERN BC AABM CHINOOK**

### **6.1 OBJECTIVES AND OVERVIEW**

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

For the period October 2008 through September 2009, the forecast chinook abundance index was 0.72 of the PST base period. Therefore, under treaty provisions, the maximum allowable catch was 107,800 chinook for WCVI AABM fisheries; an overall 30% reduction consistent with the new 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), and early-timed Upper Fraser River chinook and Interior Fraser coho populations.

Ocean fisheries in Canada that intercept WCVI origin chinook 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 chinook while still providing harvest opportunities.

Additional efforts were made in 2009 to reduce the marine harvest rate of fisheries that intercept a number of low status chinook populations. Further constraints in the form of time and area limits were introduced in the troll fishery to protect early timed Upper Fraser chinook stocks.

AABM chinook catch and release information from all fisheries can be found in Appendix 3.

**Table 6-1: Pre-Season and Post-Season Total Allowable and Preliminary Catch Estimates for October 2008 - September 2009 WCVI AABM Chinook**

	Pre-Season	Post-Season
WCVI AABM Abundance Index	0.72	under review
WCVI AABM Chinook TAC	107,800	under review
Offshore Recreational Catch	50,000	68,916
First Nations Catch	5,000	3,381
Area G Troll Catch	<b>52,800<sup>a</sup></b>	53,191
<b>Total AABM Catch</b>		<b>125,488</b>

<sup>a</sup> The total Area G troll TAC is calculated as the difference between the WCVI AABM chinook TAC less offshore recreational catch and First Nations catch. For 2009, this resulted in a reduction to the Area G troll TAC to comply with the 2008 PST.

## 6.2 RECREATIONAL

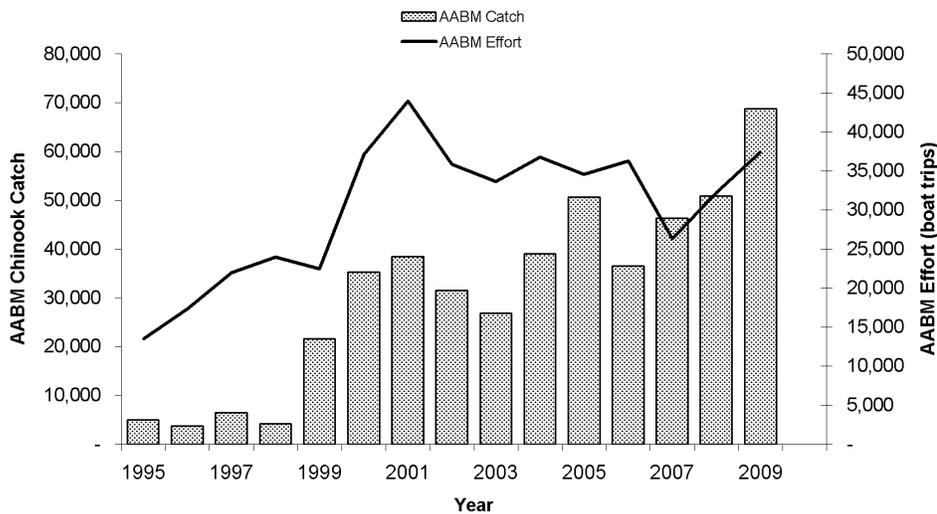
Fishing regulations in WCVI recreational AABM areas include barbless hook requirements to lower post-release mortality on sub-legal size chinook (less than 45 cm), and a daily limit of two chinook. Additional conservation measures include the '77 cm maximum size limit', imposed in those portions of Areas 124-127 that lie

shoreward of a line drawn 1-mile seaward of the surfline. This area is commonly referred to as the ‘Chinook corridor’, and is in place to protect migrating WCVI origin chinook. In 2009, in the area seaward of the ‘Chinook corridor’ recreational harvesters were permitted to retain 2 chinook per day with no maximum size limit while in the ‘Chinook Corridor’ recreational harvesters were permitted to retain 2 chinook between 45 and 77 cm in length per day.

Catch in the WCVI recreational fishery is estimated through a creel survey, which collects effort (number of boat trips), and catch per unit effort (CPUE) data. Catch for any given species within a defined time-area stratum is estimated by multiplying effort by CPUE. Total effort is estimated through vessel counts, gathered through either aerial or boat surveys of the fishing area. CPUE is estimated from interviews with anglers at specific landing sites and from trip logbooks and manifests submitted by lodges and guides through a voluntary monitoring program. Data regarding the daily activity profile of the fishery, fishing locations, and the proportion of guided versus un-guided effort are also gathered from angler interviews.

Total recreational catch and release in the 2009 WCVI AABM fishery was approximately 68,775 and 35,584 chinook, respectively, during the survey period (June-Sept). There was some additional catch during winter fisheries that occurs in near-shore areas. However, catch was very low in the winter period because inclement weather deters anglers. Overall, previous sampling has indicated that there is virtually no effort during this period.

**Figure 6-1: Recreational WCVI Chinook AABM Catch and Effort, 1995-2009**



**Table 6-2: Estimated WCVI Recreational AABM Effort, Chinook Catch, and Chinook Releases by PFMA, 2009**

	Area	AABM Effort (Boat Trips)	AABM Chinook Catch	AABM Total Chinook Releases
	Port Renfrew (21)	184	202	53
	Alberni Inlet (23)	10,747	68	17
	Barkley Sound (23)	6,863	10,125	8,419
	Clayoquot (24)	436	21	95
	Nootka (25)	-	-	-
	Kyoquot (26)	7	-	-
	Quatsino (27)	218	46	80
Offshore	Area 121	2,449	7,691	2,320
	Area 123	5,917	26,837	12,544
	Area 124	2,751	10,084	8,566
	Area 125	3,236	5,765	1,658
	Area 126	1,595	3,530	-
	Area 127	2,952	4,406	1,833
	WCVI	<b>Total</b>	<b>37,353</b>	<b>68,775</b>

### 6.3 FIRST NATIONS

The 2009 First Nations AABM chinook catch was estimated to be 3,381.

### 6.4 COMMERCIAL

After the completion of the 2009 CTC chinook model calibration, the AABM Canadian allowable harvest was 107,800. It was anticipated that the FSC harvest would be 5,000; and that the recreational catch would be 50,000, leaving 52,800 available to plan for commercial harvest by Area G troll.

For the 2008/2009 chinook year, fisheries continued to be shaped by conservation concerns for the following domestic stocks: early-timed Fraser River chinook, Interior Fraser River coho, WCVI origin chinook salmon, and LGS chinook. As well, additional management measures were introduced in-season to protect spring and summer-run Fraser River chinook stocks that were observed to be returning at very low levels. The following management measures were used to protect these domestic stocks:

- **October to March period**

During the period from October 1 to March 15, a harvest was limited to no more than 20% of the Area G annual TAC based on the preliminary forecast.

- **March 16 to April 19 period**

For the 2008/09 year, a full time-area closure was maintained from March 15 to April 20 to avoid interception of early-timed Fraser chinook.

- **Late April/mid June period**

During the period from April 20 to June 15, a harvest of no more than 40% of the Area G annual TAC was allowed. In addition, effort was limited to recent year averages, and areas of SWVI were closed until May 15 (partial openings from May 2-15) in order to avoid interception of early-timed Fraser chinook.

- **June 16 to July 31 period**

For the 2008/09 year, a full time-area closure was maintained from June 16 to July 31 to avoid interception of spring/summer run Fraser chinook.

- **August period**

During the August period, a harvest of no more than 20% of the Area G annual TAC was recommended based on the PST chinook model calibration and assigned harvest levels for the outer WCVI area. In addition, the fishery was managed to minimize mortality on wild coho through: i) a maximum interception of coho and ii) the mandatory use of large plugs. As well, the fishery was managed to minimize mortality of WCVI origin chinook through the use of closures during time and near shore areas where WCVI chinook stocks were prevalent.

- **September period**

During the September period, a planned harvest of 20% of the Area G annual TAC is recommended based on the PST chinook model calibration and assigned harvest levels for the outer WCVI area. The harvest level may increase if there is available remaining WCVI AABM TAC after accounting for First Nation and recreational fisheries. Any harvest opportunities prior to September 15 must be managed to avoid interception of coho and WCVI origin chinook. After September 15, retention of adipose fin clip (AFC) hatchery origin coho would have been permitted however during the 2008/2009 season there was no available WCVI AABM TAC thus no commercial troll fishery occurred.

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 2008/2009.

Fisheries were also monitored to determine encounter rates of other species and estimate numbers of released chinook. Biological sampling was conducted for size distributions, and stock compositions (via CWT, DNA and otolith samples).

**Table 6-3: Post-Season Preliminary Monthly Catch Estimates for 2005/06 to 2007/08 WCVI AABM Chinook Troll Fisheries**

	<b>2008/2009</b>	<b>2007/2008</b>	<b>2006/2007</b>	<b>2005/2006</b>
October	1,882	3,137	16,000	12,198
November	1,209	0	1,200	2,156
December	1,107	0	800	1,689
January	3,394	1,634	5,500	1,468
February	1,540	1,911	2,600	5,154
March	586	0	2,300	7,883
April	3,616	1,717	5,200	20,561
May	18,062	11,105	23,500	7,078
June	12,165	15,944	25,000	20,807
July	0	0	0	0
August	9,630*	9,099*	0	886*
September	0	45,157	6,000	24,098
<b>Total</b>	<b>53,191</b>	<b>89,704</b>	<b>88,100</b>	<b>103,978</b>

\* Plug fishery

## 7 SOUTHERN BC ISBM CHINOOK

### 7.1 OBJECTIVES AND OVERVIEW

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

Measures were taken in 2009 to protect WCVI, LGS, early-timed Upper Fraser River chinook stocks, and spring/summer-run Fraser River chinook stocks. Specific management actions were taken to protect WCVI origin chinook in Canadian ocean fisheries (not including enhanced terminal areas), the harvest of which was restricted to an exploitation rate of 10%. Most Southern BC commercial fisheries were regulated so that impact on WCVI wild chinook stocks was minimized. Robertson Creek hatchery-origin chinook were harvested in the terminal area of Alberni Inlet by First Nations, recreational and commercial net fisheries.

LGS chinook stocks are experiencing a period of low productivity and management measures continued to be in place throughout 2009 to protect these stocks. As in recent years, recreational chinook non-retention areas and finfish closures were in

place throughout the Strait of Georgia to reduce impacts at critical times and in key areas and commercial retention of chinook was not permitted in the Strait of Georgia and in Johnstone Strait.

In addition to these specific restrictions, in 2009 area and time closures were in place to protect returning early-timed Upper Fraser River chinook and spring/summer-run chinook stocks during sport and commercial fisheries. There was a general requirement in all commercial fisheries to apply selective fishing techniques, including area and gear restrictions and the mandatory use of revival tanks. Catch monitoring included requirements for daily catch reporting, mandatory logbooks, hailing catches on a regular basis, and independent on-board observers on vessels when requested. Post-release mortality information for chinook included in ISBM management was determined from studies conducted in 2000-2001 and detailed in the Canadian Stock Assessment Secretariat, Research Document 99/128 (CSAS, Doc 99/128).

