Executive Secretary's Summary of Decisions
2019 Post-Season Meeting

The Pacific Salmon Commission held its 2019 Post-Season Meeting January 14-17, 2019 at the Hyatt Regency Vancouver, and discussed a number of topics (see attached agenda).

The Commission AGREED:

1. The minutes from October 2018 are approved as edited.
2. The 2018 post-season reports are accepted with provisional data, and final versions will be provided by October 1, 2019.
3. The Executive Secretary's publication schedule for the revised Annex IV chapters is accepted.
4. A small workgroup on Okanagan Chinook is authorized. This group will include one Commissioner and two experts from each Party, and will develop its draft terms of reference consistent with the scope of Chapter 3, paragraph 5(b). The CIG will review these terms and recommend a draft for Commission approval at the 2019 Annual Meeting.
5. The CIG will review the January 2019 responses to the CYER questionnaire and recommend a course of action to the Commission at the 2019 Annual Meeting. If needed, the CIG will convene by telephone ahead of that meeting.
6. The CIG has not yet concluded its discussion of terminal area exclusions and hatchery add-ons, and will report to the Commission with final recommendations at a future date.
7. Commissioner Reid will work with the Executive Secretary and Mr. Bowhay to review the Annex IV implementation plans provided at the meeting. This review will identify all tasks requiring Commissioner involvement over the duration of the new agreement, and yield a comprehensive schedule for future Commission actions. The small group will report to the bilateral table at the February Annual Meeting.

ATTENDANCE

PACIFIC SALMON COMMISSION
POST SEASON MEETING
JANUARY 14-18, 2019
HYATT REGENCY VANCOUVER
VANCOUVER, B.C.

COMMISSIONERS

CANADA	UNITED STATES
R. Reid (Chair)	M. Oatman (Vice Chair)
S. Farlinger	W.R. Allen
J. McCulloch	P. Anderson
B. Rezansoff	W. Auger
B. Riddell	R. Klumph
P. Sprout	B. Turner

Draft Agenda
Post-Season Meeting
January 14-18, 2019
Vancouver, B.C.

1. Adoption of agenda
2. Approval of minutes: 2018 Fall Meeting
3. Executive Secretary's report
    a. International Year of the Salmon update
    b. Report from January 13 training: "running effective technical meetings"
    c. Summary list of Commission tasks during 2019-2028 agreement period

Chinook issues

4. Update on CYER questionnaire responses
5. CIG report
    a. Okanagan Chinook conservation concerns/Columbia River fisheries
    b. Current methodologies for hatchery add-on and terminal area exclusion calculations

Other action items pending

6. Update on entry into force for Annex IV amendments
7. Panel/Committee implementation plans for amended Annex IV chapters
8. Fraser River Panel update on Chapter 4 negotiations
9. U.S. response to October 2018 Canadian Southern coho MU letter
10. Adoption of national post-season reports
11. Presentation of PSC service plaque – Sue Farlinger
12. Public comment

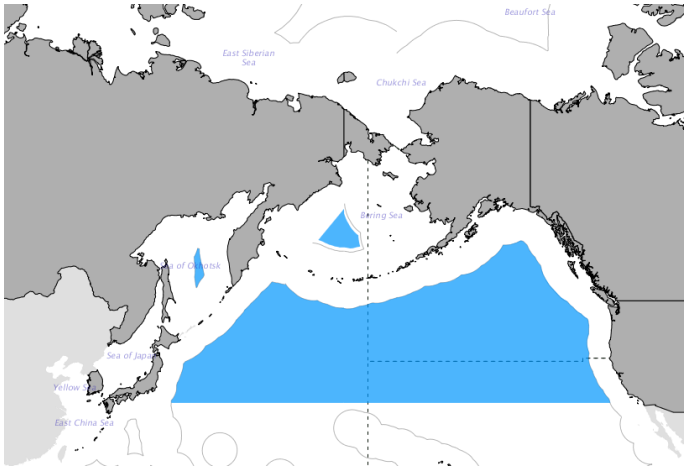
INTERNATIONAL YEAR OF THE SALMON

Mark Saunders
North Pacific Anadromous Fish Commission

Pacific Salmon Commission
January 15, 2019

THE NORTH PACIFIC OPENING IN VANCOUVER, BC

International Year of the Salmon (2018-2022)

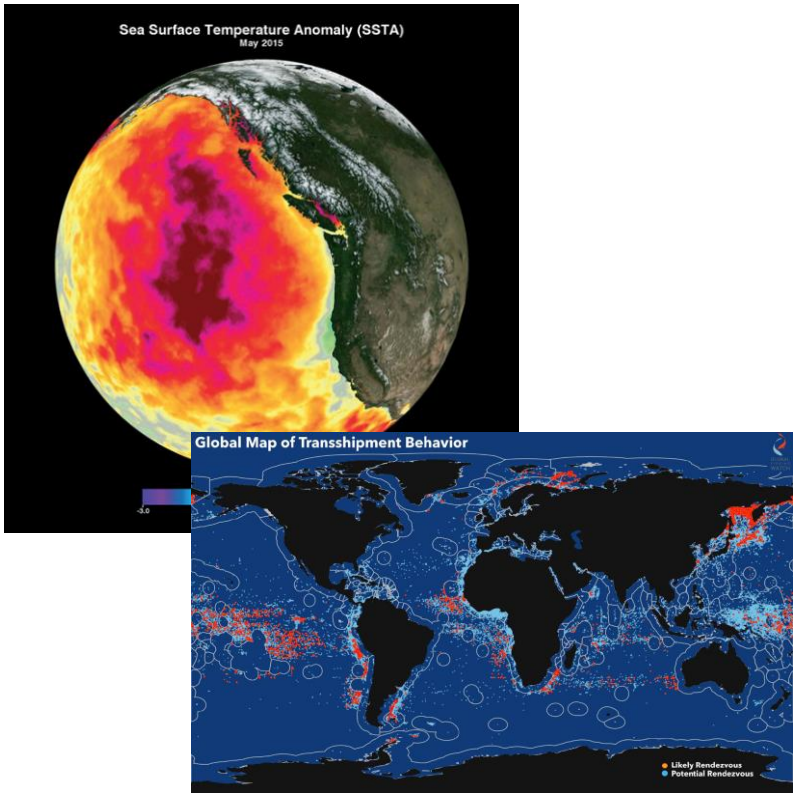


NPAFC

NASCO

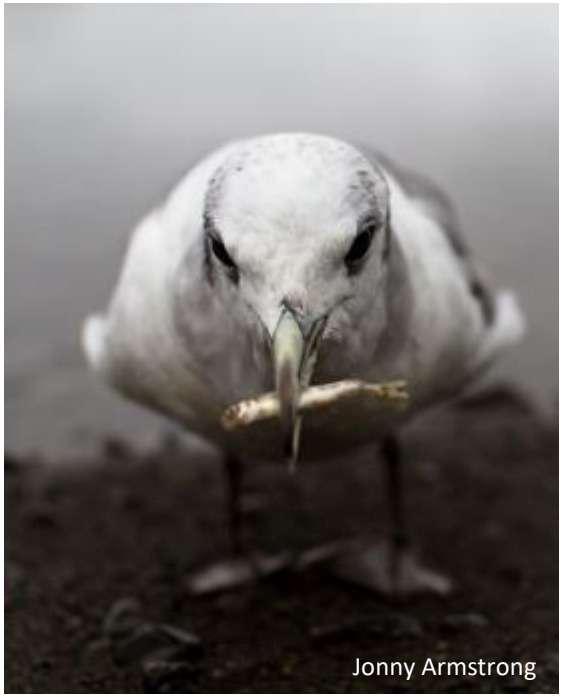
VISION: TO ENSURE SALMON AND PEOPLE ARE RESILIENT IN A CHANGING WORLD

- The IYS is a 5-year hemispheric-wide partnership to respond to a rapidly changing physical and social environment
- Through an intense burst of outreach and research IYS will fill knowledge gaps and catalyze new ways to generate and share knowledge
- IYS will leave a legacy of a well-informed community of decision makers who can establish the conditions necessary for the resilience of salmon and people in an uncertain future



IYS THEMES/OUTCOMES

- **Status of Salmon:** The present status of salmon and their environments is understood.
- **Salmon in a Changing Salmosphere:** The effects of natural environmental variability and human factors affecting salmon distribution and abundance are understood and quantified.
- **New Frontiers:** New technologies, analytical methods, ideas and ways of thinking are advanced and applied to salmon research. Research is carried out to fill gaps in poorly studied regions of the salmosphere.



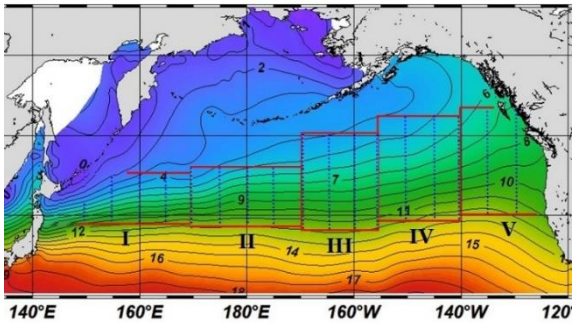
IYS OUTCOMES (continued…)

- **Human Dimension:** Communities, Indigenous Peoples, youth, harvesters, scientists and resource managers across the Northern Hemisphere share knowledge and collaborate in the development of new tools and approaches to restoring, managing and sustaining salmon.
- **Information Systems:** Information systems that house and mobilize historic and current data about salmon and their environment are freely available.
- **Outreach and Communication:** People understand the value of healthy salmon populations and engage to ensure salmon and their varied habitats are conserved and restored against amidst increasing environmental change.


Credit: Bill Bryden

HIGH SEAS SIGNATURE PROJECT

- 2019 Expedition from February 15 (Dutch Harbour) to March 14 (Vancouver) aboard a chartered Russian research trawler, *Professor Kaganovsky.*
- Collaborative project with CAN$1.2M required in funding from private donors, Pacific Salmon Foundation, Government of Canada, BC Salmon Farmers Association and the Province of BC.
- 17 scientists onboard representing all 5 NPAFC member countries.
- Will provide a comprehensive understanding of the abundance, condition, country of origin, and location of stocks from salmon producing countries.
- This information is needed as forecasts are limited in predicting how climate and the changing ocean environment affect salmon production.

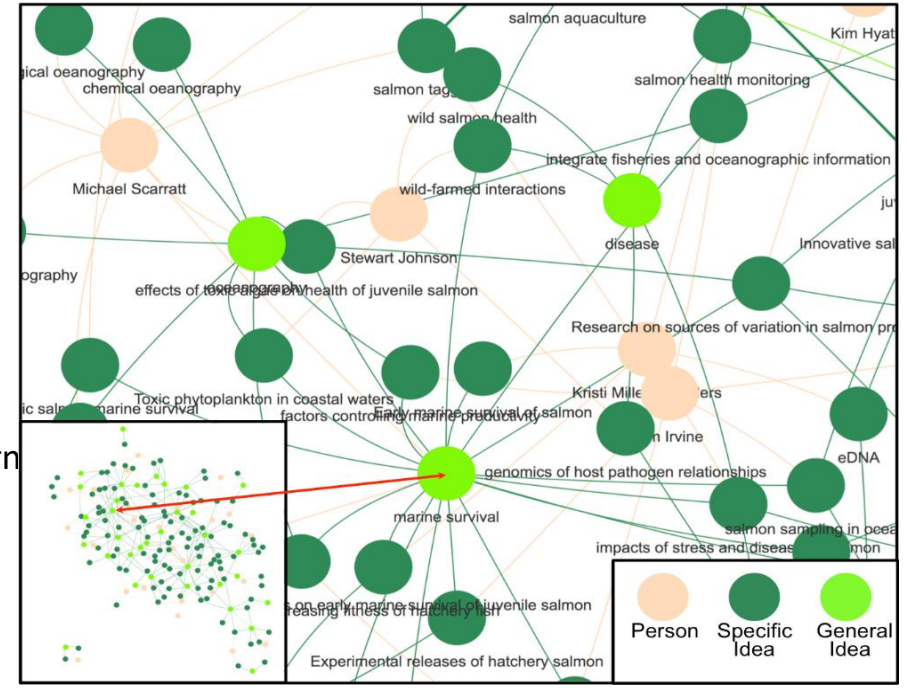


RESEARCH (1)

- **LIKELY SUSPECTS** – framework to link our understanding of salmon from freshwater to the high seas and back
- **INTERNATIONAL SALMON DATA LABORATORY** – collaboration on standardized data systems and visualization tools for salmon.
- **SALMON-FUTURE** – coupling climate drivers with ocean conditions and salmon survival to assess viability and prioritize
- **SALMON-CSI** – use of tissue and bony parts to determine marine distribution, growth, and survival

RESEARCH (2)

- **SALMON-GENOME** – use of genomics to determine physiological status, mixed stock ID in support of IUU – (Illegal, Unreported and Unenforced) enforcement activities. Use of eDNA to assess distribution and abundance in Marine and Freshwater.
- **SALMON-NET** – a modern AI inventory of data, people, organizations and activities.
- **MANAGING SALMON IN A CHANGING SALMOSPHERE** – learn from multiple workshops/symposia drawing together both western and Indigenous management systems.
- **RIVERSCAPE** – establish tools to assess and communicate the status of watersheds/basins



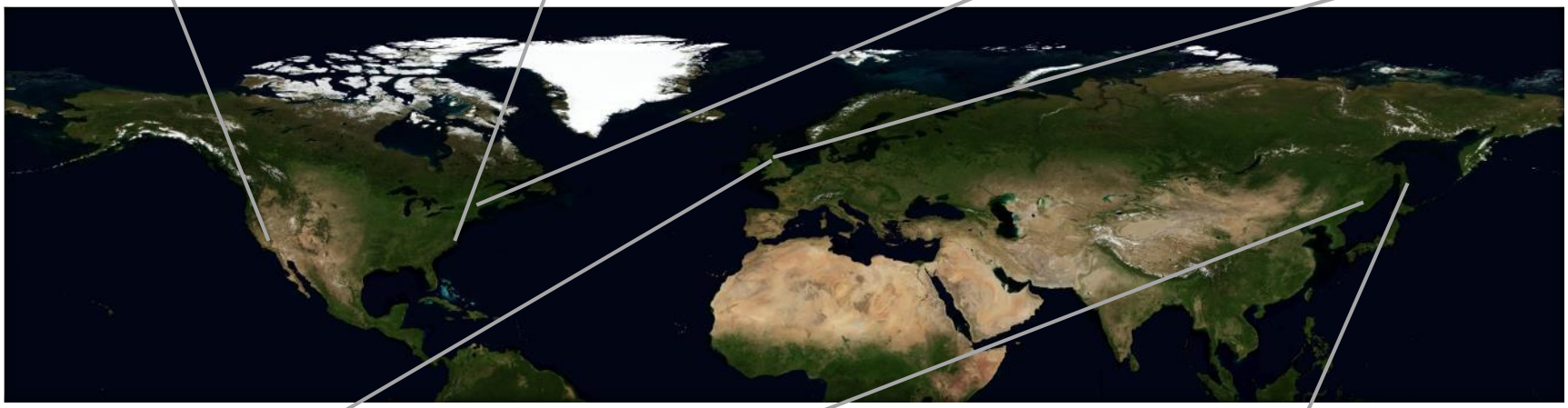
WORKSHOPS AND SYMPOSIA

Coupling Climate Drivers and Salmon Workshop
June 2018

Workshop on RAFOS Ocean Acoustic Monitoring Technology:
June 2018

Atlantic Salmon Ecosystems Forum: Are We Moving the Needle
January, 2018

NGO Outreach and Communication Workshop:
March 2018



'Likely Suspects' Workshop:
November 2017

1st NPAFC/IYS Workshop on Pacific Salmon Production in a Changing Climate:
May 2018

Japanese Fisheries Society Symposium Sustainable Management of Chum in a Changing Environment
March 2018

INTERNATIONAL YEAR OF THE SALMON

UPCOMING EVENTS

- January 2019: IYS Workshop on Salmon Status and Trends – methods and data, Vancouver, BC
- March 2019: Atlantic Salmon Ecosystems Forum, Quebec City, Québec, Canada
- **May 2019: 2nd NPAFC/IYS Workshop/Salmon Ocean Ecology Meeting in Portland OR**
- June 2019: Managing the Atlantic Salmon in a Rapidly Changing Environment, Tromsø, Norway

FOR THE COMMISSION TO CONSIDER (1)

- Engagement in the IYS to increase efficiency of research to support science and management
- Continue participation of Secretary Field and consider Commissioner participation in Steering Committee and Technical Committee members in Theme Counsel Groups to plan research
- Rapid connection across RFMO's- government-indigenous peoples, academia-industry-NGO's to share knowledge and capacity

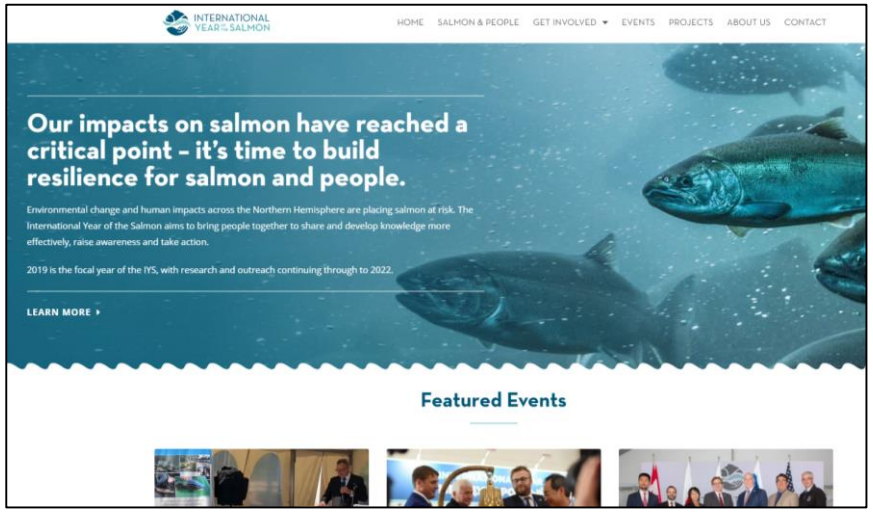
FOR THE COMMISSION TO CONSIDER (2)

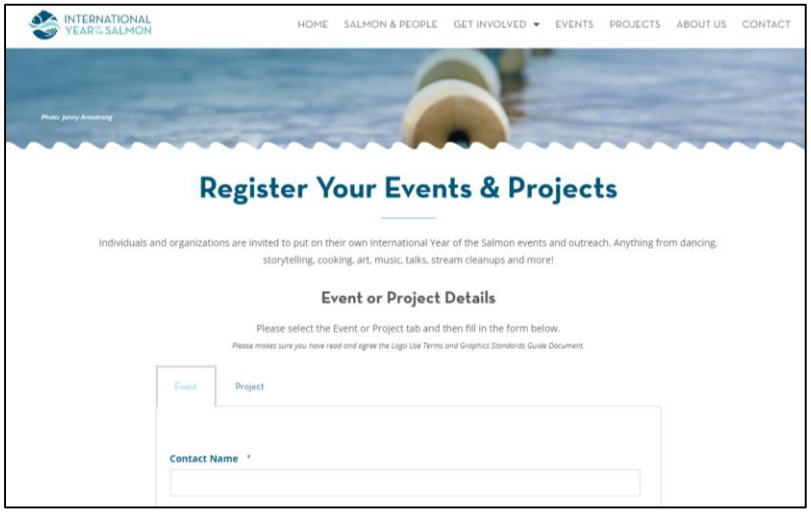
- Analysis of Endowment Fund/Commission priorities and IYS Outcomes and projects
- Potential to leverage Endowment and Party investments
- Active areas of research/outreach where IYS can be particularly relevant to the PSC
    - Development of standardized metrics and integrated data sets to effectively convey salmon status and track changes in fish and fisheries

FOR THE COMMISSION TO CONSIDER (3)

- Active areas of research/outreach (continued)
  - Development of standardized metrics and integrated data sets to effectively convey salmon status and track changes in fish and fisheries
  - Likely suspects approach to identification of bottlenecks for salmon populations across life history stages – prioritization of restoration activities
  - Application of new genomic technologies to assessment and management – eDNA, StockID, physiological condition from genomics to inform in-season management,
  - Advancing telemetry studies and microchemistry to understand where salmon are in the ocean environment
  - Climate projections of re-distribution and testing of hypothesese regarding mechanisms affecting production
  - Management systems for an increasingly uncertain social and natural environment

Join us, register events and activities… YEAROFTHESALMON.ORG





DISCUSSION

Photo : Fernando Lessa

INTERNATIONAL YEAR OF THE SALMON

2019-2028 Commission and Party tasks identified in amended Annex IV:

Chapters 1, 2, 3, 5, and 6[1]

Prepared by the Executive Secretary

December 24, 2018

Deadline	Chapter/paragraph	Task (emphasis added)
January 2019 – December 2028	Chapter 3, paragraph 2(c)	**[The Parties shall] implement through their respective domestic management authorities, a 10-year Chinook salmon CWT&R program that begins in 2019 that provides timely data to implement this Chapter via improvements and studies designed to achieve CTC and CWT work group data standards and guidelines .** The purpose of the CWT&R program shall be to: (i) maintain and improve the precision and accuracy of critical CWT-based statistics used by the CTC and Selective Fisheries Evaluation Committee (SFEC) in support of this Chapter, (ii) accelerate the processing of CWT data to provide CWT data for the pre-season planning process, (iii) increase the number of exploitation rate indicator stocks to represent Chinook production and fishery exploitation rates for escapement indicator stocks,

[1] This table summarizes new tasks identified for the Parties or the Commission under amended chapters 1, 2, 3, 5, and 6 in Annex IV. It does not include tasks that are conditional (e.g., if a fishery's limit is exceeded, then the Commission reviews and recommends remedial action), nor does it include routine management actions (e.g., pre-season run forecast delivery, sample collection schedules, means to achieve quota share, etc.). This summary does not address tasks assigned to Panels and Committees, which will be addressed through implementation plans developed by the relevant Panels/Committees and due to the Commission at the January 2019 Post-Season meeting.

		(iv) examine the representativeness of exploitation rate indicator stocks for escapement indicator stocks and CWT model stocks, and (v) develop analytical tools that involve the analysis of CWT data in the implementation of this Chapter;
January 2019 – December 2028	Chapter 3, paragraph 2(d)	**[The Parties shall] implement through their respective domestic management authorities, a 10-year Chinook salmon CEII program that begins in 2019 that provides timely data to implement this Chapter via objective and repeatable methodologies in data limited situations and in others via improvements and studies designed to achieve CTC data standards, guidelines, and analysis schedules.** The purpose of the CEII program includes the development of analytical tools that involve catch and escapement data in the implementation of this Chapter…
February 2019	Chapter 3, Appendix A, paragraph 14	The CTC shall work to complete by February 2019 improvements to the Commission Chinook model in order to add and refine the stocks and fisheries (referred to as Phase 2 in CTC 2018 work plan). **The Commission shall receive the model improvements from Phase 2 and make a decision about their implementation.**

December 2019	Chapter 3, paragraph 2(e)	**[The Parties shall] create and maintain a work group to discuss the programs initiated in sub-paragraphs (c) and (d)[2] by 2020**. The work group shall: (i) create opportunities for the exchange of project results and conclusions, advancements in knowledge, and discussion of the direction of these programs between the Parties, management entities, and knowledgeable individuals; (ii) review project results and conclusions from these programs and provide these reviews to the project proponents and the Commission; and (iii) identify, for the Commission, changes to projects or suggest new projects to fill gaps in knowledge.
c. February 2020	Chapter 1, paragraph 3(b)(i)(B)	**The Parties shall develop a joint technical report and submit it through the Parties' respective review mechanisms with the aim of establishing a bilaterally approved maximum sustainable yield (MSY) goal for Taku River sockeye salmon prior to the 2020 fishing season.[3]**
c. February 2020	Chapter 1, paragraph 3(b)(i)(C)	The Taku River sockeye salmon assessment program will be reviewed by two experts (one selected by each Party) in mark-recovery estimation techniques. **The Parties[4] shall instruct these experts to make a joint recommendation to the Parties concerning improvements to the existing program including how to address inherent mark-recovery assumptions with an aim to minimize potential bias prior to the 2020 fishing season.**
February 2020	Chapter 3, paragraph 4(c)(i)	**The CTC shall recommend standards for the desired level of precision and accuracy of data required to estimate incidental fishing mortality** by February 2020 *[Note: it is assumed this recommendation requires Commission action]*

[2] The CWT&R and CEII programs.

[3] It is not specified if the Parties will be acting through the TBR Panel or otherwise.

[4] It is not specified if the Parties will be acting through the TBR Panel or otherwise.

January 2022	Chapter 2, introduction	**By the Commission post season meeting in January 2022, the Parties will have completed a review of the performance of the provisions in this Chapter.** The review will identify management actions taken to support conservation of Nass River and Skeena River sockeye, evaluate the consistency of those actions with Chapter 2 obligations and outline, where feasible, the benefit of those actions for those populations.
January 2022, 2025, 2028	Chapter 5, paragraph 12	**The Parties shall review this Plan no later than three years after this Chapter enters into force and every three years after that date, unless otherwise specified by the Southern Panel**. The review shall include an assessment of the effectiveness of this Plan in achieving the management objectives of the Parties and any other issues either Party wants to raise, including, but not limited to: (a) whether the ER caps established under paragraphs 9(b) to (d) have prevented either Party from accessing its own stocks to meet its fishery management objectives or from harvesting other allocations that are provided under this Treaty; and (b) issues associated with the procedures and methods employed to estimate and account for total coho mortalities, including those incurred in mark-selective fisheries. **The Parties shall modify this Plan, if necessary, based on the review and the need to incorporate results of bilateral technical developments** (e.g., to establish criteria to define MUs and to biologically determine allowable ERs, to develop a common methodology for measuring ERs in Canadian and U.S. fisheries, development of bilateral management planning tools, etc.).
c. December 2022	Chapter 3, paragraph 5(e) and Appendix A, paragraph 5	**The Commission shall use the Calendar Year Exploitation Rate (CYER) metric to monitor the total mortality in ISBM fisheries and shall review the CYER metric during the year 2022 to make a decision on its continued application or the use of an alternative metric**. In the absence of a

		Commission decision to use an alternative metric, the use of the CYER metric continues. Before the review, the CTC shall complete the development of the Data Generation Model, complete the evaluation of alternative metrics for the evaluation of ISBM fisheries and develop data standards for the application of CYER as a metric.
c. January 2023, c. January 2026	Chapter 3, paragraphs 7(d-e)	**(d) [The Parties agree] to conduct up to two reviews of the CPUE-based approach to decide whether to continue to use this method to determine the catch limit for the SEAK AABM fishery, to return back to use of the Commission Chinook model, or to adopt an alternative method as determined by the Parties, to determine pre-season estimates of the aggregate AI of Chinook stocks available to the SEAK troll fishery and the relationship between the catch and AIs specified in Table 1.** The first review shall occur as soon as practical after the 2022 first post-season AI is calculated and the second review shall occur as soon as practical after the 2025 first post-season AI is calculated. The Commission decision shall be based on the outcome of: (i) a comparison of cumulative actual catch and the cumulative post-season catch limit from the Commission Chinook model, (ii) a comparison of the cumulative performance of the CPUE-based catch limit and the pre-season catch limit from the Commission Chinook model to predict the catch limit estimated from the first post-season calibration of the Commission Chinook model (model error), and (iii) a comparison of the abundance tier selected by use of the CPUE method and the abundance tier that is selected by use of the pre-season calibration of the Commission Chinook model with the abundance tier

		selected from the first post-season calibration derived from the Commission Chinook model; (e) **to consider the results of reviews described in sub-paragraph (d), immediately, and decide whether to continue to use the CPUE method for the SEAK AABM fishery**. Unless the Commission decides to continue to use the CPUE-based approach or adopt an alternative method, the Commission Chinook model estimate of the AI and Table 1 shall be used to determine the annual pre-season and post-season catch limits;
January 2023	Chapter 3, paragraph 7(h) and Appendix A paragraph 13	[The Parties agree] that, by January 2023, the CTC shall develop a draft outline for a five-year review to evaluate the effectiveness of harvest reduction measures that are taken for AABM and ISBM fisheries. The draft outline shall include stock status (including spawners, productivity, and abundance indices) and fishery performance (including catches, incidental mortality, and fishery indices such as fishery harvest rates) **and seek Commission direction to proceed with preparing a report.**
December 2023	Chapter 1, paragraph 3(a)(ii)	The Parties shall develop and implement an abundance-based approach to managing coho salmon on the Stikine River. Assessment programs need to be further developed before a biologically based escapement goal can be established. **By 2024, the Parties shall review the progress on this obligation**.
c. December 2023	Chapter 1, paragraph 5	**The Parties shall review midway through the Chapter Period, or other time mutually decided by the Parties, the current Chapter and determine if they want to renew this Chapter for an additional period of time.[5]**
January 2025	Chapter 3, paragraph 7(h)	… In January 2025, **the Commission shall review the report [from the CTC on its 5-year review] to identify any appropriate modifications to this Chapter to improve its implementation.**
December 2026	Chapter 2, paragraph 5	**The Parties agree to review[6] Annex IV, Chapter 2, a minimum of two years prior to its expiration with a view to renewing it**. If such renewal is not

[5] Chapter does not specify how this review will be conducted, including the respective roles of the Commission and TBR Panel.
[6] Chapter does not specify how this review will be conducted, including the respective roles of the Commission and the Northern Panel.

		successfully concluded prior to the expiration date, then overages and underages must be carried forward to the next Chapter period.
Unspecified	Chapter 1, paragraph 7	the Parties[7] shall consult with a view to developing, for the transboundary sections of the Columbia River, a more practicable arrangement for consultation and setting escapement targets than those specified in Article VII, paragraphs 2 and 3. Any such arrangement is intended to inter alia: (a) ensure effective conservation of the stocks; (b) facilitate future enhancement of the stocks as jointly approved by the Parties; (c) avoid interference with United States management programs on the salmon stocks existing in the non-transboundary tributaries and the main stem of the Columbia River.
Unspecified	Chapter 3, Appendix A, paragraph 14	The CTC shall complete its Phase 3 work (e.g., improved capabilities for pre-season abundance forecasts, representation of MSF and other types of fisheries regulations, inclusion of release data to estimate incidental mortalities in Chinook fisheries, incorporation of stock-specific growth functions, etc.) in time to support the five-year review. **The Commission shall receive the model improvements from Phase 3 and make a decision about their implementation.**
Unspecified	Chapter 3, paragraph 2(b) footnote	The model configuration from March 2018 (CLB1804) shall be used to establish a baseline run. **The Parties shall document specific concerns or inconsistencies between that configuration and the management regime in 2018.**

[7] It is not specified how this consultation will be conducted, including the respective roles of the Commission and TBR Panel.

Ongoing	Chapter 3, paragraph 4(a-d)	The Parties agree: (a) **to monitor and manage incidental fishing mortality in AABM fisheries** with the intent of not exceeding levels as specified in paragraph 4(f) during the Chapter Period; (b) that landed catch and incidental mortalities in ISBM fisheries are limited according to paragraph 5; (c) **to provide estimates of incidental mortality of Chinook salmon in all ISBM and AABM fisheries**. ISBM fisheries have total mortality constraints (catch plus associated incidental mortality) while AABM fisheries have catch limits. The CTC shall recommend standards for the desired level of precision and accuracy of data required to estimate incidental fishing mortality by February 2020 [see Commission task above]; (d) **to provide estimates of encounters of Chinook released in fisheries that, when multiplied by assumed gear-specific mortality rates, provide estimates of incidental mortality that are used in sub-paragraph (c).** These estimates: (i) shall be developed by the Parties annually from direct observation of fisheries, or (ii) shall be calculated from a predictable relationship between encounters and landed catch based on a time series of direct observations of fisheries reviewed by the CTC;
Ongoing	Chapter 3, paragraph 4(g)(v)	…subject to the availability of funds, the U.S. shall establish a Mark Selective Fishery Fund (Fund). **The Fund shall be administered by the Commission** to assist fishery management agencies with equipment and operations, as

		needed, to mass-mark hatchery produced Chinook salmon, to estimate incidental mortality, and to maintain and improve the ability to estimate exploitation rates on Chinook salmon indicator stocks that are encountered in MSF, including improvements and development of bilateral analytical tools. **The Commission shall adopt procedures to solicit proposals** from U.S. and Canadian management entities for the use of the Fund, be advised on the merits of proposals by specialists as it determines appropriate, and make funding decisions.
Ongoing	Attachment E, paragraph 2	The Parties request the Commission to: (a) maintain a page on its web site that documents citations, references, or links to publicly accessible information published by the Parties, management entities, or others related to the habitat protection and restoration projects and programs that are important to Pacific salmon stocks subject to this Treaty; and, (b) periodically review and discuss information on the habitat of naturally spawning stocks subject to this Treaty that cannot be restored through harvest controls alone, any non-fishing factors that affect the safe passage or survival of salmon, options for addressing non-fishing constraints and restoring optimum production, and progress of the Parties' efforts to achieve the objectives for the stocks under this Treaty.

PSC(ES) 19-1 Attachment four

SharePoint

Field, John

PSC Extranet **Bi-Lateral** U.S. Panels Committees Fund

Search this site

Negotiations Calendar

January 2019

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2

Electronic copy of active Annex IV chapters produced (Secretariat and SharePoint site)

8:30 am Fraser Negotiati

SharePoint

Field, John

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Search this site

Negotiations Calendar

February 2019

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
27	28	29	30	31	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	1	2

Ch. 4 negotiations conclude: nat'l approval sched discussed (PSC Annual Meeting; Portland, OR)

Spiral bound copies of treaty language provided (PSC Annual Meeting; Portland, OR)

SharePoint

Field, John

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Negotiations Calendar

December 2019

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4

Diplomatic notes exchanged for Ch. 4 entry into force (Washington D.C.)