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

## **7.2 RECREATIONAL**

### **West Coast Vancouver Island**

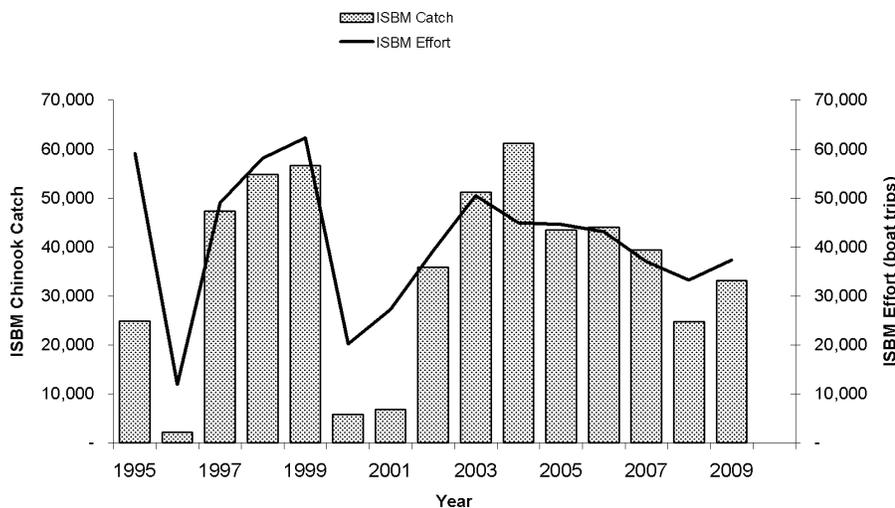
The WCVI ISBM chinook sport fishery was regulated using minimum/maximum size limits, possession limits and area closures to reduce impacts of the recreational fishery on natural (un-enhanced) WCVI chinook stocks. Daily limits were two chinook per day. Regulations in 2009 required chinook retained within the chinook corridor (one nautical mile seaward of the surfline) to exceed a minimum fork length of 45cm, and be smaller than the maximum size limit of 77cm. This restriction was in effect commencing July 15<sup>th</sup> for those waters north of Estevan Point and commencing August 1<sup>st</sup> for those waters south of Estevan Point. However, retention of chinook greater than 77cm was permitted in some terminal areas with a high percentage of returning hatchery origin fish. Area restrictions include areas “closed to salmon fishing” or “closed to all fin fishing”, depending on the vulnerability of local stocks of concern. These closed areas continued in 2009.

Total recreational chinook catch for the 2009 WCVI ISBM fishery was approximately 33,135 fish, which is an increase from the 2008 catch of 24,381 chinook. The 2009 effort was 37, 447 boat trips which is an increase from the 2008 effort level of 33, 113 trips.

**Table 7-1: Estimated WCVI Recreational ISBM Effort, Chinook Catch and Release by PFMA, 2009**

	Area	ISBM Effort (Boat Trips)	ISBM Chinook Catch	ISBM Total Chinook Releases
Inshore	Port Renfrew (21)	545	1,229	119
	Alberni Inlet (23)	6,451	2,907	195
	Barkley Sound (23)	12,026	16,013	10,916
	Clayoquot (24)	779	54	89
	Nootka (25)	13,350	11,090	6,578
	Kyoquot (26)	442	330	-
	Quatsino (27)	3,854	1,512	2,925
Offshore	Area 121	-	-	-
	Area 123	-	-	-
	Area 124	-	-	-
	Area 125	-	-	-
	Area 126	-	-	-
	Area 127	-	-	-
	WCVI	Total	37,447	33,135

Figure 7-1: Recreational WCVI Chinook ISBM Catch and Effort, 1995-2009



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

For Johnstone Strait and the Strait of Georgia north of Cadboro Point, sport catch regulations included an annual limit of 15, a daily limit of two and a minimum size limit of 62 cm. For the Canadian portion of Juan de Fuca Strait south of Cadboro

Point, the daily limit was two chinook over 45 cm and a seasonal limit of 20 chinook was in effect.

In those waters near Victoria between Cadboro Point and Sheringham Point (Areas 19-1 to 19-4 and Area 20-5), retention regulations were adjusted from March 2 to May 14 to minimize the harvest of wild, early-timed chinook stocks of concern returning to the Fraser River. Recreational harvesters were permitted to retain two chinook per day which may be wild or hatchery marked between the size limit of 45cm and 67cm or hatchery marked only chinook over 67 cm in length.

In 2009 marine recreational fisheries were monitored by creel surveys in three main areas; 1) Juan de Fuca including Victoria (south of Cadboro Point) and Juan de Fuca Strait through PFMA 20-1; 2) Strait of Georgia including Areas 14 through 18, that portion of Area 19 north of Cadboro Point, 28 and 29 and 3) Johnstone Strait including Areas 11 to 13. Monitoring of the Strait of Georgia sport fishery (April to October) and Juan de Fuca Strait sport fishery (January to December) has been fairly consistent from year to year using an access point (landing site) survey for collecting catch, CPUE, and biological information combined with an aerial survey for effort counts. The Johnstone Strait creel survey commenced in Area 13 in June and continued through until end of September; and from June through August to include Areas 11 and 12.

Overall, effort in the Strait of Georgia increased by about 50% from 2008 to 2009. The corresponding catch increased by about 78%. Juan de Fuca Strait effort also increased by approximately 40% and the catch increased by about 28%. As part of these creel surveys, encounter rate information was also collected for legal and sub-legal chinook and coho. Releases of chinook in the Strait of Georgia and Juan de Fuca Strait were significantly higher in 2009.

**Table 7-2: 2009 Catch and Effort For Inside Recreational ISBM Fisheries**

<b>Fishing Area</b>	<b>Survey Period</b>	<b>Chinook Kept</b>	<b>Chinook Released</b>	<b>Effort (Boat Trips)</b>
Strait of Georgia	May - Sept	8,899	15,194	58,965
Johnstone Strait	June - Aug	19,482	22,765	16,807
Juan de Fuca Strait	Jan-Sept	28,265	34,371	60,150
Fraser River	May - Oct	21,579	16,160	n/a
<b>TOTAL</b>		<b>78,225</b>	<b>88,490</b>	<b>135,922</b>

### **7.3 FIRST NATIONS FISHERIES**

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

An agreement was reached in 2009 with the Hupacasath and Tseshah First Nations for an economic fishery targeting Somass chinook (Area 23). Hupacasath and Tseshah First Nations harvested 7,622 chinook in upper Alberni Inlet. WCVI First Nation's (excluding Tseshah and Hupacasath FN's) catch reports indicate a combined ISBM chinook harvest of 1,404. Total WCVI First Nations ISBM catch estimate is 9,026.

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

Data are still being compiled on various First Nations catches in the Strait of Georgia; however, preliminary catch is estimated at 977 chinook. There were no economic opportunity fisheries.

Cowichan Tribes conduct a spear fishery in the lower Cowichan River. Data provided by Cowichan Tribes show a preliminary 2009 estimate of 475 adult and 30 jack chinook. Additional biological data was collected from this fishery, including collection of heads from CWT/AD marked chinook.

#### **Fraser River FSC and Economic Opportunity Fisheries**

FSC fisheries, as well as economic opportunity fisheries took place in the Fraser River in 2009 harvesting ISBM chinook in the both the upper and lower reaches of the Fraser River. Approximately 3,241 chinook were harvested by First Nations in the upper river FSC and economic opportunity fisheries, and approximately 29,460 chinook were harvested in the lower river; for a total chinook harvest of 32,701.

### **7.4 COMMERCIAL FISHERIES**

In 2009 several commercial fisheries targeted ISBM chinook including gillnet and seine fisheries in Alberni Inlet (Barclay Sound) and Tlupana Inlet (Nootka Sound).

#### **Area B seine**

In 2009, seine fisheries occurred on August 24<sup>th</sup>, 25<sup>th</sup>, and 31<sup>st</sup> in upper Alberni Inlet targeting Somass chinook. Three vessels fished during these openings with a total chinook catch of 2,598 chinook.

## **Area D gill net**

In 2009, gill net fisheries occurred in Alberni Inlet and Tlupana Inlet. These fisheries target hatchery returns to Robertson Creek and Conuma River hatcheries. On August 24<sup>th</sup>, 25<sup>th</sup>, 31<sup>st</sup> and September 09<sup>th</sup> in upper Alberni Inlet (Area 23) targeting Somass chinook. An average of 77 vessels participated in the first three openings, with 18 vessels participated in the final openings. The total gill net chinook catch in these opening was 3,671. On August 18 there was an Area D gillnet opening in Tlupana Inlet. The total chinook catch in that fishery was 3,496. The total Area D WCVI ISBM chinook harvest was 7,167 chinook.

The total WCVI commercial net ISBM harvest was 9,799 chinook.

## **7.5 STOCK STATUS**

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

#### **Interior Fraser**

Spring chinook returns to the Fraser continue to be of concern. Returns to the Spring 5<sub>2</sub> (stream-type or yearling) aggregate were mixed. Some stocks exceed parental escapements such as Slim Ck. (3,173) and the upper Fraser at Tete Jaune (2,755), however many others failed to reach parental levels and in aggregate, returns were approximately 85% of the parental brood. Returns to the Spring 4<sub>2</sub> aggregate were very poor and of concern for the aggregate as a whole. Returns averaged only 22% of parent brood escapements. Of particular concern were Nicola (440), Coldwater (26) and Louis (10).

Yearling (stream-type) summer chinook returns were also poor and averaged only 65% of brood year escapements. Chilko (8,548) and Quesnel ~1,944 averaged about 55% of parental escapements, while Clearwater (5,982) exceeded brood. In contrast, the late South Thompson ocean-type aggregate was relatively strong again, and while performance of escapements varied, in aggregate, levels were roughly equivalent to those of the parental brood. South Thompson declined from brood (45,049), whereas Lower Adams (6,399) and Lower Shuswap (24,654) both exceeded parental escapements.

#### **Lower Fraser River**

*Spring-run:* Lower Fraser Spring chinook returns were mixed. Returns to Birkenhead River (625) were much improved compared to 2008, however, escapement

to the upper Pitt River (Blue Creek) were very poor at only 90. Information for other populations is unavailable at this time.

**Summer-run:** Summer-run chinook returns to Maria Slough were assessed visually in 2009. The escapement of ~546 is very slightly less than the parental brood year (574). Information for other summer populations is not available at this time.

**Fall-run:** Annual lower Fraser River fall-run chinook stock group escapements are, on average, large (>100,000). The major contributor and principal focus of assessment of this stock group is chinook returning to the Harrison River, and Harrison River transplants to the Chilliwack River. For both the Harrison and Chilliwack Rivers, the field study portions of the escapement assessments are complete; however, analyses are ongoing. Extreme rain events significantly raised water levels in these systems make in-season assessments difficult. Preliminary escapement estimates are not yet available.

### **Howe Sound/Squamish River**

No information is available at this time.

### **Burrard Inlet**

No information is available at this time.

### **Boundary Bay**

Escapement data are unavailable at present.

## **Strait of Georgia Chinook**

### **Fall Stocks**

Total returns to Strait of Georgia streams north of Nanaimo, virtually all of which are enhanced, have been stable for the last seven to ten years (Puntledge and Englishman) or eighteen years (Big Qualicum and Little Qualicum). In general, all have had recent escapements near or above target.

On the mainland side of the northern Strait of Georgia, Sliammon and Lang hatcheries continue to have variable returns. 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 migrates 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.

In the southern Strait of Georgia, returns to the Nanaimo River have been generally stable since 1995 at slightly higher levels than those recorded back to 1975. The area of most concern is further south, where chinook stocks returning to the Chemainus, Cowichan, and Goldstream Rivers have experienced continued declines. Unlike the central and northern Strait stocks, these southern populations historically rear within the Strait of Georgia. However, there appears to be an increasing proportion rearing off the west coast of Vancouver Island.

In particular, Cowichan River chinook (a wild chinook indicator stock) has been in decline since 1995-1996. The status of this population continues to be a stock of concern. According to preliminary estimates, the 2009 escapement is the lowest on record since 1953. Exploitation rates on Cowichan chinook were historically high (averaging 80-90%), declined to a low of 34% on the 1995 brood year, and then have steadily increased to 75% on the 2000 and 2001 brood years. Various harvest restrictions have been put into effect over the last 20 years to reduce exploitation on Strait of Georgia chinook. Additional conservation measures were introduced in 2005 to reduce the harvest of Cowichan chinook by the Strait of Georgia sport and WCVI troll fisheries. First Nations harvest of Cowichan chinook has been substantially reduced in recent years. The declining returns to various southern Strait of Georgia rivers are attributed to high exploitation rates, a drastic decline in marine survival, and in some cases, freshwater habitat issues.

The preliminary 2009 escapement to Cowichan River is 1250 adult and 300 jack chinook. Of these approximately 300 adults and 50 jacks were used for brood and about 475 adults and 50 jacks were caught in local FSC fisheries. The low number of age 2 jack chinook indicates that the 2010 escapement may be even lower.