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Field, John

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Negotiations Calendar

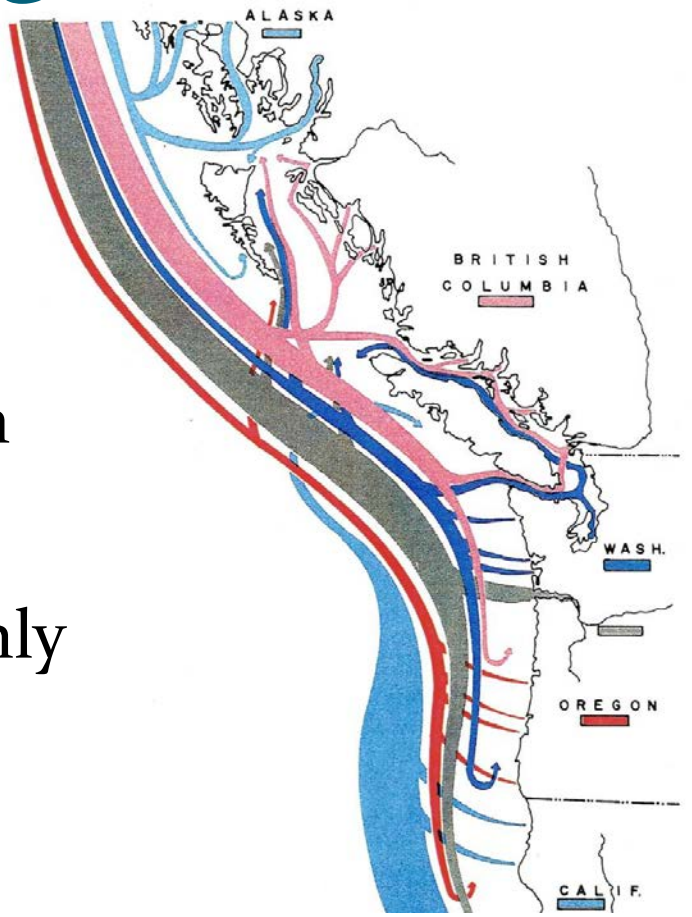
January 2020

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1

Bound treaty booklets first available (PSC Post-Season Meeting; Portland, OR)

Southern U.S. CHINOOK MANAGEMENT IN 2018

Management Along the Migration



- ESA-Impact Limits Severely Constrain Fisheries
- Mixed Stock Fisheries – Incidental Only
- Environmental Variability – New Challenges
- Intensive Management - Preseason & Inseason

Annual Management Process

1. Forecast abundance and determine status
2. Identify stock - specific impact limits
3. Model proposed fisheries & identify constraining stocks
4. Negotiate among the parties for fair sharing of catch and impacts
5. Document “List of Agreed Fisheries”
6. Intensive inseason management

Puget Sound Wild Chinook Forecasts: 2018 vs. 2017

Basin	Wild		
	2017	2018	Comparison
Hoko	606	1,071	1.77
Dungeness	77	89	1.16
Elwha	153	238	1.56
Nooksack springs	225	202	0.90
Skagit springs	2,785	2,317	0.83
Skagit summer/falls	15,837	13,340	0.84
Stillaguamish	438	487	1.11
Snohomish	3,412	3,460	1.01
Lake Washington	948	1,461	1.54
Green	2,374	2,110	0.89
Puyallup	945	672	0.71
White River springs	593	528	0.89
Nisqually	478	586	1.23
Skokomish	1,956	3,532	1.81
Mid Hood Canal	326	358	1.10
Total (others included)	31,330	29,380	0.94

2018 LIMITING STOCKS

LAT = Low Abundance Threshold

Below LAT

- Nooksack
- Mid Hood Canal

Near LAT

- Skagit Spring
- Skagit Fall
- Snohomish

Other ESA Stocks

- Lower Columbia River Tules

Stock-Specific Limits

Stock	Management Criteria			Model Prediction			
	Abundance Tier	ER Ceiling	ER Type	Escapement	Total ER	SUS ER	PT-SUS ER
Spring/Early:							
Nooksack - Total		10.5%	SUS		31.6%	**10.5%**	5.8%
North/Middle Fork	< LAT			178			
South Fork	< LAT			23			
Skagit - Total	> LAT	38.0%	Total	1,967	**28.4%**	18.6%	4.7%
Upper Sauk	> LAT			1,110			
Upper Cascade	> LAT			261			
Suiattle	> LAT			596			
White	> UMT	22.0%	SUS	1,945	26.8%	**18.9%**	7.7%
Dungeness	> LAT	10.0%	SUS	810	12.3%	**3.6%**	3.5%
Summer/Fall:							
Skagit - Total	> LAT	47.0%	Total	12,219	**37.2%**	17.1%	4.5%
Upper Skagit	> LAT			9,108			
Sauk	> LAT			607			
Lower Skagit	> LAT			2,227			
Stillaguamish - Total	> 1500	24.0%	Total	1,551			
Unmarked ER		13.0%	UM SUS		**20.8%**	**12.2%**	5.5%
Marked ER		NA	M SUS		25.6%	16.5%	10.2%
Snohomish - Total		21.0%	Total	3,382	**19.1%**	9.1%	7.6%
Skykomish	> LAT			2,635			
Snoqualmie				747			
Lake WA (Cedar R.)	> UMT	13.0%	PT-SUS	1,722	30.6%	19.9%	**12.0%**
Green	**> UB**	13.0%	PT-SUS	5,079	49.4%	38.8%	**12.0%**
				7,443			
Puyallup	> UMT	50.0%	Total	1,713	**49.9%**	39.3%	12.0%
				3,232			
Nisqually	> LAT	47%	Total	16,576	**47.0%**	38.3%	10.5%
Western Strait-Hoko	> UMT	10%	SUS	1,295	18.0%	**2.2%**	2.2%
Elwha	> UMT	10%	SUS	4,599	13.0%	**4.0%**	3.9%
Mid-Hood Canal	< LAT	12%	PT-SUS	365	22.1%	12.3%	**12.0%**
Skokomish	> UMT	48%	Total	2,432	**47.9%**	38.2%	12.7%
				21,526			

Model Run: Chin3218; Final

Run Date & Time: 04/12/18 14:52

SRFI =	**48.1%**	**(70% Ceiling)**
Lower Col Nat Tule ER =	**37.7%**	**(38% Ceiling)**

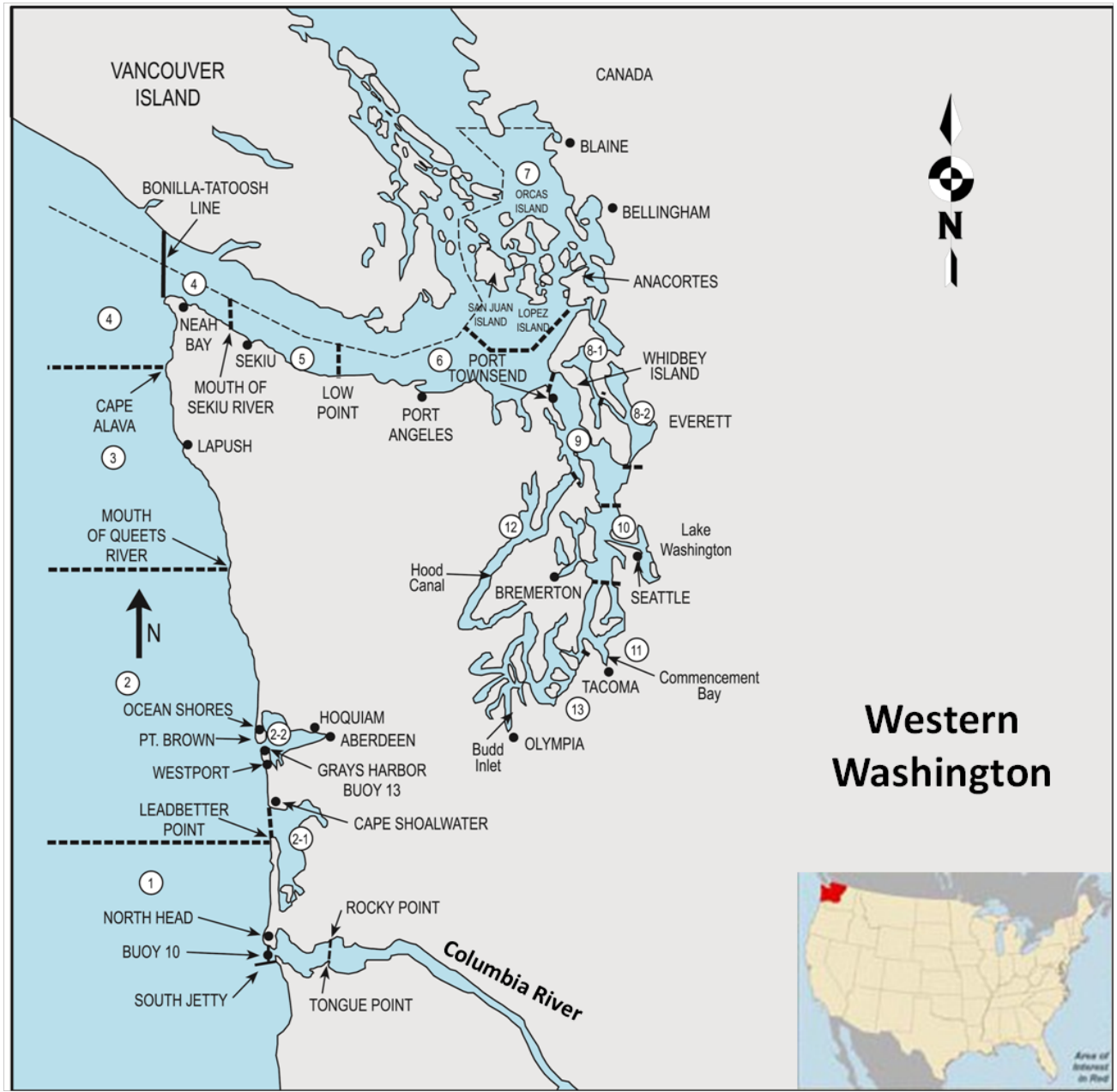
Nooksack Detail

	Management Criteria			Model Prediction			
Stock	Abundance Tier	ER Ceiling	ER Type	Escapement	Total ER	SUS ER	PT-SUS ER
Spring/Early:							
Nooksack - Total		10.5%	SUS		31.6%	**10.5%**	5.8%
North/Middle Fork	< LAT			178			
South Fork	< LAT			23			

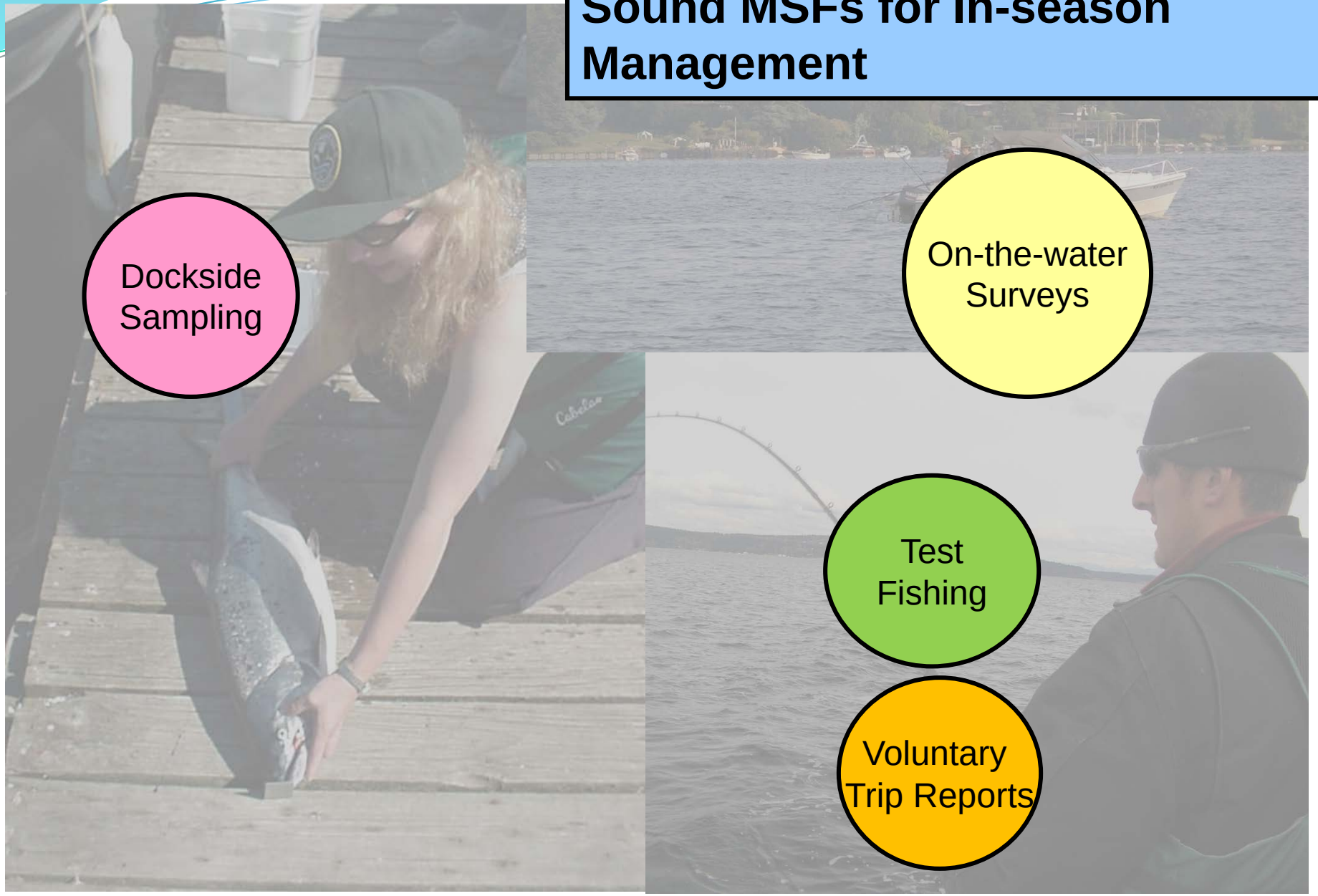
2018 – PRESEASON OVERVIEW

- Restrictive fishery measures remained in place
- Puget Sound Recreational Fishery
  - San Juan Sport
    - Sept. Chinook Nonretention
    - Closed ½ April
- Total (Treaty/Non-Treaty) Ocean Chinook quotas
  - Down in 2018 compared to 2017
  - 2017 = 130,000 and 2018 = 95,000 (2018 was 73% of 2017 levels)

Map of Washington Fishing Areas



Intensive Monitoring of Puget Sound MSFs for In-season Management



Dockside Sampling

On-the-water Surveys

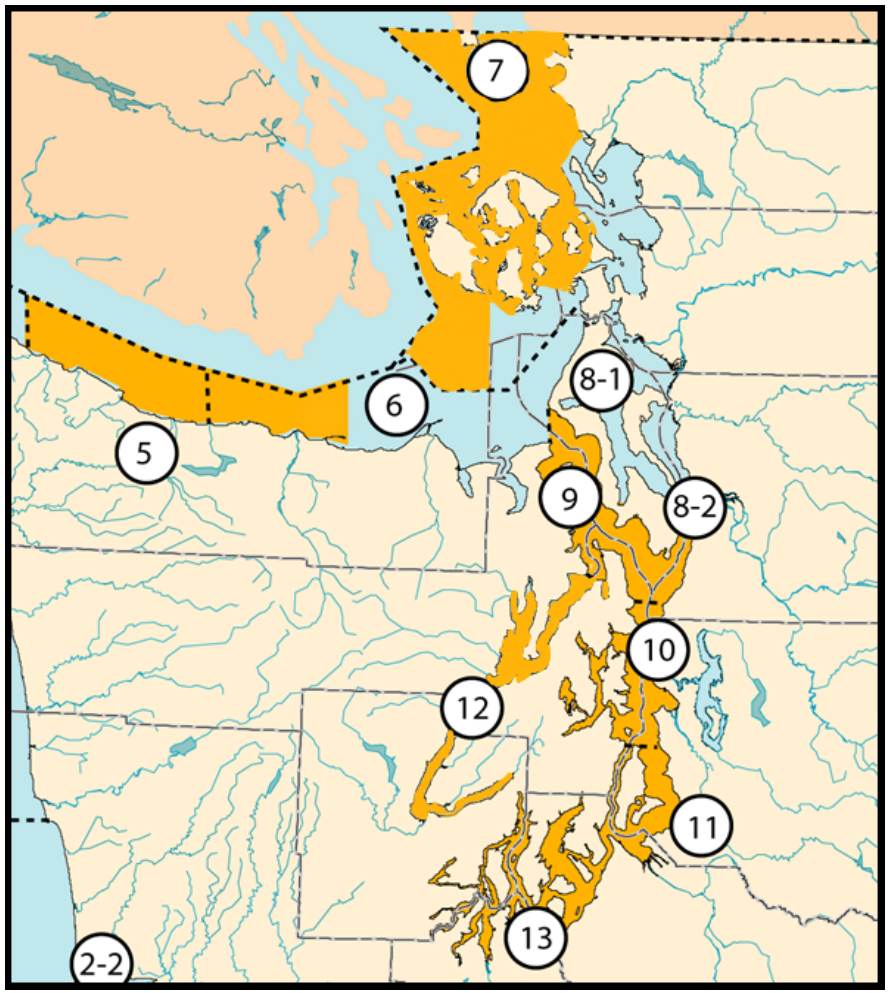
Test Fishing

Voluntary Trip Reports

Fisheries	2018			Prior Years - Landed	
	Pre-season modeled		Actual		
	Total Mortality	Landed	Preliminary Landed	2017	2016
OCEAN FISHERIES					
Commercial Troll					
Neah Bay and La Push (Areas 3, 4, 4B)	54,600	48,100	33,700	35,200	28,100
Columbia Ocean Area and Westport (Areas 1, 2)	30,600	19,400	13,900	24,700	14,200
Sport					
Neah Bay (Area 4)	5,500	4,900	3,000	7,300	3,300
La Push (Area 3)	1,700	1,500	400	500	300
Westport (Area 2)	14,600	13,100	4,900	6,600	8,400
Columbia Ocean Area (Area 1)	10,300	8,000	2,200	7,600	6,000
INSIDE FISHERIES					
Sport					
Strait of Juan de Fuca (area 5,6)	16,300	10,300	na	9,810	15,000
San Juan Islands (area 7)	11,000	7,600	na	7,000	5,900
Puget Sound Marine (area 8-13)	36,500	29,500	na	21,600	16,700
Puget Sound Rivers	12,500	12,000	na	23,700	9,600
North WA Coastal Rivers	-	-	na	1,600	600
Grays Harbor	1,700	1,500	na	2,200	2,800
Columbia River (Spring)	-	-	8,200	9,100	14,100
Columbia River (Summer)	2,800	2,600	1,000	3,800	6,800
Columbia River (Fall) (incl. Buoy 10)	25,900	24,800	21,900	60,400	65,600
Commercial					
Strait of Juan de Fuca net and troll (Area 4B, 5, 6C)	7,200	4,500	3,200	1,900	700
San Juan Islands (Area 6, 7, 7A)	8,000	7,900	4,000	2,600	100
Puget Sound Marine (Area 8-13,7B-D)	45,500	44,700	70,400	90,600	55,800
Puget Sound Rivers	35,900	35,900	40,500	53,900	23,300
North WA Coastal Rivers	-	-	11,000	14,200	9,400
Grays Harbor (Areas 2A-2D)	1,000	1,000	2,600	3,700	2,100

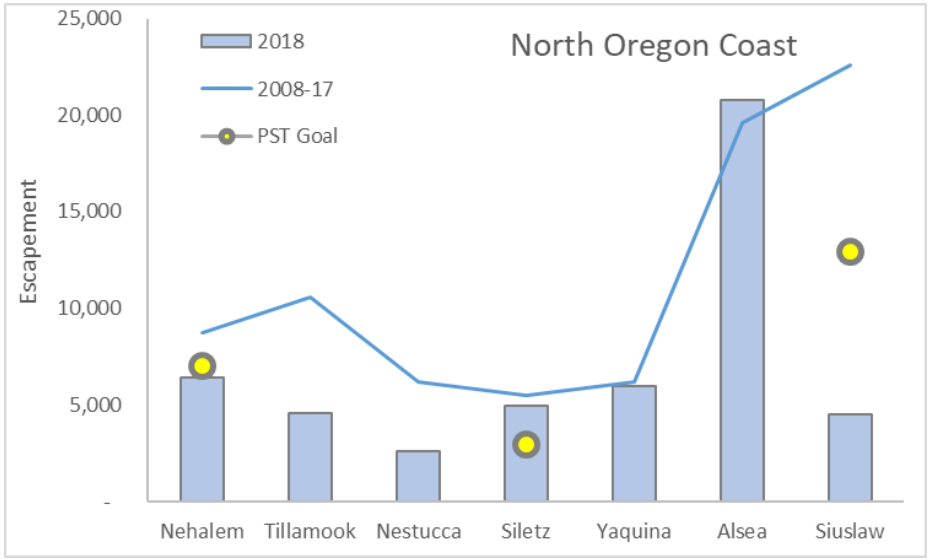
Examples of 2018 In-season Actions

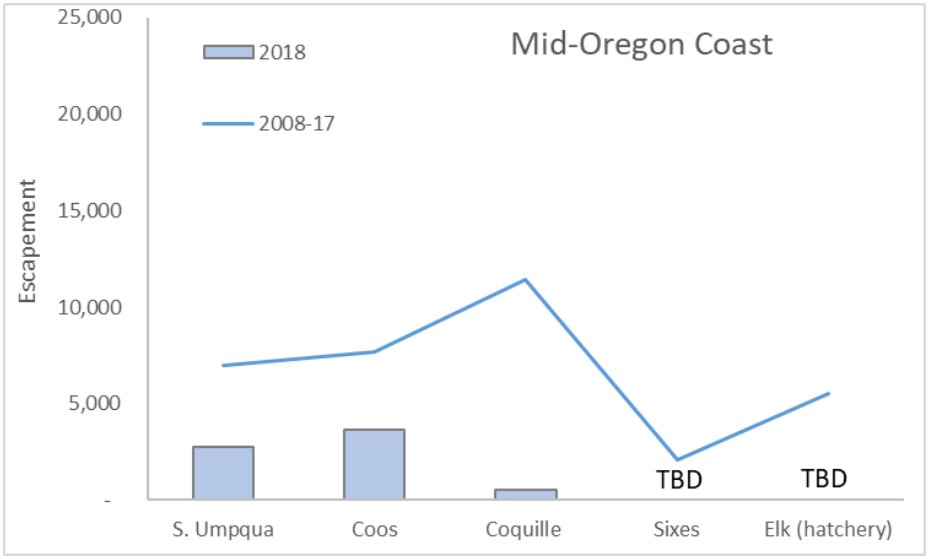
- Puget Sound Recreational:
  - Area 9 Summer MSF: Managed to a harvest quota of 5,587 marked (hatchery) Chinook.
    - In-season Action:
      Area 9 MSF (July 16 – Aug 15) closed early on July 22 when met quota.
  - Area 6 winter MSF closed early (April 8)
  - Area 7 winter MSF maintained reduced bag limit of 1 hatchery Chinook
- WA Ocean (Areas 1-4)
  - Similar thorough sampling programs, in-season management



Examples of 2018 In-season Actions

- Tribal and Non-tribal troll fisheries:
  - E.g., In-season management of commercial troll and tribal troll in the Ocean; tracking harvest quotas with regularly updated fish ticket information.
- In-river management: terminal areas are last in line; therefore, if returns are significantly below forecasts, there can be reduced or no fishing to meet escapement objectives.



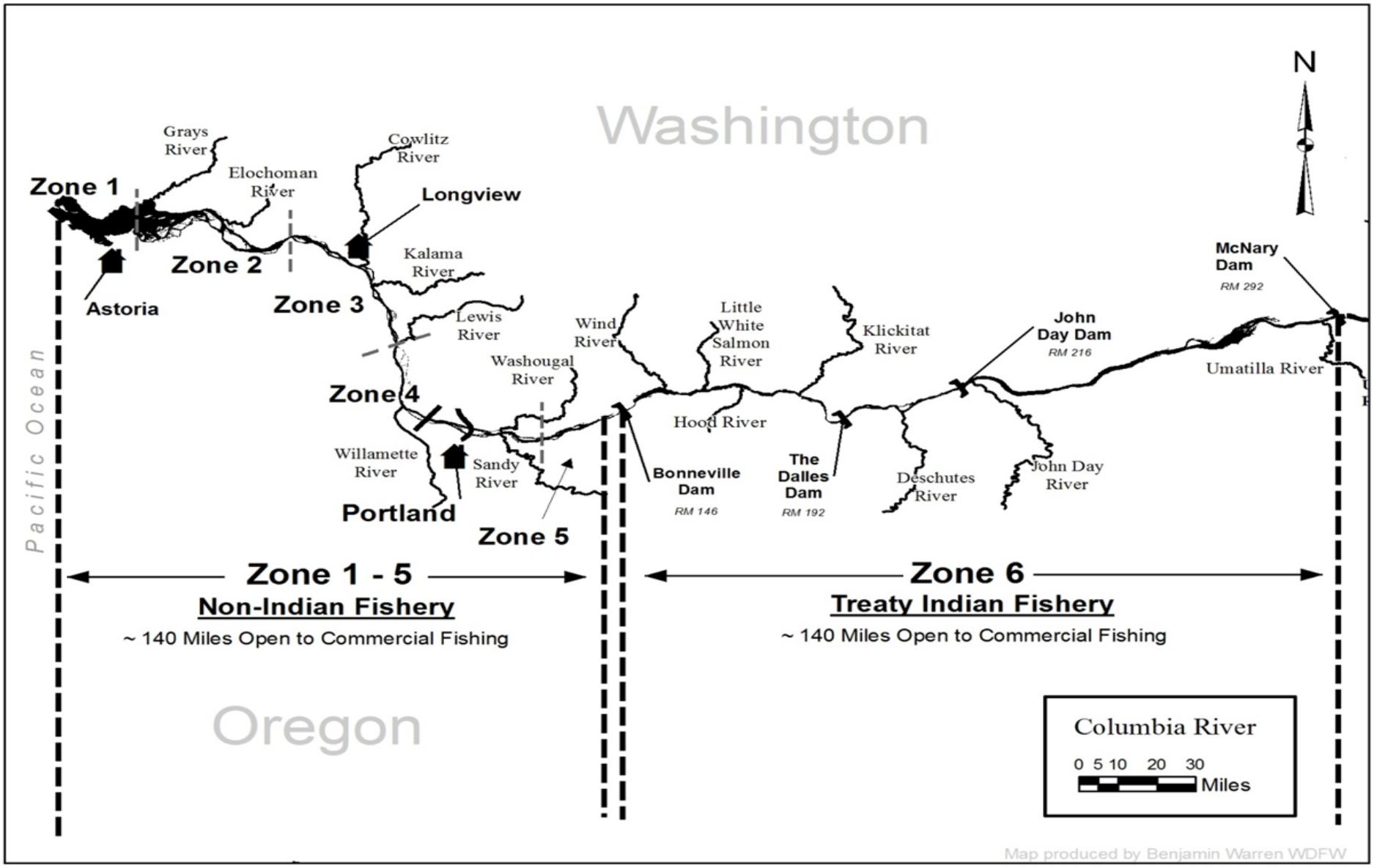


Escapement data are preliminary

In-season restrictions for FW fisheries were implemented in most areas

Columbia River Chinook Management

Columbia River Fisheries



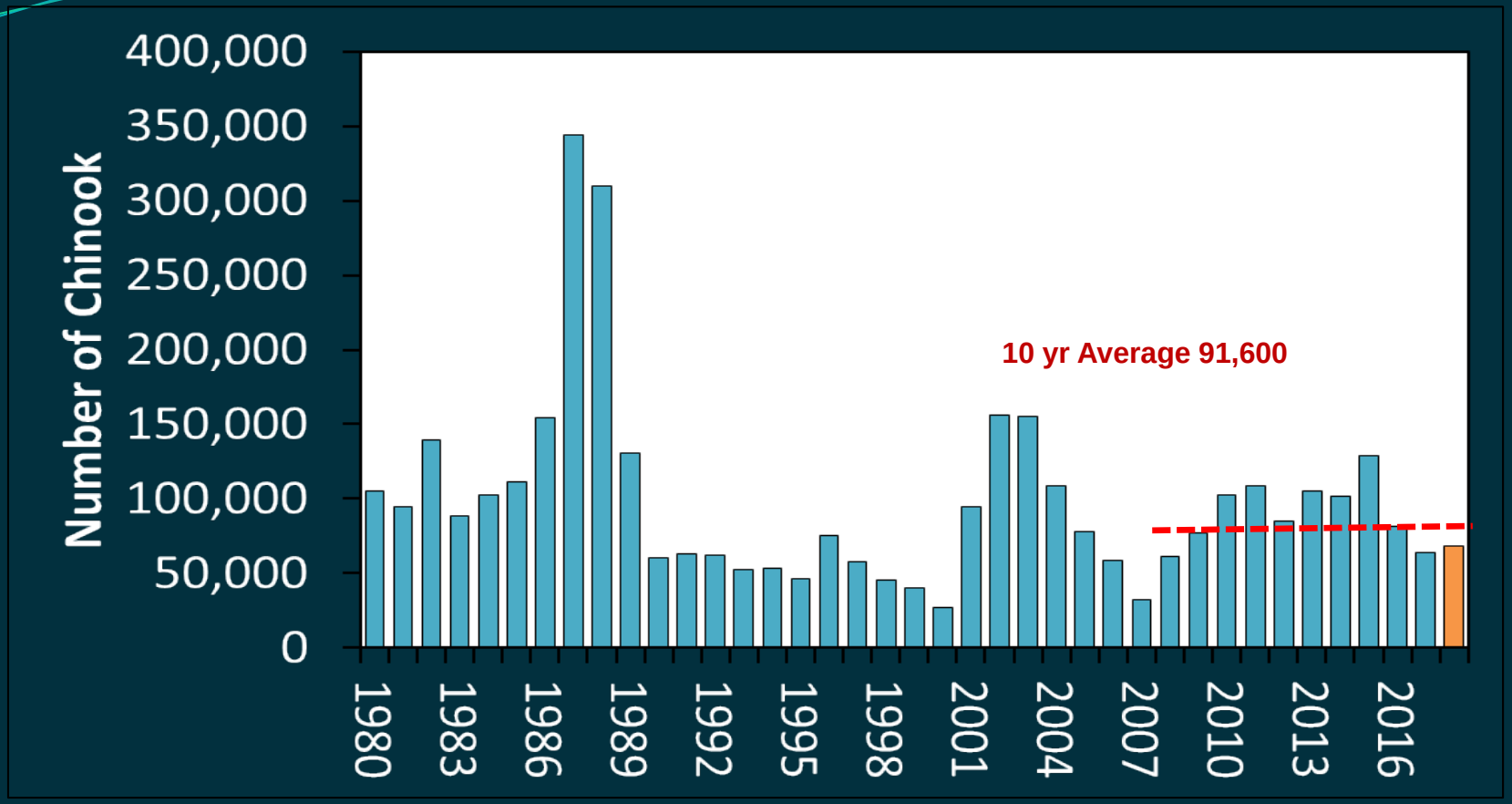
Columbia River Spring & Summer Chinook 2018 Actual Return down vs. forecast

Stock Group	Return River/Area	2018 Forecast	2018 Actual Return	Ratio (Return/ Forecast)
Spring Chinook -Lower Columbia	Cowlitz, Kalama, Lewis, Willamette, Sandy, Select Areas	81,820	61,561	.75
Spring Chinook -Mid/Upper Columbia	Wind, Drano Lake/Little White Salmon, Hood River, Klickitat, Yakima, Umatilla, Snake River	166,700	115,081	.69
Summer Chinook	Upper Columbia	67,300	42,120	.63

Columbia River Fall Chinook
2018 Forecasts – down vs. 2017

	Stock Group	Return Area	2017 Returns	2018 Forecast
LRH	Lower River Hatchery (tules)	Grays, Eloch, Cowlitz, Toutle, Coweeman, Kalama, Wash	64,600	62,400
LRW	Lower River Wild	Lewis River brights	7,800	7,600
URB	Upriver Bright	Hanford, Snake	297,100	200,100
BPH	Bonneville Pool Hatchery (tules)	Spring Creek Hatchery	48,200	50,100
PUB	Pool Brights	Brights above Bonn	46,000	36,400
SAB	SAFE Brights	Oregon areas	6,600	5,300

Lower Columbia River Tule Fall Chinook



- Stock was down 28% compared to the previous 10 year average return.
- 2018 forecast (H+W) of 62,400 -- managed in ocean and in-river fisheries to not to exceed a 38% ER on wild fish.

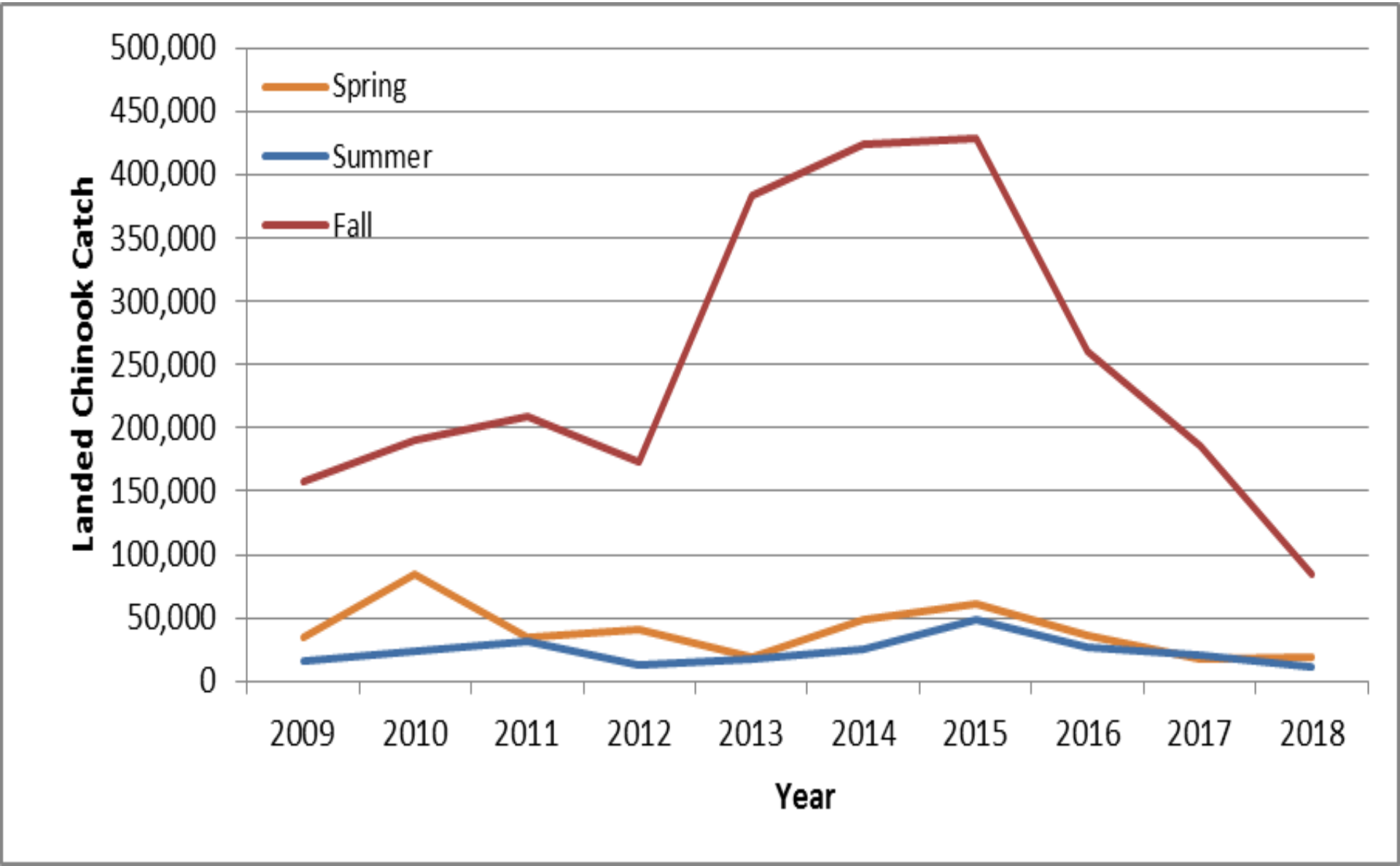
Columbia River: Management Along the Migration

- Summer Management Period
  - 2018 forecast was for 67,300 adult summer Chinook at Columbia River mouth
  - Actual run was 42,120 (lowest adult run since 2007, lowest jack return since 1999)
  - 2019 pre-season forecast is 35,900 (lowest run since 2000)
- Fisheries:
  - Chinook catches managed in-season to be at or near total allowed catch limit (impacts from NT PFMC ocean fisheries are included for abundance and fish available for in-river non-treaty fisheries).

Columbia River: Management Along the Migration

- Fall Management Period
  - 2018 forecast was for 205,060 Upriver Bright (URB) Fall Chinook
  - Preliminary URB run size was 140,500 adults (69% of forecast
  - 31,507 jack fall Chinook passed Bonneville Dam
    - Lowest lowest jack count since 2006
    - Outlook for fall chinook returns in 2019 is similar to this year or worse
- Fisheries:
  - Early closures of fisheries due to lower than expected Fall Chinook returns – nontreaty fisheries met limits sooner than expected.
    - E.g., Treaty fisheries closed early October; Non-treaty closure of steelhead retention and fall chinook fishery in mid-September.

2009-18 Harvest: All Fisheries



Conclusions

- SUS fisheries limited by conservation of weak stocks
- Sampling and management are intensive to be as precise as possible to allow for fishing opportunity in the face of:
  - Freshwater habitat loss
  - Climate change and diminished/more erratic marine survival
  - Forecast and preseason model imprecision

SOUTHEAST ALASKA CHINOOK SALMON FISHERIES AND ESCAPEMENTS

Alaska Department of Fish and Game

SEAK AABM FISHERY PRIMARY TREATY OBLIGATIONS

1) Not to exceed catch limits, specified in Table 1, applicable to the all-gear SEAK AABM fishery (Ch 3, Paragraph 9(d)).