### *Spring/Summer stocks*

Of the three early runs in the Strait of Georgia, assessment data are available for Puntledge and Nanaimo; the Cowichan summer run still exists but it is small and quantitative data are not available for that stock. Efforts to recover Puntledge Summers to viable levels have resulted in improved returns to the river since 1999. The 2006 and 2007 natural spawning escapements range from 200 - 500 adults (not including brood capture), which is down from the record high in 2005 of approximately 2,500 adults, but substantially higher than escapements recorded in the previous decades. The preliminary estimate for 2009 escapement is approximately 1200 adults (including 412 brood removals). Of concern is the exploitation rate which climbed sharply from a low of approximately 30% in 2001 to 55-60% in 2003-2004. Monitoring of Nanaimo spring and summer chinook escapement has occurred less frequently. This year's escapement is estimated to be around 200 chinook which is at the low end of the range in recent years.

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

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

2009 salmon escapement estimates from extensively surveyed WCVI streams are preliminary. Observations indicate escapement to NWVI systems were at or above recent year averages whereas SWVI systems were well below average. In particular, escapements to Clayoquot Sound (Area 24) and the Nahmint River (Area 23) remain very low. In two un-enhanced systems in Clayoquot Sound (Megin and Bedwell-Ursus) less than 70 spawners were observed. Similarly, in the Nahmint River less than 70 spawners were observed and only limited brood stock was collected to support the stock enhancement program there.

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

The preliminary total terminal return of Stamp River/Robertson Creek hatchery chinook was approximately 34,500 adults, below the pre-season forecast of 57,000. The preliminary escapement through Stamp Falls was approximately 12,000 adult chinook (expected to increase slightly as data are reviewed). The total terminal return and escapement to the Conuma River hatchery system was approximately 25,000 and 8,600, respectively. The total terminal return and escapement to the Nitinat River hatchery system was approximately 7,000 and 6,000, respectively.

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

Currently only two systems are monitored consistently in Areas 12 and 13. The Nimpkish River is assessed using standardized swim surveys and stream walks by hatchery staff and an intensive mark-recapture program is carried out by Quinsam Hatchery to estimate escapement on the Campbell/Quinsam system. Other systems are covered using intermittent visual surveys.

#### ***Nimpkish River***

Preliminary observations from the swim surveys indicate a continued low abundance of chinook to the Nimpkish Watershed, similar to recent years. At this time approximately 100% of the brood target has been obtained by the hatchery. Final estimates are not available at this time.

#### ***Campbell/Quinsam System***

Lower than normal river levels in early fall, initially provided good conditions for the mark-recapture program, however, a series of rain events in November resulted in extremely high water on both rivers and disruptions to the program. The favourable river conditions of early October permitted installation of a floating fence on the Quinsam River (for brood stock capture) and the chinook target to be attained by the hatchery. Normal chinook migration timing was observed on both systems. Abundance estimates are not available at this time, however preliminary indications suggest the total return to be slightly less than that of 2008, but remaining above the historical average.

## 8 SOUTHERN BC COHO

### 8.1 OBJECTIVES AND OVERVIEW

In 2009 the abundance forecast indicated that the status of Interior Fraser River (including Thompson River) coho remained critically low. The lower Fraser, Georgia Basin (east and west), and the Johnstone Strait coho management units were all forecast as either critically low or low status.

In 2009, Interior Fraser coho were a primary concern when implementing fisheries. Under the Abundance Based Management provisions in the Pacific Salmon Treaty, the US was limited to a maximum 10% exploitation on Interior Fraser coho. In Canada, the management objective for these coho was to limit the total mortality to a ceiling of 3% across all Canadian fisheries. The total exploitation on Interior Fraser coho was therefore limited to a maximum of 13%.

To ensure this limit was not exceeded in Canadian fisheries, retention of wild “unmarked” coho was not permitted in all recreational and commercial fisheries operating in areas of southern BC where Interior Fraser coho were known to be prevalent. Wild coho retention was permitted in some terminal areas along the west coast Vancouver Island (WCVI), in the Mainland Inlets, and in a small portion of upper Johnstone Strait, and Queen Charlotte Strait.

**Table 8.1 Preliminary coho catch and release estimates of the recreational, First Nations (FSC, economic opportunity and ESSR), and commercial fisheries for 2009.**

	<b>Catch</b>	<b>Release</b>
<b>Recreational</b>	117,320	178,551
<b>First Nations</b>	53,136	1,997
<b>Commercial</b>	934	40,283

<b>Total</b>	<b>171,390</b>	<b>220,831</b>
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Coho catch and release information from all fisheries can be found in Appendix 6.

## 8.2 RECREATIONAL

Sport fisheries can be categorized as occurring in mixed stock areas where specific coho stocks (such as Interior Fraser River coho) could not be avoided and terminal areas where local stocks dominate the catch. The table below outlines the areas in Southern BC where these mixed stock fisheries occurred and the general regulations pertaining to them.

**Table 8.2 Southern BC coho fishery regulations.**

<b>Mixed stock fishing area</b>	<b>Daily Limit (marked or unmarked)</b>	<b>Size Limit</b>	<b>Coho Season</b>
WCVI offshore areas 121-127 and areas 21 and 26	2 marked	30 cm.	Jun 1 – Aug 31
WCVI offshore areas 121-127 and areas 21 and 26	4 marked	30 cm.	Sept 1 – Dec 31
WCVI inshore area 23,24,25 and 27	2	30 cm.	Jun 1 – Aug 31
WCVI inshore area ,23,25,and 27	4,	30 cm.	Sept 1 – Dec 31
WCVI inshore area 24	4, 2 may be wild	30cm	Sept 1 – Dec 31
Juan de Fuca: areas 19-20	2 marked	30 cm.	Jun 1 – Dec 31
Strait of Georgia: areas 13-19, 28, portions of 29, excluding some terminal areas and times.	2 marked	30 cm.	June 1 – Dec 31
Johnstone Strait – Queen Charlotte Strait: all areas	2 marked	30 cm.	June 1 – Dec 31

The table below outlines coho catch and release information for recreational coho fisheries in Southern BC. The WCVI coho fisheries had a boundary in place

distinguishing coho catch in the mixed-stock fishery (outside the coho boundary) and catch in the terminal area (inside the coho boundary).

**Table 8.3 2009 recreational coho catch and release in Southern BC.**

Area	Coho Kept	Coho Released	Effort (Boat Trips)
WCVI – Outside Coho Boundary	40,952	85,962	18,900
WCVI – Inside Coho Boundary	48,181	24,441	55,901
Strait of Georgia (June – Sept)	521	3,221	58,963
Fraser River	7,633	9,045	NA
Juan de Fuca (Jan – Sept)	9,521	26,382	60,150
Johnstone Strait	10,512	29,500	NA

### **Mixed Stock Areas**

In 2009, hatchery selective mark fisheries (SMF) fisheries in southern BC allowed hatchery coho retention starting June 1<sup>st</sup> in most areas.

Release of wild “unmarked” coho was required in all sport fisheries operating in areas of southern BC where Interior Fraser River coho were known to be prevalent, including the mixed stock areas of the WCVI (Statistical Areas 21-27, 121-127), Strait of Juan de Fuca (Statistical Areas 19-20), Strait of Georgia (Areas 14-19, 28, 29), and the majority of Johnstone Strait and Queen Charlotte Strait (Statistical Areas 11, 12 and 13). Some wild “unmarked” retention opportunities were provided in terminal areas of WCVI and Areas 11, 12 and 13 with catch limit, time and area constraints (Details in Pacific Region Integrated Fisheries Management Plan, Salmon Southern B.C. 2008). In addition, the use of barbless hooks was mandatory in all these areas.

### **West Coast Vancouver Island**

In offshore and rearing areas off the WCVI, SMF regulations are in effect in order to protect weak coho stocks of concern, such as those originating from the Interior Fraser River. The daily limit is 2 marked coho (i.e. hatchery-origin coho with an adipose clip). For 2009, total catch in offshore areas was estimated at 40,952, about a three-fold increase from 2008 levels.

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

Recreational catch monitoring occurs year-round in portions of the Strait of Georgia but operates mainly from May-October. Coho catch, release, and mark rates are derived from two main sources; creel surveys and guide logbooks. The total coho

catch in Strait of Georgia mixed stock and terminal areas was approximately –Strait of Georgia– 521, Juan de Fuca Strait– 9,521, Johnstone Strait– 10,512.

### **Terminal Fishing Areas**

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

In WCVI terminal fishing areas, retention of adipose clipped hatchery origin coho was permitted as well as retention of wild “unmarked” coho in some portions of inshore areas where WCVI origin stocks dominate (portions of Port San Juan (Area 20), Alberni Inlet and portions of Barkley Sound (Area 23), portions of Clayoquot Sound (Area 24), portions of Nootka Sound and Esperanza Inlet (Area 25), and portions of Quatsino Sound (Area 27). Where retention of wild coho was permitted, the seasonal daily limit was 2 coho after June 1<sup>st</sup> with the exception of portions of Alberni Inlet, Tlupana Inlet and Nitinat Lake (Tidal) where the bag limit was increased to 4 coho after August 1<sup>st</sup>. In 2009, the total coho catch from the inshore WCVI terminal area was approximately 48,181, almost a four-fold increase from 2008.

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

Terminal coho SMF were implemented in most areas in the Strait of Georgia in 2009 where impacts on other species or stocks were not a concern. In some of these areas special management actions, including changes in daily limits or size limits, were implemented depending on the situation.

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

#### **Strait of Georgia**

During 2009 there were limited non-tidal openings throughout the Strait of Georgia. No directed coho opportunities were permitted in Big Qualicum River.

#### **Johnstone Strait**

In Johnstone Strait, non-tidal openings for coho were initially available on the Campbell/Quinsam River from October 1<sup>st</sup> to December 31<sup>st</sup> where 4 coho were permitted, which included jacks. Other non-tidal opportunities were provided, but limited to where hatchery marked coho were available and limited to 2 per day.

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

During 2009 there was a non-tidal opening for the Somass/Stamp Rivers (Area 23-1) open from August 25, 2009 to December 31, 2009. The daily limit was four salmon per day. Anglers were allowed to retain two coho (marked or unmarked) and two chinook (of which only one may be greater than 77cm in length). The Somass/Stamp Rivers were not monitored by creel survey during 2009.

## 8.4 FIRST NATIONS FISHERIES

### **Somass Economic Opportunity Fishery**

Tseshah and Hupacasath Bands both signed a Fisheries Agreement for chinook, coho and chum. There were directed fishery on both coho and chum salmon in upper Alberni Inlet from mid September through October. The total coho catch in these fisheries was 737.

The remainder of the WCVI First Nations in fisheries statistical Area 21 to 26 reported a total coho catch of 2,626.

### **Lower Fraser**

Total FSC, EO and ESSR catch in 2009 for the Lower Fraser River was 16,754 coho, the majority of which was caught in ESSR fisheries (15,807).

### **Strait of Georgia**

Data are still being compiled on various First Nations catches in the Strait of Georgia, however, the total preliminary catch is estimated to be 5,065 coho, of which 2,458 was caught in FSC fisheries and 2,607 in ESSR fisheries. There were no economic opportunity fisheries.

## 8.5 COMMERCIAL FISHERIES

In 2009, Southern BC commercial fisheries were generally regulated so that impacts on coho, and especially Interior Fraser coho stocks, were minimized. Terminal opportunities to retain coho by-catch during directed chinook and chum fisheries were available to Area B seine, Area D gill net and Area G Troll.

### **WCVI Terminal Area Coho**

In 2009, commercial gill net and seine fisheries occurred in Alberni Inlet while only gill net fisheries occurred in Tlupana Inlet. These fisheries when targeting hatchery chinook returns encounter and retain coho by-catch. In 2009 the total coho by-catch in commercial net fisheries on the WCVI was 909.

In years of chum abundance, coho by-catch is also retained in targeted chum gill net fisheries on the WCVI in Fisheries Statistical Areas 23, 24 and 25. In 2009 because of low chum abundances there were no chum fisheries on the WCVI.