SEAK AABM FISHERY PRIMARY TREATY OBLIGATIONS

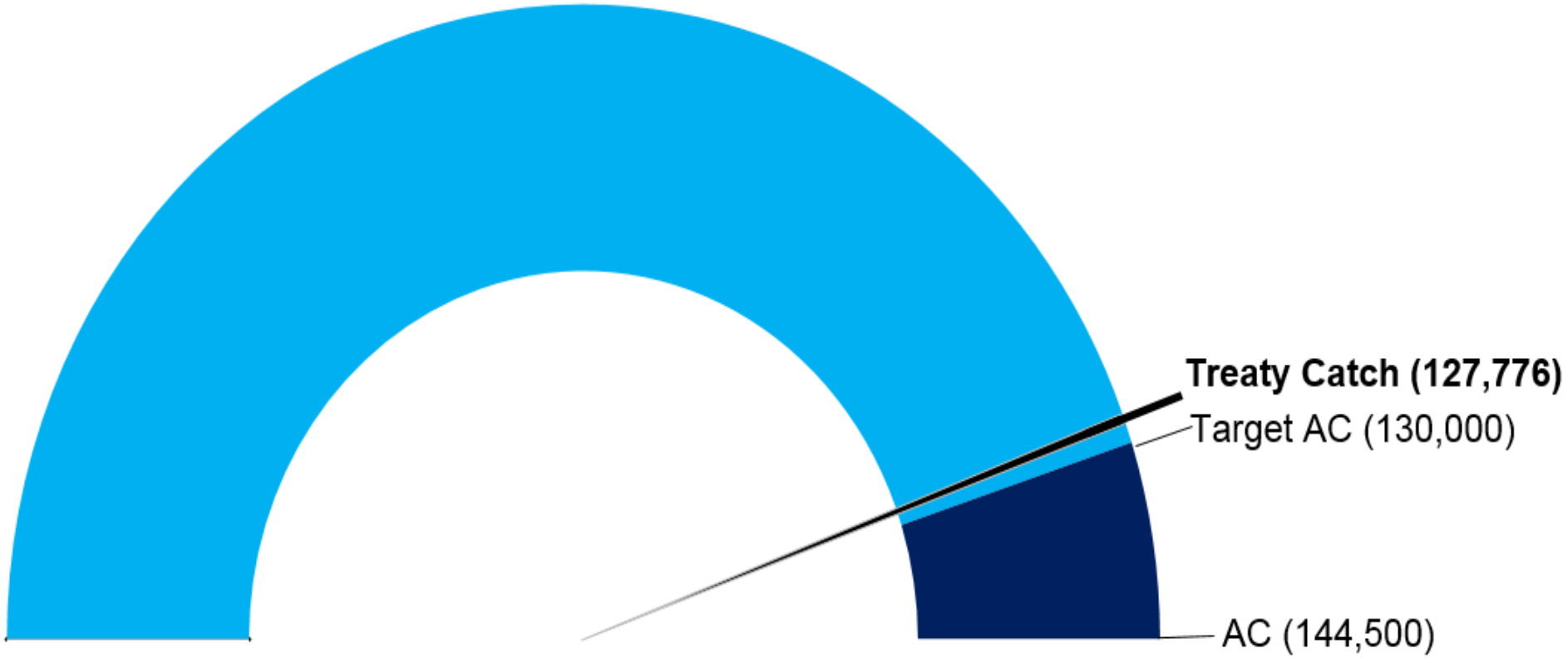
1) *Not to exceed catch limits, specified in Table 1, applicable to the all-gear SEAK AABM fishery (Ch 3, Paragraph 9(d)).*

2) *Manage SEAK fisheries to achieve escapement objectives for SEAK and TBR Chinook stocks (Ch 3,Attachment I, footnote 16).*

2018 SEAK Chinook Fishery

- Preseason Abundance Index (AI) of 1.07 → Allowable Catch (AC) of 144,500
- Due to conservation concerns for SEAK, TBR & NBC wild stocks the AC was lowered 10% → Modified AC of 130,000
- How did we do? → All-gear treaty catch of 127,776
- Total catch 164,742, Addon 36,966

2018 SEAK All-Gear Treaty Harvest

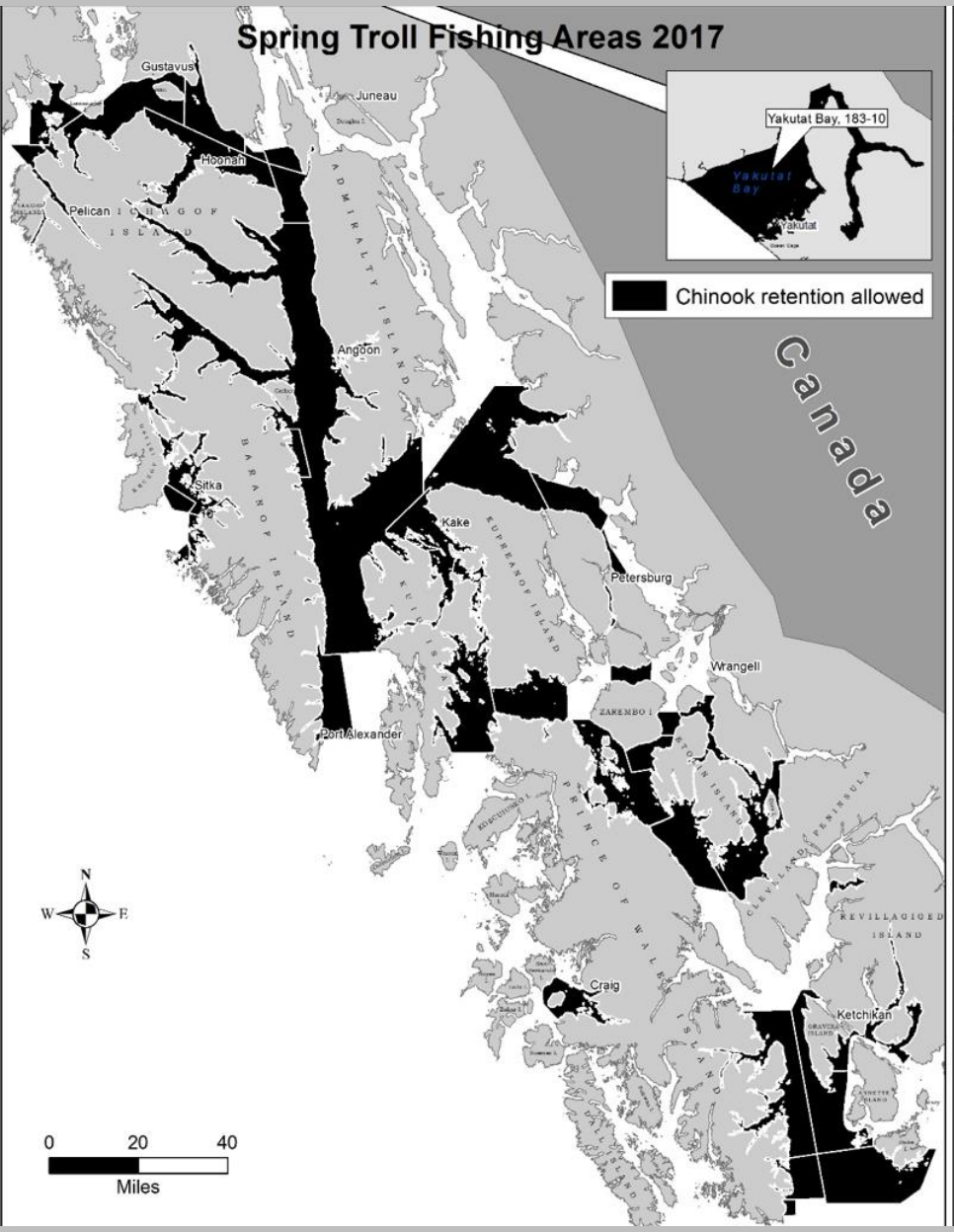


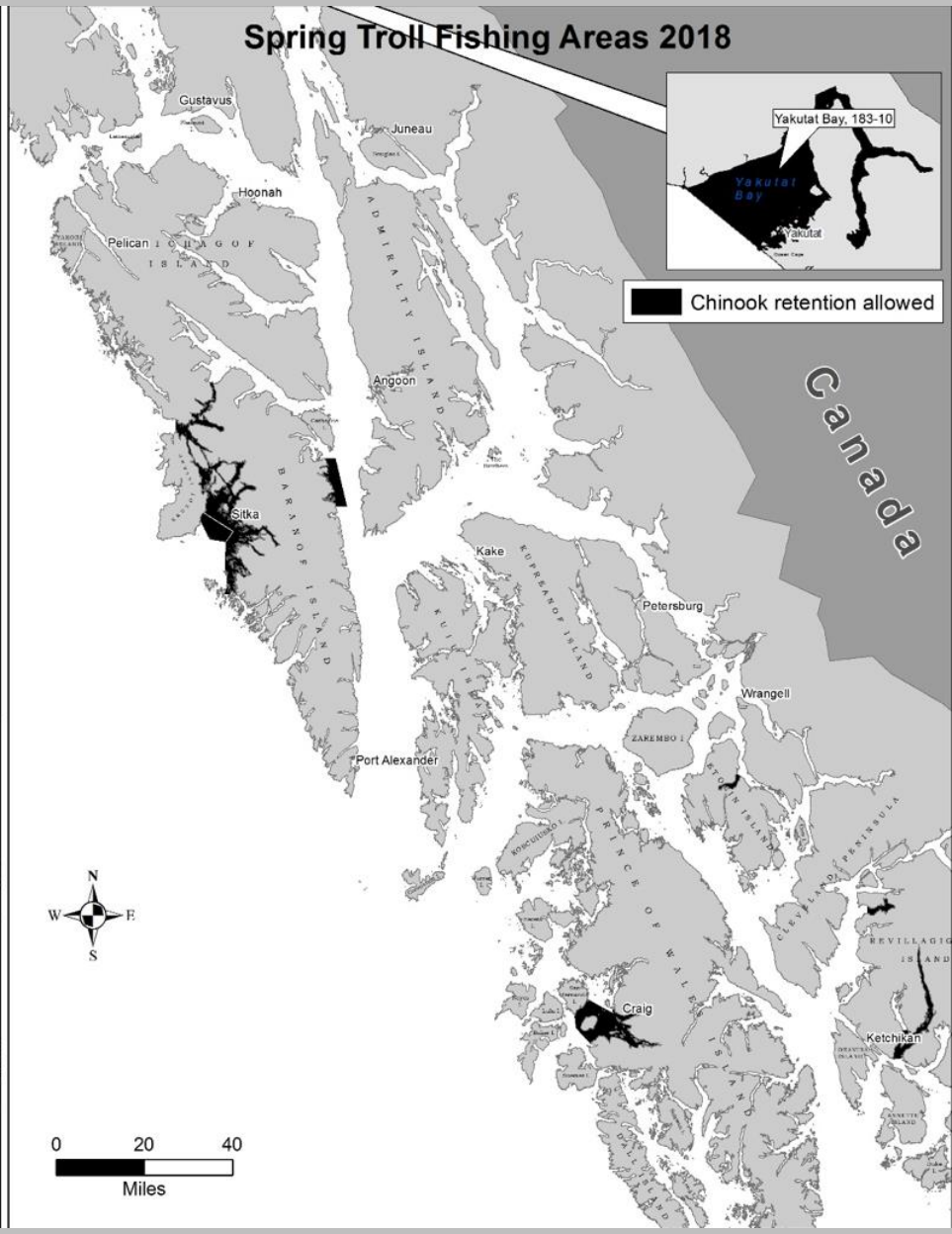
Winter Troll Fishery Management

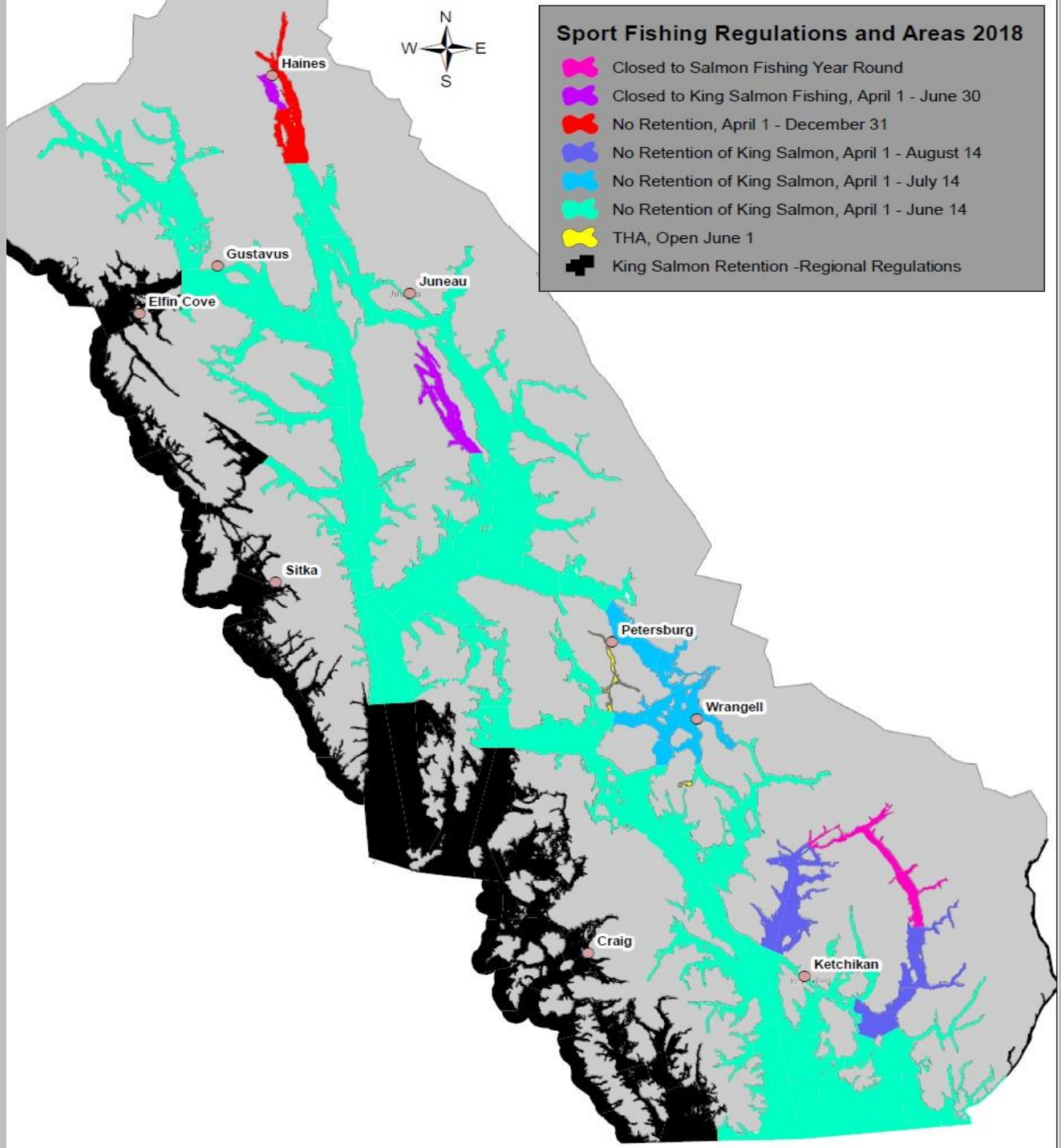
- Guideline harvest limit = 45,000 non-AK hatchery-produced fish
- Season length in regulation Oct 11-April 30, or until GHL reached
- ➢ In 2018, to help reduce encounters of wild SEAK and TBR Chinook the fishery was closed from March 16 through April 30, prior to reaching the GHL.

Spring/Summer Fisheries Management

- In 2018, to help reduce encounters of wild SEAK and TBR Chinook salmon during spring and summer, restrictions were implemented in both commercial and sport fisheries.
  - Transboundary 'directed' fisheries: (Stikine and Taku rivers) remained closed
  - Spring troll fisheries: May and June restricted to outer coast and/or near Chinook salmon release sites or hatcheries, all inside waters outside terminal harvest areas closed.
  - Summer troll fishery: All waters of District 8 (adjacent to terminus of Stikine River) and select areas of District 1 (migration corridors for Unuk River Chinook) closed to Chinook retention during first summer Chinook opening, July 1-14.
  - Purse seine fishery: was closed to Chinook salmon retention outside Terminal Harvest Areas where hatchery Chinook are produced.
  - Drift gillnet fisheries: A combination of delayed openings, reduced area, and mesh restrictions were implemented.
  - Sport fisheries: all inside waters outside terminal harvest areas were closed to Chinook retention April 1–June 14, with extended closures near several wild SEAK and TBR terminal areas.

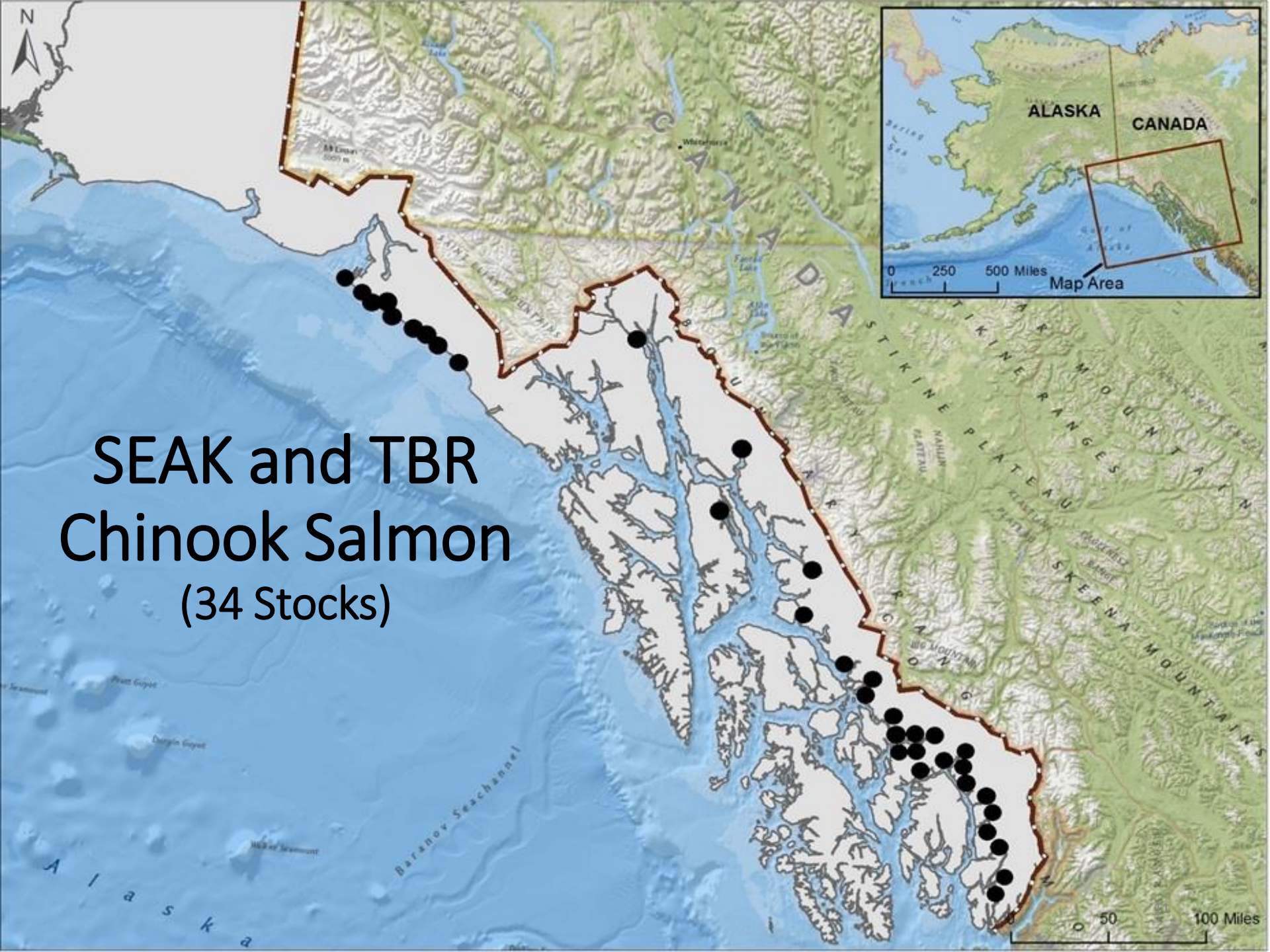

Spring Troll Fishing Areas 2017
Yakutat Bay, 183-10
Chinook retention allowed
Canada
Gustavus
Juneau
Hoonah
Pelican
Angoon
Sitka
Kake
Petersburg
Wrangell
Port Alexander
Craig
Ketchikan
N
W
E
S
0
20
40
Miles

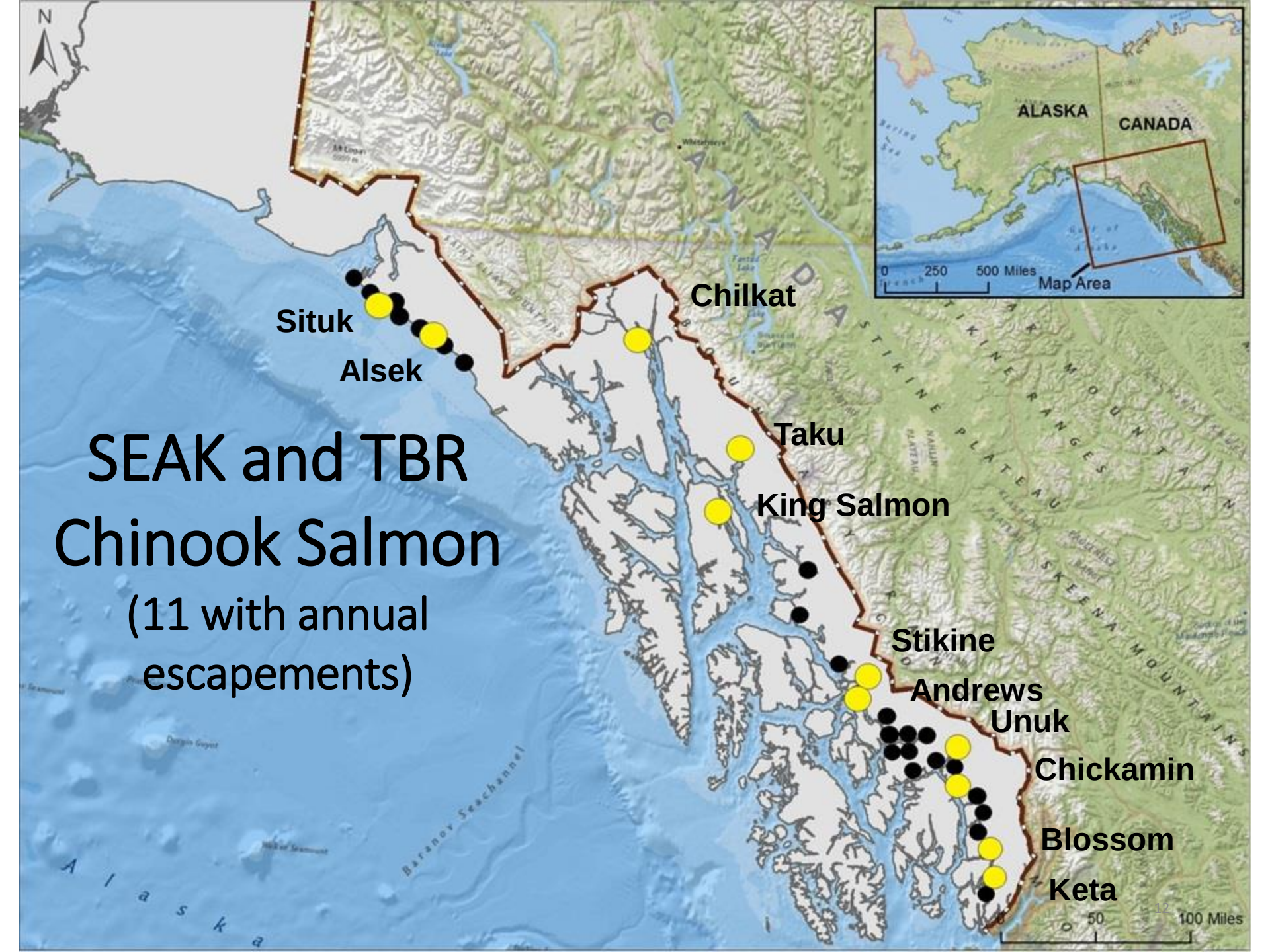

Spring Troll Fishing Areas 2018
Yakutat Bay, 183-10
Chinook retention allowed
Canada
Gustavus
Juneau
Hoonah
Pelican
Angoon
Sitka
Kake
Petersburg
Wrangell
Port Alexander
Craig
Ketchikan
N
W
E
S
0
20
40
Miles

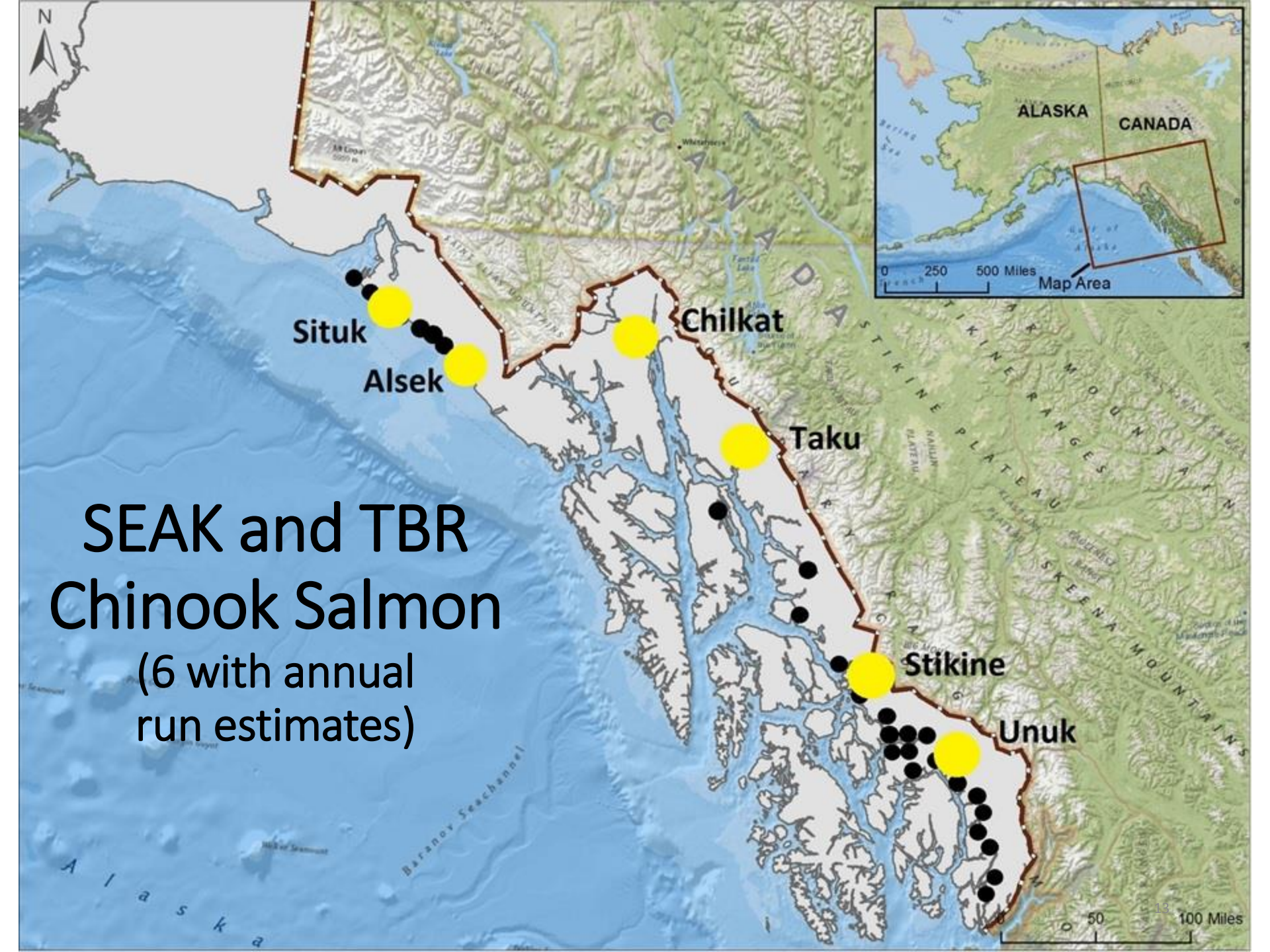

Sport Fishing Regulations and Areas 2018
Closed to Salmon Fishing Year Round
Closed to King Salmon Fishing, April 1 - June 30
No Retention, April 1 - December 31
No Retention of King Salmon, April 1 - August 14
No Retention of King Salmon, April 1 - July 14
No Retention of King Salmon, April 1 - June 14
THA, Open June 1
King Salmon Retention -Regional Regulations
N
W
E
S
Haines
Gustavus
Juneau
Elfin Cove
Sitka
Petersburg
Wrangell
Craig
Ketchikan

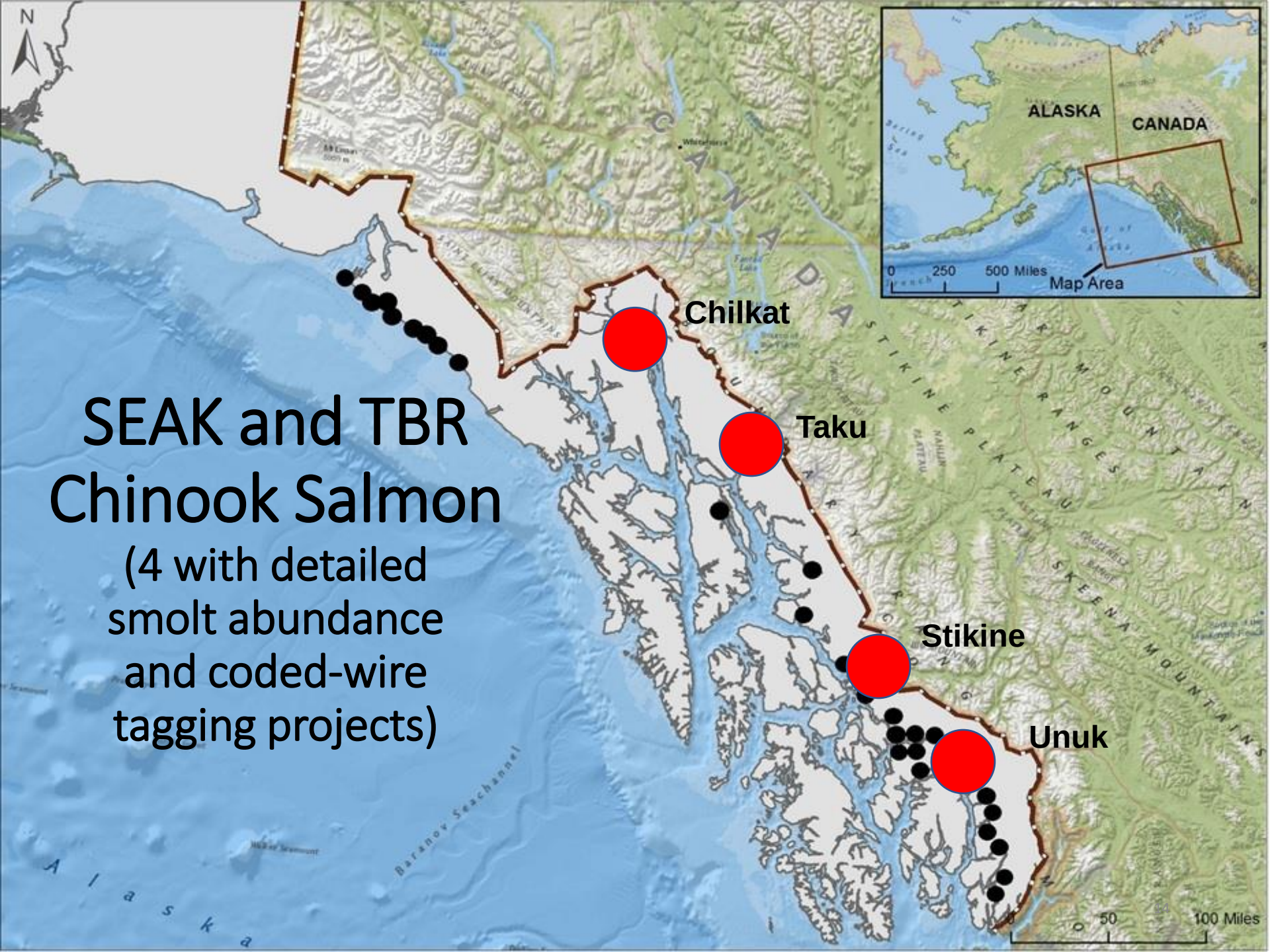
SEAK AABM FISHERY PRIMARY TREATY OBLIGATIONS

2) Manage SEAK fisheries to achieve escapement objectives for SEAK and TBR Chinook stocks (Ch 3,Attachment I, footnote 16).

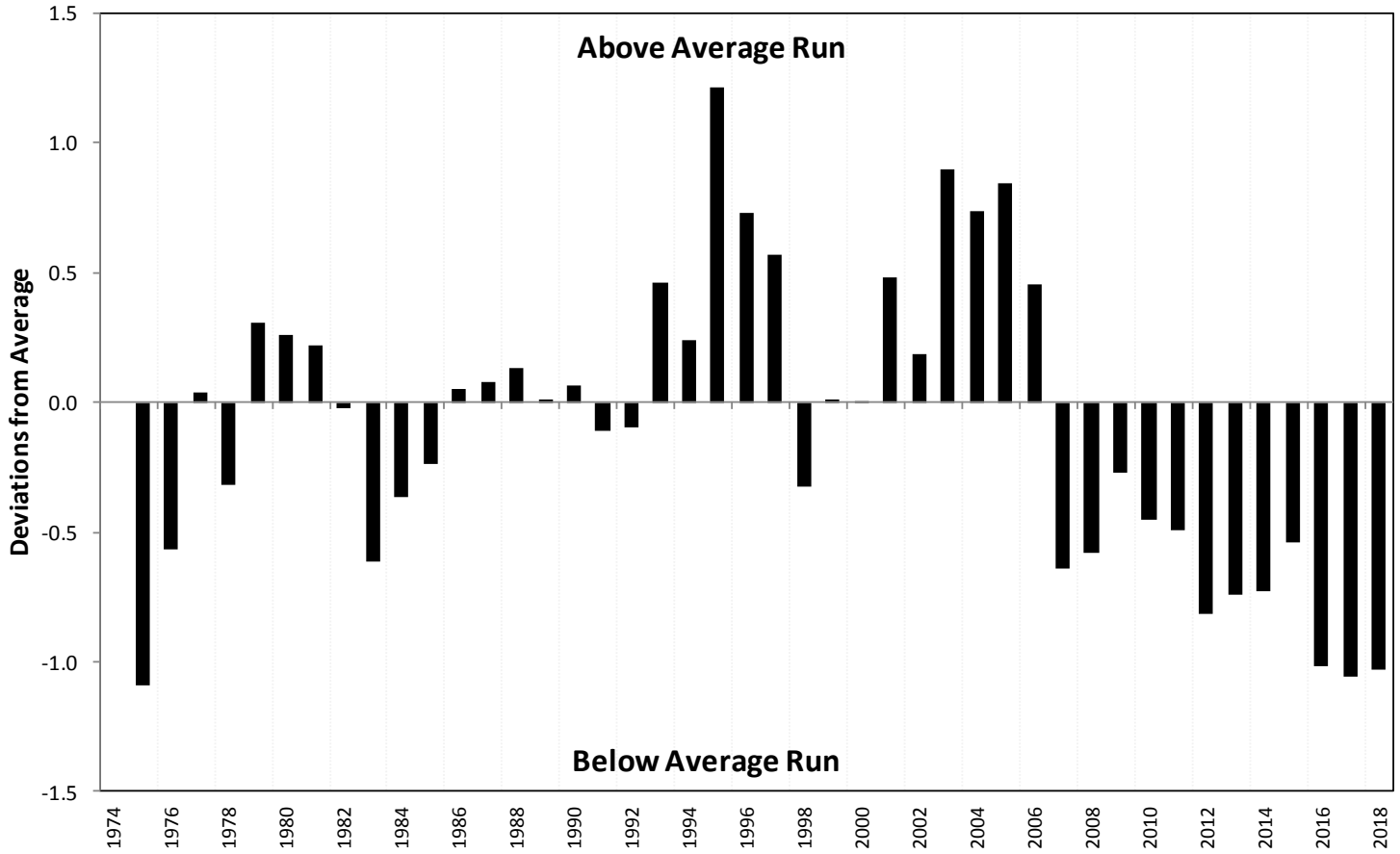

SEAK and TBR
Chinook Salmon
(34 Stocks)
ALASKA
CANADA
0 250 500 Miles
Map Area
0 50 100 Miles
Alaska
Baranov Seachannel


SEAK and TBR
Chinook Salmon
(11 with annual
escapements)
Situk
Alsek
Chilkat
Taku
King Salmon
Stikine
Andrews
Unuk
Chickamin
Blossom
Keta
ALASKA
CANADA
Map Area
0 250 500 Miles
0 50 100 Miles
N
Alaska
Baranov Seachannel
STIKINE PLATEAU
STIKINE RANGES
SKEENA MOUNTAINS


SEAK and TBR
Chinook Salmon
(6 with annual
run estimates)
Situk
Alsek
Chilkat
Taku
Stikine
Unuk
ALASKA
CANADA
0 250 500 Miles
Map Area
0 50 100 Miles
CANADA
Alaska
Baranov Seachannel
STIKINE PLATEAU
SKEENA MOUNTAINS


SEAK and TBR
Chinook Salmon
(4 with detailed
smolt abundance
and coded-wire
tagging projects)
Chilkat
Taku
Stikine
Unuk
ALASKA
CANADA
0 250 500 Miles
Map Area
0 50 100 Miles
N

SEAK and TBR Chinook Salmon Runs



SEAK and TBR Chinook Escapements

Stock	Esc goal	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Situk	500	902	197	240	322	912	475	174	329	1,187	420
Alsek	3,500	6,239	9,526	6,850	3,027	4,992	3,357	5,697	2,514	1,762	4,312
Chilkat	1,750	4,406	1,797	2,674	1,723	1,719	1,529	2,452	1,380	1,173	873
Taku	19,000	22,761	28,769	27,523	19,538	18,002	23,532	28,827	12,381	8,214	7,271
Stikine	14,000	12,803	15,116	14,482	22,327	16,783	24,366	21,597	10,554	7,206	8,344
Unuk	1,800	3,157	3,835	3,195	956	1,135	1,691	2,623	1,463	1,203	1,971

Management for SEAK/TBR Stocks is a cooperative effort by the

SEAK and TBR Chinook Harvest Rates

Stock	2009	2010	2011	2012	2013	2014	2015	2016	2017	Avg	2018
Situk	0.35	0.49	0.03	0.22	0.29	0.07	0.10	0.03	0.03	0.14	0.01
Alsek	0.16	0.07	0.11	0.25	0.10	0.26	0.06	0.08	0.10	0.12	0.02
Chilkat	0.10	0.38	0.27	0.34	0.19	0.39	0.18	0.10	0.11	0.21	0.08
Taku	0.41	0.27	0.23	0.30	0.15	0.20	0.15	0.24	0.11	0.17	0.01
Stikine	0.37	0.36	0.37	0.32	0.29	0.22	0.26	0.37	0.20	0.27	0.00
Unuk	0.26	0.29	0.32	0.71	0.56	0.44	0.56	0.48	0.30	0.41	0.23

SEAK and TBR Chinook Harvest Rates

Stock	2009	2010	2011	2012	2013	2014	2015	2016	2017	Avg	2018
Situk	0.35	0.49	0.03	0.22	0.29	0.07	0.10	0.03	0.03	0.14	0.01
Alsek	0.16	0.07	0.11	0.25	0.10	0.26	0.06	0.08	0.10	0.12	0.02
Chilkat	0.10	0.38	0.27	0.34	0.19	0.39	0.18	0.10	0.11	0.21	0.08
Taku	0.41	0.27	0.23	0.30	0.15	0.20	0.15	0.24	0.11	0.17	0.01
Stikine	0.37	0.36						0.37	0.20	0.27	0.00
Unuk	0.26	0.29						0.48	0.30	0.41	0.23

Situk	0.14	0.01
Alsek	0.12	0.02
Chilkat	0.21	0.08
Taku	0.17	0.01
Stikine	0.27	0.004
Unuk	0.41	0.23

Summary

- Lowest Chinook production on record
  - Information spanning a half century

- 2018 management actions were a cooperative effort by the U.S. and Canada
  - Most conservative measures since mid-80s
  - Alaska's harvest was managed below the all-gear catch limit by 16,724 Chinook (12%)
  - Resulting harvest rates were the lowest in four decades

- 2019 forecasts are for continued poor production
  - (4 of 5 forecasts are for runs less than the escapement goal)

Stock	Esc goal	Forecast
Situk	500	300
Chilkat	1,750	1,000
Taku	19,000	9,050
Stikine	14,000	8,250
Unuk	1,800	3,050

QUESTIONS?

Overview of the 2018 Canadian Post Season Report

January 8, 2019

1. CHANGES/CORRECTIONS TO CANADA'S REPORT

- Canada has revised the format of the post-season report on Canadian fisheries to provide information on Canadian fishery catches at the end of each section.

- For sections where data was not yet available (e.g. spawning ground enumeration programs), Canada anticipates providing final estimates in a revised post-season report that will be submitted in October 2019.

3. KEY POINTS ON THE CANADIAN REPORT

1. Transboundary Rivers

- Stikine River –
    i. Chinook: No directed chinook fishery given pre-season forecast; limited FSC harvest. Escapement of 8,600 Chinook was well below esc. goal range of 14,000-28,000 Chinook.
    ii. Sockeye: Preliminary information indicates sockeye run was approx. 83K (or <50% pre-season forecast). Post-season CDN TAC was 14,630 and actual catch in CDN fisheries was 22,737.
    iii. Joint sockeye enhancement program: approximately 2.5 million Sockeye salmon eggs (meeting the target of 2.5 million) were collected at Tahltan Lake and transported to Snettisham Hatchery in Alaska.
- Taku River –
    i. Sockeye: Preliminary post-season run size of 164K. CDN TAC was 16.8K and actual catch was approx. 17K. Escapement of 112,700 wild sockeye exceeded target range of 71,000-80,000 sockeye.
    ii. Chinook: Pre-season run size of 4,700 was below lower end of escapement goal; no directed chinook fisheries. Chinook spawning escapement estimate for 2018 was approximately 7,300 fish which was well below the SMSY target of 25,500 and the goal range of 19,000 to 36,000.
    iii. Joint sockeye enhancement program: objective was to collect 2.5 million Sockeye salmon eggs from Tatsamenie Lake and 500,000 eggs from Little Trapper lake for transport to Snettisham Hatchery in Alaska for incubation and thermal marking. Objective was met for Tatsamenie Lake but no sockeye were collected at Little Trapper lake given a shortage of females in the escapement.
- Alsek River –
    i. no chinook or sockeye directed fisheries given pre-season / inseason run size information.

ii. The 2018 Chinook escapement estimate was 1,078; within the escapement goal range of 800 to 1,200 Klukshu Chinook salmon.

2. Northern BC Chinook

- DFO implemented new conservation measures to reduce impacts on Nass, Skeena and small wild chinook populations in 2018 in the AABM and ISBM fisheries.
- NBC AABM - The pre-season abundance index was 1.01, which permitted a total allowable catch of 131,300 Chinook salmon. Total harvest was 106,976 chinook (or 81% of the TAC)
- NBC ISBM - Chinook escapements to the upper Nass River were 13,262 (based on mark-recapture data). Skeena River Chinook escapements were greater than 2017 at approximately 33,802.
- Chinook salmon escapements to Nass and Skeena Rivers in 2018 represented a significant improvement over 2017, near or exceeding minimum spawning escapement levels. Initial indications are that the improvements were due to increased production rather than decreased exploitation.

3. Northern BC Pink

- Majority of pink harvest in Area 3 and 4 occurred in Area 3 (approx. 101K) of 120K total.
- Minimal directed pink harvest in northern troll fishery.

4. Southern BC Chinook

- DFO implemented new conservation measures to reduce impacts on all Fraser River chinook populations in 2018 in the AABM and ISBM fisheries.
- WCVI AABM - The pre-season abundance index was 0.59 which permitted a total allowable catch of 88,300 Chinook. Total harvest was 76,843 Chinook (or 87% of the TAC).
- Southern ISBM – Variable escapements throughout Vancouver Island with continued good returns to the Cowichan River. Total catch in all ISBM fisheries was 176,535 Chinook (includes all marine and terminal fisheries).
- Fraser chinook escapements - Relative to the parental brood escapements, the 2018 escapement decreased approximately as follows to the Spring 4_2 (-88%), Spring 5_2 (-50%), Summer -5_2 (-60%), and Summer 4_1 (-50%) stock groups. For both the Harrison and Chilliwack rivers, the field study portions of the escapement assessments are just concluding; and data entry and analyses have not started.

5. Fraser River Sockeye

- The final in-season estimated return of Fraser sockeye was 10.725 million or 23% below the pre-season p50 value of 13.981 million. Late run sockeye accounted for the largest

difference with a final in-season return of 4.7 million (which was close to the p25 pre-season forecast) compared to 7.398 million at the p50 value.

- The International TAC was 5,452,150 sockeye
    i. U.S. share (16.5%) of the TAC, including payback (-2,400) was 897,100 sockeye
    ii. Canadian share of the TAC, including Aboriginal Fisheries Exemption (AFE), was 4,955,045 sockeye.
- Catches:
    i. US harvested: 989,459 sockeye (approx. 110% TAC)
    ii. Canada harvested: 4,724,754 sockeye (approx. 95% TAC)
- Near-final sockeye escapement estimates of 48,489 Early Stuart (108K target based on run size) and 786,223 Early Summer sockeye (720K target based on run size). Spawner enumeration programs on-going for Summer and Late run.

6. Southern BC Coho

- The Canadian objective for Interior Fraser River (IFR) Coho (including Thompson River Coho) was to manage Canadian fisheries in a highly precautionary manner with fisheries management measures similar to those in place prior to 2014. This approach was expected to achieve an overall exploitation rate in Canadian waters within the 3 to 5 % range.
- Escapement surveys to estimate returns of Coho to the Interior Fraser are currently underway, and preliminary escapement estimates will not be available until mid-January 2019 at the earliest.

7. Southern Chum

- Canada implemented additional domestic conservation measures implemented management measures for 2018 to reduce the incidental impacts of Chum fisheries on co-migrating IFR Steelhead.
- Inner South Coast (ISC) Chum - Information on escapements and catches suggest aggregate returns (Johnstone Strait, Strait of Georgia and Fraser combined) were below average but highly variable with some populations well below goal and others well above goal throughout the area.
- JS Chum - Chum catch per unit effort (CPUE) in the test fishery was at or below what was encountered in the low 2010 return and it was determined on October 1st that the index of abundance was likely below the 1.0 million critical level. As the season progressed, test fishery CPUE improved and on October 10th, indicated abundance was now at or above the 1.0 million threshold for ISC Chum and timing appeared to be slightly later. Fisheries were permitted with lower than average catch.
- Fraser River chum – The inseason run size of chum was assessed at less than the 800,000 chum escapement goal (final inseason run size was 769,000). Only limited FN

FSC harvests of Fraser chum were permitted. There were no chum directed commercial or economic opportunity fisheries in the Fraser River.

POST-SEASON REPORT FOR THE 2018 CANADIAN TREATY LIMIT FISHERIES

Fisheries and Oceans Canada
Pêches et Océans Canada

Canada

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I INTRODUCTION

The chapters in Annex IV of the Pacific Salmon Treaty outline the joint conservation and harvest sharing arrangements between Canada and the United States of America (U.S.) for key stocks and fisheries subject to the Treaty. On December 23, 2008, Canada and the U.S. ratified new provisions for five chapters under Annex IV of the Pacific Salmon Treaty. These chapters came into effect on January 1, 2009 and remain in force until 2018. Chapter 4, which covers Fraser River Sockeye and Pink salmon, was revised in July 2014 and these revisions cover fisheries in 2014 through 2019. All management regimes under Annex IV continue to be implemented by Fisheries and Oceans Canada (DFO) for the 2018 season.

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

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

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

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

2 TRANSBOUNDARY RIVERS

2.1 STIKINE RIVER

Following the 2018 pre-season meeting of the Transboundary Panel, Canada developed its 2018 domestic fishing strategy for Stikine River salmon fisheries based on the catch sharing and management arrangements outlined in Annex IV, Chapter 1, and Paragraph 3 of the Pacific Salmon Treaty (PST). The 2018 Canadian Stikine River salmon fishery management approach was designed to achieve the spawning escapement targets and the following harvest objectives: 1) to harvest 50% of the total allowable catch (TAC) of Stikine River Sockeye salmon in existing fisheries; 2) to allow additional harvesting opportunities in terminal areas for enhanced Sockeye that were surplus to spawning requirements; and 3) to harvest up to 5,000 Coho salmon in a directed Coho fishery. A pre-season forecast of 6,900 Chinook was below the PST threshold run size of 28,100 which did not allow for a directed Chinook fishery in 2018. Due to concerns over run abundance and escapement, the Chinook assessment fishery was not prosecuted in 2018.

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

Fishing gear employed within the 2018 season was limited to one 135-metre (443 ft.) gill net per licence holder. The maximum mesh size allowed was 140 mm (5.5") through August 25, after which time the maximum mesh size was increased to 204 mm (8"). The lower Stikine commercial fishing zone covered the area from the international (U.S. / Canada) border upstream to near the confluence of the Porcupine and Stikine Rivers, and also included the lower 10 km (6 mi.) reach of the Iskut River.

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

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

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

2.1.1 CHINOOK SALMON

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

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

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

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

In addition to the mark-recapture study, the Little Tahltan weir project and aerial surveys, genetic samples were collected on a weekly basis from Chinook salmon incidentally caught in U.S. marine fisheries. These data were used to determine the total U.S. interception of Canadian-origin Stikine River Chinook salmon.

2.1.2 SOCKEYE SALMON

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

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

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

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

The spawning escapements for the non-Tahltan and the Tuya stock groups are calculated using stock identification, test fishery and in-river commercial catch and effort data. The average of the test fishery and the commercial fishery catch-per-unit of effort (CPUE), which operated over the full duration of the run, were used as the principal tool in assessing the spawning ground escapements of non-Tahltan Lake and the Tuya Sockeye stock groupings. Based on the run reconstructions generated from the test and commercial fishery CPUE, the preliminary escapement estimates for 2018 were 25,256 non-Tahltan and 1,000 Tuya Sockeye salmon. The non-Tahltan spawning escapement estimate was within the escapement goal range of 20,000 to 40,000 and was 5% above the 10 year average of 24,000 fish. The estimated return of Tuya Lake Sockeye salmon was below the recent 10 year average of 12,000 fish. These fish do not contribute to the natural production of Stikine River Sockeye salmon due to migration barriers that obstruct entry to Tuya Lake.

Based on the preliminary in-river run reconstruction of the Tahltan Lake run expanded by run timing and stock identification data in the lower river and estimated harvests of Stikine River Sockeye salmon in U.S. terminal gill net fisheries, the preliminary post-season estimate of the terminal Sockeye salmon run size is approximately

[1] Terminal run excludes U.S. interceptions that occur outside Districts 108 and 106.

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

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

2.1.3 COHO SALMON

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

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

2.1.4 JOINT SOCKEYE SALMON ENHANCEMENT PROGRAM

Joint Canada/U.S. enhancement activities continued from 2017 through 2018 with the collection of Sockeye salmon eggs from Tahltan Lake in British Columbia, transportation of eggs to the Snettisham Hatchery in Alaska where they were raised to fry, and subsequent transportation and release at out-plant sites in British Columbia.

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

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

2.2 TAKU RIVER

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

Canadian strategy incorporated specific conservation considerations and contained the following harvest objectives: 1) harvest 21% of the TAC of Taku River Sockeye salmon (adjusted as necessary according to projections of the number of enhanced Sockeye), plus the projected wild Sockeye in-river escapement in excess of 1.6 times the spawning escapement goal; 2) to harvest enhanced Taku River Sockeye salmon incidentally to wild Sockeye salmon; 3) to harvest 5,000, plus any excess over the escapement target of 70,000 Coho salmon in a directed Coho salmon fishery, dependent on in-river run size projections; and 4) to consider a directed Chinook salmon fishery, dependent on in-river run size projections.

The 2018 commercial fishing season on the Taku River opened on June 26 (statistical week 26), and closed on September 17 (statistical week 38). Fishing area and gear restrictions were as per recent years, and incorporated the maximum gill net length of 36.6 metres, established in 2008 for drift gill nets and in 2009 for set gill nets.

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

The First Nation FSC fishery is primarily located in the lower Taku River in the same area as the Canadian commercial. Small numbers of fish are also harvested on the lower Nakina River and at the outlet of Kuthai and King salmon lakes. There were no time or gear restrictions imposed on the First Nation fishery in 2018.

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

2.2.1 CHINOOK SALMON

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

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

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

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

2.2.2 SOCKEYE SALMON

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

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

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

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

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

2.2.3 COHO SALMON

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

2.2.4 JOINT SOCKEYE ENHANCEMENT

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

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

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

2.3 ALSEK RIVER

Although catch sharing provisions for Alsek River salmon stocks between Canada and the U.S. have not yet been specified, Annex IV of the Pacific Salmon Treaty calls for the development and implementation of cooperative abundance-based management plans and programs for Alsek River Chinook and Sockeye salmon. In 2013, escapement goal ranges for Alsek River Chinook and Sockeye salmon were recommended by the

Transboundary Panel, these are: 3,500 to 5,300 Chinook and 24,000 to 33,500 Sockeye salmon. Additionally, the escapement targets were revised for Klukshu River Chinook and Sockeye salmon, these are: 800 to 1,200 Chinook and 7,500 to 11,000 Sockeye. The principal escapement-monitoring tool for Chinook, Sockeye, and Coho salmon stocks on the Alsek River is the Klukshu weir, in operation since 1976 by DFO in collaboration with the Champagne-Aishihik First Nation (CAFN).

Total drainage abundance programs are being investigated as part of the development of abundance-based management regimes and to accurately assess whether the escapement goals for Alsek River Chinook and Sockeye salmon stocks are appropriate and achievable. At this time, there are no programs in place to estimate the drainage-wide Coho salmon escapement. A large and variable proportion of the escapement of each species is enumerated at the Klukshu River using video enumeration techniques. Current escapement monitoring programs include the Klukshu River, Village Creek Sockeye enumeration, and post-season run reconstructions using genetic stock identification analyses which allow for annual comparisons of escapement indices. The most reliable long-term comparative escapement index for Alsek River drainage salmon stocks is the Klukshu River count.

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

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

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

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

Table 2. Transboundary Rivers Fisheries (Treaty Harvest)

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

: not applicable

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

3.1 OBJECTIVES AND OVERVIEW

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

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

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

3.2 STOCK STATUS

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

3.3 RECREATIONAL FISHERIES

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

3.4 COMMERCIAL FISHERIES

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

Table 3. North Coast AABM Chinook Directed Fisheries

Licence Group	Fishing Area	Chinook Kept	Chinook Released	Sockeye Kept	Sockeye Released	Pink Kept	Pink Released	Coho Kept	Coho Released	Chum Kept	Chum Released
Commercial											
	Haida Gwaii	70,276	22,455	0	11,244	30,630	8,613	176,200	144	3,175	5,012
Total Commercial Catch		70,276	22455	0	11,244	30,630	8,613	176,200	144	3,175	5,012
Recreational											
	Haida Gwaii	36,700	40,564	170		1,950		34,200	7,795	950	
Total Recreational Catch		36,700	40,564	170	0	1,950	0	34,200	7,795	950	0
TOTALS		**106,976**	**63,019**	**170**	**11,244**	**32,580**	**8,613**	**210,400**	**7,939**	**4,125**	**5,012**

Notes:

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

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

4.1 OBJECTIVES AND OVERVIEW

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

4.2 STOCK STATUS

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

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

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

4.3 FIRST NATIONS FSC FISHERIES

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

4.4 RECREATIONAL FISHERIES

4.4.1 RECREATIONAL – TIDAL

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

June 1, 2018 to June 15, 2018 – Daily limit of one (1) Chinook per day.
June 16, 2018 to July 9, 2018 – Zero (0) retention of Chinook.
July 10, 2018 to July 31, 2018 – Daily limit of one (1) Chinook per day.

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

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

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

4.4.2 RECREATIONAL- NON-TIDAL

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

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

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

4.5 COMMERCIAL FISHERIES

North and Central Coast commercial catches includes gill net catches from Areas 3 to 8 (from hailed catch data). Estimates of gill net catches include Chinook less than 5 pounds (graded as jacks and small red fleshed Chinook) not normally included for PSC accounting. Small Chinook typically make up less than 5% of commercial gill net catches. Hail catch data tend to underestimate catch reported in fish slips by 25 to 30%.

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

Table 4. North Coast ISBM Chinook Fisheries

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

Note: No released catch data available.

5 NORTHERN BC PINK SALMON FISHERIES

5.1 OBJECTIVES AND OVERVIEW

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

Canada was also to manage the Area 1 troll fishery to achieve an annual catch share of 2.57% of the annual allowable harvest (AAH) of Alaskan Districts 101, 102 and 103 Pink salmon.

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

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

5.3 AREA 1 PINK TROLL CATCH

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

Table 5. Northern BC Pink Directed Fisheries

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

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

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

6.1 OBJECTIVES AND OVERVIEW

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

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

Further considerations for managing Chinook catch in WCVI AABM fisheries are driven by concerns regarding the low status of natural WCVI, Lower Strait of Georgia (LGS), Fraser River Chinook, and Interior Fraser Coho populations.

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

Continued efforts were made in 2018 to limit the impact of the troll fishery on low status Chinook populations, including time and area constraints, and limits on effort (boat-days) to protect stocks of concern.

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

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

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

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

6.2 RECREATIONAL FISHERIES

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

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

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

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

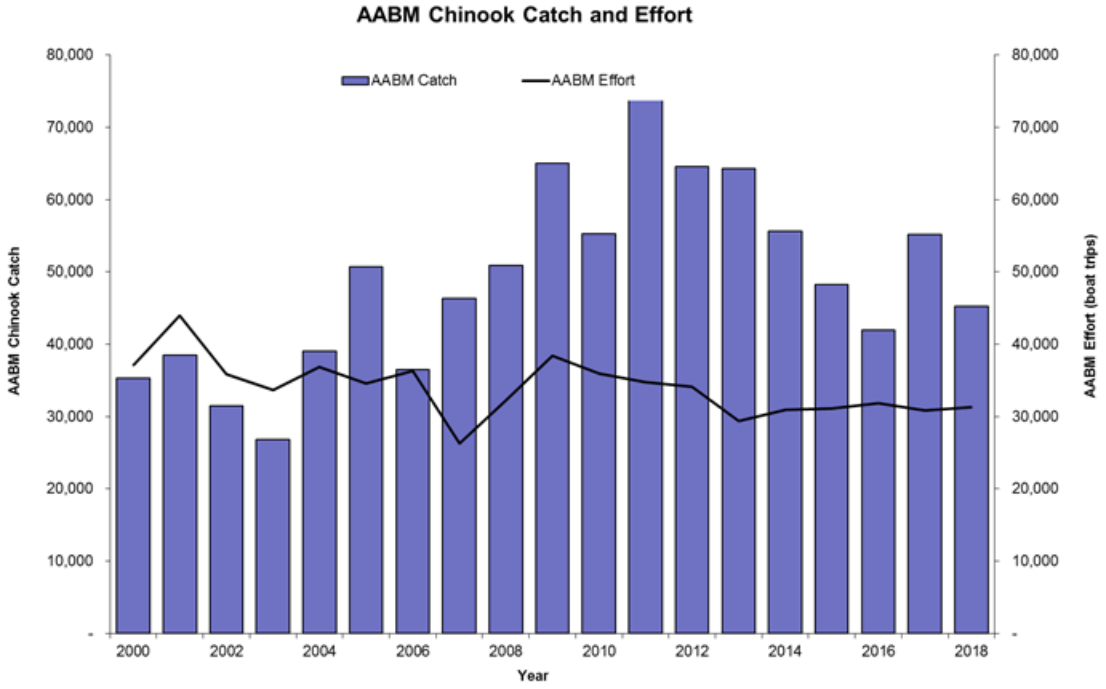

Figure 6-1 WCVI Recreational AABM Catch and Effort- Chinook, 2000-2018

6.3 COMMERCIAL FISHERIES

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

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

6.3.1 AREA G TROLL SUMMARY

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

The management plan is subject to change when required to address specific conservation concerns. For the 2018 fishing season, the following changes to annual fishing plan were implemented:

- Additional conservation to address to further protect low returns of Fraser River Spring 4_2, Spring 5_2, and Summer 5_2 Chinook were implemented. For Area G troll this includes a fishery closure for June and July and the use of additional time/area closures.
- To avoid exceeding the overall WCVI AABM TAC, 5,000 Chinook of the Area G TAC was allocated to September fisheries. If AABM catch estimates indicate the overall WCVI AABM TAC may be exceeded, the Area G TAC for September would be used to assist Canada with staying within its overall WCVI Chinook TAC.
- The retention of hatchery marked Coho was not permitted in fisheries after September 15 which has been permitted in recent years

<u>Area G Troll Fishing Periods Generalized Fishing Plan</u>

October to March:

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

March 16 to April 18:

A full time-area closure was maintained from March 16 to April 18 annually to avoid interception of Fraser River Spring 4_2 and Fraser Spring & Summer 5_2 Chinook.

Late April/ mid-June:

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

(partial openings from May 2 to 7), in order to avoid interception of Fraser River Spring 4_2, Spring 5_2, and Summer 5_2 Chinook.

June 16 to July 23:

A full time-area closure was maintained from June 15 to July 23 in Management Areas 125 to 127, and from June 16 to July 31 in Management Areas 123 to 124, to avoid interception of Fraser River Spring 4_2, Spring 5_2, and Summer 5_2 Chinook.

July 24 through early August:

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

September:

During the September period, a harvest of approximately 20% of the Area G annual TAC is permitted based on the PST Chinook model calibration and assigned harvest levels for the WCVI AABM area. The Area G harvest level in September has the potential to increase if there is available remaining WCVI AABM TAC after accounting for First Nation FSC and recreational fisheries. However, if First Nations or the recreational sectors catches are larger than projected, the available commercial TAC is reduced. During harvest opportunities between September 15 and December 31 retention of marked Coho by-catch may be permitted.

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

Since 1999, a major objective for the management of the WCVI troll fishery has been to distribute the catch throughout the fall-winter-spring-summer periods. This objective was continued in 2017/2018.

6.3.1 FIRST NATIONS COMMERCIAL HARVEST

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

6.4 First Nations Domestic and FSC Fisheries

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

Table 6. Southern BC - AABM Chinook Directed Fisheries

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

Notes:

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

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

7.1 OBJECTIVES AND OVERVIEW

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

Measures were taken in 2018 in First Nations FSC, recreational and commercial Chinook fisheries to protect West Coast Vancouver Island (WCVI), Lower Strait of Georgia (LGS), and Fraser RiverChinook stocks. FSC management actions included time and area closures and reduced fishing times. Recreational measures included barbless hooks, time/area closures, reductions to daily/possession limits, size restrictions and mark selective fisheries. Commercial measures included barbless hooks, time and area closures, gear restrictions, mandatory use of revival tanks, daily catch reporting and mandatory logbooks.

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

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

Fraser River Spring 4_2, Spring 5_2, and Summer 5_2 Chinook stocks have had specific management measures in place to reduce exploitation in FSC, recreational and commercial fisheries.

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

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

Recreational fisheries in Juan de Fuca Strait, the lower Strait of Georgia and the approach waters of the Fraser River had specific time, area, size and mark-selective restrictions designed to minimize the amount of exploitation on these Chinook stocks.

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

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

7.2 STOCK STATUS

7.2.1 WEST COAST VANCOUVER ISLAND CHINOOK

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

Hatchery production supports terminal fisheries directed at surplus production with extensive management measures in place to reduce impacts on wild origin stocks. For WCVI hatchery stocks, the terminal return is defined as total catch (First Nation FSC, sport and commercial) in the near approach areas of the hatchery plus escapement (brood collection plus natural spawners, and ESSR if applicable). In these approach areas, catch is dominated by the hatchery stock (e.g. >95%), therefore, higher exploitation rates are permitted than in times and areas dominated by naturally produced WCVI Chinook stocks.

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

7.2.2 STRAIT OF GEORGIA CHINOOK

Fall Season

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

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

Cowichan River Chinook (a wild Chinook indicator stock) declined from a high of 16,982 adults in 1995 to 1,260 in 2009. The declining trends after 1990 in various southern Strait of Georgia Rivers are attributed to high exploitation rates, a decline in marine survival, and habitat issues. Exploitation rates on CWT hatchery fish were estimated at 80-90% in the early 1990s but declined to an average of 56% for the period 2006-2012 as a result of various harvest restrictions implemented over the last 20 years. Additional conservation measures were introduced in 2005 to reduce the harvest of Cowichan Chinook by the Strait of Georgia sport and WCVI troll fisheries. First Nations have substantially reduced harvests of Chinook in the Cowichan River in recent years.

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

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

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

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

Spring/Summer:

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

7.2.3 JOHNSTONE STRAIT MAINLAND INLET CHINOOK

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

Nimpkish River

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

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

Campbell/Quinsam System

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

Phillips River

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

7.2.4 FRASER RIVER CHINOOK

Escapements of spring and summer stream type stocks have been at low levels during the 2009 Agreement, and in 2018 fisheries were restricted further in the Canadian marine fisheries and Fraser River to address concerns about poor status for all Fraser Chinook stock groups. Relative to the parental brood escapements, the 2018 escapement decreased approximately as follows to the Spring 4_2 (-88%), Spring 5_2 (-50%) and Summer -5_2 (-60%) stock groups. Escapement estimates are still being developed for some stocks following the summer wildfires, so the aggregate totals are currently unavailable.

Status has declined for the Summer 4_1 stock group. In 2018, the escapement of the Summer 4_1 aggregate declined by approximately 50% from the brood escapement levels.

Annual Fraser River fall-run Chinook stock group escapements are, on average, large (~100,000 during the 2009 Agreement). Historically, the major contributor and principal focus of assessment of this stock group is Chinook returning to the Harrison River, and Harrison River transplants to the Chilliwack River Hatchery. For both the Harrison and Chilliwack rivers, the field study portions of the escapement assessments are just concluding; and data entry and analyses have not started.

Howe Sound/Squamish River

No information is available at this time.

Burrard Inlet

No information is available at this time.

Boundary Bay

No information is available at this time.

7.3 First Nations Domestic and FSC Fisheries

WCVI FSC Fisheries and Treaty Domestic Fisheries

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

Strait of Georgia FSC Fisheries and Treaty Domestic Fisheries

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

Johnstone Strait FSC Fisheries

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

Fraser River FSC Fisheries

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

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

7.4 Commercial Fisheries

Area B Seine

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

Area D Gill Net

Area D gill net fisheries were initiated in Area 23. The fisheries occurred in Subarea 23-1, upper Alberni Inlet, targeting Chinook with a bycatch of Coho allowed. The fisheries were opened one day a week for night-time only fisheries in late August. After Labour Day there were multiple openings nightly in early and mid-September. The fisheries occurred on August 22, 26 and September 3,4,5,7,8,10,11,12,13. The Area D in season TAC was 9,768 Chinook. There was also additional quota reallocated to Area D from uncaught catch in the recreational sector. The fisheries were successful and a total Chinook catch and Coho bycatch can be found in Table7.

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

Area E Gill Net

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

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

7.4.1 FIRST NATIONS COMMERCIAL HARVEST

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

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

Fraser River Economic Opportunity and Inland Demonstration Fisheries

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

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

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

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

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

7.5 Excess Salmon to Spawning Requirements (ESSR) Fisheries

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

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

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

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

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

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

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

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

There were no Johnstone Strait ESSR opportunities on Chinook in 2018

There were no Interior ESSR opportunities on Chinook in 2018

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

7.6 Recreational Fisheries

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

West Coast Vancouver Island

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

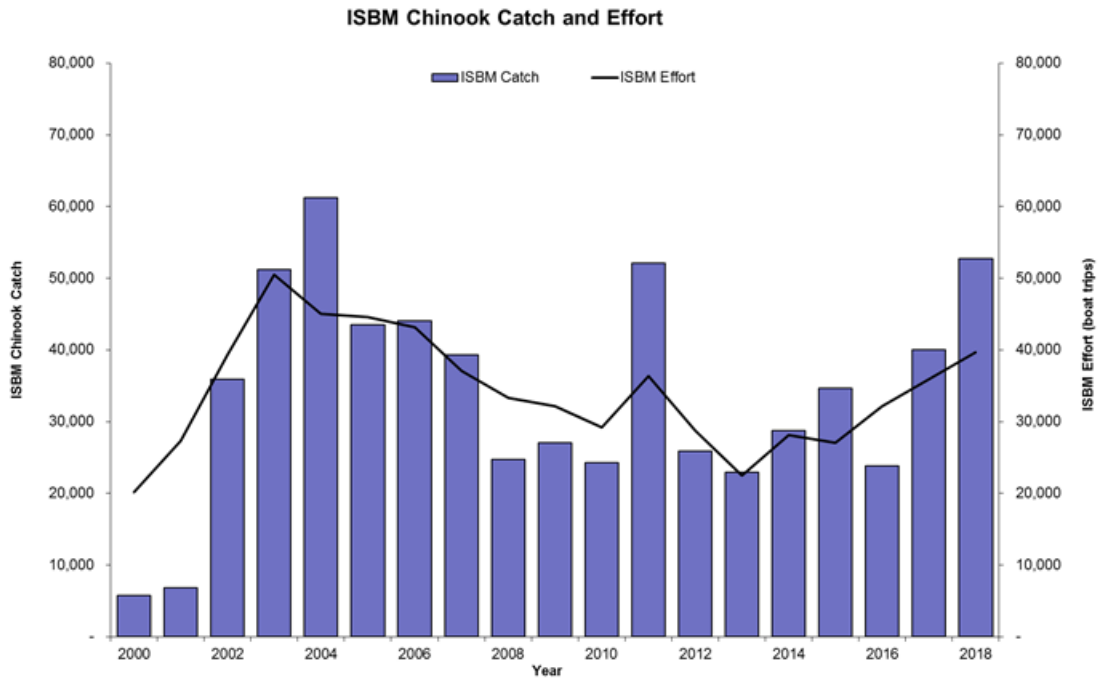

Figure 7-1 Recreational WCVI Chinook ISBM Catch and Effort, 2000 to 2018

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

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

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

> June 1, 2018 until September 30, 2018, the daily limit for Chinook Salmon was one (1) per day in in Areas 13 to 17, 28 and 29 with the exception of those areas listed below where additional actions were in place for Southern Resident Killer Whales (SRKW).
>
> October 1, 2018 until further notice, the daily limit for Chinook Salmon was two (2) per day in in Areas 13 to 19, 28 and 29.

Exceptions:

Strait of Georgia:

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

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

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

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

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

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

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

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

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

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

In 2018, marine sport fisheries were monitored by creel surveys in three main areas; 1) Juan de Fuca including Victoria (south of Cadboro Point) and Juan de Fuca Strait through Subareas 20-1; 2) Portions of the Strait of Georgia including Areas 14 through 18, that portion of Area 19 north of Cadboro Point, Areas 28 and 29; and 3) Johnstone Strait including Areas 11 to 13. Creel survey monitoring of these fisheries includes using an access point (landing site) survey for collecting catch, CPUE, and biological information combined with an aerial survey for effort counts. In addition, logbook programs, directed at estimating the sport catch by fishing guides during guided trips, were conducted in the Campbell River and Victoria Areas in 2018. Electronic survey estimates from the iREC program will also be used to produce catch estimates for those areas where creel surveys did not take place.

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

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

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

Region 1 Vancouver Island Tributaries-

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

Qualicum River

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

Somass/ Stamp

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

Nitinat

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

Conuma

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

Fraser River and Tributaries

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

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

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

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

Tidal Fraser and Region 2 Fraser River:

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

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

Fraser River Tributaries:

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

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

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

Region 3 - Fraser River Tributaries

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

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

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

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

Region 5 – Fraser Watershed

There were no recreational Chinook fisheries in 2018.

Region 7

There were no recreational Chinook fisheries in 2018.

Region 8

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

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

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

Middle Shuswap River: No fishing for salmon.