Area G troll fisheries were permitted to retain incidentally caught SHM coho in October 2008 and in any fisheries that would occur until January 2009 and from the middle of September until the end of September 2009. For the 2008/09 AABM chinook fishing periods, the estimated total coho retained was 1 and releases during this period were estimated at approx. 12,667.

## 8.6 STOCK STATUS

### **Upper Fraser**

Field programs to estimate escapements have just concluded, analysis is underway, and only very preliminary results are available. Early returns to the Interior Fraser River indicate an improvement over 2008 returns and likely a significant improvement over the 2006 parent brood escapements. Very preliminary data indicate returns to the entire Interior Fraser River may range between 20,000 and 30,000; however, preliminary estimates are not yet available for many systems, and near final estimates will not be available until late January or early February, as some field studies are not yet completed.

### **Lower Fraser**

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

#### ***Lower Fraser River***

Escapement studies are currently underway, and many populations have not reached peak spawning at the time of writing. Preliminary escapement estimates for the surveyed systems should be available by early February, 2010.

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

#### ***Howe Sound/Squamish River***

Assessments for Howe Sound and Squamish River are incomplete at this time. Tenderfoot hatchery staff will be taking brood stock until February, 2010.

#### ***Burrard Inlet***

An assessment of the returns to Capilano Hatchery is not yet complete, and therefore, the 2010 abundance and status of this stock group is not known at this time.

#### ***Boundary Bay***

Community-run SEP projects contribute significantly to coho returns to this sub-area. The 2009 data will not be available until late February 2010.

## **Strait of Georgia**

The observed 2008 marine survivals for hatchery Coho were similar to the previous year (0.3% - 0.7% hatchery) and lower for wild Coho (0.7%) These levels remain very low. The forecast models predicted continuing low levels of marine survival in 2009, 0.2% - 0.7% for hatchery stocks and 1.4% for wild stocks.

### ***Hatchery stocks***

The 2009 coho escapement estimate to Puntledge River and Lang Creek were substantially higher than the previous year (2008) and the previous brood return (2006). Conversely, Qualicum River, and Goldstream Hatcheries saw similar escapements than the previous year and previous brood year.

### ***Wild stocks***

There are two wild indicators in the Strait of Georgia, at Black Creek and Myrtle Creek.

### **Myrtle Creek**

The Myrtle Creek escapement is estimated to be 25 adults which is much higher than last year (10) and similar to the previous brood return in 2006 (21). The fence count was hampered by several high water events however bypass coho were monitored throughout the event.

### **Black Creek**

Creek conditions throughout September and half way through October were very dry with extremely low water levels. Several reports of coho holding in the approach waters/estuary indicated a significant burst of fish migration would occur as soon as some precipitation occurred. Adequate discharge due to an initial rainfall event that started on October 16<sup>th</sup> brought about the beginning escapement of adult coho to Black Creek. Two pulses of fish migration, one in the third week of October (16<sup>th</sup>-20<sup>th</sup>) and another in late October and early November (Oct 29<sup>th</sup> – Nov 6<sup>th</sup>) made up the bulk of adult coho escapement to Black Creek in 2009. Heavy rainfall beginning on the 29<sup>th</sup> of October and continuing until mid November caused water levels to rise to a point on Nov 6<sup>th</sup> where the fence was under water and remained that way until almost the end of the month. A total of 3,316 coho were enumerated through the fence; of those 1,053 (32%) were male, 1,531 (46%) were female, and 732 (22%) were jacks. The deadpitch program commenced on November 17<sup>th</sup> and recovered a total of 362 coho carcasses of which 231 had a floy tag number and/or opercular punch (therefore sampled at the fence) and 131 had neither a tag nor an opercular punch. Both fence enumeration and deadpitch programs have concluded for the year. Analysis of data is still in progress and a final escapement estimate is currently unavailable.

Overall, stock status of Coho in the Strait of Georgia continues to be very low. The observed Creel CPUE from the west coast of Vancouver Island indicated an increase in the number of Coho present in those waters. This was confirmed by the early escapement data from monitored systems. This population increase was likely due to an improvement in the marine survival however actual survival rates will not be determined until early 2010.

### **West Coast Vancouver Island**

There are two indicators in WCVI, Robertson Creek Hatchery (RCH) and Carnation Creek. Both are located in DFO Statistical Area 23. In 2009, preliminary escapement to Robertson Creek Hatchery is estimated at about 69,000, which would suggest coho from the 2006 brood year experienced about an average survival rate. Escapement to the Carnation Creek indicator system was also above the long term average. Similarly, preliminary estimates of escapement to other WCVI systems suggest average to above average escapement. Although recent year WCVI coho escapements are about average, the overall abundance of WCVI coho has been low given the relatively limited harvest of these populations relative to historic periods. Therefore, the status of WCVI coho remains low to moderate at best.

### **Johnstone Strait and Mainland Inlet**

The Keogh River plays an important role as the wild coho indicator stock for the Upper Johnstone Strait Area. Smolt production in 2008 was around 72,000, significantly higher than the long term average of 55,000. Preliminary indication from the resulting adult escapement in 2009 is that marine survival has improved relative to the last few years (~5-6% smolt to adult survival). Smolt production from the Keogh in 2009 of approximately 77,000 was again significantly higher than the long term average.

The marine survival indicator for Area 13 is the Quinsam River Hatchery. Early information from Quinsam indicated improved smolt to adult survival relative to the last few years.

Current extensive escapement reports are also indicating higher than expected returns of coho throughout Johnstone Strait and the Mainland Inlets. At this time it is still too early to provide an indication of stock status.

## **9 JOHNSTONE STRAIT CHUM**

### **9.1 OBJECTIVES AND OVERVIEW**

The Johnstone Strait chum fisheries primarily target chum that spawn in Johnstone Strait, Strait of Georgia, and Fraser River areas. In order to improve the management

of Johnstone Strait chum fisheries and to ensure sufficient escapements, a 20% fixed exploitation rate strategy, independent of run size, was implemented in 2002 for Study Area Chum in Johnstone Strait. This year constituted the 7th year of the fixed exploitation rate harvest strategy. Of the 20% exploitation rate, 16% is allocated to the commercial sector; the remaining 4% is set aside for the First Nations and recreational harvesters, and to provide a buffer to the commercial exploitation. Since the implementation of this management strategy, annual fisheries have been planned well in advance of the chum return.

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

In 2009, the Area B (seine) and Area D (gill net) fisheries did not opt to participate in chum demonstration fisheries; full derby fisheries were held for both gear types.

The Area H (troll) fleet opted to participate in an effort based ITQ demonstration fishery for the second year (2008 and 2009). A total number of 325 boat-days were modeled to correspond to the troll share of the harvest rate described above, and two time periods were defined to spread the catch over a 36 day period. Each Area H licence holder was assigned 3 boat-days in period 1 and 2 boat-days in period 2. Boat-days from each period could be transferred to other licence holders within each period but not between periods. A maximum of one third of the total number of boat days in period 1 could be carried over to fishing period 2, provided that day was not fished.

Data are still being compiled and analyzed to determine the final harvest rate estimates.

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

## **9.2 FIRST NATIONS**

First Nations fisheries for chum were not restricted. The preliminary estimated catch by First Nations in the Johnstone Strait area is estimated at 12,341 chum salmon.

## **9.3 MARINE RECREATIONAL**

The marine recreational daily limits for chum are 4 per day and a possession limit of 8. The recreational catch in Johnstone Strait, Areas 12 and 13, was estimated at 109 chum. This estimate represents catch from July through September from a directed creel survey. This year there was no creel survey in the month of October where the majority of chum catch occurs in Area 13. The catch in 2008 was estimated at 2,892 chum.

## 9.4 NON-TIDAL RECREATIONAL

There were no directed chum fisheries in non-tidal waters in the Johnstone Strait area.

## 9.5 COMMERCIAL

Seine, gillnet and troll fisheries were conducted in Johnstone Strait between September 28 and November 5. The total commercial chum catch from Johnstone Strait is estimated at 510,708 pieces. A description of each fishery is provided below.

There was a general requirement to apply selective fishing techniques, including area and gear restrictions and the mandatory use of revival tanks in all commercial fisheries. Catch monitoring included requirements for catch reporting and mandatory logbooks.

### Area B Seine

In 2009, there were two commercial seine openings for chum salmon in portions of Areas 12 and 13. The first opening took place on October 5<sup>th</sup> for 12 hrs, the second on October 19<sup>th</sup> for 10 hrs. The total Area B catch is estimated at 316,185 chum.

### Area D Gillnet

In 2009, there were three commercial gillnet openings for chum salmon in portions of Areas 12 and 13. The first opening took place from 1600h September 30 to 0900h October 2; the second opening was from 1600h October 8 to 0900h October 10; and, the third opening was from 1600h October 22 to 1700h October 24. The total Area D catch is estimated at 126,625 chum.

### Area H Troll

In 2009 there were two commercial troll fishing periods. Period 1 of the effort-based troll ITQ fishery opened on September 28<sup>th</sup> and closed on October 11<sup>th</sup>, although it was closed for a 24 hr period on October 5 during the commercial seine opening. A maximum of 40 vessels participated in the opening and the total catch was 29,394 chum. Period two opened on October 13<sup>th</sup> and ended on November 5<sup>th</sup>, although it was closed for a 24 hr period on October 19<sup>th</sup> during the commercial seine opening. A maximum of 37 vessels participated in the second opening and the total catch was 38,504. In total, 349 boat days were fished with a total catch of 67,898 chum.

**Table 9-1: Johnstone Strait Commercial Catch and By Date and Gear Type**

**Johnstone Strait Fisheries (Areas 12  
and 13)**

<b>Fishery Date</b>	<b>Gear type</b>	<b>Effort</b>	<b>Catch</b>
Oct 5	B - SN	102	170,200
Oct 19	B - SN	105	145,985
Sept 30 to Oct 2	D- GN	130	27,900
Oct 8 to 10	D- GN	173	63,425
Oct 22 to 24	D- GN	111	35,300
Sept 28 to Oct 11	H-TR	2-31	29,394
Oct 13 to Nov 5	H-TR	2-26	38,504

**Table 9-2: Johnstone Strait Fisheries (Area 12 and 13)**

<b>Gear Type</b>	<b>Total Catch</b>	<b>% of catch</b>	<b>J.S. Allocation Plan</b>
<b>Area B</b>	316,185	69.1%	77%
<b>Area D</b>	126,625	24.8%	17%
<b>Area H</b>	67,898	13.3%	6%
<b>Total Catch:</b>	<b>510,708</b>		

### **Nimkish River**

Conditions for monitoring chum returns to the Nimkish watershed have been hampered by heavy rain events during November. Chum return estimates to the Nimkish River are incomplete at this time but appear to be low. There was no chum harvest other than removals for Nimkish River Hatchery brood stock.

## **9.6 STOCK STATUS**

### **Mixed Stocks**

The pre-season expectation for Study Area chums suggested average to below average returns to the area. The main component to the return was expected to be the Fraser River stocks, although both Fraser and non-Fraser components of the return were originating from below average brood returns in 2005.

The Johnstone Strait test-fishery provided timing and spread information of the 2009 return which is important for assessing the performance of the 20% harvest strategy implemented in the Johnstone Strait fisheries. Age composition derived from the test-fishery samples demonstrated a dominant 4-year old brood component as expected. Preliminary information on escapements and catches to date suggest returns were average to below average for Inside Study Area chum stocks. In-season information is still being collected and analyzed in regards to total stock size.

### **Terminal returns**

Most summer run chum returns in Area 12 were varied, with stronger than expected returns to the Viner and stable returns to other systems (Ahta and Ahnuhati Rivers). Summer chum returns to the Orford River (Bute Inlet) were well below brood returns, as has been the case in recent years.

It is still too early to assess the status of fall run chum in the Johnstone Strait Area. Preliminary information indicates returns are average to below average for a variety of systems within the area. Initial observations on the Nimpkish River, under poor assessment conditions, indicate some abundance of returning chum. The assessment of the Nimpkish system will continue into late December.