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

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

Table 7. Southern BC - ISBM Chinook Directed Fisheries*

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

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

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

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

8 FRASER RIVER SOCKEYE

8.1 OBJECTIVES AND OVERVIEW

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

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

- The FRP operated in accordance with Chapter 4, Annex IV of the Pacific Salmon Treaty;

- The U.S. share of the annual Fraser River Sockeye salmon total allowable catch (TAC), harvested in the waters of Washington State was set at 16.5% of the aggregate. To the extent practicable, the FRP shall manage the United States fishery to implement a fishing plan that concentrates harvest on the most abundant management group or groups;

- It is understood that the U.S. harvest may exceed 16.5% of the TAC for one or more of the less abundant management groups by a small but acceptable amount despite concentrating the harvest in this manner;

- For computing TAC by stock management groupings, the Aboriginal Fishery Exemption (AFE) of 400,000 Fraser River Sockeye, shall be allocated to management groups as follows: The Early Stuart Sockeye exemption shall be up to 20% (maximum 80,000) of the Fraser River AFE, and the remaining balance of the latter exemption shall be based on the average proportional distribution of First Nations Food, Social and Ceremonial catch for the most recent three cycles and modified annually as required to address concerns for Fraser River Sockeye stocks and other species, and as otherwise agreed to by the Fraser River Panel;

- It was anticipated that an in-season run size estimate for Cultus Lake Sockeye would not be possible due to low abundance relative to co-migrating Sockeye stocks. As a result the Cultus exploitation rate is assumed to be the same as the exploitation rate from the similarly timed Late run stocks (excluding the Birkenhead and Birkenhead-type miscellaneous stocks), caught seaward of the confluence of the Fraser and the Harrison Rivers;

- The four run timing aggregates identified under the Pacific Salmon Treaty Annex generally contain stocks with similar timing in the marine area. Recent trends in timing of some stocks, including Raft River and North Thompson (in the Early Summer run prior to 2012), and Harrison River (in the Late run prior to 2012) Sockeye now differ substantially from the other stocks in their respective historical run timing groups. Fisheries and Oceans Canada continues to manage these stocks as part of the Summer run aggregate to better align these stocks with other stocks of similar run timing. Escapement plans, management adjustments and harvest rules have been adjusted to account for this change;

- Canada's escapement plan specified escapement requirements that varied with run size for each of the run timing aggregates;

- The Total Allowable Mortality (TAM) cap describes the upper range of the total mortality (including management adjustments and exploitation rate). The TAM cap was 60% for all run timing/management groups;

- At low abundances, low abundance exploitation rates (LAERs) are implemented to protect 80-90% of the run timing aggregate (10-20% LAER) while allowing for fisheries on more abundant co-migrating run timing groups and/or other species. In 2018 Canada's escapement plan permitted up to a 20% LAER for all stock groups with the exception of Early Stuart sockeye which permitted up to a 10% LAER. If the Late Run reached the p75 level abundance in-season the LAER for this group increases to 30%;

- The allowable harvest in a LAER situation is not a target and in most circumstances would be considered incidental harvest or bycatch only; however, in some circumstances limited directed harvest in terminal areas may be considered;

- In 2018, Early Stuart Sockeye window closures and other fishing restrictions were planned for commercial, recreational and First Nations fisheries to protect a significant proportion (90%) of the Early Stuart return. These measures included a rolling window closure based on run timing of the Early Stuart Sockeye migration through various fishery areas; and

- Conservation concerns for other Sockeye stocks and species continued to impact the planning of Sockeye fisheries. The stocks and species of concern in 2018 were: Cultus Lake Sockeye, Nimpkish River Sockeye, Sakinaw Lake Sockeye, Interior Fraser River Coho, Southern B.C Chinook including Fraser River Chinook, and Interior Fraser River Steelhead.

8.2 STOCK STATUS

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

8.2.1 PRE-SEASON ASSESSMENT

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

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

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

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

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

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

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

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

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

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

*** The expected allowable Early Stuart Catch.

The goals for each Sockeye management group were established by applying Canada's Spawning Escapement Plan to the forecasted pre-season run size. For pre-season planning purposes, the harvest rule for Early Stuart Sockeye was constrained by a Low Abundance Exploitation Rate (LAER) limit of up to10%, while the Early Summer and Summer run Sockeye LAER limit was up to 20%, and the Late run Sockeye LAER limit was 20-30%. Harvest rules were further constrained by a 60% Total Allowable Mortality (TAM) rate for all management groups (Table 8-3).

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

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

Management Unit		Pre-season Forecast Return				
		p10	p25	**p50**	p75	p90
Early Stuart	forecast	37,000	54,000	**84,000**	133,000	199,000
	TAM Rule (%)	0%	0%	**0%**	19%	46%
	Escapement Target	37,000	54,000	**84,000**	108,000	108,000
	MA	25,500	37,300	**58,000**	74,500	74,500
	Esc. Target + MA	62,500	91,300	**142,000**	182,500	182,500
	LAER	10%	10%	**10%**	10%	10%
	Available ER at Return	0%	0%	**0%**	0%	8%
	Allowable ER	10%	10%	**10%**	10%	10%
	Allowable Harvest	3,700	5,400	**8,400**	13,300	19,900
	2018 Performance					
	Projected S (after MA)	19,600	28,700	**44,600**	70,600	105,700
	BY Spawners	68,613	68,613	**68,613**	68,613	68,613
	Proj. S as % BY S	29%	42%	**65%**	103%	154%
	cycle avg S	33,275	33,275	**33,275**	33,275	33,275
	Proj. S as % cycle S	59%	86%	**134%**	212%	318%

Management Unit		Pre-season Forecast Return				
		p10	p25	**p50**	p75	p90
Early Summer (w/o RNT)	*lower ref. pt. (w misc)*	267,500	294,300	**330,100**	312,600	316,200
	upper ref. pt. (w misc)	668,700	735,800	**825,300**	781,500	790,400
	forecast (incl. misc)	584,000	1,102,000	**2,155,000**	3,765,000	6,587,000
	TAM Rule (%)	54%	60%	**60%**	60%	60%
	Escapement Target	267,500	440,800	**862,000**	1,506,000	2,634,800
	MA	61,500	101,400	**198,300**	346,400	606,000
	Esc. Target + MA	329,000	542,200	**1,060,300**	1,852,400	3,240,800
	LAER	20%	20%	**20%**	20%	20%
	Available ER at Return	44%	51%	**51%**	51%	51%
	Allowable ER	44%	51%	**51%**	51%	51%
	Allowable Harvest	255,000	559,800	**1,094,700**	1,912,600	3,346,200
	2018 Performance					
	Projected S (after MA)	266,500	439,200	**858,800**	1,500,400	2,625,000
	BY Spawners	647,784	647,784	**647,784**	647,784	647,784
	Proj. S as % BY S	41%	68%	**133%**	232%	405%
	cycle avg S	330,355	330,355	**330,355**	330,355	330,355
	Proj. S as % cycle S	81%	133%	**260%**	454%	795%

Management Unit		Pre-season Forecast Return				
		p10	p25	**p50**	p75	p90
Summer (w. RNT & Har)	*lower ref. pt. (w misc)*	1,064,300	1,064,300	**1,064,300**	1,064,300	1,064,300
	upper ref. pt. (w misc)	2,660,900	2,660,900	**2,660,900**	2,660,900	2,660,900
	forecast	1,470,000	2,473,000	**4,344,000**	7,669,000	13,173,000
	TAM Rule (%)	28%	57%	**60%**	60%	60%
	Escapement Target	1,064,300	1,064,300	**1,737,600**	3,067,600	5,269,200
	MA	106,400	106,400	**173,800**	306,800	526,900
	Esc. Target + MA	1,170,700	1,170,700	**1,911,400**	3,374,400	5,796,100
	LAER	20%	20%	**20%**	20%	20%
	Available ER at Return	20%	53%	**56%**	56%	56%
	Allowable ER	20%	53%	**56%**	56%	56%
	Allowable Harvest	299,300	1,302,300	**2,432,600**	4,294,600	7,376,900
	2018 Performance					
	Projected S (after MA)	1,065,300	1,065,300	**1,739,400**	3,070,700	5,274,500
	BY Spawners	2,837,275	2,837,275	**2,837,275**	2,837,275	2,837,275
	Proj. S as % BY S	38%	38%	**61%**	108%	186%
	cycle avg S	815,485	815,485	**815,485**	815,485	815,485
	Proj. S as % cycle S	131%	131%	**213%**	377%	647%

Management Unit		Pre-season Forecast Return				
		p10	p25	**p50**	p75	p90
Late (w/o Har)	*lower ref. pt. (w misc)*	1,105,200	1,105,200	**1,105,200**	1,105,200	1,105,200
	upper ref. pt. (w misc)	2,763,100	2,763,100	**2,763,100**	2,763,100	2,763,100
	forecast	3,174,000	4,794,000	**7,398,000**	11,370,000	16,934,000
	TAM Rule (%)	60%	60%	**60%**	60%	60%
	Escapement Target	1,269,600	1,917,600	**2,959,200**	4,548,000	6,773,600
	MA	545,900	824,600	**1,272,500**	1,955,600	2,912,600
	Esc. Target + MA	1,815,500	2,742,200	**4,231,700**	6,503,600	9,686,200
	LAER	20%	20%	**20%**	30%	30%
	Available ER at Return	43%	43%	**43%**	43%	43%
	Allowable ER	43%	43%	**43%**	43%	43%
	Allowable Harvest	1,358,500	2,051,800	**3,166,300**	4,866,400	7,247,800
	2018 Performance					
	Projected S (after MA)	1,270,900	1,919,500	**2,962,200**	4,552,500	6,780,300
	BY Spawners	2,303,384	2,303,384	**2,303,384**	2,303,384	2,303,384
	Proj. S as % BY S	55%	83%	**129%**	198%	294%
	cycle avg S	2,652,186	2,652,186	**2,652,186**	2,652,186	2,652,186
	Proj. S as % cycle S	48%	72%	**112%**	172%	256%
Allowable Harvest (TF, US, CDN)		1,916,500	3,919,300	**6,702,000**	11,086,900	17,990,800
Total projected spawners		2,622,300	3,452,700	**5,605,000**	9,194,200	14,785,500

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

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

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

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

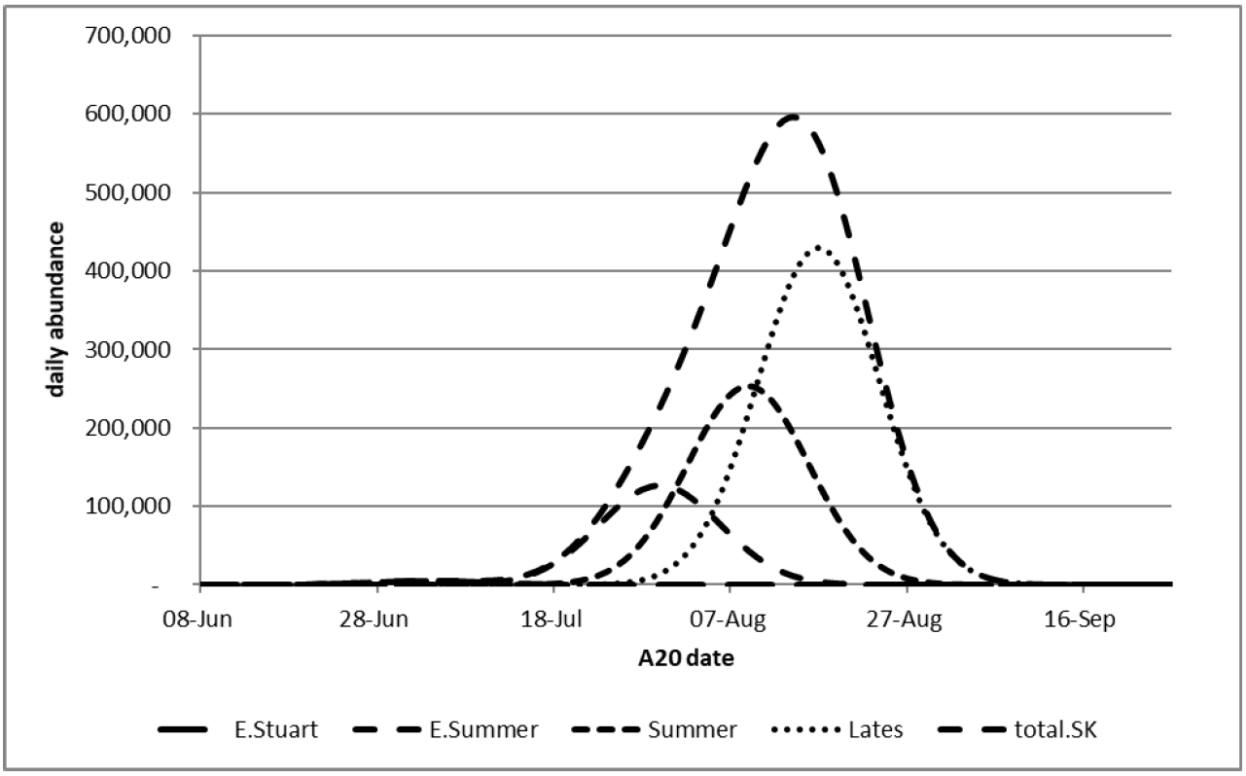

Figure 8-1 Pre-Season Projections of Daily Fraser River Sockeye Salmon Abundance by Management Group

8.2.2 IN-SEASON ASSESSMENT

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

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

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

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

8.2.3 POST-SEASON ASSESSMENT

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

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

8-4 Preliminary Post- Season Total Allowable Catch

		Fraser Sockeye				
		Early Stuart	Early Summer	Summer	Lates	Total
RUN STATUS, ESCAPEMENT NEEDS & AVAILABLE SURPLUS						
Pre-season or Adopted In-season Run Size		**125,000**	**1,800,000**	**4,100,000**	**4,700,000**	**10,725,000**
Adult Spawning Escapement Target (SET)		**108,000**	**720,000**	**1,640,000**	**1,880,000**	**4,348,000**
Management Adjustment (MA)*		**74,500**	**165,600**	**164,000**	**75,200**	**479,300**
Test Fishing (TF)		**1,100**	**24,000**	**51,600**	**34,300**	**111,000**
DEDUCTIONS & TAC FOR INTERNATIONAL SHARING						
Aboriginal Fishery Exemption (AFE)		**6,850**	**75,077**	**153,442**	**164,631**	**400,000**
Available TAC for International Sharing		**0**	**815,323**	**2,090,958**	**2,545,869**	**5,452,150**
UNITED STATES (Washington) TAC						
Proportionally Distributed TAC ***	16.5%	0	134,500	345,000	420,100	899,600
U.S. Payback ***	0.0%	0	-400	-900	-1,100	-2,400
Proportionally Distributed TAC + Payback		**0**	**134,100**	**344,100**	**419,000**	**897,200**
Treaty Indian Share **	67.7%	0	90,700	232,700	283,300	606,700
All Citizen Share	32.3%	0	43,400	111,400	135,700	290,500
CANADA TAC						
Proportionally Distributed TAC	83.5%	0	681,223	1,746,858	2,126,869	4,554,950
Aboriginal Fishery Exemption (AFE)		6,850	75,077	153,442	164,631	400,000
Canadian TAC + AFE		**6,850**	**756,300**	**1,900,300**	**2,291,500**	**4,954,950**
First Nations Catch (including AFE)		0	0	0	0	0
Planned Charter & Recreational		0	0	0	0	0
Total Commercial (including FN EO/Demo****)		6,850	756,300	1,900,300	2,291,500	4,954,950

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

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

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

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

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

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

Early Stuart	48,489	81.9%	21.450
Early Summer	786,223	79.9%	322,288
Summer	*Not yet available*		
Late	*Not yet available*		
TOTAL			

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

8.3 First Nations FSC and Treaty Domestic Fisheries

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

8.4 Recreational Fisheries

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

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

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

8.5 COMMERCIAL FISHERIES

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

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

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

Table 8. Fraser River Sockeye Catch and Directed Fisheries*

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

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

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

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

9 FRASER RIVER PINK SALMON

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

10 SOUTHERN BC COHO

10.1 OBJECTIVES AND OVERVIEW

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

In Southern BC, Coho management measures in commercial and recreational fisheries are implemented based on their impacts to specific stocks. Southern BC Coho management is primarily based on managing Interior Fraser River, Lower Fraser, Strait of Georgia, Johnstone Strait and West Coast Vancouver Island (WCVI) Coho stocks or MUs.

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

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

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

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

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

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

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

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

10.2 STOCK STATUS

10.2.1 STOCK STATUS- UPPER FRASER RIVER

Interior Fraser

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

10.2.2 STOCK STATUS – LOWER FRASER RIVER

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

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

10.2.3 STOCK STATUS- STRAIT OF GEORGIA

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

Hatchery stocks

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

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

Wild stocks

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

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

Black Creek (DFO Wild Indicator for SOG)

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

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

10.2.4 STOCK STATUS- WEST COAST VANCOUVER ISLAND

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

10.2.5 STOCK STATUS- JOHNSTONE STRAIT AND MAINLAND INLET

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

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

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

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

10.3 FIRST NATIONS

WCVI FSC and Treaty Fisheries

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

Lower Fraser

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

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

BC Interior

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

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

Strait of Georgia FSC Fisheries and Treaty Domestic Fisheries

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

Johnstone Strait

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

10.4 RECREATIONAL

10.4.1 TIDAL RECREATIONAL FISHERIES

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

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

Table 10-1 Southern BC Coho Fishery Regulations in 2018

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

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

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

10.4.2 NON-TIDAL RECREATIONAL FISHERIES

Region 1 Vancouver Island Tributaries

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

Northern Vancouver Island

Typical non-tidal openings for Coho were available on:

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

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

Strait of Georgia

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

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

Typical Non-tidal openings for Coho are available on:

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

Catch is not estimated in these fresh water fisheries.

West Coast Vancouver Island

Typical Non-tidal openings for Coho were available on:

- Somass/Stamp River from August 25 to December 31 the daily limit was two, marked or unmarked. A single, barbless hook restriction is in effect all year and there is a bait restriction in the Upper Somass and Stamp from May 1 to October 31.
- Nitinat River from October 15 to December 31 the daily limit for Coho was two, marked or unmarked. The 2 week closure between October 1 and October 14 provides protection to Chinook salmon during the peak spawning period. The area above Parker Creek is closed to fishing. A single barbless hook restriction is in effect all year and there is also a bait restriction in effect.
- Conuma River opened August 25 with a daily limit of two Coho, marked or unmarked and was reduced to one per day from September 26 to December 31 in response to observations of a lower than expected abundance in-river.
- Washlawlis River and Waukwass River and other west coast rivers are open year-round with a daily limit of one Coho, marked or unmarked. Barbless hooks are required. No creel survey information is collected. Other rivers receiving some directed effort for Coho stocks are the Wakeman, Artlish, Zeballos, Tahsis, Burman, Ash, Taylor, Pacheena, Toquart and Leiner. The quota for all west coast streams unless identified above is zero (0).

Catch is not estimated in these fresh water fisheries.

Fraser River and Tributaries

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

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

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

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

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

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

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

10.5 COMMERCIAL

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

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

WCVI Terminal Area Coho

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

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

10.5.1 COMMERCIAL

10.5.2 FIRST NATIONS COMMERCIAL HARVEST

WCVI Economic Opportunity (EO)

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

T'aaq-wiihak Salmon Demonstration Fishery

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

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

Lower Fraser

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

10.6 Excess Salmon-to-Spawning Requirements (ESSR) Fisheries

WCVI ESSR Fisheries

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

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

Lower Fraser ESSR Fisheries

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

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

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

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

Strait of Georgia ESSR Fisheries

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

Johnstone Strait ESSR Fisheries

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

Table 10. Southern BC - Coho Directed Fisheries*

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

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

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

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

11 JOHNSTONE STRAIT CHUM SALMON

11.1 OBJECTIVES AND OVERVIEW

The Johnstone Strait Chum salmon fisheries primarily target Chum that spawn in Johnstone Strait, the Strait of Georgia, and the Fraser River areas. In order to improve the management of Johnstone Strait Chum fisheries and to ensure adequate escapement, a 20% fixed exploitation rate strategy was implemented in 2002. Of the 20% exploitation rate, 15% is allocated to the commercial fisheries and the remaining 5% is set aside for test fisheries, First Nations FSC, sport harvesters, and to also provide a buffer to commercial exploitation. Since the implementation of this management strategy, annual fisheries have been planned well in advance of the Chum return.

The pre-season commercial fishing plan was developed based on expectation of effort, exploitation levels by gear group, and historical run timing (peak was modeled at October 8). The fishing plan was developed to achieve the commercial allocation sharing guidelines of 77% for seine, 17% for gill net and 6% for troll. Adjustments to the fishing plan are made in-season, if warranted, and are typically based on effort and weather.

As outlined in Chapter 6 of the Pacific Salmon Treaty, commercial Chum fisheries in Johnstone Strait are suspended when an abundance estimate of less than 1 million Chum salmon migrating through Johnstone Strait is expected. Early indications from the test fishery were that Inner South Coast Chum abundance was tracking at or below the 1 million critical threshold. Troll fisheries had been initiated as per the preseason plan but on September 30th those fisheries and the other planned fisheries were suspended and the US was notified as per the treaty language. On October 10th, with an improvement to the test fishery CPUE indicating that the abundance would be over 1.0 million, the US was notified and a modified fishing plan was initiated. This year, the Area B (seine) and Area D (gill net) were competitive (derby style) fisheries, and the Area H (troll) fleet was managed using an effort-based individual transferable effort (ITE) demonstration fishery.

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

11.2 STOCK STATUS

Mixed Stocks

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

The Johnstone Strait test fishery, which ran from September 12th through October 27th, provided timing and abundance information for the 2018 return, which is important in assessing the performance of the 20% fixed exploitation rate strategy. It also provided an index of abundance, used to determine the likelihood of the number of returning Chum being over the 1.0 million critical level (requirement for commercial openings). Initially, Chum catch per unit effort (CPUE) in the test fishery was at or below what was encountered in the low 2010 return and it was determined on October 1st that the ISC index of abundance was likely below the 1.0

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

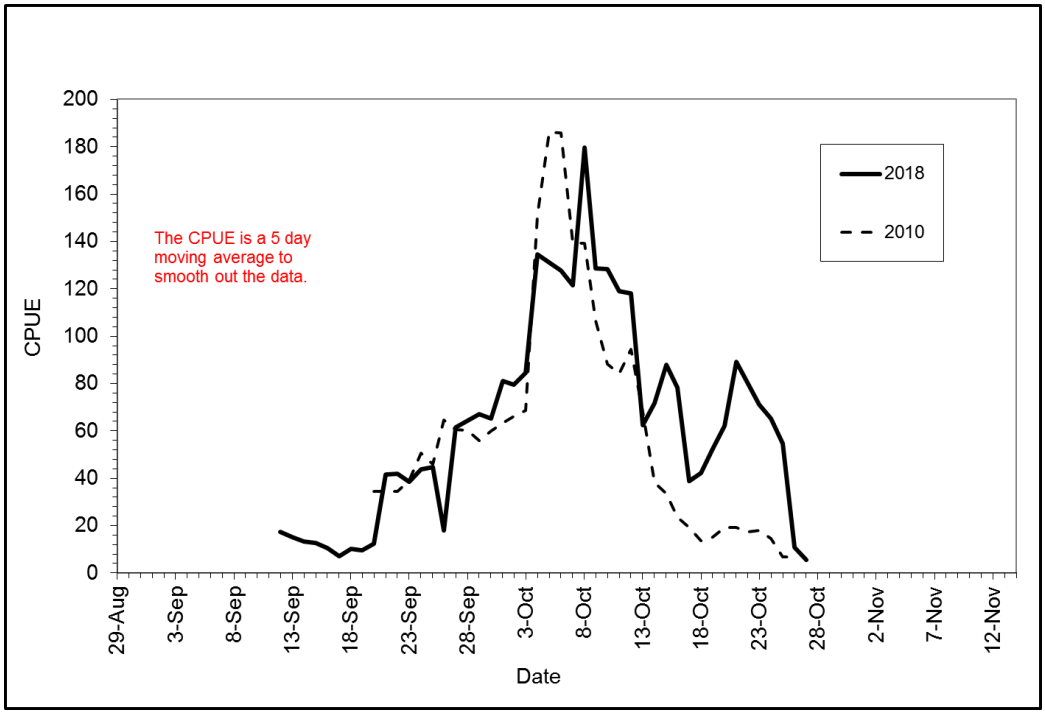

Figure 11-1 2018 Johnstone Strait Chum Test Fishery Catch per Unit Effort (CPUE) compared to 2010, the lowest Chum return in recent years.

Terminal returns

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

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

11.3 First Nations FSC Fisheries

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

11.4 RECREATIONAL FISHERIES

11.4.1 TIDAL RECREATIONAL FISHERIES

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

11.4.2 NON-TIDAL RECREATIONAL FISHERIES

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

11.5 COMMERCIAL FISHERIES

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

11.5.1 COMMERCIAL

Area B Seine

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

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

Area D Gill net

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

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

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

Area H Troll

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

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

11.5.2 FIRST NATIONS COMMERCIAL HARVEST

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

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

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

Table 11. Johnstone Strait - Chum Directed Fisheries

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

12 FRASER RIVER CHUM

12.1 OBJECTIVES AND OVERVIEW

Chum salmon return to the Fraser River from September through December, with the typical peak of migration through the lower river occurring from mid to late-October. Spawning locations are predominately located in the Fraser Valley downstream of Hope, BC, with major spawning aggregations occurring within the Harrison River (including Weaver Creek and Chehalis River), the Stave River, and the Chilliwack River. No spawning locations have been identified upstream of Hell's Gate.

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

Fraser River Chum are typically harvested in Johnstone Strait, the Strait of Georgia, U.S. waters of Area 7 and 7A, and in the Fraser River.

Within the Fraser River, Chum directed fisheries include: First Nations FSC fisheries; recreational fisheries; and commercial fisheries. In recent years, significant conservation measures have been implemented in-river during the Fraser River Chum migration period to protect co-migrating stocks of concern (including Interior Fraser River (IFR) Coho and IFR Steelhead). Depending on the fishery, these measures have included both time and area closures, and gear restrictions. These conservation measures have restricted Fraser River commercial Chum fishing opportunities in recent years.

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

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

12.2 STOCK STATUS

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

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

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

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

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

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

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

12.3 First Nations fisheries

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

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

12.4 Recreational fisheries

In 2018 two of the major Fraser River watershed recreational salmon fisheries impacting Chum salmon were assessed, these were the lower Fraser River mainstem sport fishery and a significant salmon fishery occurring in the Chilliwack River (a tributary to the Fraser River in the lower Fraser Valley).

The lower Fraser River mainstem recreational fishery was open to the retention of Chum salmon from September 4 to September 27 downstream of Mission Bridge with a daily limit of four and from September 5 to September 28 upstream of Mission Bridge with a daily limit of two. In 2018 the Fraser mainstem was closed to fishing for salmon during the Interior Fraser River Steelhead window closure (downstream of Mission Bridge from September 28 to October 24 and upstream of Mission Bridge from September 29 to October 25). Following the IFR Steelhead window closure period, chum non-retention was in place in the Fraser mainstem downstream of Mission Bridge from October 25 to December 31 and upstream of Mission Bridge from October

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

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

12.5 COMMERCIAL FISHERIES

12.5.1 COMMERCIAL

Area B

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

Area E

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

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

Area H

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

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

12.5.2 FIRST NATIONS COMMERCIAL HARVEST

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

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

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

12.6 EXCESS-TO-SPAWNING REQUIREMENT (ESSR) FISHERIES

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

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

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

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

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

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

13 STRAIT OF GEORGIA CHUM

13.1 OBJECTIVES AND OVERVIEW

Strait of Georgia Chum fisheries consist of terminal opportunities for Chum returning to their natal spawning streams. Many of the terminal fishing areas have enhancement facilities and/or spawning channels associated with adjacent river systems. Terminal fishery strategies consist of monitoring and assessing stocks (escapement and returning abundance), with the objective of ensuring adequate escapement and providing harvest opportunities where possible. Stock assessments may include test fisheries, escapement enumeration including swim surveys, stream walks, channel entry counts, fence counts, Sonar (DIDSON) counts and over flights. In some areas where stocks receive considerable enhancement or where stocks have above average productivity, limited fishing may occur prior to escapement objectives being reached.

13.2 STOCK STATUS

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

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

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

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

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

Table 13-1 Strait of Georgia Chum Spawning Escapements

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

13.3 First Nations FSC Fisheries

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

13.4 Recreational Fisheries

13.4.1 TIDAL RECREATIONAL FISHERIES

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

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

13.4.2 NON-TIDAL RECREATIONAL FISHERIES

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

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

Catch is not estimated in these freshwater fisheries.

13.5 COMMERCIAL FISHERIES

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

13.5.1 COMMERCIAL

Area 14

Chum returning to this area have been enhanced since the late 1960s and terminal fisheries have occurred in October and November since the 1970s. The returning Area 14 Chum abundance is forecasted pre-season using brood escapement, average survival and age composition. In-season run strength is assessed from any early catches, visual observations at river estuaries and by escapement counts to the three major river systems.

The Area 14 Chum fishery is directed at the enhanced stocks of three systems: Puntledge, Qualicum and Little Qualicum Rivers. The Qualicum River is often referred to as the 'Big' Qualicum River, to better distinguish it from the Little Qualicum River. The escapement goals for the three river systems are 60,000 for Puntledge River, 85,000 for Little Qualicum River, and 85,000 for Qualicum River, adding up to an overall interim escapement goal of 230,000 Chum, not including enhancement facility requirements (about 10,000 Chum, bringing the total escapement goal to 240,000).

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

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

Area 16

This fishery targets wild Chum stocks returning to river systems in the Jervis Inlet area. The main systems are Tzoonie, Deserted and Skwawka Rivers. The overall escapement goal for rivers in Jervis/Narrows Inlet is 85,000. These terminal fisheries occur when the individual or combined escapement goals have been assured. Fishing opportunities do not occur on a regular basis. There were no fisheries in Area 16 in 2018.

Area 17

This fishery is a terminal fishery targeting Nanaimo River stocks. The Nanaimo River Chum stocks are supplemented by the Nanaimo River hatchery (supplementation is on a sliding scale), where increased enhancement occurs during poor escapement years. Escapements fluctuate annually and fishery openings are planned in-season based on escapement estimates. The overall escapement goal for the Nanaimo River is 40,000.

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

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

Area 18

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

Fishery openings are planned in-season based on escapement estimates from a DIDSON counter. Management is also guided by advice from the Cowichan Fisheries Roundtable and the Mid Vancouver Island (MVI) Chum Subcommittee, and an in-season Chum Escapement Forecast Tool based on the DIDSON count and date. The overall escapement goal for the Cowichan River is currently 160,000 Chum passing by the DIDSON counter.

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

Area 19

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

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

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

13.5.2 FIRST NATIONS COMMERCIAL HARVEST

Area 18

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

Area 19

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

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

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

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

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

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

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

Table 13. Strait of Georgia - Chum Directed Fisheries

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

14 WEST COAST VANCOUVER ISLAND CHUM

14.1 OBJECTIVES AND OVERVIEW

Commercial Chum salmon fisheries normally occur on the WCVI from late September to early November in years of Chum abundance. The majority of Chum fishing on WCVI takes place adjacent to Nitinat Lake (Area 21), in Nootka Sound and Tlupana Inlets (Area 25). In some years there have been limited-fleet gill net fisheries in Barkley Sound (Area 23), Clayoquot Sound (Area 24), Nootka Sound and Esperanza Inlet (Area 25) and Kyuquot Sound (Area 26).

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

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

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

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

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

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

14.2 STOCK STATUS

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

14.3 EXCESS SALMON TO SPAWNING REQUIREMENTS (ESSR) FISHERIES

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

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

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

14.4 FIRST NATIONS FSC FISHERIES

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

14.5 RECREATIONAL FISHERIES

14.5.1 TIDAL RECREATIONAL

The WCVI recreational fishery is open year-round with a daily limit of four (4) and possession of eight (8) Chums. Anglers are restricted to the use of barbless hooks and there is a minimum size limit of 30 cm. In both offshore and inshore areas of WCVI, sport catch of Chum is very low (estimated at less than 200 for all areas combined).

14.5.2 NON-TIDAL RECREATIONAL

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

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

14.6 COMMERCIAL FISHERIES

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

Nitinat (Area 21/121)

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

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

Esperanza Inlet (Area 25)

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

Kyuquot Sound (Area 26)

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

14.7 FIRST NATIONS COMMERCIAL HARVEST

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

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

Table 14. West Coast Vancouver Island - Chum Directed Fisheries

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

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

15 APPENDICES

15.1 APPENDIX 1: CATCHES IN CANADIAN TREATY LIMIT FISHERIES, 1997 TO 2018

Fisheries/Stocks	Species	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996
Stikine River (all gears)	Sockeye	17,322	41,749	86,729	60,046	42,800	36,146	30,352	55,623	50,543	48,049	33,614	59,237	101,209	85,890	84,866	58,784	17,294	25,600	27,468	38,055	43,803	65,559	74,281
	Coho	3,685	5,502	5,346	5,619	4,992	4,835	5,748	4,703	4,952	5,061	2,398	47	72	276	275	190	82	233	301	181	726	401	1,404
	Chinook-lg	-	593	2,731	4,157	3,308	3,415	4,573	2,307	1,766	2,330	7,860	10,576	15,776	18,997	3,857	1,396	1,362	1,480	3,086	2,916	2,164	4,483	2,471
	Chinook-jk	-	788	794	1,537	759	1,594	1,213	1,165	1,001	714	1,067	1,735	2,078	2,177	2,574	1,052	578	103	628	1,264	423	286	421
Taku River (commercial gill net)	Sockeye	17,974	30,209	37,624	19,747	17,872	21,163	30,209	24,012	20,211	11,057	19,445	16,564	21,093	21,932	19,860	32,730	31,053	47,660	28,009	20,681	19,038	24,003	41,665
	Coho	9,503	7,726	9,513	7,886	14,568	10,374	8,689	6,102	10,349	5,649	4,866	5,399	9,180	6,860	5,954	3,168	3,082	2,568	4,395	4,416	5,090	2,594	5,028
	Chinook-lg	-	246	1,021	868	2,472	738	1,909	2,333	4,658	7,031	1,184	862	7,312	7,534	2,074	1,894	1,561	1,458	1,576	908	1,107	2,731	3,331
	Chinook-jk	-	88	205	-	657	N/A	478	514	697	1,183	330	337	198	821	334	547	291	118	87	257	227	84	144
Alsek River (all gear)	Sockeye	-	644	815	1,084	1,140	508	1,786	2,110	1,716	717	-	1,340	1,327	594	2,122	2,795	2,255	1,177	745	554	585	520	1,361
	Coho	-	-	-	-	-	29	N/A	29	7	3	34	1	-	71	127	192	289	99	52	28	112	5	65
	Chinook	-	74	10	87	39	73	85	214	294	125	7	41	19	114	185	228	2,194	277	142	412	346	530	1,098
Areas 3 (1-4)* (commercial net)****	Pink	101,267	704,450	430,435	80,266	450,671	1,249,570	118,164	160,757	30,686	404,460	8,330	1,740,270	228,378	878,552	402,459	667,103	876,631	473,318	127,000	2,162,280	61,000	329,000	987,000
Area 1 (commercial troll)****	Pink	266	38,763	32,343	41,551	31,775	84,216	57,013	52,221	19,948	60,402	29,295	61,276	34,854	39,430	27,751	98,347	41,418	175,000	28,295	25,000	-	261,000	732,000
North Coast** (troll + sport)	Chinook	106,976	143,330	190,180	158,903	221,001	115,914	120,305	122,660	136,613	109,470	95,647	144,235	215,985	243,606	241,508	191,657	150,137	43,500	32,048	70,701	144,650	145,568	26,900
		70,276 + 36,700	97,730 + 45,600	147,381+ 42,800	106,703 + 52,200	172,001 + 49,000	69,264 + 46650	80,256 + 40050	74,660 + 48000	90,213 + 46400	75,470 + 34,000	52,147 + 43500	83,235 + 61000	151,485 + 64500	174,806 + 68,800	167,508 + 74,000	137,357 + 54,300	103,037 + 47,100						
West Coast Vancouver Island (troll + sport + FN)	Chinook	77,017	103,260	93,294	113,293	178,558	108,710	130,719	206,569	137,660	125,488	143,817	139,150	145,970	195,791	210,875	179,706	165,824	102,266	89,139	28,540	10,855	59,796	3,677
		28,840 + 45,233 + 2,944	54,411 + 46,707 + 2143	55,168 + 37,809 + 317	60,572 + 48,775 + 3,946	127,177 + 48,365 + 3,655	43,043 + 61,712 + 3955	62,573 + 61,822 + 4300	123,930 + 78,350 + 4289	79,123 + 52,698 + 5839	53,191 + 68,775 + 3381	89,704 + 50,319 + 3794	87,921 + 46,229 + 5,000	103,978 + 36,992 + 5,000	143,614 + 52,177	168,837 + 42,038	152,677 + 27,029	134,308 + 31516	78,302 + 23964	64,216 + 24923	6,906 + 21634	6,678 + 4177	53,396 + 6400	4 + 3673
Fraser River Canadian Commercial Catch	Sockeye	3,683,351	-	-	-	7,945,474	2,124	-	443,000	9,305,104	-	16,942	-	4,633,623	137,000	1,993,800	1,042,986	2,182,700	295,000	953,000	54,000	1,295,000	8,737,000	1,019,000
	Pink	90,982	-	-	452	-	2,855,441	-	4,751,800	-	1,442,840	-	333,300	68,325	338,000	-	1,149,189	-	579,000	-	3,000	-	3,660,000	-
Fraser River U.S. Commercial Catch	Sockeye	989,459	-	-	44,100	691,000	4,609	105,100	266,000	1,970,000	-	49,800	3,900	701,300	-	192,200	244,000	434,600	240,000	494,000	41,000	707,000	1,578,000	257,000
	Pink	-	105,930	-	334,700	-	3,057,222	-	2,893,400	-	2,726,230	-	377,600	-	-	-	773,000	-	427,000		3,000	-	1,565,000	-
West Coast Vancouver Island (commercial troll)	Coho	-	331	774	18,126	32,992	5,499	1,988	-	458	-	369	1,424	2,399	5,989	-	-	-	-	-	-	-	-	761,000
Johnstone Strait (commercial catch)***	Chum	53,166	401,957	1,333,478	492,841	318,984	597,003	391,324	751,560	62,510	510,708	298,931	494,944	800,363	787,226	1,089,100	1,026,029	700,000	236,000	161,000	41,411	1,820,000	104,593	101,971

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

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

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

****ALL PINK CATCHES FOR ALL YEARS (1995-2012) IN AREAS 3(1-4) AND AREA 1 HAVE BEEN UPDATED TO REFLECT FINAL ESTIMATES.

NOTE 1: WCVI CHINOOK CATCHES FROM 1995-1998 ARE REPORTED BY CALENDAR YEAR; CATCHES FROM 2008-1999 ARE REPORTED BY CHINOOK YEAR (OCT-SEPT)

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

15.2 APPENDIX 2: 2018 SOUTH COAST TEST FISHERY CATCHES

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

All test fish catches include assessment and non-assessment sets
Note: Jacks included in the above test fishing catches if encountered

15.3 APPENDIX 3: 2018 SOUTHERN BC COMMERCIAL CATCH TOTALS BY GEAR AND AREA

License Group	Fishing Area	Adult Sockeye Kept	Sockeye Released	Coho Kept	Coho Released	Pink Kept	Pink Released	Chum Kept	Chum Released	Chinook Kept	Chinook Released
Area G Troll*	WCVI AABM Chinook (23-27,123-127)	0	50	0	3,739	0	0	31	7	19,156	2,209
Area G Troll	WCVI Sockeye (11,12,111,123 to 127)	29,400	4	0	587	107	37	6	9	0	643
Area H Troll	Fraser Sockeye (12,13)	63,334	36	0	299	764	444	58	56	0	609
Area H Troll	Fraser Sockeye (29)	118,706	0	0	321	1	18	5	11	0	656
Area H Troll	Fraser Pink (12, 13, 29)										
Area H Troll	JST Chum (12,13)	0	3	0	14	0	1	1,976	0	0	4
Area H Troll	Fraser Chum (29)										
Area H Troll	MVI Chum (14)	0	0	0	32	0	0	19,616	0	0	0
Area B Seine	Barkley Sockeye (23)										
Area B Seine	Fraser Sockeye (12,13)	1,279,614	8,557	621	4,996	56,044	6	13,084	53	243	3,168
Area B Seine	Fraser Sockeye (16)	0	0	0	0	0	0	0	0	0	0
Area B Seine	Fraser Sockeye (29)	627,514	1	29	158	0	0	35	2	11	76
Area B Seine	Mainland Pinks (12, 13, 16)	0	0	0	0	0	0	0	0	0	0
Area B Seine	Howe Sound Pink (28)	0	0	0	0	0	0	0	0	0	0
Area B Seine	Fraser Pink (12, 13, 29)	0	0	0	0	0	0	0	0	0	0
Area B Seine	Nitinat Chum (21, 121)										

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

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

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

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

**Reported Somass Sockeye Recreational catch

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

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

Fishery type	Fishing Area	Sockeye Kept	Sockeye Released	Coho Kept	Coho Released	Pink Kept	Pink Released	Chum Kept	Chum Released	Chinook ISBM Kept	Chinook ISBM Released	Chinook AABM Kept	Chinook AABM Released
ESSR	Johnstone Strait												
	Strait of Georgia			37	0			4,793	0	3,336	0		
	WCVI							40,359	0	28,762	0		
	Fraser River							9,353	0	13,593	0		
TOTAL		**0**	**0**	**37**	**0**	**0**	**0**	**54,505**	**0**	**45,691**	**0**	**0**	**0**

2018 POST SEASON REPORT UNITED STATES SALMON FISHERIES OF RELEVANCE TO THE PACIFIC SALMON TREATY

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

January 11, 2019

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POST SEASON REPORT

I. PRELIMINARY 2018 SOUTHEAST ALASKA FISHERIES

NORTHERN BOUNDARY AREA FISHERIES

District 104 Purse Seine Fishery

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

The District 104 purse seine fishery opens by regulation on the first Sunday in July. In 2018, the first potential opening was July 1 (week 27), but due to Skeena River sockeye salmon concerns ADF&G kept the fishery closed for the first two weeks of the season. The pre-week 31 fishing plan for District 104 was based on the preseason Canadian Department of Fisheries and Oceans (DFO) forecast runs of approximately 1.03 million Nass and Skeena sockeye salmon. In the 2018 Treaty period (Alaska statistical weeks 27-30), 19,743 sockeye salmon were harvested during an18-hour opening in Week 29 and a 30-hour opening in week 30 (Table 1). A total of 55 purse seine vessels fished at some time in the district during the Treaty period. In past years 60% to 80% of Treaty-period sockeye salmon have been of Nass and Skeena origin, therefore we would anticipate between 11,800 and 15,800 Nass and Skeena sockeye salmon may have been harvested in the District 104 purse seine fishery during the 2018 Treaty period. The final number of Nass and Skeena sockeye salmon harvested, and the actual harvest by stock, will not be available until harvest, escapement, and stock composition estimates are finalized for the year.

In 2018, a total of 789,552 pink salmon, 121,365 sockeye salmon, 114,796 chum salmon, 37,511 coho salmon, and 0 Chinook salmon were harvested in the District 104 purse seine fishery (Table 1). The number of days that the fishery was open, and the number of boats fishing were both well below the 1985–2017 average (Figure 1 and 2). Purse seine fisheries were on non-retention for Chinook salmon throughout the season. Sockeye salmon harvests were below average until the final week of the season (Figure 4) and the treaty period (week 28–30) harvest of 19,743 was only 20% of the 1985–2017 average. The total sockeye salmon harvest of 121,365 was 26% of the 1985–2017 average of 468,000 fish. Harvests of coho salmon were also well below average throughout the season (Figures 5) and the overall harvest of 37,511 was only 33% of the long-term average. The overall pink salmon harvest of 789,552 was only 10% of the long-term average (Figure 6) and the chum salmon harvest of 114,796 was 39% of the long-term average (Figure 7).

Since the PST was signed in 1985, the number of hours open, boats fished, and boat-days fished in the pre-Week 31 annex period in District 104 are down 56%, 62% and 85% respectively compared to the averages in the pre-treaty 1980-1984 period (Table 2). The total pre-week 31 Treaty-period sockeye salmon harvest is also down 48%. The seine fleet moves freely between

districts as various species are harvested, so seining opportunities elsewhere affect the effort and catch in District 104.

Table 1.–Catch and effort in the Alaska District 104 purse seine fishery, 2018.

Week/ Opening	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Hours
29	7/15	0	2,860	1,661	25,777	6,615	31	8
29B	7/19	0	4,698	2,047	31,085	6,272	10	10
30	7/22	0	6,833	2,253	74,338	11,411	22	15
30B	7/26	0	5,352	7,817	127,090	15,322	36	15
31	7/29	0	1,252	1,532	38,504	3,124	20	15
31B	8/2	0	2,506	2,887	96,272	9,634	33	15
32	8/5	0	7,119	5,344	137,126	14,931	27	15
32B	8/9	0	3,651	2,566	109,448	9,567	23	15
33	8/12	0	1,949	614	32,483	3,930	9	15
33B	8/16	0	8,608	1,744	43,340	8,864	12	15
34	8/19	0	43,329	4,868	47,303	12,187	27	15
34B	8/23	0	33,208	4,178	26,786	12,939	45	15
							Permits Fished	
Weeks 28-30		0	19,743	13,778	258,290	39,620	55	48
Weeks 31-36		0	101,622	23,733	531,262	75,176	68	120
Total		0	121,365	37,511	789,552	114,796	85	168

Table 2.–Fishing opportunity, effort, and sockeye salmon harvest prior to week 31 in the District 104 purse seine fishery, 1980–2018.

Year	Hours Fished	Individual Permits Fished	Days Fished (1d=15hrs)	Approximate Boat-Days	Sockeye Harvest	Sockeye Catch per Boat-Day
1980	207	244	13.8	2,877	266,273	93
1981	132	212	8.8	1,108	185,188	167
1982	117	255	7.8	1,435	213,150	149
1983	108	241	7.2	1,211	170,306	141
1984	132	174	8.8	805	103,319	128
1985	84	141	5.6	502	100,590	200
1986	108	194	7.2	968	91,320	94
1987	90	134	6	457	72,385	158
1988	108	210	7.2	994	248,789	250
1989	84	135	5.6	438	157,566	360
1990	42	171	2.8	276	169,943	615
1991	41	134	2.7	243	98,583	406
1992	29	108	1.9	142	79,643	561
1993	45	171	3	343	163,189	476
1994	55	84	3.7	202	158,524	783
1995	58	109	3.9	218	71,376	328
1996	31	113	2.1	128	215,144	1,684
1997	56	159	3.7	409	572,942	1,402
1998	32	78	2.1	89	17,394	196
1999	30	38	2	44	7,664	174
2000	81	66	5.4	192	48,969	255
2001	50	95	3.3	182	203,090	1,115
2002	72	44	4.8	124	26,554	215
2003	52	40	3.5	97	84,742	875
2004	107	24	7.1	102	30,758	302
2005	68	38	4.5	93	35,690	382
2006	95	39	6.3	117	89,615	766
2007	50	68	3.3	136	112,135	824
2008	33	17	2.2	22	6,262	281
2009	72	38	4.8	95	15,971	168
2010	55	21	3.7	39	4,617	118
2011	84	29	5.6	77	25,280	329
2012	75	30	5.0	93	18,300	196
2013	46	36	3.1	59	13,102	222
2014	60	101	4	260	115,015	442
2015	70	39	4.7	100	43,873	439
2016	60	106	3.8	332	110,346	332
2017	20	24	1.3	20	12,036	602
2018	48	55	3.2	154	19,743	128
Avg. 80-84	139	225	9	1,487	187,647	136
Avg. 85-17	62	86	4	230	97,618	471
% Change	-56%	-62%	-56%	-85%	-48%	248%

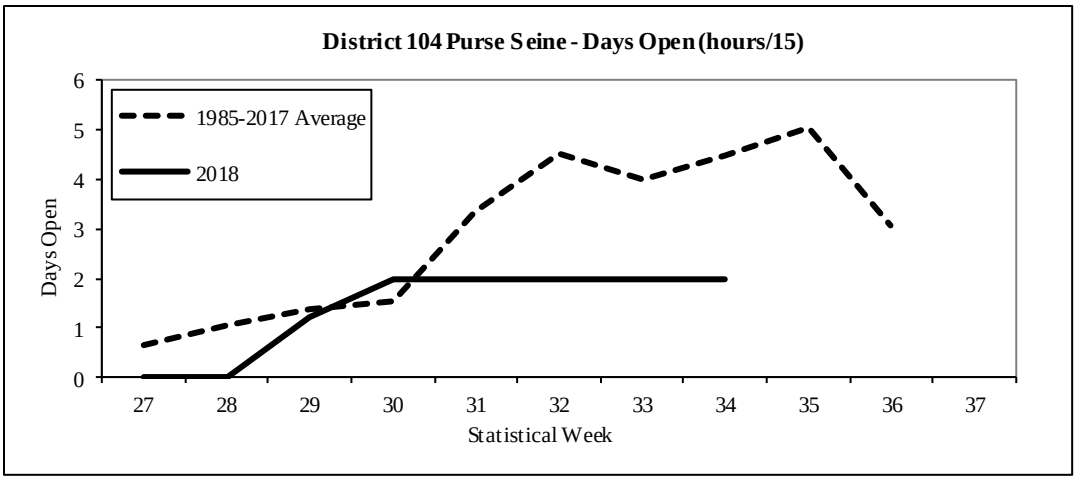


Figure 1.–Days open by week in the District 104 purse seine fishery, 2018.

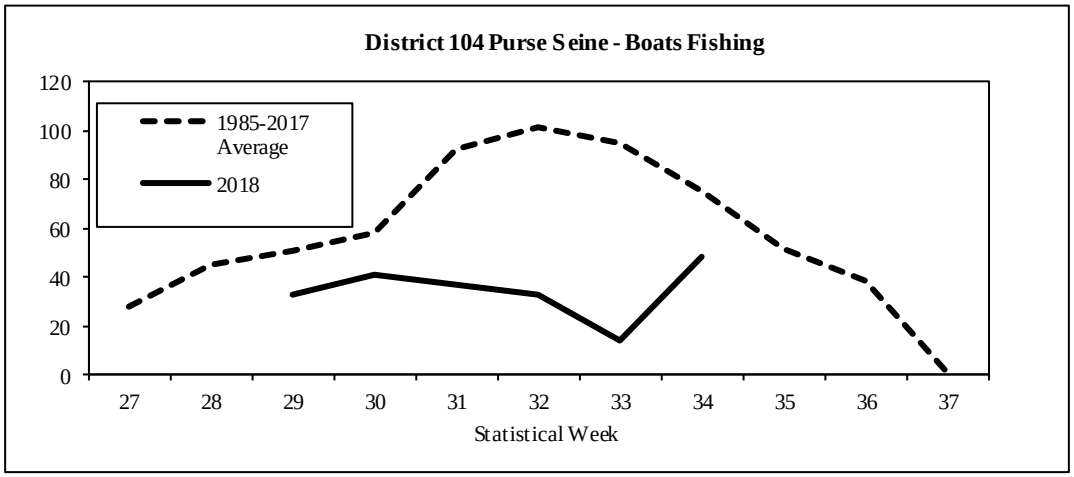


Figure 2.–Number of boats fishing by week in the District 104 purse seine fishery, 2018.

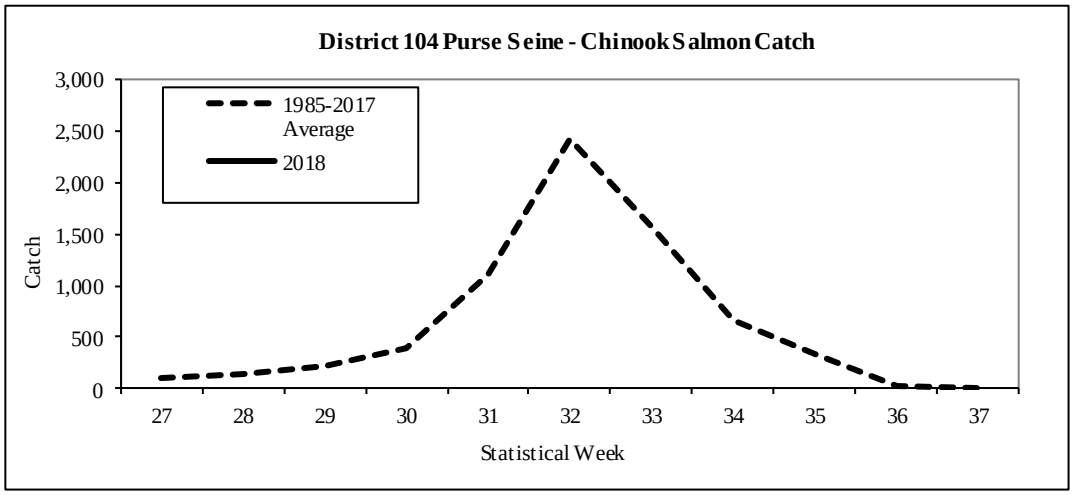


Figure 3.–Chinook salmon harvest by week in the District 104 purse seine fishery, 2018.

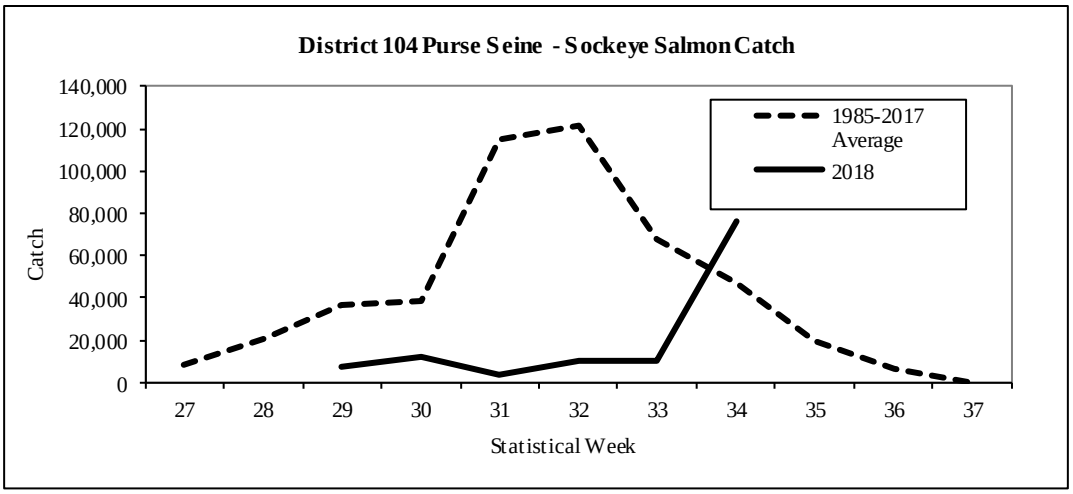


Figure 4.–Sockeye salmon harvest by week in the District 104 purse seine fishery, 2018.

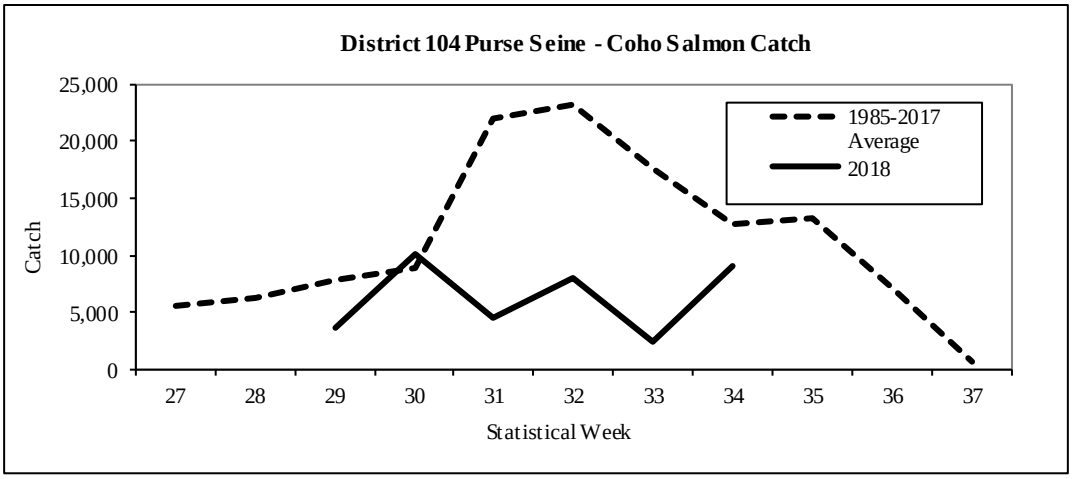


Figure 5.–Coho salmon harvest by week in the District 104 purse seine fishery, 2018.

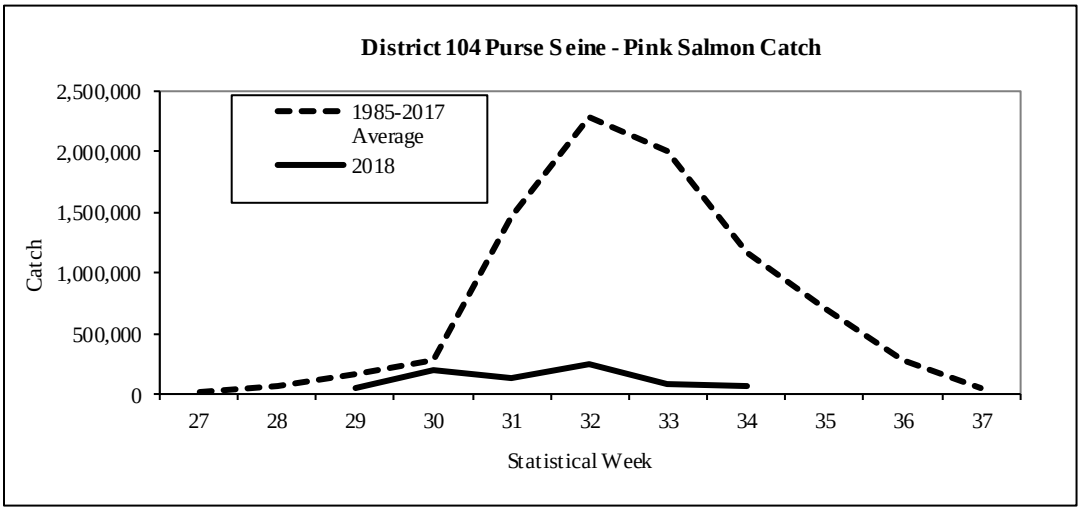


Figure 6.–Pink salmon harvest by week in the District 104 purse seine fishery, 2018.

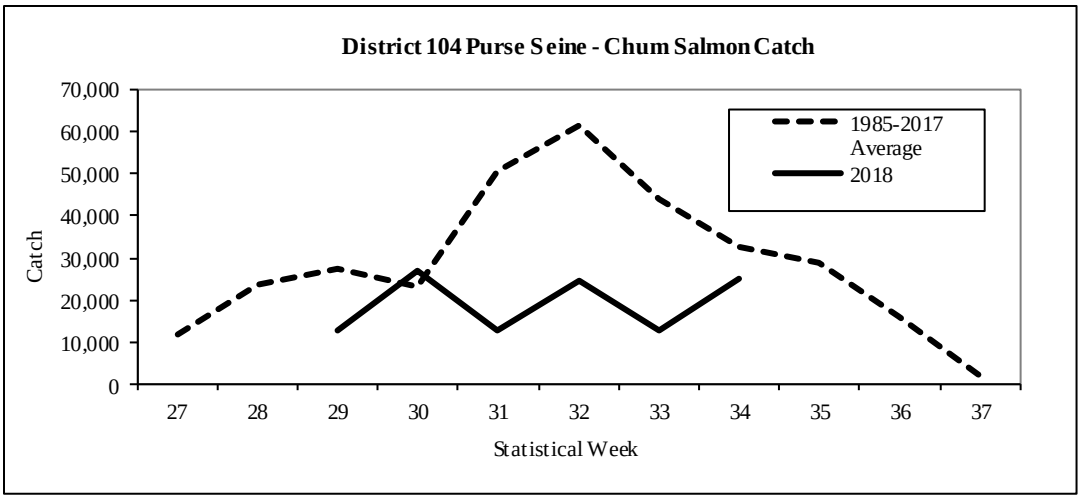


Figure 7.–Chum salmon harvest by week in the District 104 purse seine fishery, 2018.

District 101 Drift Gillnet Fishery

The 2009 PST agreement calls for abundance-based management of the District 101 (Tree Point) drift gillnet fishery. The agreement specifies a harvest of 13.8 percent of the AAH of the Nass River sockeye salmon run. The AAH is calculated as the total run of Nass sockeye salmon minus either the escapement requirement of 200,000 or the actual in-river escapement, whichever is less. The run of Nass sockeye salmon was forecasted at 377,000 in 2018 which, minus an escapement goal of 200,000, would result in an AAH of about 177,000. Using this forecast, the 2018 allowable harvest in the District 101 drift gillnet fishery was approximately 24,426 Nass River sockeye salmon.

The District 101 drift gillnet fishery opens by regulation on the third Sunday in June, which was June 17 in 2018. During the early weeks of the fishery, management is based on the run strength of Alaska wild stock chum and sockeye salmon and on the run strength of Nass River sockeye salmon. Beginning in the third week of July, when pink salmon stocks begin to enter the fishery in large numbers, management emphasis shifts by regulation to that species. By regulation, the District 101 Pink Salmon Management Plan (PSMP) begins the third Sunday in July and sets gillnet fishing time in this district in relation to the District 101 purse seine fishing time. Beginning in Week 36 (September 3) management was based on the strength of wild stock fall chum and coho salmon.

The District 101 drift gillnet fishery opened Sunday June 17 (week 25) in 2018. The number of days the fishery was open was near average all season (Figure 8), but the number of boats fishing during weekly openings was below average throughout the season (Figure 9). The total number of individual boats fishing during the season was 64, which was approximately 60% of the 1985-2017 average of 106 boats. A total of 19,920 sockeye salmon were harvested, which was only 17% of the 1985–2018 average of 114,656 fish and the lowest harvest since the inception of the PST (Tables 3 and 4). Harvests of sockeye salmon were well below treaty period averages throughout the season (Figure 10). The cumulative sockeye salmon harvest prior to the initiation of the PSMP in Week 30 was 18,540 fish, or about 93% of the season's total sockeye salmon harvest. The final number of Nass River sockeye salmon harvested at Tree Point will not be available until catch, escapement, and stock composition estimates are finalized for the 2018 season. In past years approximately 65% of the District 101 gillnet sockeye salmon harvest has

been of Nass River origin, therefore we would anticipate that approximately 12,948 Nass River sockeye salmon may have been harvested in the District 101 gillnet fishery in 2018.

Coho salmon harvests were below average for most weeks of the season and the total harvest of 35,457 fish was 72% of the treaty period average (Figure 11). Pink salmon harvests were well below average all season and the total harvest of 113,346 fish was 23% of average (Figure 12) and was the lowest harvest since the inception of the PST. Chum salmon harvests were near or below average in most weeks of the fishery and the total harvest of 187,661 fish was 62% of average (Figure 13). Chinook salmon harvests were near average throughout the season (Figure 14).

Table 3.–Weekly harvest and effort in the Alaska District 101 commercial drift gillnet fishery, 2018.

Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Hours
25	6/17	493	915	49	21	5,876	40	96
26	6/24	422	1,185	63	66	16,234	33	96
27	7/1	297	2,163	141	3,069	26,822	37	96
28	7/8	211	1,443	216	11,892	18,617	36	96
29	7/15	32	585	90	11,133	13,505	30	48
30	7/22	59	1,966	504	25,439	31,665	43	96
31	7/29	30	2,523	698	23,082	19,509	44	96
32	8/5	47	5,197	1,189	10,188	13,220	40	96
33	8/12	14	1,888	1,803	16,155	11,362	31	96
34	8/19	1	446	1,524	6,949	5,746	25	48
35	8/26	5	1,144	6,746	4,899	11,602	31	96
36	9/2	4	316	10,232	416	9,949	38	96
37	9/9	2	109	7,918	27	2,711	35	96
38	9/16	1	36	3,864	9	739	28	96
39	9/23	1	4	420	1	104	7	48
Total		1,619	19,920	35,457	113,346	187,661	64	1,296
1985-2017 Avg.		1,480	114,656	49,007	501,436	301,552	74	1,371

Table 4.–Sockeye salmon harvest in the Alaska District 101 gillnet fishery, 1985 to 2018, and comparison of harvest and effort (boats, hours, and boat-hours) between weeks 26 and 35 when sockeye salmon are most abundant in this district.

	Total	Catch and Effort between Weeks 26-35			
Year	Sockeye Harvest	Sockeye Harvest	Individual Permits Fished	Total Hours Open	Boat-Hours[1]
1985	173,100	159,021	155	1,032	106,209
1986	145,699	143,286	201	960	109,490
1987	107,503	106,638	178	615	64,104
1988	116,115	115,888	192	756	93,072
1989	144,936	130,024	178	1,023	117,465
1990	85,691	78,131	159	840	70,421
1991	131,492	123,508	136	984	80,064
1992	244,649	243,878	118	1,080	94,159
1993	394,098	390,299	149	1,032	102,814
1994	100,377	98,725	144	984	74,408
1995	164,294	151,131	140	1,008	82,512
1996	212,403	175,569	130	1,104	86,108
1997	169,474	152,662	138	1,008	81,672
1998	160,506	159,307	124	1,044	87,358
1999	160,028	158,268	118	1,032	80,424
2000	94,651	94,399	95	912	49,488
2001	80,041	62,129	76	1,020	46,874
2002	120,353	106,360	76	1,008	42,528
2003	105,263	96,921	71	1,104	44,008
2004	142,357	141,395	61	1,104	42,400
2005	79,725	75,875	70	1,104	40,864
2006	62,770	53,048	48	840	28,265
2007	66,822	50,642	56	1,032	33,713
2008	34,113	30,672	54	936	31,961
2009	69,859	69,325	65	1,080	43,432
2010	62,680	61,987	68	1,008	45,135
2011	88,618	87,744	87	840	47,627
2012	62,506	40,518	85	1,008	43,695
2013	54,575	45,413	92	1,104	59,437
2014	55,828	49,722	73	1,095	44,551
2015	28,155	27,365	71	912	35,946
2016	39,912	38,078	71	1,008	44,640
2017	25,073	19,702	68	984	39,672
2018	19,920	18,540	64	1,296	30,960
Average 1985-2017	114,657	107,201	107	988	63,470

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

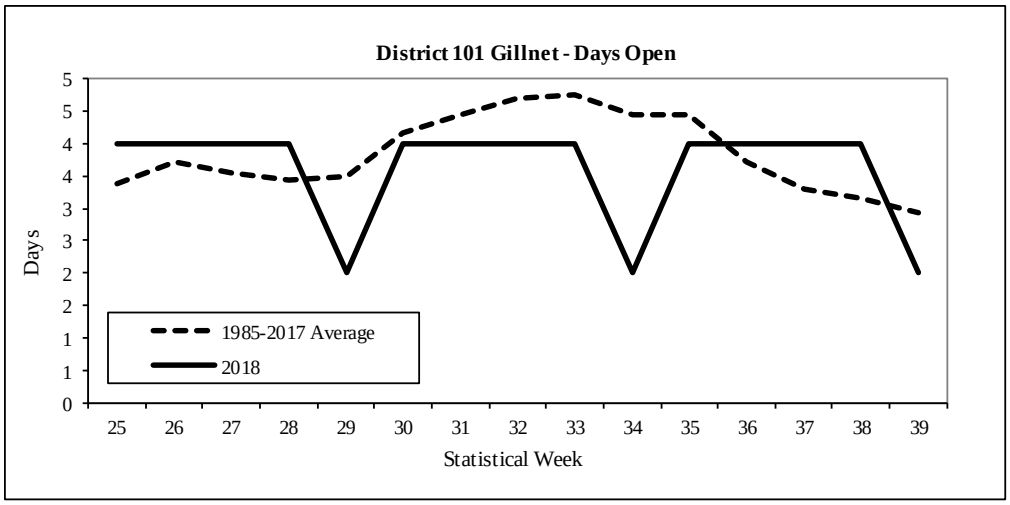


Figure 8.–Days open by week in the District 101 drift gillnet fishery, 2018.

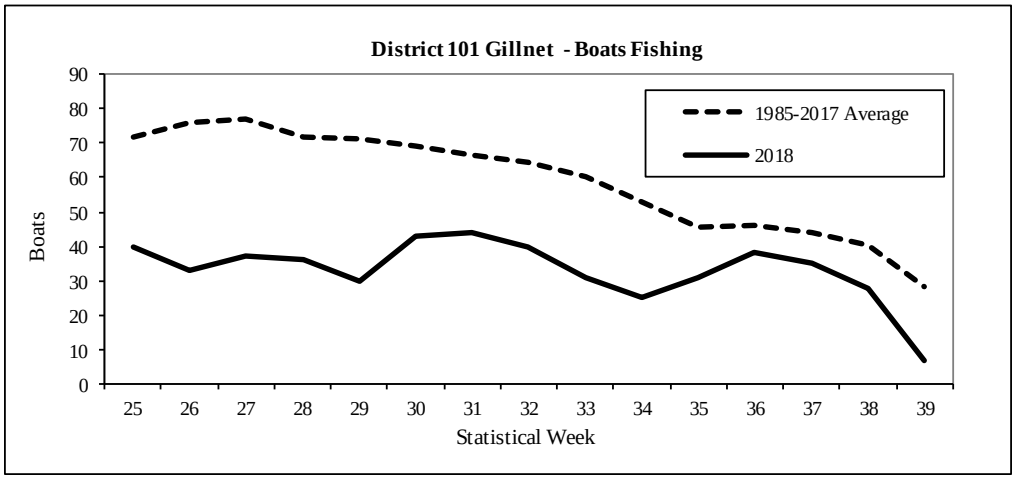


Figure 9.–Number of boats fishing by week in the District 101 drift gillnet fishery, 2018.

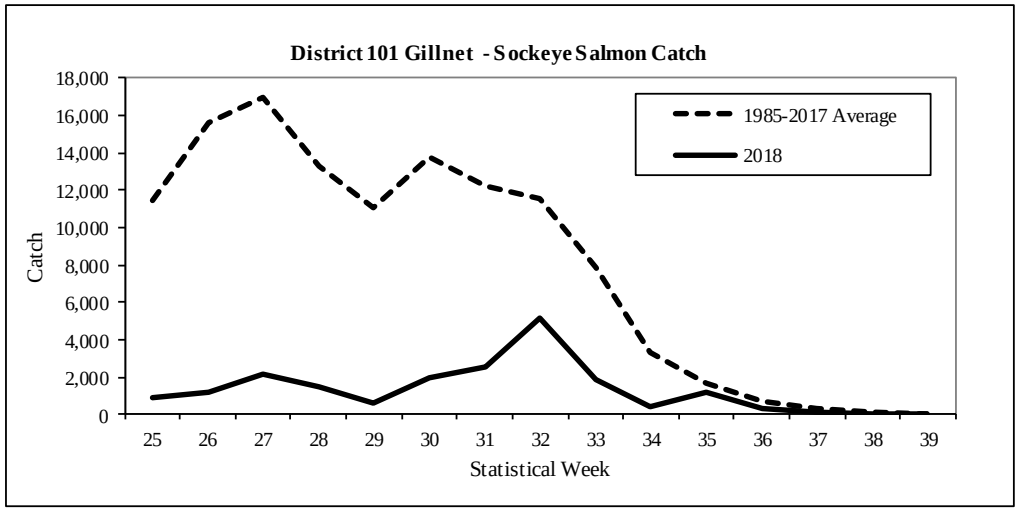


Figure 10.–Sockeye salmon harvest by week in the District 101 drift gillnet fishery, 2018.

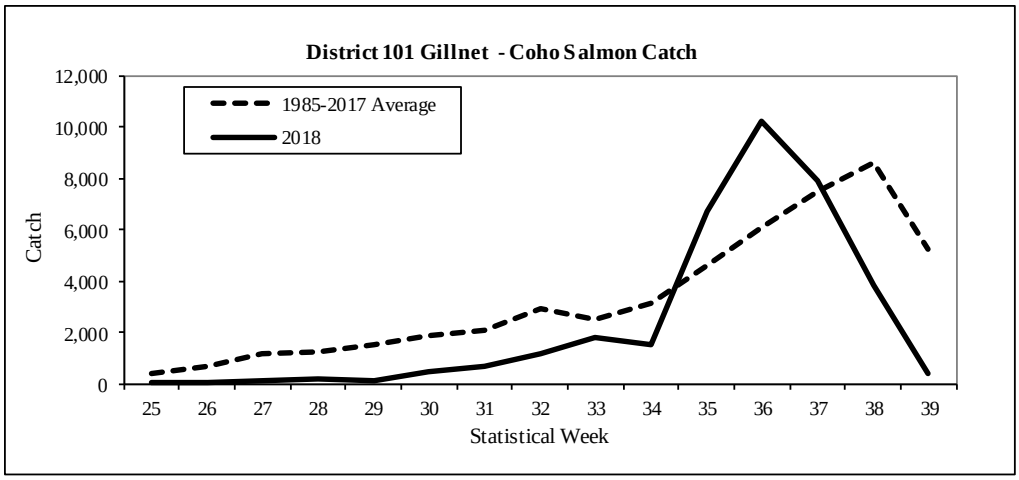


Figure 11.–Coho salmon harvest by week in the District 101 drift gillnet fishery, 2018.