## **10 FRASER RIVER CHUM**

### **10.1 OBJECTIVES AND OVERVIEW**

The escapement objective for Fraser River chum is 800,000. Conservation measures for co-migrating stocks of concern delays in-river chum fisheries from the peak of the run (mid-October) to the end of the run (late October – early November). Chum escapements to the Fraser have been estimated to be above the escapement objective for return years 1998 to 2008, with the exception of the 2000 return. Fraser River chum salmon spawning locations are predominately located in the Fraser Valley downstream of Hope, BC; no spawning locations have been identified upstream of Hells Gate. Small numbers of short fishery openings have prevented adverse impacts on local chum populations.

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

### **10.2 GENERAL OVERVIEW OF FISHERIES**

Fraser River chum are harvested in Johnstone Strait, in the Strait of Georgia, in Juan de Fuca Strait, in US waters of 7 and 7A, as well as in the Fraser River.

Fraser River chum returns coincide with Interior Fraser coho and Interior Fraser steelhead runs. Therefore, commercial Gillnet Chum fisheries in the Fraser River are

severely limited by conservation concerns for Interior Fraser (including Thompson River) coho and Interior Fraser steelhead.

### **10.3 FIRST NATIONS**

FSC gill-net fisheries commenced October 10 (below Mission) following closures to protect co-migrating Interior Fraser coho. The estimated catch from all fisheries (FSC and economic opportunity) below Sawmill Creek to the end of November is 81,275. The FSC catch was 13,118 and the economic opportunity catch was 68,157. ESSR harvests are ongoing for 2009. As of December 11<sup>th</sup> there have been 8,458 chum reported harvested through ESSR fisheries.

### **10.4 RECREATIONAL**

In 2009, the major Fraser River watershed recreational salmon fisheries impacting chum salmon were assessed, including significant salmon fisheries occurring in the lower Fraser River mainstem and the Chilliwack River (a tributary to the Fraser River in the lower Fraser Valley). Two minor recreational fisheries that occurred on the Harrison River and the Nicomen Slough/Norrish Creek drainage were also assessed (both are tributaries 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 May to December with a bag limit of 2 chum per angler per day. In 2009, this mainstem fishery was assessed from May 1<sup>st</sup> to October 15<sup>th</sup>; preliminary estimates of 44 and 890 chum were kept and released, respectively. The Chilliwack River recreational fishery was open to the retention of chum salmon from July to March. The Chilliwack River fishery was assessed from September 15<sup>th</sup> to November 15<sup>th</sup> in 2009; preliminary estimates of 2,404 and 11,238 chum were kept and released, respectively.

The Harrison River recreational fishery was open to the retention of chum salmon year round. In 2009, the assessment of this fishery began on September 1<sup>st</sup> and was ongoing at the time of this report. In-season estimates to Nov. 15<sup>th</sup> are 742 and 8,839 chum kept and released, respectively. Although historically not directed at chum, Nicomen Slough was open to the retention of chum salmon year round. The Nicomen Slough/Norrish Creek fishery was assessed from October 10<sup>th</sup> to November 30<sup>th</sup> in 2009. In-season estimates to November 15<sup>th</sup> of 10 and 1,116 chum were kept and released, respectively.

In total, for assessed recreational fisheries occurring in the Fraser River in 2009, preliminary estimates of 3,200 and 22,083 chum were kept and released, respectively.

### **10.5 COMMERCIAL**

Chum test fishing began on September 1<sup>st</sup> and was conducted every alternate day until October 21<sup>st</sup> when chinook test fishing was terminated and chum test fishing then continued on a daily basis. Chum catches in the 6.75” chum test net from September 1<sup>st</sup> to November 23rd, representing 56 test fishing days, totalled 7,003 chum.

Commercial fisheries in the lower Fraser River (below Mission) were closed from September 8<sup>th</sup> to October 9<sup>th</sup> to protect Interior Fraser coho. Further restrictions on commercial fisheries were in place until late October to protect Interior Fraser steelhead. Due to these constraints, only one Area E (gill net) commercial opening took place in Area 29 during the 2009 fishing season. This opening occurred on October 27<sup>th</sup> for 24 hours in portions of Area 29. The total catch from this opening was estimated at 42,000.

## **10.6 STOCK STATUS**

Terminal run-size to the Fraser River (at Albion) is estimated in-season using a Bayesian model (CSAS Res.Doc. 2000/159, Gazey and Palermo) and Albion test fishing catch per unit effort data (CPUE). In 2009, a terminal run-size of 1.725 million was estimated using Albion CPUE data to November 3rd.

Fraser River chum return to many spawning locations in the lower Fraser River. Spawning escapement to five of the largest chum producing populations and to a small number of lesser producing populations is assessed annually. Projects assessing the escapements to these systems in 2009 are ongoing and therefore estimates are currently not available.

While there have been substantial returns in recent years (e.g. 1998) concern has been raised over the recent timing of the run; the late run component appears to be truncated compared to historical run distribution. In the past, chum returned to the Fraser River and its tributaries well into December. The run is now predominately over by mid-late November. Additionally, although estimated escapement to the Fraser continues to be greater than the 800,000 objective (e.g. the 2008 preliminary escapement was estimated at approx. 1M); estimated escapement over the last 10 years is trending downwards. Whether these observations are the result of fishing practices, habitat changes to the spawning areas that were used by late returning fish (e.g. mainstem spawning areas), freshwater production changes, marine environment affects or other currently unidentified factors, has yet to be determined.

## **11 STRAIT OF GEORGIA CHUM**

### **11.1 OBJECTIVES AND OVERVIEW**

Strait of Georgia chum fisheries consist of terminal opportunities for chum returning to their natal spawning streams. Many of the potential terminal fishing areas have

enhancement facilities and/or spawning channels associated with the rivers. Terminal fishery strategies consist of monitoring and assessing stocks (escapement and returning abundance) with the objective of ensuring adequate escapement and providing harvest opportunities where possible. Stock assessments may include test fisheries, escapement enumeration, and over flights. In some areas where stocks receive considerable enhancement or where stocks have above average productivity, limited fishing may occur prior to major escapement occurring.

#### **Area 14**

This fishery is directed at the enhanced stocks of three systems: Puntledge, Qualicum and Little Qualicum Rivers. The Qualicum River is often referred to as the 'big' Qualicum River, to better distinguish it from the Little Qualicum River. 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 river systems. The escapement goals for the three river systems are 60,000 for Puntledge River, 130,000 for Little Qualicum River, and 100,000 for Qualicum River, adding up to an overall escapement goal of 290,000 chum not including enhancement facility requirements (about 10,000 chum bringing the total escapement goal to 300,000).

This fishery has a specific harvest strategy, implemented since 1981. The strategy consists of limited early harvest prior to escapement occurring. The allowable early chum harvest is calculated from 65% of the predicted surplus (terminal return run size minus escapement (300,000) and buffer 100,000. The buffer safeguards against errors in forecast stock abundance. The surplus within the 100,000 buffer and remaining 35% of the surplus may be harvested provided that escapement targets have been achieved. Since 2002, Puntledge River stock returns have been above average resulting in terminal fisheries focusing on this slightly earlier timed stock. This fishery continued in 2009.

#### **Area 16**

This fishery targets wild chum stocks returning to river systems in the Jervis Inlet area. The main systems are Tzoonie, Deserted and Skwawka Rivers. The overall escapement goal for Jervis Inlet streams is 110,000. These terminal fisheries occur when the individual or combined escapement goals have been assured. Fishing opportunities do not occur on a regular basis. There were no fisheries in Area 16 in 2009

#### **Area 17**

This fishery is a terminal fishery targeting Nanaimo River stocks. The Nanaimo River chum stocks are supplemented by the Nanaimo River Hatchery (supplementation is on a sliding scale), where increased enhancement occurs during poor escapement years. Escapements fluctuate annually and fishery openings are planned in-season based on escapement estimates. The overall escapement goal for the Nanaimo River is 60,000.

### **Area 18**

This fishery is directed primarily at Cowichan River stocks, however Goldstream chum are also harvested. Fishery openings in mid to late November are limited to Satellite Channel in order to minimize impacts on the earlier timed Goldstream stocks. Chemainus River stocks could also be impacted if the fisheries are earlier in November, but likely to a lesser extent.

Fishery openings are planned in-season based on escapement estimates from a DIDSON counter and information from a test fishery. Management is also guided by advice from the Cowichan Fisheries Roundtable (the Roundtable) and the Mid Vancouver Island (MVI) Chum Subcommittee. The overall escapement goal for the Cowichan River is currently 140,000 Chum counted by the DIDSON counter.

### **Area 19**

This fishery is directed primarily at Goldstream River stocks although some Cowichan River Chum are also harvested. Fishery openings set for mid to late November are limited to the portion of Saanich Inlet (Sub area 19-8) which is outside or to the north of Squally Reach. This area restriction is implemented to minimize impact on Goldstream chinook and coho stocks.

Fisheries are planned in-season based on escapement estimates and a test fishery. Area 19 falls under the same management regime as Area 18. The overall escapement goal for the Goldstream River is 15,000.

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

## **11.2 FIRST NATIONS**

The preliminary estimated catch by First Nations in the Strait of Georgia is estimated to be approximately 5,478 chum; additional catch data are currently being compiled. In addition, there was an ESSR fishery at the Puntledge hatchery where approximately 2,856 chum were harvested.

## **11.3 RECREATIONAL**

The recreational creel survey extends from the marine area of Discovery Passage, (outside of Campbell River) to Saanich Inlet. The majority of recreational effort directed at chum salmon occurs in the Discovery Passage area. The total creel catch estimate for the recreational fleet in the Strait of Georgia area is approximately 1,000 chum, most of which were caught in Area 13 (reported in the tables as Johnstone Strait) during the month of October.

Tidal recreational fisheries are subject to the normal daily and possession limits (daily limit four per day/possession eight) and are open throughout the area.

Occasionally recreational in-river fisheries occur where surpluses or target escapements will be met. These fisheries are almost exclusively where enhancement facilities are present.

#### **11.4 COMMERCIAL**

Strait of Georgia chum are managed as a component of “mixed-stock harvest strategy” chum for Johnstone Strait and the northern Strait of Georgia. Fishing opportunities are guided by commercial allocation targets for chum salmon in the south coast. Management is guided by advice from the MVI Chum Subcommittee.

Strait of Georgia commercial chum fisheries for seine, gillnet and troll were conducted between October 13<sup>th</sup> and November 16<sup>th</sup>. The total commercial chum catch from Strait of Georgia is estimated at 59,116 pieces (see table 11.1 below). A description of each fishery is provided below.

##### **Area 14**

Area D gill net openings occurred on October 13<sup>th</sup> to 16<sup>th</sup>, October 19<sup>th</sup> to 21<sup>st</sup>, October 22<sup>nd</sup> to 23<sup>rd</sup>, October 29 to November 1<sup>st</sup> and November 3<sup>rd</sup> to 5<sup>th</sup> in upper Area 14 (Puntledge area). There were no openings in lower Area 14 (Qualicum and Little Qualicum areas) due to low escapements. There was a total of 11 days fished for a catch of 46,609 chum. The troll fishery opened from October 13<sup>th</sup> to November 6<sup>th</sup> in the same area as for gill net; there was almost no effort nor catch in this fishery. An Area B limited opportunity seine fishery occurred on October 28 to November 1<sup>st</sup>, and on November 3<sup>rd</sup> to 5<sup>th</sup> with a total catch of approximately 2,030 chum.

##### **Area 16 – Jervis Inlet**

No commercial fisheries occurred in Jervis Inlet as no surplus was identified.

##### **Area 17 - Nanaimo**

Two gill net openings occurred for 48 hours on November 1<sup>st</sup> and November 7<sup>th</sup>, with a total catch of 6,731 chum.

### Area 18 - Cowichan

There were 3 gill net openings in Area 18, one on November 10<sup>th</sup>, 11<sup>th</sup> and the 16<sup>th</sup> for 12 hours. The total estimated catch is approximately 3,731 chum.

### Area 19 - Goldstream

No commercial fisheries occurred in the Goldstream area as there was no surplus available for commercial fisheries.