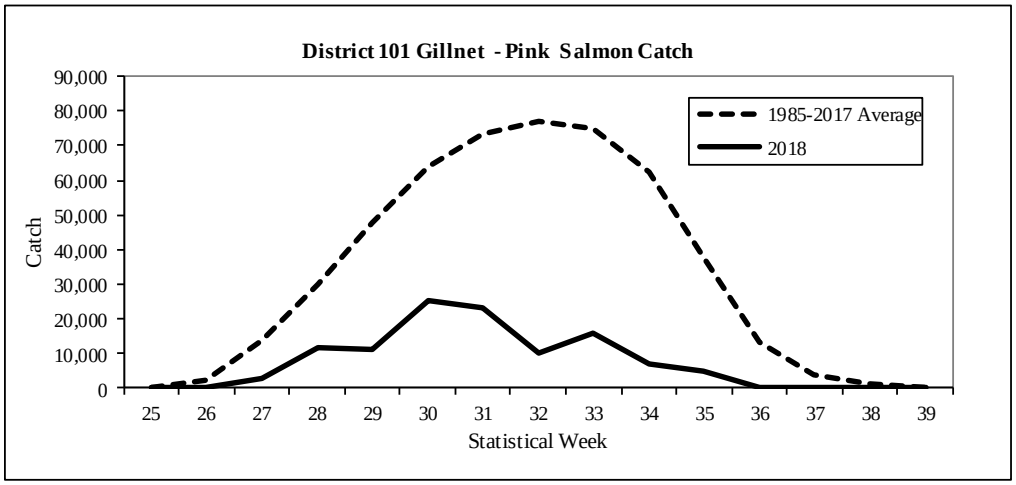


Figure 12.–Pink salmon harvest by week in the District 101 drift gillnet fishery, 2018.

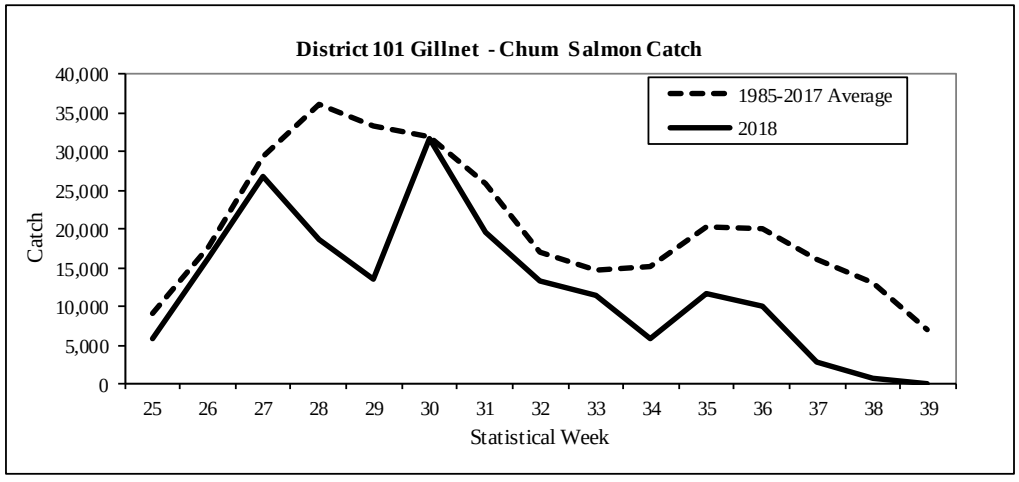


Figure 13.–Chum salmon harvest by week in the District 101 drift gillnet fishery, 2018.

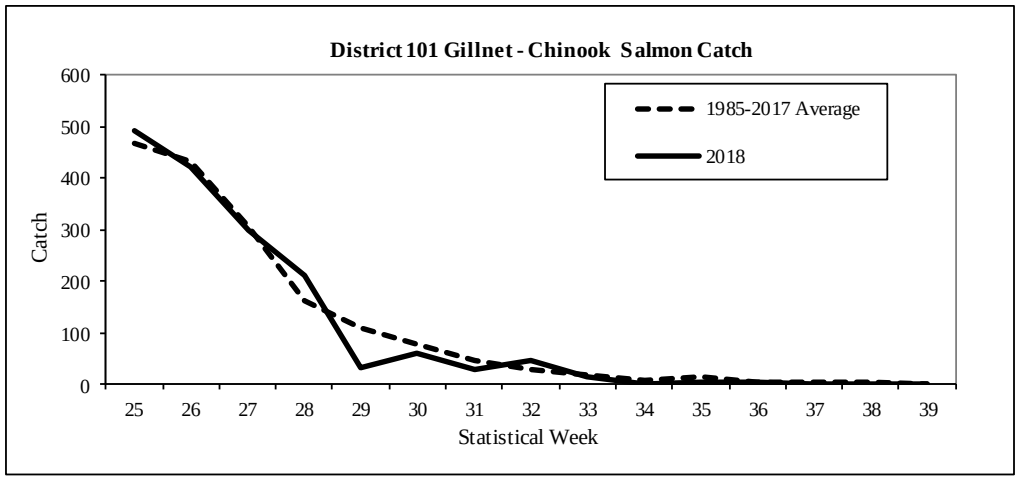


Figure 14.–Chinook salmon harvest by week in the District 101 drift gillnet fishery, 2018.

Pink, Sockeye, and Chum Salmon Escapements

Escapements of pink salmon were generally poor to average throughout Southeast Alaska. The total 2018 Southeast Alaska pink salmon escapement index of 8.15 million index fish ranked 35th since 1960. Biological escapement goals were met in the Southern Southeast and Northern Southeast Outside subregions, but escapement to the Northern Southeast Inside Subregion was below goal in 2018 (Table 5). On a finer scale, escapements were below management targets for 8 of 15 districts in the region and for 22 of the 46 pink salmon stock groups in Southeast Alaska. The Southern Southeast Subregion includes all of the area from Sumner Strait south to Dixon Entrance (Districts 101–108). The escapement index value of 4.87 million was within the escapement goal range of 3.0 to 8.0 million index fish. The pink salmon harvest of 5.4 million in the Southern Southeast Subregion was only 26% of the recent 10-year average. The overall Southeast Alaska pink salmon harvest of 8.1 million fish was approximately 21% of the 2008–2017 average of 37.8 million.

Table 5.–Southeast Alaska 2018 pink salmon escapement indices and biological escapement goals by subregion (in millions).

Subregion	2018 Pink Salmon Index	Biological Escapement Goal Lower Bound	Biological Escapement Goal Upper Bound
Southern Southeast	4.87	3.0	8.0
Northern Southeast Inside	1.37	2.5	6.0
Northern Southeast Outside	1.90	0.75	2.50
Total	8.15		

Sockeye salmon runs throughout Southeast Alaska were mixed in 2018, and escapement targets were met for at least 6 of the 12 sockeye salmon systems with formal escapement goals (escapement estimates not yet available for Stikine River mainstem and Tahltan-Stikine). The Hugh Smith Lake adult sockeye salmon escapement was 2,039, which was well below the optimal escapement goal range of 8,000 to 18,000 adult sockeye salmon. Based on the expanded peak foot survey count, the escapement of sockeye salmon into McDonald Lake was only 11,000 fish, which was far below the sustainable escapement goal range of 55,000 to 120,000.

For summer-run chum salmon, lower bound sustainable escapement goals were met for two of the three subregions in Southeast Alaska. Runs are divided into summer and fall stocks. The Southern Southeast summer-run chum salmon stock group is composed of an aggregate of 15 summer-run chum salmon streams on the inner islands and mainland of southern Southeast Alaska, from Sumner Strait south to Dixon entrance, with a sustainable escapement goal of 62,000 index spawners (based on the aggregate peak survey to all 15 streams). Summer chum salmon escapements were near or above average at most index streams in southern Southeast Alaska, and the index of 127,000 in 2018 was well above the escapement goal (Figure 15).

Cholmondeley Sound is the only area in southern Southeast Alaska with a formal escapement goal for fall chum salmon. Fall chum salmon runs are monitored in Cholmondeley Sound through aerial surveys at Disappearance and Lagoon creeks. The escapement index of 70,000 was well above the upper bound of the sustainable escapement goal range of 30,000 to 48,000 index spawners (based on the aggregate peak survey to both streams; Figure 16).

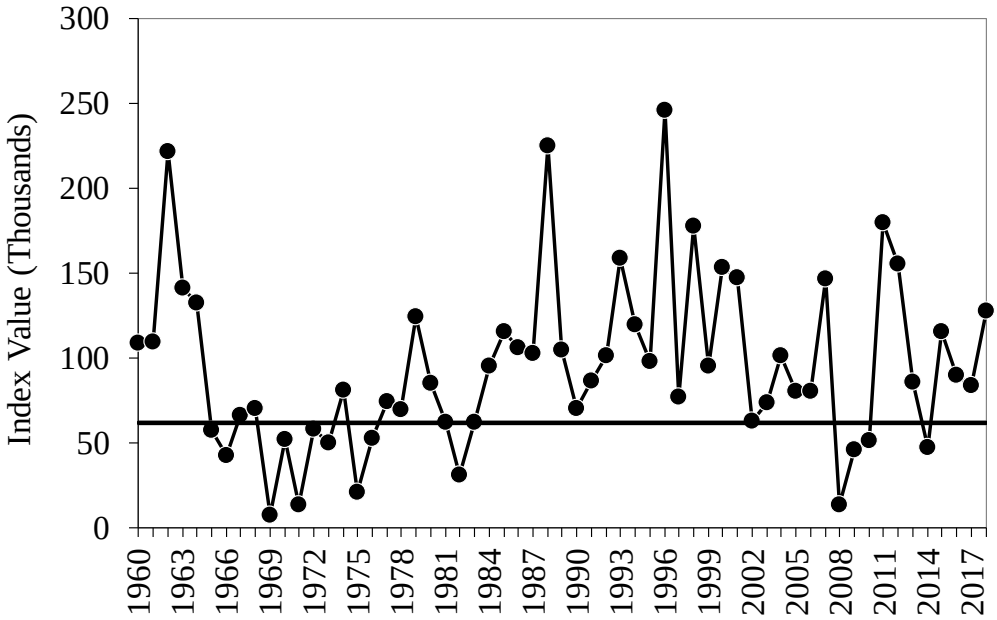


Figure 15.–Observed escapement index value by year (solid circles) and the sustainable escapement goal threshold of 62,000 index spawners (horizontal line) for wild summer-run chum salmon in the Southern Southeast Subregion, 1960–2018.

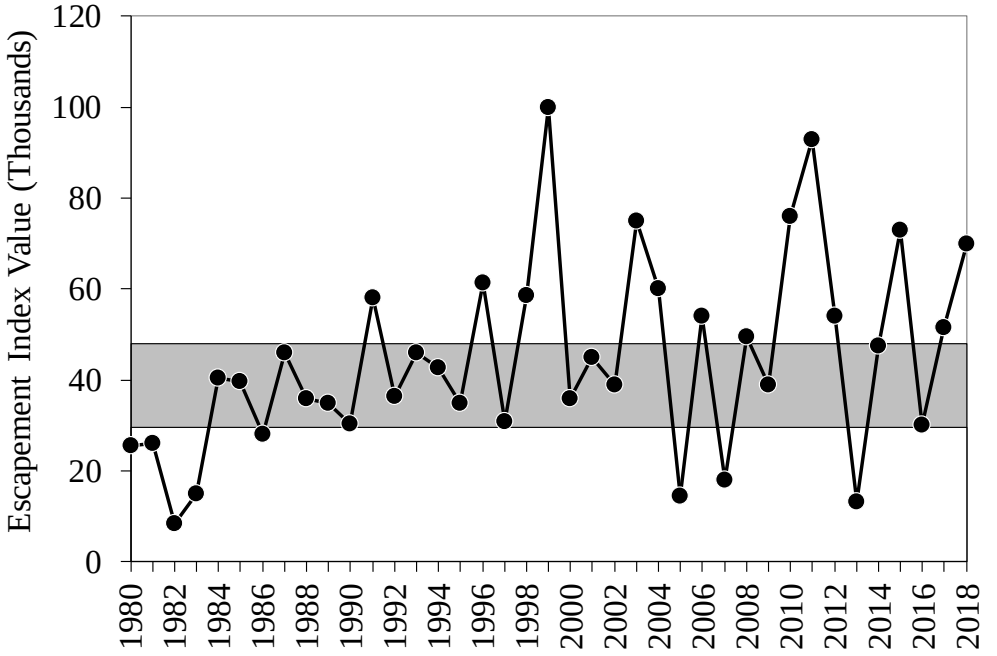


Figure 16.–Observed escapement index value by year (solid circles) and the sustainable escapement goal range of 30,000 to 48,000 index spawners (shaded area) for Cholmondeley Sound fall-run chum salmon, 1980–2018.

TRANSBOUNDARY AREA FISHERIES

Stikine River Area Fisheries

The 2018 preseason forecast for large Chinook salmon returning to the Stikine River was approximately 6,900 fish, which did not allow for directed Chinook salmon fisheries in District 108. The standard mark-recapture program was not operated this year due to the low forecasted run and the desire by both countries to reduce mortality associated with the program. Inseason estimates produced by the Stikine Chinook Management Model (SCMM) indicated a run size less than 10,000 fish initially and less than 8,000 fish later in the season. More exact estimates of run size were not available due to low numbers of fish caught, thus creating very low confidence in model estimates. The post-season SCMM projected a terminal run of less than 8,000 fish and an escapement of well below the escapement goal range of 14,000 to 28,000 fish. The final run size estimate was not available by the time of publication.

The 2018 preseason forecast for sockeye salmon returning to the Stikine River was 161,000 fish, which was near the recent 10-year average of 159,000 fish. The 2018 forecast included approximately 46,000 wild Tahltan (29%), 66,000 enhanced Tahltan (41%), 13,000 enhanced Tuya (8%), and 36,000 mainstem (22%) sockeye salmon. Due to the near identical run timing of the Tahltan Lake and Tuya Lake stocks, any open fishing periods in District 108, and to a lesser extent in District 106, were determined by the inseason abundance estimate of the Tahltan Lake run. Typically, the Tahltan Lake and Tuya Lake sockeye salmon run timing peaks in statistical week 26 (June 24–June 30) through the Districts 106 and 108 fisheries. During an average Tahltan Lake run significant numbers of sockeye salmon could be present as early as statistical week 24 (June 10–16) and as late as statistical week 31 (July 29–August 4). The 2018 runs of local area sockeye salmon stocks were expected to be average.

Due to the poor performance of Chinook salmon stocks in SE Alaska, restrictions were implemented in the Districts 106 and 108 gillnet fisheries to conserve Chinook salmon. In District 106, the initial opening was delayed by one week and a six-inch maximum mesh restriction was in place for the first three openings. In District 108, in addition to a three-week delay of the initial opening; time, area, and mesh restrictions were also implemented through statistical week 29 (July 15–July 21). Estimated harvest of large Stikine River Chinook salmon by the District 108 drift gillnet fishery during the sockeye salmon directed fishery period (weeks 27–29) was 5 fish based on GSI. The District 108 Spring Troll hatchery access fishery was closed for 2018. Commercial trolling remained closed in District 108 until the opening of the Summer Troll fishery on July 1st. U.S. harvest of large Stikine River Chinook salmon in all District 108 fisheries was estimated to be 23 fish; well below the U.S. base level catch (BLC) of 3,400 fish.

The District 106 drift gillnet sockeye salmon fishery opened Sunday, June 17 (week 25) and the District 108 drift gillnet fishery opened Sunday, July 1 (week 27). The initial openings in District 106 were limited to two days in week 25 and three days in week 26. The following week, both districts were opened for three days with mesh and area restrictions in place. The mesh restriction was lifted from District 6 in week 28, but mesh and area restrictions continued to be in place for District 108. Fishing time peaked with three days in District 106 and four days in District 108 during this period to harvest the surplus Stikine River sockeye salmon. By week 29, it became apparent that sockeye salmon returning to the Stikine River were coming in below expectations and open time in District 108 was reduced by one day each week through week 31.

Open time in District 106 also experienced weekly reductions and were limited to two days per week in weeks 29 through 31 for McDonald Lake sockeye conservation (Tables 6 and 7). The preliminary postseason assessment for Stikine River sockeye salmon was 89,600 fish and included 20,200 wild Tahltan (23%), 21,400 enhanced Tahltan (24%), 11,100 Tuya (12%), and 36,900 Mainstem (41%) fish.

Districts 106 and 108 were managed based on pink salmon abundance during the month of August and three-day openings occurred in weeks 32 through 34 (Figures 17 and 24). In late August, management focus switched to coho salmon and the fisheries continued to be open for two to four days weekly through the remainder of the season.

The number of boats participating in the District 106 fishery was near or above average in most weeks (Figure 18), and the seasonal number of permits fished was 101% of average (Table 6). The number of boats participating in the District 108 fishery was below average during the first weeks of the sockeye salmon fishery and increased to above average from mid-to-late July; the 103 permits fished was 75% of the average of 137 permits (Figure 25; Table 7).

During the 2018 season, 348,277 pink salmon, 25,203 sockeye salmon, 176,392 chum salmon, 112,000 coho salmon, and 3,247 Chinook salmon were harvested in the District 106 drift gillnet fishery (Table 6). Chinook salmon harvests were generally above average from late June through late August (Figure 19) and were comprised of 47% Alaska hatchery origin fish. Sockeye salmon harvests were below average all season (Figure 20), and the total sockeye salmon harvest of 25,203 fish was 30% of the recent 10-year average; 3,000 were estimated to be of Stikine River origin. Harvests of coho salmon were also below average early in the season, but increased to above average from early August to early September. The overall harvest of 112,000 coho salmon was 77% of the recent 10-year average of 145,700 fish (Figure 21). Pink salmon harvests were above average from late July through through August (Figure 22), and the overall harvest of 348,277 fish was 125% of the recent 10-year average. Chum salmon harvests were near or above average throughout the season. The overall harvest of 176,392 fish was 114% of average (Figure 23).

During the 2018 season, 15,643 pink salmon, 5,731 sockeye salmon, 133,812 chum salmon, 8,823 coho salmon, and 2,649 Chinook salmon were harvested in the District 108 drift gillnet fishery (Table 7). The harvest of Chinook salmon was near average in all but the first week of the fishery and was comprised of 73% Alaska hatchery origin fish for the season (Figure 26). An estimated 23 Stikine River large Chinook salmon were harvested in District 108 from weeks 25 through 29 by subsistence, sport, troll, and drift gillnet fisheries. District 108 gill net sockeye salmon harvests were below average throughout the season (Figure 27) and the harvest of 5,731 fish was only 18% of the recent 10-year average. An estimated 4,200 fish, or 73% of the harvest, were estimated to be Stikine River sockeye salmon. The overall coho salmon harvest of 8,823 fish was also well below the recent 10-year average of 29,000 fish (Table 7, Figure 28). Pink salmon harvests were below average throughout the season and the overall harvest was 34% of the recent 10-year average (Figure 29). The overall harvest of 133,812 chum salmon was 93% of the recent 10-year average (Figure 30).

Table 6.–Weekly salmon harvest in the Alaskan District 106 commercial drift gillnet fisheries, 2018.

Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Days	Boat Days
25	17-Jun	206	447	280	65	714	52	2	104
26	24-Jun	573	1,946	1,907	705	10,420	44	3	132
27	1-Jul	422	2,097	2,382	1,932	9,327	37	3	111
28	8-Jul	308	2,937	3,632	6,182	19,220	38	3	114
29	15-Jul	178	2,647	2,035	12,576	14,987	42	2	84
30	22-Jul	266	3,817	2,519	42,214	29,176	68	2	136
31	29-Jul	511	3,569	5,110	60,986	13,721	87	2	174
32	5-Aug	89	3,002	9,440	85,749	11,890	74	3	222
33	12-Aug	142	2,367	8,790	57,553	11,684	72	3	216
34	19-Aug	111	1,423	8,782	43,907	15,856	72	3	216
35	26-Aug	311	733	13,598	29,207	16,033	81	3	243
36	2-Sep	82	152	26,459	6,883	13,078	95	3	285
37	9-Sep	38	56	20,360	310	7,694	99	4	396
38	16-Sep	4	5	5,800	6	2,099	63	3	189
39	23-Sep	6	5	906	2	493	18	2	36
Total		3,247	25,203	112,000	348,277	176,392	151	41	2,657
2008-2017 Average		2,172	82,773	145,700	278,552	154,801	150	48	2,753
2018 as % of Average		149%	30%	77%	125%	114%	101%	85%	97%

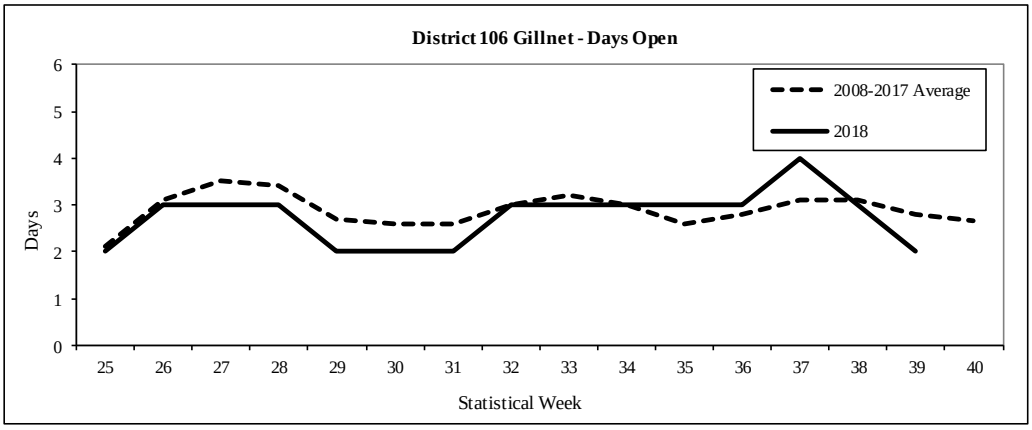


Figure 17.– Days open by week in the District 106 drift gillnet fishery, 2018.

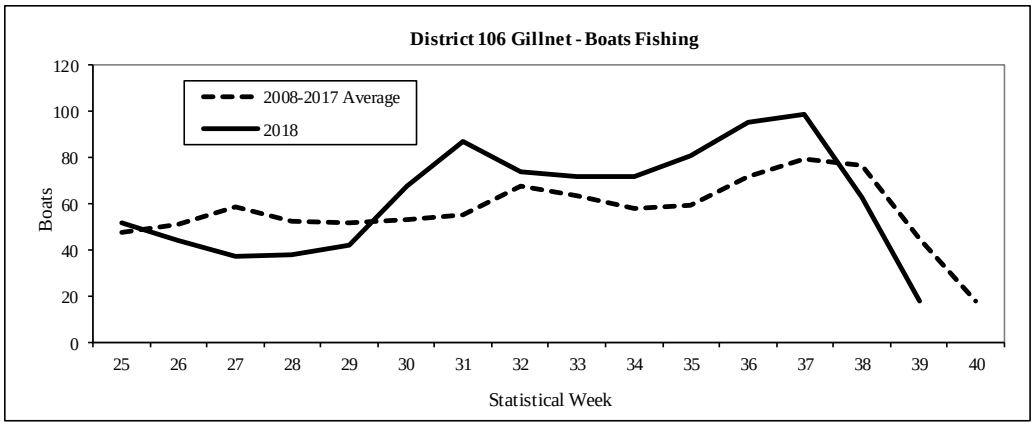


Figure 18.–Number of boats fishing by week in the District 106 drift gillnet fishery, 2018.

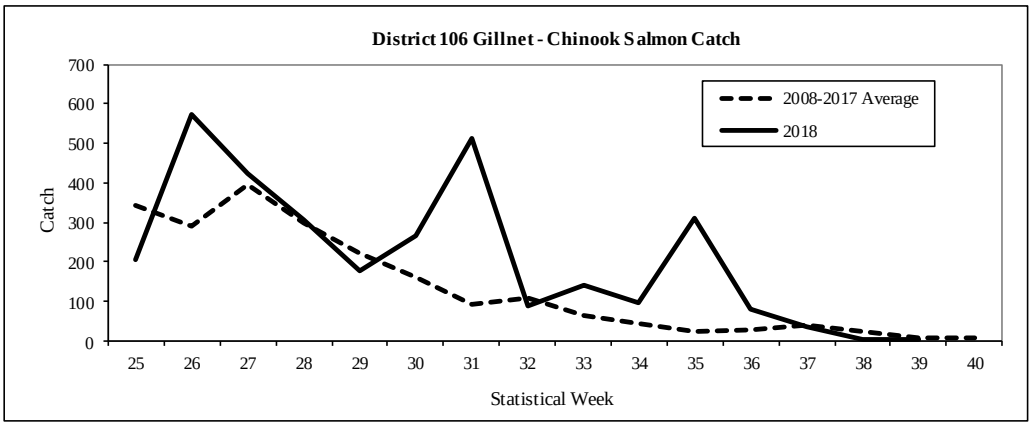


Figure 19.–Chinook salmon harvest by week in the District 106 drift gillnet fishery, 2018.

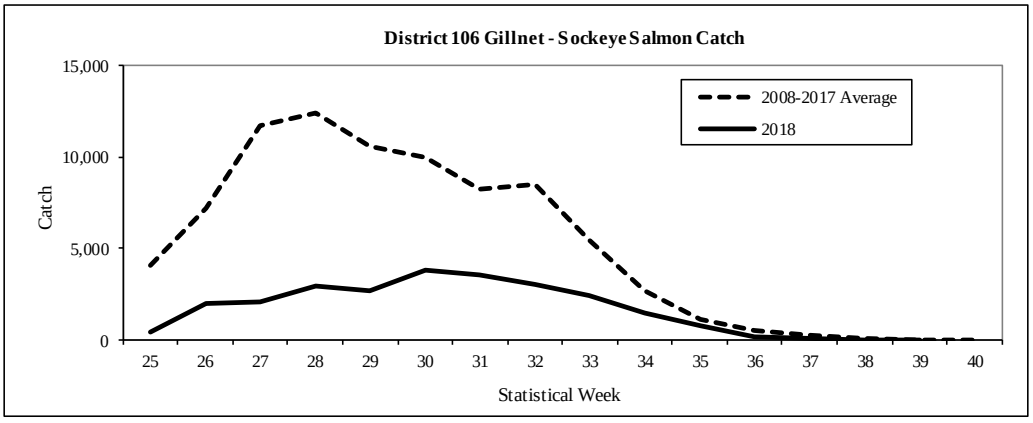


Figure 20.–Sockeye salmon harvest by week in the District 106 drift gillnet fishery, 2018.

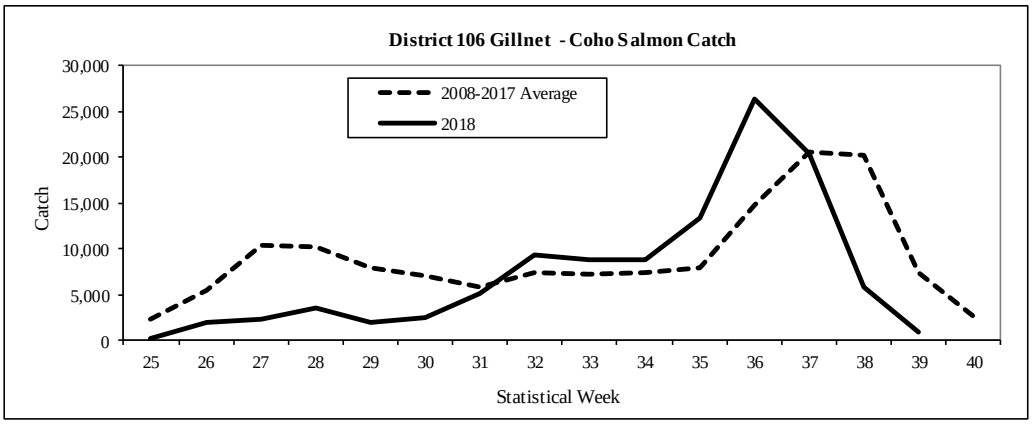


Figure 21.–Coho salmon harvest by week in the District 106 drift gillnet fishery, 2018.

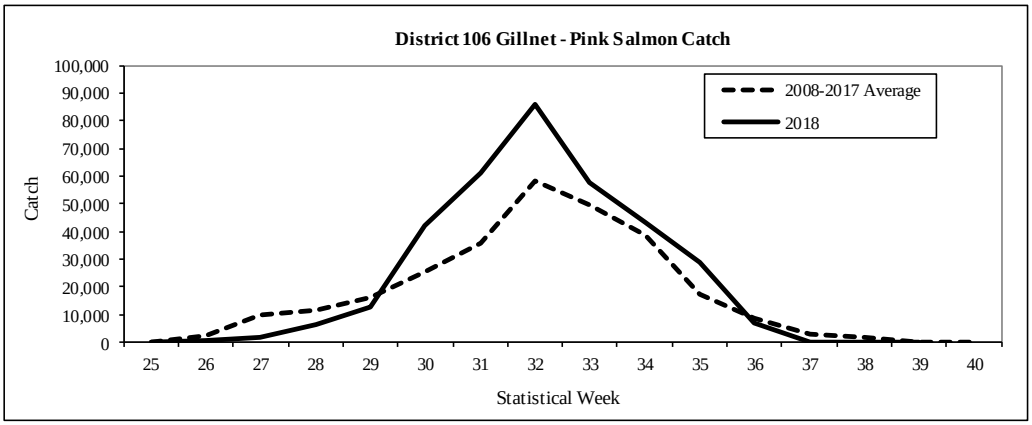


Figure 22.–Pink salmon harvest by week in the District 106 drift gillnet fishery, 2018.

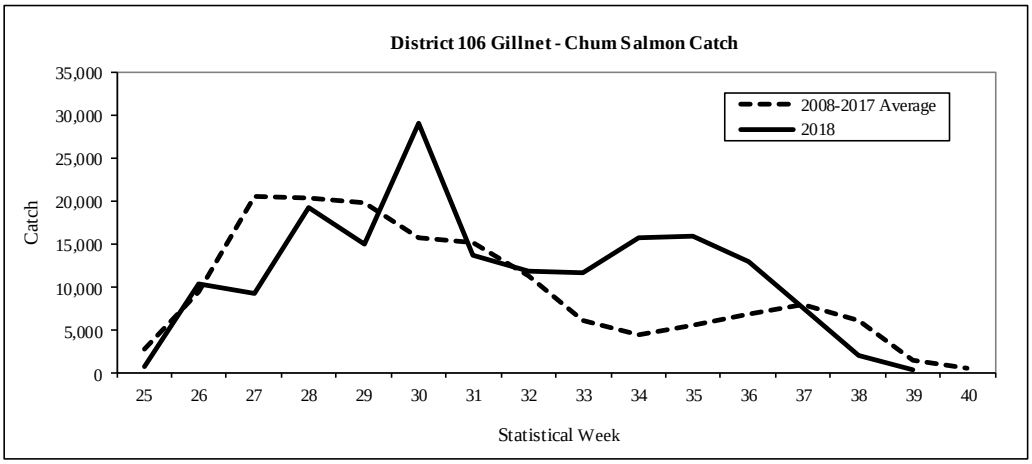


Figure 23.–Chum salmon harvest by week in the District 106 drift gillnet fishery, 2018.

Table 7.–Weekly salmon harvest and effort in the Alaskan District 108 traditional commercial drift gillnet fishery, 2018.

Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Days	Boat Days
27	1-Jul	226	1,276	64	37	4,050	16	3	48
28	8-Jul	1,423	1,404	260	359	10,251	35	4	111
29	15-Jul	516	1,184	158	1,547	46,690	58	4	158
30	22-Jul	284	1,125	171	4,448	27,417	78	3	174
31	29-Jul	116	404	308	3,337	10,605	48	2	96
32	5-Aug	41	212	1,220	4,089	19,449	54	3	162
33	12-Aug	15	63	816	1,447	12,491	38	3	114
34	19-Aug	6	17	937	186	1,771	16	3	48
35	26-Aug	10	30	999	124	416	11	3	33
36	2-Sep	4	9	1,632	58	300	13	3	39
37	9-Sep	4	6	1,697	11	348	12	4	44
38-39	16-Sep	4	1	561	0	24	13	5	37
Total		2,649	5,731	8,823	15,643	133,812	103	40	1,064
2008-2017 Average		7,966	32,631	28,858	45,518	143,837	137	51	2,107
2018 as % of Average		33%	18%	31%	34%	93%	75%	78%	50%

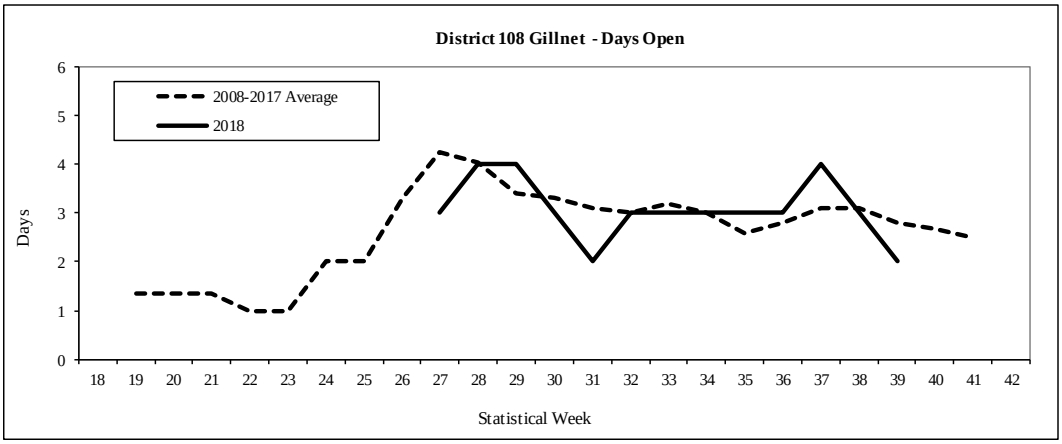


Figure 24.–Days open by week in the District 108 drift gillnet fishery, 2018.

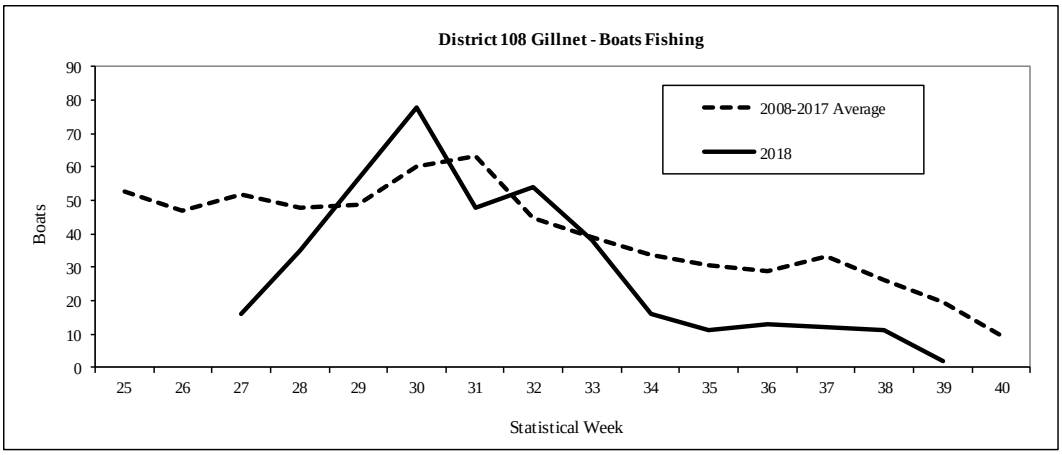


Figure 25.–Number of boats fishing by week in the District 108 drift gillnet fishery, 2018.

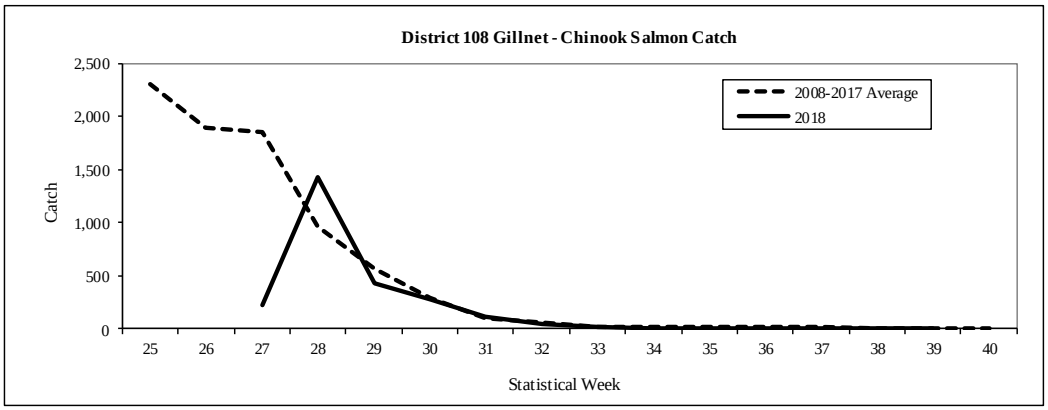


Figure 26.–Chinook salmon harvest by week in the District 108 drift gillnet fishery, 2018.