**Table 11-1: Strait of Georgia Commercial Chum Catch by Date and Gear Type**

Fishery Date	Gear type	PFMA	Effort	Catch
Oct. 13-16	D	14	69	19,760
Oct. 13 - Nov. 5	H	14	1	15
Oct. 19-21	D	14	99	19,654
Oct. 22-23	D	14	20	574
Oct. 29-Nov. 1	D	14	51	4,642
Oct. 28	B	14	3	1,830
Oct. 29-Nov.1	B	14	0	0
Nov. 1-3	E	17	51	4,603
Nov. 3-4	B	14	1	200
Nov. 3-5	D	14	32	1,979
Nov. 7-9	E	17	43	2,128
Nov. 10	E	18	42	2,110
Nov. 11	E	18	25	1,216
Nov. 16	E	18	15	405

## 11.5 STOCK STATUS

A below average chum return to the Strait of Georgia was forecast for 2009. The forecast was based on below average brood year escapements (primarily 2005) and anticipated average to below average survival. Historically however, chum returns have been highly variable relative to brood year escapements. Conditions for returning chum migration and spawning were good with water flows ample for most of the season. Spawning escapements continue to be monitored and are currently being compiled. To date, returns have been variable with some areas achieving their escapement goal while others are below target (Table 11.2), although estimates are preliminary and subject to change.

Two marine test-fisheries were conducted, one off the Cowichan River and the other adjacent to the Goldstream River. The Cowichan seine test-fishery commenced on October 27<sup>th</sup> and continued until November 30<sup>th</sup> for a total of 6 fishing days. Test catches totaled 1,054 chum and 20 coho. The Goldstream River (Saanich Inlet) seine test-fishery commenced on October 28<sup>th</sup> and continued until December 1<sup>st</sup> for a total of

6 days. Test catches totaled 311 chum and 0 coho. Each test fishing day generally consists of six sets; all captured fish were released.

Spawning escapements continue to be monitored and are currently being compiled.

**Table 11-2: Strait of Georgia Preliminary Spawning Escapements**

River System	Preliminary Escapement	Escapement Goal
Puntledge	76,000	60,000
Little Qualicum	37,000	130,000
Qualicum	36,500	100,000
Nanaimo	58,000	60,000
Cowichan	140,000	140,000
Goldstream	18,000	15,000

## 12 WEST COAST VANCOUVER ISLAND CHUM

### 12.1 OBJECTIVES AND OVERVIEW

Commercial chum salmon fisheries occur from late September to early November in WCVI fishing areas in most years. The majority of chum fishing on WCVI takes place adjacent to Nitinat Lake (Area 21), and in Nootka Sound and Esperanza Inlet (Area 25). Commercial fisheries target both wild chum stocks returning to local streams, and enhanced chum stocks from Nitinat and Conuma hatcheries.

With the exception of Nitinat and Tlupana Inlet where hatchery stocks dominate, WCVI chum fisheries are managed to a 20% harvest rate. Fishery managers consider run timing, fishing effort, and fleet distribution when implementing in-season management measures. In-season management measures, such as limiting fishing effort to one or two days per week, are implemented to ensure that target harvest rate objectives are not exceeded.

Both the Area D and Area E commercial gillnet fleets, and the Area B commercial seine fleet target WCVI chum. Seine opportunities generally occur once surplus to escapement/brood requirements have been identified (Nitinat and Conuma).

There were no commercial net fisheries on WCVI in 2009 due to very low abundance of most wild and hatchery stocks. Since 2004, there were limited-fleet gillnet fisheries in both Esperanza Inlet (Area 25) and Barkley Sound (Area 23). A limited-fleet assessment fishery was initiated for Clayoquot Sound (Area 24) in 2007 and operated again in 2008.

First Nations FSC fisheries remain a priority, and primarily occur in terminal areas. FSC fishing effort and catch was approximately 1,700 for WCVI in 2009. An ESSR

fishery, operated by the Ditidaht First Nation, took place at Nitinat Lake targeting hatchery surplus production.

In-river recreational fisheries generally have low effort, but recently effort has increased in some terminal area rivers (i.e. Nitinat River). Directed effort and catch of chum in recreational marine fisheries off WCVI is relatively low.

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

## **12.2 FIRST NATIONS**

The Ditidaht First Nation conducts FSC and ESSR fisheries in Nitinat Lake and at Nitinat hatchery. In 2009 the FSC chum harvest was 900 and ESSR chum harvest was 14,491.

Tseshah and Hupacasath First Nations signed an Economic Opportunity Fisheries Agreement for chinook, coho and chum. Combined harvest was 1,332 chum during directed FSC chum and coho fisheries.

## **12.3 RECREATIONAL**

The WCVI recreational fishery is open year-round with a limit of four (4) per day. WCVI recreational anglers kept approximately 87 chum during the 2009 WCVI sport fishery.

## **12.4 COMMERCIAL**

### **Nitinat**

There was no commercial fishery in 2009 due to lower than expected chum abundance. The Nitinat commercial chum fishery is typically the largest on the west coast and targets returning Nitinat River hatchery stocks. The fishing period is generally October 1<sup>st</sup> to November 15<sup>th</sup>. The fishery is managed to achieve a minimum escapement target of 225,000 and maximum escapement target of 325,000 chum salmon. The commercial TAC is based on the pre-season forecast.

This fishery has provided opportunities for both seine and gill net fleets. Gill net and seine fishing opportunities are dependent on reaching established in-lake escapement milestones by specific dates. Fleet size has varied over the past 15 years, largely due to pre-season forecasts and fish value. The size of the gill net fleet in the 1990s ranged as high as 240 vessels. From 2004 to 2008 the gill net fleet size fluctuated between 30 and 90 vessels. The seine fleet size typically varies from 20 to 100 vessels.

In-season abundance observations by a test-fishing vessel, by First Nations collecting broodstock for Nitinat hatchery, and by the hatchery staff counting adult chum in

Nitinat River concurred on a maximum return of approximately 85,000 chum. No commercial harvest opportunity was provided at this run size. Bi-weekly calls were held with industry representatives to update on test-fishing results.

#### **Areas 23, 24 and 25 Chum Fisheries**

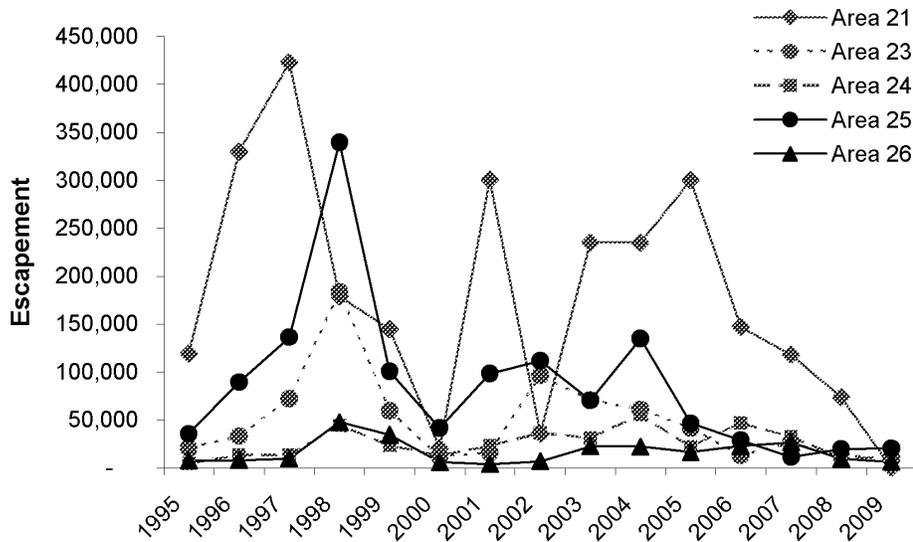
Commercial chum fisheries in Areas 23, 24 and 25 are typically managed using weekly in-season effort estimates. This harvest rate approach is designed to maintain a harvest rate of 20% or less on all stocks.

In 2009, the Department met with Area D advisors to discuss the probability of no gill net openings in 2009 on WCVI chum stocks due to low predicted abundance. Additional funds were provided to the Charter Patrol in Area 25 to increase observations of escapement in all known chum streams in Nootka Sound and Esperanza and Muchalat Inlets. The Department's Stock Assessment staff and contractors provided escapement counts for chum in Areas 23, 24 and 25. Escapements in most systems were lower than predicted. There was an insufficient abundance of Conuma River chum to trigger a gill net fishery in Tlupana Inlet.

### **12.5 STOCK STATUS**

All salmon escapement estimates from extensively surveyed WCVI streams are preliminary. Peak live plus dead observations indicate escapement of chum to most natural systems was similar in 2009, relative to 2008, in the WCVI conservation unit (CU). Overall, preliminary return estimates across PFMA's were only 20 to 40% of long term (1995 – 2008) average returns. Similarly, the Nitinat hatchery (Area 21/22) total return is currently estimated at about 85,000, which is well below average, and the 2008 return of 130,000. Pending further analysis of catch composition and escapement data, the status of chum returns in 2009 to WCVI populations is low to very low across the WCVI CU. Low returns were influenced by poor returns of age 4 and 5 fish, resulting from poor survivals from the 2004 and 2005 sea entry years.

**Figure 12-1: Escapement of WCVI Chum Stocks, by PFMA and Return Year (1995-2009)**



### 13 APPENDICES

Note: Johnstone Strait includes Areas 11-13  
 WCVI includes Areas 21-27 and 121 to 127  
 Strait of Georgia includes 14-18 (and 19A which has zero catch) and Areas 28, 29 marine only.  
 Juan de Fuca includes Area 19 and 20

**Appendix 1: Catches in Canadian Treaty Limit Fisheries, 1995 to 2009 (Preliminary)**

Fisheries/Stocks	Species	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995
Stikine River (all gears)	Sockeye	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	53,467
	Coho	5,061	2,398	47	72	276	275	190	82	233	301	181	726	401	1,404	3,418
	Chinook-1g Chinook-jk	2,330 714	7,860 1,067	10,576 1,735	15,776 2,078	18,997 2,177	3,857 2,574	1,362 578	1,396 1,052	1,480 103	1,480 103	3,086 628	2,916 1,264	2,164 423	4,483 286	2,471 421
Taku River (commercial gillnet)	Sockeye	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	32,640
	Coho	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	13,629
	Chinook-1g Chinook-jk	7,031 1,183	1,184 330	862 337	7,312 198	7,534 821	2,074 334	1,894 547	1,894 547	1,561 291	1,458 118	1,576 87	908 257	1,107 227	2,731 84	3,331 144
Areas 3 (1-4)* (commercial net)	Pink	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	2,613,000
Area 1 (commercial troll)	Pink	60,402	29,295	61,276	34,854	39,430	27,751	98,347	41,418	175,000	28,295	25,000	0	261,000	732,000	1,284,000
North Coast** (troll + sport)	Chinook	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	119,100
West Coast Vancouver Island (troll + sport + FN)	Chinook	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	3677	86,230
	Sockeye	53,191+	89,704+	87,921 +	103,978 +	143,614 +	168,837+	152,677 +	134,308+	78,502+	64,216+	6,906+	6,678+	53,396+	4+	81,258+
	Pink	68,775+	50,319+	46,229 +	36,992 +	52,177	42,038	27,029	31,516	23,964	24,923	21,634	4,177	6,400	3,673	4,972
Fraser River Canadian Commercial Catch	Sockeye	0	16,942	0	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	903,000
Fraser River U.S. Commercial Catch	Pink	1,442,840	0	333,300	68,325	338,000	0	1,149,189	0	579,000	0	3,000	0	3,660,000	0	3,777,000
Vancouver Island (commercial troll)	Sockeye	0	49,800	3,900	701,300	0	192,200	244,000	434,600	240,000	494,000	41,000	707,000	1,578,000	257,000	415,000
	Pink	2,726,230	0	377,600	0	0	0	773,000	0	427,000	0	3,000	0	1,565,000	0	1,919,000
West Coast Vancouver Island (commercial troll)	Coho	0	369	1,424	2,399	5,989	0	0	0	0	0	0	0	0	761,000	1,345,000
Johnstone Strait (clockwork catch)***	Chum	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	269,000

\*AREA 5-11 CATCHES INCLUDED PRIOR TO 1995 AND EXCLUDED FROM 1995-1998 INCLUSIVE. NOT PART OF 1999 ANNEX IV PROVISIONS.

\*\* NORTH COAST CATCH EXCLUDES TERMINAL EXCLUSION CATCHES OF 6,000 ('91), 6,100 ('92), 7,400 ('93), 6,400 ('94), 1,702 ('95), 16,000 ('96), 5,943 ('97), and 2,182 in 1998. NO TERMINAL EXCLUSION IN THE 1999 AGREEMENT - COVERED UNDER THE AABM ARRANGEMENT; CENTRAL COAST AREAS NOT PART OF 1999 ANNEX IV PROVISIONS.

\*\*\* CANADIAN CATCH INCLUDES COMMERCIAL, FSC AND TEST-FISH CATCHES IN AREAS 11-13 FOR 1991-94 INCLUSIVE, AND IN AREAS 12-13 FOR 1995 TO 2004 INCLUSIVE. 2002-PRESENT, CATCHES FROM FISHERIES MANAGED TO FIXED HARVEST RATE OF 20%.

NOTE 1: WCVI CHINOOK CATCHES FROM 1996-1998 ARE REPORTED BY CALENDAR YEAR; CATCHES FROM 2008-1999 ARE REPORTED BY CHINOOK YEAR (OCT-SEPT).

NOTE 2: 1999 CATCHES ARE REPORTED ACCORDING TO FISHERIES/STOCKS UNDER THE 1999 ANNEX IV PROVISIONS.

## Appendix 2: Preliminary 2009 South Coast Sockeye Catch By Fishery and Area

### SOCKEYE

Fishery	Gear	Fishery (Area)	Numbers		
			Non-Fraser Kept	Fraser Kept	All stocks Released
<b>Commercial</b>	Area G Troll	WCVI AABM Chinook (23 - 27, 123 - 127)	0	0	14
	Area H Troll	Mainland Inlet Pinks (12)	0	0	0
	Area H Troll	MVI Chum (14)	0	0	0
	Area H Troll	Fraser Chum (29)	0	0	0
	Area H Troll	JST Chum (12,13)	0	0	2
	Area H Troll	Fraser Pink (13,18)	0	0	364
	Area H Troll	Fraser Pink (29)	0	0	0
	Area B Seine	Somass Sockeye (23)	15,039	0	0
	Area B Seine	Somass Chinook (23)	0	0	4,841
	Area B Seine	Mainland Inlet Pinks (12)	0	0	0
	Area B Seine	JST Chum (12,13)	0	0	1
	Area B Seine	MVI Chum (18)	0	0	0
	Area B Seine	Fraser Pink (12,13)	0	13	9,978
	Area B Seine	Fraser Pink (29)	0	0	34
	Area D Gillnet	Somass Sockeye (23)	9,213	0	0
	Area D Gillnet	Tlupana Chinook (25)	0	0	0
	Area D Gillnet	Somass Chinook (23)	0	0	69
	Area D Gillnet	Mainland Inlet Pinks (12)	0	0	11
	Area D Gillnet	JST Chum (12,13)	0	0	0
	Area D Gillnet	MVI Chum (14)	0	0	0
	Area E Gillnet	Fraser Chum (29)	1	0	5
	Area E Gillnet	MVI Chum (17/18)	0	0	0
<b>Total Commercial Catch</b>			<b>24,253</b>	<b>13</b>	<b>15,319</b>
<b>Recreational</b>	Sport	Juan de Fuca (19,20)	-	152	1,091
	Sport	Strait of Georgia (14-18,28,29)	-	0	1,095
	Sport	Johnstone Strait (11-13)	-	49	367
	Sport	WCVI - Inside (21-27)	56,500	-	NA
	Sport	Fraser River	0	29	21,213
<b>Total Recreational Catch</b>			<b>56,500</b>	<b>230</b>	<b>23,766</b>
<b>First Nations FSC</b>		Johnstone Strait		10,124	0
		Strait of Georgia	475	20	0
		WCVI	77,547	91	0
		Fraser River	-	59,873	1,315
<b>Total First Nations FSC Catch</b>			<b>78,022</b>	<b>70,108</b>	<b>1,315</b>
<b>First Nations EO</b>		Johnstone Strait		-	-
		Strait of Georgia		-	-
		WCVI	0	0	0
		Fraser River		44	244
<b>Total First Nations EO Catch</b>				<b>44</b>	<b>244</b>
<b>TOTAL - ALL FISHERIES</b>			<b>158,775</b>	<b>70,395</b>	<b>40,644</b>

### Appendix 3: Preliminary 2009 South Coast Pink Catch by Fishery and Area

#### PINK

Fishery	Gear	Fishery (Area)	Numbers	
			Kept	Released
<b>Commercial</b>	Area G Troll	WCVI AABM Chinook (23 - 27, 123 - 127)	98	112
	Area H Troll	Mainland Inlet Pinks (12)	0	0
	Area H Troll	MVI Chum (14)	0	0
	Area H Troll	Fraser Chum (29)	0	0
	Area H Troll	JST Chum (12,13)	1	8
	Area H Troll	Fraser Pink (13, 18)*	16,728	0
	Area H Troll	Fraser Pink (29)*	0	19
	Area B Seine	Barkley Sockeye (23)	0	0
	Area B Seine	Somass Chinook (23)	0	0
	Area B Seine	Mainland Inlet Pinks (12)	0	0
	Area B Seine	JST Chum (12,13)	3	0
	Area B Seine	MVI Chum (18)	0	0
	Area B Seine	Fraser Pink (12,13)*	1,295,095	53
	Area B Seine	Fraser Pink (29)*	98,461	0
	Area D Gillnet	Barkley Sockeye (23)	0	0
	Area D Gillnet	Tlupana Chinook (25)	0	0
	Area D Gillnet	Somass Chinook (23)	0	0
	Area D Gillnet	Mainland Inlet Pinks (12)	746	0
	Area D Gillnet	JST Chum (12,13)	7	4
	Area D Gillnet	MVI Chum (14)	0	0
	Area E Gillnet	Fraser Chum (29)	1	73
	Area E Gillnet	MVI Chum (17/18)	0	0
<b>Total Commercial Catch</b>			<b>1,411,140</b>	<b>269</b>
<b>Recreational</b>	Sport	Juan de Fuca (19,20)	50,917	15,560
	Sport	Strait of Georgia (14-18,28,29)	2,595	1,093
	Sport	Johnstone Strait (11-13)	38,897	17,118
	Sport	WCVI (21-27, 121-127)	924	738
	Sport	Fraser River	66,093	272,189
<b>Total Recreational Catch</b>			<b>159,427</b>	<b>306,698</b>
<b>First Nations FSC</b>		Johnstone Strait	22,501	0
		Strait of Georgia	211	0
		WCVI	133	0
		Fraser River	1,893	217
<b>Total First Nations FSC Catch</b>			<b>24,738</b>	<b>217</b>
<b>First Nations EO</b>		Johnstone Strait	-	-
		Strait of Georgia	-	-
		WCVI	-	-
		Fraser River	512,185	61,265
<b>Total First Nations EO Catch</b>			<b>512,185</b>	<b>61,265</b>
<b>First Nations ESSR</b>		Johnstone Strait	-	-
		Strait of Georgia	-	-
		WCVI	-	-
		Fraser River	12,312	0
<b>Total First Nations ESSR Catch</b>			<b>12,312</b>	<b>0</b>
<b>TOTAL - ALL FISHERIES</b>			<b>2,119,802</b>	<b>368,449</b>

\* Note: includes non-Fraser pink catch

**Appendix 4: Preliminary 2009 South Coast AABM Chinook Catch By Fishery and Area**

**AABM Chinook**

PST Regime	Fishery	Month	Numbers	
			Kept	Released
WCVI-AABM	Area G Troll	Oct-08	1,882	758
		Nov-08	1,209	157
		Dec-08	1,107	136
		Jan-09	3,394	351
		Feb-09	1,540	134
		Mar-09	586	13
		Apr-09	3,616	87
		May-09	18,062	1,144
		Jun-09	12,165	1,169
		Jul-09	0	0
		Aug-09	9,630	801
	Sep-09	0	0	
<b>Troll Total</b>			<b>53,191</b>	<b>4,750</b>
<b>Sport Total</b>			<b>68,775</b>	<b>35,584</b>
First Nations	Johnstone Strait			
First Nations	Strait of Georgia			
First Nations	WCVI Offshore		3,381	0
First Nations	WCVI Inshore			
First Nations	Fraser River			
<b>First Nations Total</b>			<b>3,381</b>	<b>0</b>
<b>All Total</b>			<b>125,347</b>	<b>40,334</b>

## Appendix 5: Preliminary 2009 South Coast ISBM Chinook Catch By Fishery and Area

### ISBM CHINOOK

Fishery	Gear	Fishery (Area)	Numbers	
			Kept	Released
ISBM	Area G Troll	WCVI Chinook	0	0
	Area H Troll	Mainland Inlet Pinks (12)	0	0
	Area H Troll	MVI Chum (14)	0	0
	Area H Troll	Fraser Chum (29)	0	0
	Area H Troll	JST Chum (12,13)	0	10
	Area H Troll	Fraser Pink (13,18)	0	21
	Area H Troll	Fraser Pink (29)	0	1
	Area B Seine	Barkley Sockeye (23)	0	0
	Area B Seine	Somass Chinook (23)	2,598	0
	Area B Seine	Mainland Inlet Pinks (12)	0	0
	Area B Seine	JST Chum (12,13)	0	9
	Area B Seine	MVI Chum (18)	0	0
	Area B Seine	Fraser Pink (12,13)	0	506
	Area B Seine	Fraser Pink (29)	0	0
	Area D Gillnet	Barkley Sockeye (23)	0	6
	Area D Gillnet	Tlupana Chinook (25)	3,496	0
	Area D Gillnet	Somass Chinook (23)	3,671	0
	Area D Gillnet	Mainland Inlet Pinks (12)	0	0
	Area D Gillnet	JST Chum (12,13)	0	14
	Area D Gillnet	MVI Chum (14)	0	2
	Area E Gillnet	Fraser Chum (29)	33	48
	Area E Gillnet	MVI Chum (17/18)	1	0
<b>Total Commercial Catch</b>			<b>9,799</b>	<b>617</b>
Recreational	Sport	Juan de Fuca (19,20)	28,265	34,371
	Sport	Strait of Georgia (14-18,28,29)	8,899	15,194
	Sport	Johnstone Strait (11-13)	19,482	22,765
	Sport	WCVI (ISBM areas)	33,135	20,822
	Sport	Fraser River	21,579	16,160
<b>Total Recreational Catch</b>			<b>111,360</b>	<b>109,312</b>
First Nations FSC		Johnstone Strait	344	0
		Strait of Georgia	977	0
		WCVI	1,404	0
		Fraser River	28,541	33
<b>Total First Nations FSC Catch</b>			<b>31,266</b>	<b>33</b>
First Nations EO		Johnstone Strait	-	-
		Strait of Georgia	-	-
		WCVI	7,622	-
		Fraser River	4,160	72
<b>Total First Nations EO Catch</b>			<b>11,782</b>	<b>72</b>
First Nations ESSR		Johnstone Strait	-	-
		Strait of Georgia*	3,273	-
		WCVI	607	-
		Fraser River	5,000	0
<b>Total First Nations ESSR Catch</b>			<b>8,880</b>	<b>0</b>
<b>TOTAL - ALL FISHERIES</b>			<b>173,087</b>	<b>110,034</b>

\*Number includes both adults and jacks; FSC & ESSR combined.

## Appendix 6: Preliminary 2009 South Coast Coho Catch By Fishery and Area

### COHO

Fishery	Gear	Fishery (Area)	Numbers	
			Kept	Released
<b>Commercial</b>	Area G Troll	WCVI AABM Chinook (23 - 27, 123 - 127)	0	12,667
	Area H Troll	Mainland Inlet Pinks (12)	0	0
	Area H Troll	MVI Chum (14)	0	0
	Area H Troll	Fraser Chum (29)	0	0
	Area H Troll	JST Chum (12,13)	6	396
	Area H Troll	Fraser Pink (13,18)	0	634
	Area H Troll	Fraser Pink (29)	0	0
	Area B Seine	Barkley Sockeye (23)	0	0
	Area B Seine	Somass Chinook (23)	531	0
	Area B Seine	Mainland Inlet Pinks (12)	0	0
	Area B Seine	JST Chum (12,13)	0	717
	Area B Seine	MVI Chum (18)	0	4
	Area B Seine	Fraser Pink (12,13)	7	22,759
	Area B Seine	Fraser Pink (29)	0	0
	Area D Gillnet	Barkley Sockeye (23)	0	8
	Area D Gillnet	Tlupana Chinook (25)	1	0
	Area D Gillnet	Somass Chinook (23)	377	8
	Area D Gillnet	Mainland Inlet Pinks (12)	0	22
	Area D Gillnet	JST Chum (12,13)	1	1,196
	Area D Gillnet	MVI Chum (14)	1	133
	Area E Gillnet	Fraser Chum (29)	10	1,651
	Area E Gillnet	MVI Chum (17/18)	0	88
<b>Total Commercial Catch</b>			<b>934</b>	<b>40,283</b>
<b>Recreational</b>	Sport	Juan de Fuca (19,20)	9,521	26,382
	Sport	Strait of Georgia (14-18,28,29)	521	3,221
	Sport	Johnstone Strait (11-13)	10,512	29,500
	Sport	WCVI - Inshore (21-27)	48,181	24,441
	Sport	WCVI - Offshore (121-127)	40,952	85,962
	Sport	Fraser River	7,633	9,045
<b>Total Recreational Catch</b>			<b>117,320</b>	<b>178,551</b>
<b>First Nations FSC</b>		Johnstone Strait	1,448	0
		Strait of Georgia	2,301	-
		WCVI	2,626	0
		Fraser River	304	26
<b>Total First Nations FSC Catch</b>			<b>6,679</b>	<b>26</b>
<b>First Nations EO</b>		Johnstone Strait	-	-
		Strait of Georgia	-	-
		WCVI	737	0
		Fraser River	643	1,971
<b>Total First Nations EO Catch</b>			<b>1,380</b>	<b>1,971</b>
<b>First Nations ESSR</b>		Johnstone Strait	-	-
		Strait of Georgia	2,607	0
		WCVI	26,663	0
		Fraser River	15,807	0
<b>Total First Nations ESSR Catch</b>			<b>45,077</b>	<b>0</b>
<b>TOTAL - ALL FISHERIES</b>			<b>171,390</b>	<b>220,831</b>

Appendix 7: Preliminary 2009 South Coast Chum Catch By Fishery and Area

**Chum**

Fishery	Gear	Fishery (Area)	Numbers	
			Kept	Released
<b>Commercial</b>	Area G Troll	WCVI AABM Chinook (23 - 27, 123 - 127)	167	4
	Area H Troll	Mainland Inlet Pinks (12)	0	0
	Area H Troll	MVI Chum (14)	15	0
	Area H Troll	Fraser Chum (29)	1	0
	Area H Troll	JST Chum (12,13)	67,898	841
	Area H Troll	Fraser Pink (13,18)	44	0
	Area H Troll	Fraser Pink (29)	0	0
	Area B Seine	Barkley Sockeye (23)	0	0
	Area B Seine	Somass Chinook (23)	0	0
	Area B Seine	Mainland Inlet Pinks (12)	0	0
	Area B Seine	JST Chum (12,13)	316,185	0
	Area B Seine	MVI Chum (14)	2,030	0
	Area B Seine	Fraser Pink (12,13)	6,215	487
	Area B Seine	Fraser Pink (29)	0	0
	Area D Gillnet	Barkley Sockeye (23)	0	0
	Area D Gillnet	Tlupana Chinook (25)	0	0
	Area D Gillnet	Somass Chinook (23)	8	0
	Area D Gillnet	Mainland Inlet Pinks (12)	0	2
	Area D Gillnet	JST Chum (12,13)	126,625	5
	Area D Gillnet	MVI Chum (14)	46,609	15
	Area E Gillnet	Fraser Chum (29)	42,115	22
	Area E Gillnet	MVI Chum (17/18)	10,462	0
<b>Total Commercial Catch</b>			<b>618,374</b>	<b>1,376</b>
<b>Recreational</b>	Sport	Juan de Fuca (19,20)	127	54
	Sport	Strait of Georgia (14-18,28,29)	0	0
	Sport	Johnstone Strait (11-13)	186	74
	Sport	WCVI (21-27, 121-127)	87	0
	Sport	Fraser River	3,200	22,083
<b>Total Recreational Catch</b>			<b>3,600</b>	<b>22,211</b>
<b>First Nations FSC</b>		Johnstone Strait	12,341	0
		Strait of Georgia	5,478	-
		WCVI	2,600	0
		Fraser River	13,118	30
<b>Total First Nations FSC Catch</b>			<b>33,537</b>	<b>30</b>
<b>First Nations EO</b>		Johnstone Strait	-	-
		Strait of Georgia	-	-
		WCVI	1,332	0
		Fraser River	68,157	348
<b>Total First Nations EO Catch</b>			<b>69,489</b>	<b>348</b>
<b>First Nations ESSR</b>		Johnstone Strait	-	-
		Strait of Georgia	2,856	0
		WCVI	14,491	0
		Fraser River	8,458	0
<b>Total First Nations ESSR Catch</b>			<b>25,805</b>	<b>0</b>
<b>TOTAL - ALL FISHERIES</b>			<b>750,805</b>	<b>23,965</b>

**Appendix 8: Preliminary 2009 Southern BC Commercial Catch Totals By Gear and Area**

Gear	Fishing Area	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,	0	14	0	12,667	98	112	167	4	53,191	4,750
Area H Troll	Mainland Inlet Pinks (12)	0	0	0	0	0	0	0	0	0	0
Area H Troll	MVI Chum (14)	0	0	0	0	0	0	15	0	0	0
Area H Troll	Fraser Chum (29)	0	0	0	0	0	0	1	0	0	0
Area H Troll	JST Chum (12,13)	0	2	6	396	1	8	67,898	841	0	10
Area H Troll	Fraser Pink (13, 18)	0	364	0	634	16,728	0	44	0	0	21
Area H Troll	Fraser Pink (29)	0	0	0	0	0	19	0	0	0	1
Area B Seine	Barkley Sockeye (23)	15,039	0	0	0	0	0	0	0	0	0
Area B Seine	Somass Chinook (23)	0	4,841	531	0	0	0	0	0	2,598	0
Area B Seine	Mainland Inlet Pinks (12)	0	0	0	0	0	0	0	0	0	0
Area B Seine	JST Chum (12,13)	0	1	0	717	3	0	316,185	0	0	9
Area B Seine	MVI Chum (18)	0	0	0	4	0	0	2,030	0	0	0
Area B Seine	Fraser Pink (12, 13)	13	9,978	7	22,759	1,295,095	53	6,215	487	0	506
Area B Seine	Fraser Pink (29)	0	34	0	0	98,461	0	0	0	0	0
Area D Gillnet	Barkley Sockeye (23)	9,213	0	0	8	0	0	0	0	0	6
Area D Gillnet	Tlupana Chinook (25)	0	0	1	0	0	0	0	0	3,496	0
Area D Gillnet	Somass Chinook (23)	0	69	377	8	0	0	8	0	3,671	0
Area D Gillnet	Mainland Inlet Pinks (12)	0	11	0	22	746	0	0	2	0	0
Area D Gillnet	JST Chum (12,13)	0	0	1	1,196	7	4	126,625	5	0	14
Area D Gillnet	MVI Chum (14)	0	0	1	133	0	0	46,609	15	0	2
Area E Gillnet	Fraser Chum (29)	1	5	10	1,651	1	73	42,115	22	33	48
Area E Gillnet	MVI Chum (17/18)	0	0	0	88	0	0	10,462	0	1	0
<b>TOTALS</b>		<b>24,266</b>	<b>15,319</b>	<b>934</b>	<b>40,283</b>	<b>1,411,140</b>	<b>269</b>	<b>618,374</b>	<b>1,376</b>	<b>62,990</b>	<b>5,367</b>

\*Oct08-Sept09

**Appendix 9: 2009 Southern BC Recreational Catch Totals By Area**

Fishing Area	Sockeye		Sockeye Released		Coho		Coho Released		Pink		Pink Released		Chum		Chum Released		Chinook ISBM		Chinook ISBM Released		Chinook AABM Kept		Chinook AABM Released		
	Kept	Released	Kept	Released	Kept	Released	Kept	Released	Kept	Released	Kept	Released	Kept	Released	Kept	Released	Kept	Released	Kept	Released	Kept	Released	Kept	Released	
Juan de Fuca Strait of Georgia	152	1,091	9,521	26,382	50,917	15,560	127	54	28,265	34,371	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Johnstone Strait	49	1,095	521	3,221	2,595	1,093	0	0	8,899	15,194	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
WCVI	56,500	367	10,512	29,500	38,897	17,118	186	74	19,482	22,765	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fraser River	29	1,726	89,133	110,403	924	738	87	0	33,135	20,822	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>56,730</b>	<b>25,492</b>	<b>117,320</b>	<b>178,551</b>	<b>159,427</b>	<b>306,698</b>	<b>3,600</b>	<b>22,211</b>	<b>111,360</b>	<b>109,312</b>	<b>68,775</b>	<b>68,775</b>	<b>35,584</b>	<b>35,584</b>	<b>35,584</b>	<b>35,584</b>	<b>35,584</b>	<b>35,584</b>							

All totals are preliminary.

JDF totals are from Jan to Sept; the program is still running and will end Dec31.

SoG totals are from May to Sept.

**Appendix 10: 2009 Southern BC First Nations Catch Estimates By Area**

Fishery type	Fishing Area	Sockeye		Coho		Pink		Chum		Chinook ISBM		Chinook AABM	
		Kept	Released	Kept	Released	Kept	Released	Kept	Released	Kept	Released	Kept	Released
FSC	Johnstone Strait	10,124	0	1,448	0	22,501	0	12,341	0	344	0	-	-
FSC	Strait of Georgia	495	0	2,301	-	211	0	5,478	-	977	0	-	-
ESSR	Strait of Georgia	-	-	2,607	0	-	-	2,856	0	3,273	-	-	-
FSC	WCVI	77,638	0	2,626	0	133	0	2,600	0	1,404	0	3,381	0
EO	WCVI	0	0	737	0	-	-	1,332	0	7,622	-	-	-
ESSR	WCVI	-	-	26,663	0	-	-	14,491	0	607	-	-	-
FSC	Fraser River	59,873	1,315	304	26	1,893	217	13,118	30	28,541	33	-	-
EO	Fraser River	44	244	643	1,971	512,185	61,265	68,157	348	4,160	72	-	-
ESSR	Fraser River	-	-	15,807	0	12,312	0	15,807	0	5,000	0	-	-
<b>Total</b>		148,174	1,559	53,136	1,997	549,235	61,482	136,180	378	51,928	105	3,381	0

**Appendix 11: 2009 South Coast Test-Fishery Catches**

Test-Fishery	Sockeye retain	Sockeye release	Coho retain	Coho release	Pink retain	Pink release	Chum retain	Chum release	Chinook retain	Chinook release	GRAND TOTAL
Albion Chinook Gillnet	1003	10			55	67	2239	14	1995	0	5383
Albion Chum Gillnet	171	2			328	362	7010		271		8144
Area 12 Chum Seine	13		643		196		60265	1007	26		62150
Area 13 Sockeye Seine	17176	4322	465		2	3861	289	1	237		172888
Area 23 Sockeye Seine	12632	696	12				1		45		13386
Blinkhorn Sockeye Seine	18897	5387	2328	48	250485	3224	1238	2	545		282154
Cowichan Chum Seine			20				1350		1		1371
Nitinat Lake Chum Gillnet			72				66	4755			4893
Round Island Sockeye Gillnet	922	2130	4112	150	239	211	801	67	26	32	3936
San Juan Sockeye Seine	50814	14957	7802	672	483883	16198	72547	5846	3531	32	656282
Grand Total											