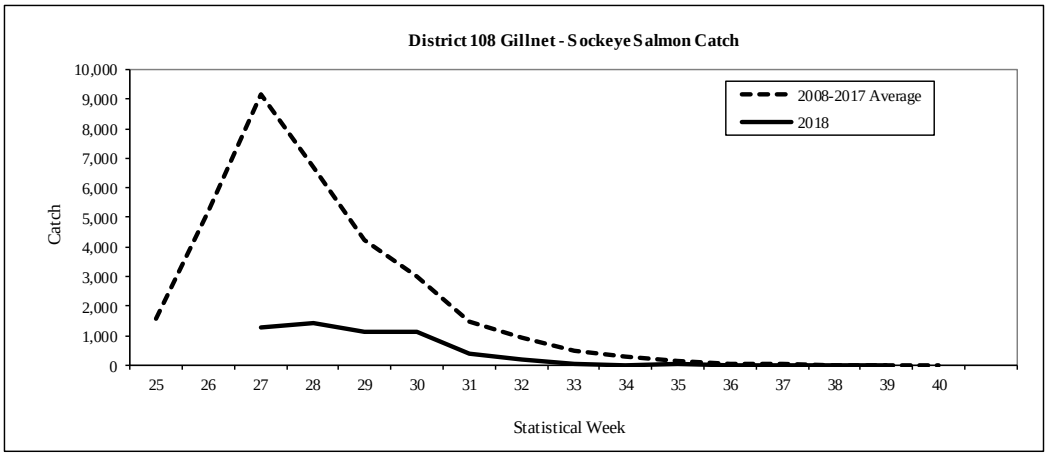


Figure 27.–Sockeye salmon harvest by week in the District 108 drift gillnet fishery, 2018.

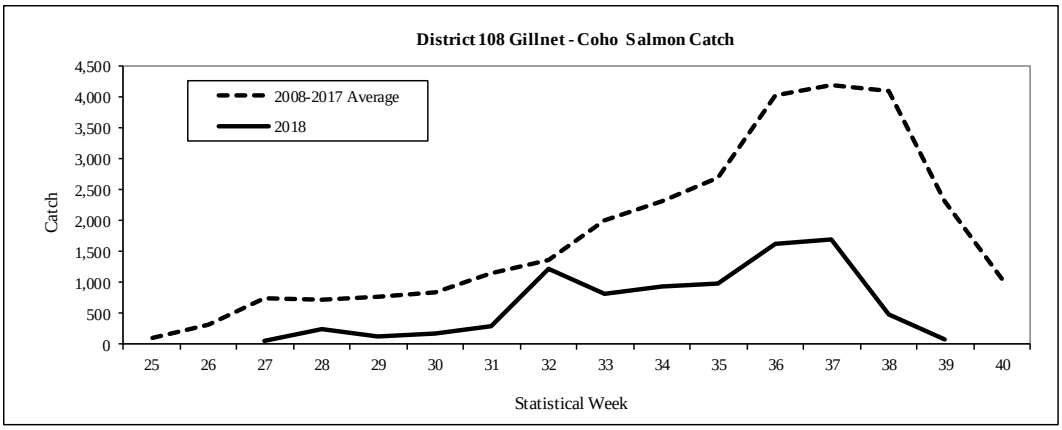


Figure 28.–Coho salmon harvest by week in the District 108 drift gillnet fishery, 2018.

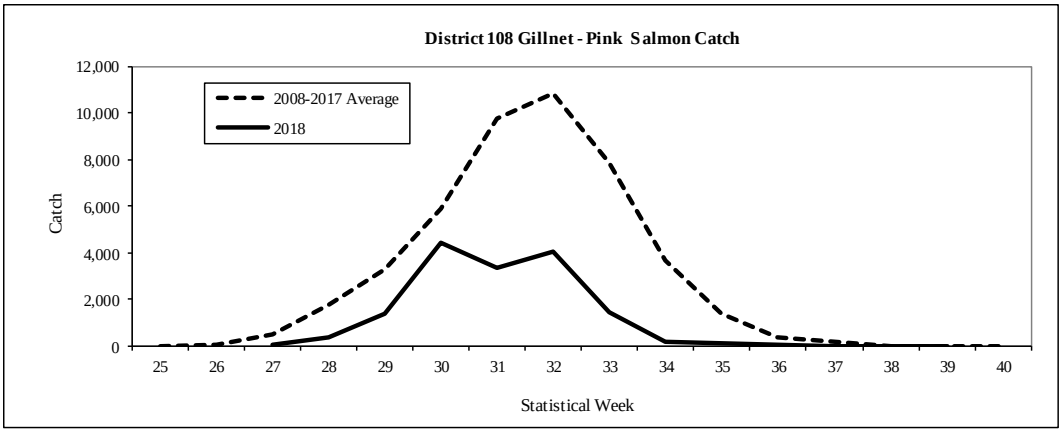


Figure 29.–Pink salmon harvest by week in the District 108 drift gillnet fishery, 2018.

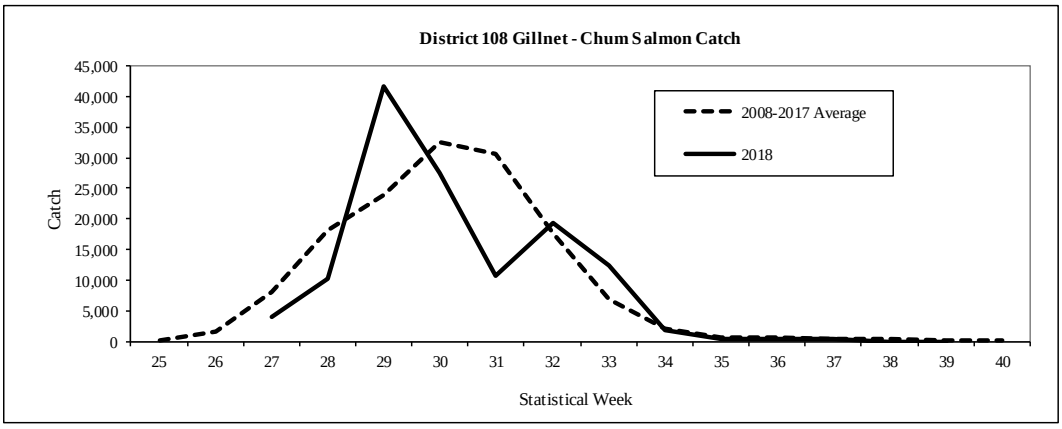


Figure 30.–Chum salmon harvest by week in the District 108 drift gillnet fishery, 2018.

Taku River Area Fisheries

The traditional drift gillnet fishery in District 111 targets salmon stocks bound for the trans-boundary Taku River. This fishery is managed for Chinook salmon from week 18 to week 24

when there are sufficient fish surplus to escapement needs to provide for a fishery. From week 25 to week 33 the fishery is managed for Taku River sockeye salmon, and from week 34 to week 42 for Taku River coho salmon. Also harvested in this fishery are salmon bound for Stephens Passage and Port Snettisham streams as well as enhanced Chinook, sockeye, coho and chum salmon from Douglas Island Pink and Chum, Inc. (DIPAC) hatchery releases. The traditional fishery does not include harvests from the Speel Arm Special Harvest Area (SHA) inside Port Snettisham.

The escapement goal range for Taku River large Chinook salmon is 19,000 to 36,000 fish with a point goal of 25,500 fish. In years of high abundance, directed Chinook salmon fisheries can be implemented to harvest runs in excess of escapement needs. The 2018 preseason terminal run forecast for the Taku River of 4,700 large Chinook salmon did not allow for any directed Chinook salmon fisheries in District 111 and significant restrictions in time, area, and gear were implemented in the first three directed sockeye salmon openings (weeks 25–27) to minimize Chinook salmon harvest.

The spawning objective range for Taku River sockeye salmon is 71,000 to 80,000 fish, with a point goal of 75,000 fish. The 2018 Taku River sockeye salmon forecast was below the average of 160,000 wild fish, based on the average of Canadian stock-recruit and sibling forecasts. DIPAC forecasted 243,000 enhanced sockeye salmon returning through District 111 waters to Port Snettisham.

An escapement goal range of 50,000 to 90,000 Taku River coho salmon with a point goal of 70,000 fish was adopted in early 2015. The U.S. management intent in 2018 was to pass a minimum of 75,000 coho salmon above the border, providing for escapement and a 5,000 fish Canadian assessment fishery. The preseason Taku River forecast was for a below average terminal run of 81,000 coho salmon in the Taku River, and DIPAC forecast a run of 37,000 enhanced coho salmon from releases in Gastineau Channel. For 2018, DIPAC forecasted runs totaling 1,090,000 enhanced chum salmon to Gastineau Channel and Limestone Inlet, which was below the recent average.

The traditional drift gillnet fishery in District 111 began on Sunday, June 17, 2018 (week 25). The initial drift gillnet opening of the season in District 111 was for two days, with a significant area restriction, six inch maximum mesh size restriction, and night closures in place, intended to minimize harvest of Taku River Chinook salmon. Effort for the opening was 28 boats, which was near the ten-year average of 31 boats. Only 244 sockeye salmon were harvested during the opening, but the chum salmon harvest of 16,777 fish was by far the largest week 25 harvest ever for the district (Figures 34 and 37). A total of 66 Chinook salmon were harvested, which was well below average for week 25 (Figure 33).

From late June through early August (weeks 26–29) effort in the District 111 drift gillnet fishery was generally above average, with a peak of 154 boats fishing in week 28 (Figure 32). Harvests of sockeye salmon were below average through mid-July, but then improved to near average in late July before dropping to well below average for the rest of the season (Figure 34). Weekly chum salmon catches were well above average and approximately 516,000 fish were harvested from late June to mid-August (Figure 37). The vast majority of the summer-run chum salmon harvest in District 111 consists of DIPAC hatchery fish returning to release sites in Gastineau Channel and Limestone Inlet. Chinook salmon harvests were below average and the total harvest

of 739 fish was approximately half the average (Figure 33). Pink salmon harvests were well below average throughout the season and the harvest of 23,183 fish was only 15% of average (Figure 36). From late August through late September (weeks 34–39), overall effort in the fishery was near or below average in most weeks (Figure 31 and 32). The overall coho salmon harvest of 35,608 fish was near average and the peak weekly harvest of 12,252 fish occurred in week 36 (Figure 35). Fall chum salmon harvests were below the recent ten-year average from week 34 through 39 (Figure 37).

A number of Chinook salmon stocks are known to contribute to the Juneau area sport fishery, including those from the Taku, Chilkat, and King Salmon rivers, and local hatchery stocks, but the major contributor of mature wild fish is believed to be the Taku River. Non-retention of Chinook salmon in District 111, 112, 115, and parts of District 113 and 114, from April 1 through June 14, resulted in minimal harvest of wild fish in the sport fishery. The final, GSI-based District 111 harvest estimates of Taku River large Chinook salmon during the accounting period was 31 fish in the drift gillnet fishery, 9 in the sport fishery, and an estimated 10 in the personal use fishery, for a total of 50 fish. Harvests of Taku River large Chinook salmon in these fisheries from week 30 onwards were minimal and resulted in a total harvest well below the U.S. base level catch of 3,500 fish. The preliminary escapement estimate of Taku River large Chinook salmon is 7,271 fish, which was well below the escapement goal range.

The 2018 traditional District 111 sockeye salmon harvest of 68,122 fish was 66% of the recent ten-year average. Peak catches of sockeye salmon occurred in weeks 29 and 30 (mid-to-late July; Figure 34). The Speel Arm SHA was opened from week 32 to 37 and 24,767 sockeye salmon were harvested in the common property fishery. The lower bound of the Speel Lake sustainable escapement goal range of 4,000 to 9,000 fish was reached with 4,244 fish counted through the weir through September 18. DIPAC sockeye salmon returning to the Snettisham Hatchery contributed a minimum of 41,000 fish to the traditional District 111 harvest. The preliminary escapement estimate of Taku River sockeye salmon is 108,000 fish, which was above the escapement goal range.

The 2018 traditional District 111 coho salmon harvest of 35,608 fish was near the recent ten-year average (Figure 35). Approximately 90% of the coho salmon were harvested in Taku Inlet, which was above the ten-year average of 80%, and 10% were harvested from Stephens Passage and Port Snettisham. Coho salmon stocks harvested in District 111 include runs to the Taku River, Port Snettisham, Stephens Passage, and local Juneau area streams as well as Alaskan hatcheries. This was the fourth year of full production for DIPAC's revitalized enhanced coho salmon program. Alaska hatchery (nearly entirely DIPAC) enhanced coho salmon first appeared in the District 111 harvest in week 33, and comprised substantial proportions of the harvest each remaining week of the fishery. Alaska hatchery enhanced coho salmon contributed 39% of the 2018 District 111 traditional drift gillnet harvest. The final escapement estimate of Taku River coho salmon is 51,600 fish, which was just inside the escapement goal range of 50,000 to 90,000 fish.

The 2018 District 111 traditional pink salmon harvest of 23,183 fish was 15% of the ten-year average (Figure 36). Pink salmon escapements were very poor in the Northern Southeast Inside subregion of Southeast Alaska and the District 111 escapement index was approximately 25% of the lower end of the management target range. The 2018 District 111 traditional fishery chum salmon harvest of 517,104 fish was 83% of the recent ten-year average and was comprised

almost entirely of summer run fish (Figure 37). The summer chum salmon run continues through mid-August (week 33) and is comprised mostly of domestic hatchery fish and small numbers of wild stocks. Chum salmon returning to DIPAC release sites in Gastineau Channel and Limestone Inlet contributed a major portion of the harvest, but quantitative contribution estimates are not available. Approximately 57% of the District 111 chum harvest was taken in Taku Inlet, and 43% in Stephens Passage. The harvest of 1,507 fall-run chum salmon (i.e. chum salmon caught after week 33) was 47% of the recent ten-year average. Most of these fall-run chum salmon are probably wild fish of Taku and Whiting River origin.

Table 8.–Weekly salmon harvest in the Alaskan District 111 traditional commercial drift gillnet fishery, 2018[a].

Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Days	Boat Days
25	17-Jun	66	244	6	0	16,777	28	2	56
26	24-Jun	89	1,100	8	0	39,971	64	2	128
27	1-Jul	96	1,721	19	9	115,954	119	2	238
28	8-Jul	133	6,208	53	404	160,306	154	3	462
29	15-Jul	96	17,058	376	2,121	104,783	150	4	600
30	22-Jul	108	18,588	1,724	6,113	48,844	123	4	492
31	29-Jul	96	9,934	1,775	9,802	20,668	75	4	300
32	5-Aug	31	8,199	1,565	4,383	7,340	68	4	272
33	13-Aug	4	2,172	727	319	954	25	3	75
34	20-Aug	6	1,789	3,098	32	752	28	3	84
35	26-Aug	5	889	4,471	0	304	24	3	72
36	2-Sep	4	185	12,252	0	339	34	4	136
37	9-Sep	5	31	6,633	0	79	34	3	102
38	16-Sep	0	3	2,736	0	33	28	2	56
39	23-Sep	0	1	165	0	0	7	1	7
Total		739	68,122	35,608	23,183	517,104	218	44	3,080
2008–2017 Average		1,434	103,184	36,592	152,604	624,011	191	52	2,947
2018 as % of Average		52%	66%	97%	15%	83%	114%	85%	104%

[a] The 2018 District 111 drift gillnet harvest and effort, as well as the 2008-2017 averages, are for the directed sockeye and coho salmon portions of the fishery only. There was no directed fishery for Chinook salmon in District 111 in 2018 due to a low Taku River preseason abundance forecast.

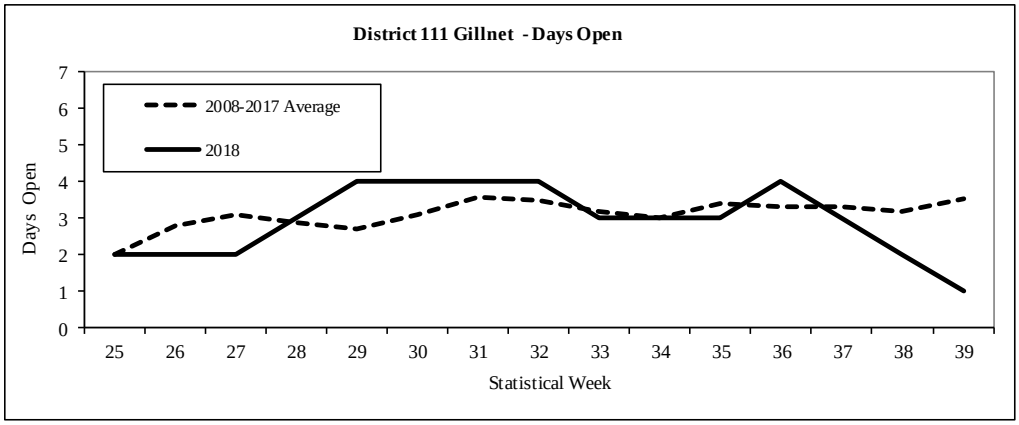


Figure 31.–Days open by week in the District 111 drift gillnet fishery, 2018.

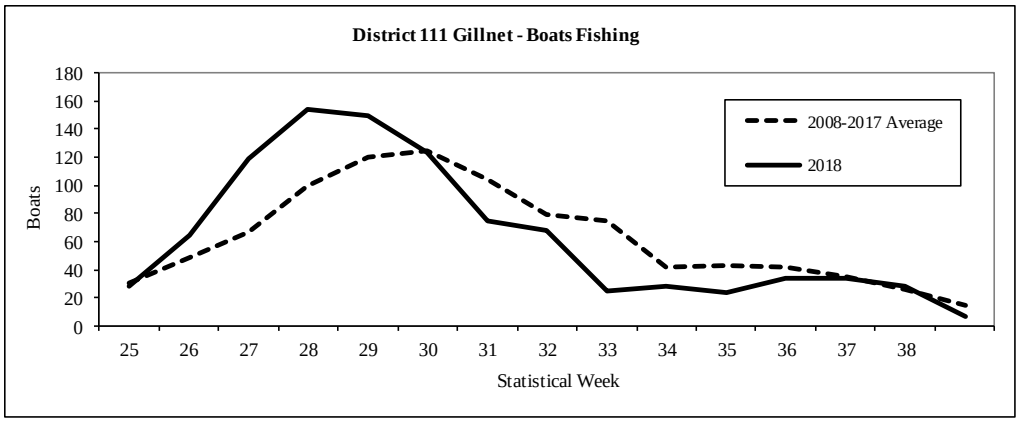


Figure 32.–Number of boats fishing by week in the District 111 drift gillnet fishery, 2018.

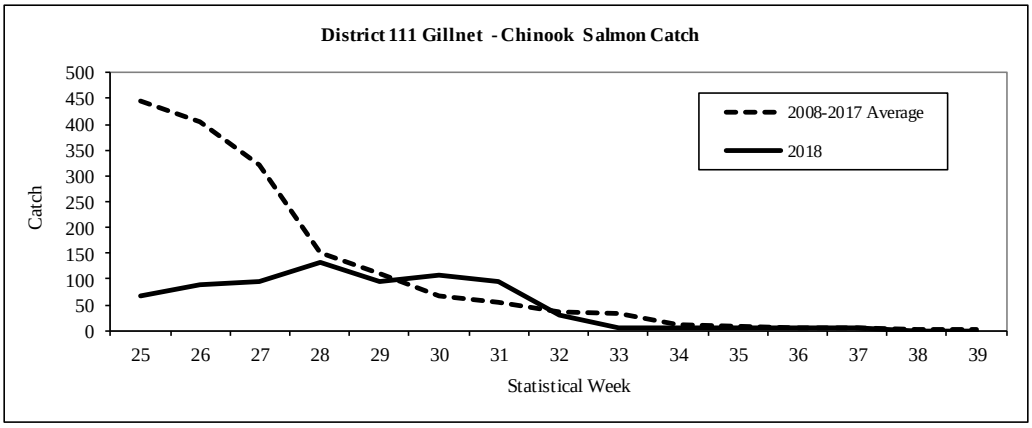


Figure 33.–Chinook salmon harvest by week in the District 111 drift gillnet fishery, 2018.

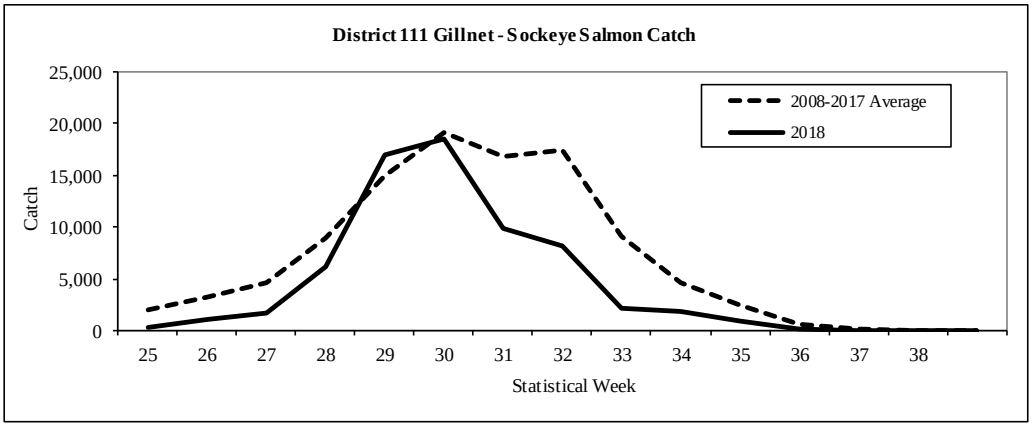


Figure 34.–Sockeye salmon harvest by week in the District 111 drift gillnet fishery, 2018.

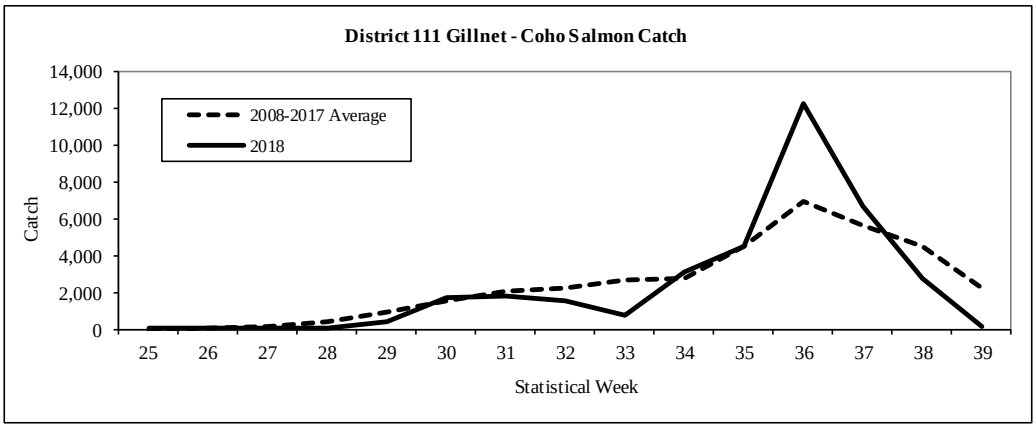


Figure 35.–Coho salmon harvest by week in the District 111 drift gillnet fishery, 2018.

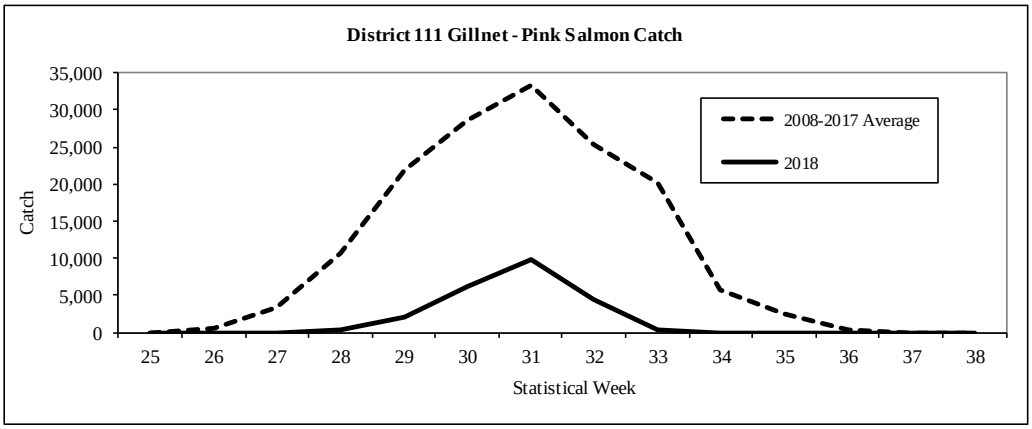


Figure 36.–Pink salmon harvest by week in the District 111 drift gillnet fishery, 2018.

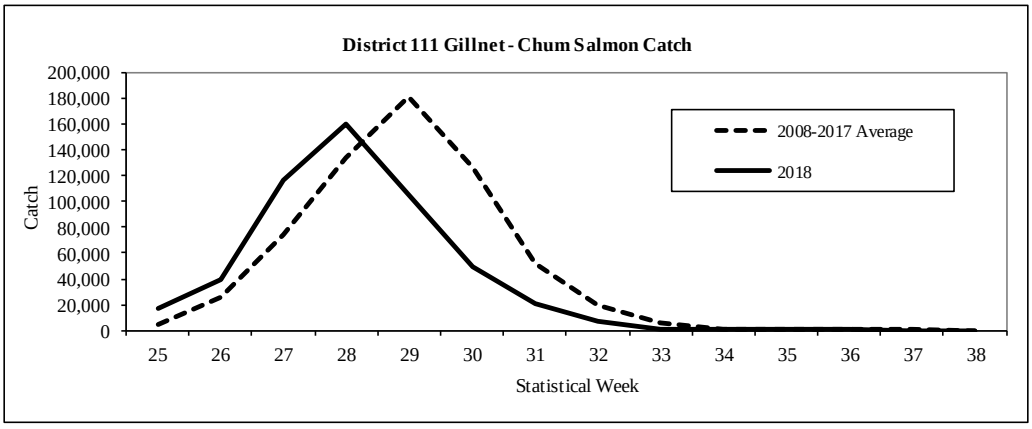


Figure 37.–Chum salmon harvest by week in the District 111 drift gillnet fishery, 2018.

Transboundary River Joint Enhancement

The transport of sockeye salmon fry from the Snettisham Hatchery facility back to the Canadian lakes was complete on June 5, 2018. Approximately 4.30 million fry were released in Tahltan, Tatsamenie, and Trapper lakes in Canada. The overall green egg to fry survival for brood year (BY) 2016 releases was 71% (Table 9). After transporting BY17 fry back to their respective

lakes, all TBR modules, incubators, and short-term fry rearing containers were broken down, cleaned, and disinfected prior to setting up to receive green eggs from BY18 egg-takes.

Brood year 2018 egg-takes began on September 12th at Tahltan Lake and September 19th at Tatsamenie Lake. An estimated total of 5.0 million green eggs were collected from the two donor lakes. Tahltan Lake egg-takes were completed on September 24th after collecting an estimated 2.5 million eggs in 7 egg lots. Tatsamenie Lake egg-takes were completed on October 8th after collecting 2.5 million eggs in 5 lots. DFO contractors collected adult sockeye salmon tissues on the spawning grounds and shipped them to the ADF&G Juneau Fish Pathology laboratory via Snettisham Hatchery per the treaty agreement.

Table 9.–Summary of numbers and survival rates of brood year 2017 sockeye salmon fry released May and June 2018. Fish were raised at Snettisham Hatchery as part of the Transboundary River Salmon Enhancement Project.

Brood stock	Release site	Number of trips	Survival rate to eyed stage	Survival rate to release	Number released
Tahltan	Tahltan Lk	6	79.2%	68.4%	2,634,200
Tatsamenie	Upper Tats Lk	3	81.4%	74.3%	1,263,500
Tatsamenie	Upper Tats Lk, Extended Rearing	2	85.1%	83.2%	214,300
Trapper	Trapper Lk	1	75.1%	67.0%	187,700
	Average/Totals	12	79.8%	70.6%	4,299,700

During the 2018 season, the ADF&G Thermal Mark Lab processed 12,985 sockeye salmon otoliths collected by ADF&G and DFO staff as part of the U.S./Canada fry-planting evaluation program. These collections came from commercial and test fisheries in both U.S. and Canadian waters on the Taku and Stikine Rivers over a 13-week period. The laboratory provided estimates on hatchery contributions for 73 distinct sample collections. Estimates of the percentage of hatchery fish contributed to commercial fishery catches were provided to ADF&G and DFO fishery managers 24 to 48 hours after samples arrived at the lab.

Alsek River Area Fisheries

Although harvest sharing arrangements of Alsek salmon stocks between Canada and the U.S. have not been specified, Annex IV of the Pacific Salmon Treaty calls for the development and implementation of cooperative abundance-based management plans and programs for Alsek River Chinook and sockeye salmon. Escapement goals are in place for Chinook and sockeye salmon stocks spawning at the Klukshu River, a tributary that flows into the Tatshenshini River, approximately 80 km northeast of its junction with the Alsek River. The principal escapement-monitoring tool for Chinook, sockeye, and coho salmon stocks on the Alsek River is the Klukshu River weir, operated by Fisheries and Oceans Canada in cooperation with the Champagne-Aishihik First Nation since 1976. In 2013, Canadian and U.S. biologists adopted a new biological escapement goal range of 7,500 to 11,000 sockeye salmon through the Klukshu River weir. The current biological escapement goal range for Klukshu River Chinook salmon, adopted in February 2013, is a range of 800 to 1,200 fish.

ADF&G manages the Alsek River commercial set gillnet fishery to achieve the agreed upon escapement goal ranges. Time and area openings are adjusted by monitoring fishery performance data and comparing it to historical CPUE. The duration of weekly fishing periods is based on

fishery performance data (CPUE) and Klukshu River weir data. Historically, gillnets have often been restricted to a maximum mesh size of 6 inches through July 1 to minimize Chinook salmon harvest. The U.S. commercial set gillnet sockeye salmon fishery was delayed two weeks in 2018 and a 6-inch maximum mesh restriction was in effect through July 1 as a Chinook salmon conservation measure.

Preseason expectations were for below average Chinook and sockeye salmon runs in 2018. The overall Alsek drainage sockeye salmon run was expected to be approximately 28,200 fish; well below the recent 10-year average run size of approximately 61,000 sockeye salmon. The preseason outlook for 2018 was based on a predicted run of 6,500 Klukshu River sockeye salmon derived from a Klukshu River stock-recruitment model and an assumed Klukshu River contribution rate of 23% to the total run (based on mark-recapture results from 2000–2004 and run size estimates using GSI from 2005–2006 and 2011–2014). Principal contributing brood years for the 2018 run were 2013 and 2014. The Klukshu River escapements in 2013 and 2014 were 3,800 and 12,100 sockeye salmon respectfully; both below the 10-year average of 14,000 fish.

The 2018 Alsek River set gillnet fishery opened Sunday June 17 (week 25). The total number of individual permits fished during the season was 10, which was below the 2008–2017 average of 17 permits. The commercial fishery was opened for a total of 32.5 days which was well below the ten-year average of 44 days. The overall effort in boat-days was 23% of the average due to low or no effort in many weeks late in the season (Table 10). Harvests of Chinook salmon through late June were below the recent ten-year average (Table 10). Harvests of sockeye salmon were below average in all weeks of the fishery and the total harvest of 1,363 fish was only 10% of the 2008–2017 average of 13,966 fish (Table 10). There was little effort after early August. In the past several years there has been reduced fishing effort during the coho salmon season due to economic struggles and lack of pilots to transport fish to town. In 2018, only 2 coho salmon were harvested (Table 10).

The Klukshu River weir count of 7,035 sockeye salmon was below the lower bound of the 7,500 to 11,000 fish escapement goal range. The count of 91 early run sockeye salmon (count through August 15) and the late run count of 6,944 were both below average. The Klukshu River weir count of 1,078 Chinook salmon met the escapement goal range of 800 to 1,200 fish.

Table 10.–Weekly fishing effort and salmon harvest for Alsek River, 2018.

Statistical Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Boats	Days	Boat Days
25	17-Jun	15	59	0	0	0	9	1	9
26	24-Jun	70	322	0	0	0	9	1	9
27									
28	8-Jul	3	397	0	0	0	8	0.5	4
29									
30	22-Jul	0	471	0	0	0	10	1	10
31-39[ab]	29-Jul	0	114	2	0	0	5	29	7
Total		88	1,363	2	0	0	10	32.5	39
2008-2017 Avg.		410	13,966	1,096	0	6	17	44	170
2018 as % of Avg.		21%	10%	0%		0%	59%	74%	23%

[a] Includes weeks with fewer than three permits, confidential information so data combined in catch table.
[b] Weeks 33-34, 36-39 opened to fishing but not fished.

SOUTHEAST ALASKA CHINOOK SALMON FISHERY

All Gear Harvest

The SEAK (Southeast Alaska/Yakutat) Chinook salmon fishery is managed to achieve the annual all-gear PST allowable catch associated with the preseason abundance index, which is generated by the PSC Chinook model each spring. The 2018 SEAK Chinook salmon management programs were configured around an abundance index (AI) of 1.07 for the 2018 fishing season. This equates to an all-gear PST allowable harvest limit of 144,500 Treaty Chinook salmon, which reflects a 15% reduction in allowable catch (AC) from that allowed under the 1999 PST Agreement. However, owing to conservation concerns for SEAK, Transboundary River, and Northern British Columbia Chinook salmon stocks, extraordinary measures were taken, and Alaska targeted 10% below the harvest limit of the preseason AI (130,000).

The preliminary total Chinook salmon harvest by all SEAK commercial fisheries was 138,650 fish, and the preliminary sport fish harvest was 26,400, for an all-gear harvest of 165,050 (Table 11). The preliminary all-gear PST harvest was 128,623 fish (Table 12).

Table 11.–Preliminary estimated all-gear Chinook salmon harvests in 2018**.**

Gear	Total Harvest	AK Hatchery Harvest	Wild Terminal Exclusion	Alaska Hatchery Addon	Treaty Harvest
Troll	107,565	9,203	0	5,935	101,630
Sport	26,400	6,859	0	5,073	21,327
Drift Gillnet	14,128	11,198	0	10,005	4,123
Purse Seine	16,871	15,613	0	15,413	1,458
Set Gillnet	86	0	0	0	86
Total Net	31,085	26,812	0	25,418	5,667
Total All Gear	***165,050***	***42,873***	***0***	***36,427***	***128,623***

Note: Annette Island and terminal area harvests are included.
**Not available until 2019 model calibration is complete and postseason AI is generated.*

Table 12.–Chinook all-gear harvests in Southeast Alaska and deviation from the harvest ceiling limit (1987-1998) and postseason allowable catch (1999-2018). Harvests are in thousands.

Year	Total Harvest	Add-on and Exclusion Harvest	Postseason Target Treaty Harvest	Treaty Harvest	Deviation Number	Deviation Percent
1987	282.4	17.1	263.0	265.3	2.3	0.9%
1988	279.3	22.5	263.0	256.8	-6.2	-2.4%
1989	291.0	21.5	263.0	269.5	6.5	2.5%
1990	366.9	45.9	302.0	321.0	19.0	6.3%
1991	359.5	61.5	273.0	298.0	25.0	9.2%
1992	258.8	36.8	243.0	222.0	-21.0	-8.7%
1993	304.1	32.9	263.0	271.2	8.2	3.1%
1994	264.4	29.2	240.0	235.2	-4.8	-2.0%
1995	235.7	58.8		176.9		
1996	236.3	72.6		155.0		
1997	343.0	46.5		286.7		
1998	270.6	27.4	260.0	243.2	-16.8	-6.5%
1999	251.0	52.2	184.2	198.8	14.6	7.9%
2000	263.3	76.8	178.5	186.5	8.0	4.5%
2001	265.7	78.8	250.3	186.9	-63.4	-25.3%
2002	426.5	69.4	371.9	357.1	-14.8	-4.0%
2003	439.4	59.3	439.6	380.2	-59.4	-13.5%
2004	499.3	82.2	418.3	417.0	-1.3	-0.3%
2005	493.2	104.6	387.4	388.6	1.2	0.3%
2006	435.5	75.5	354.5	360.1	5.6	1.6%
2007	404.7	76.4	259.2	328.3	69.1	26.6%
2008	244.3	71.4	152.9	172.9	20.0	13.1%
2009	293.6	65.7	176.0	228.0	52.0	29.5%
2010	284.8	54.1	215.8	230.6	14.8	6.9%
2011	357.4	66.2	283.3	291.2	7.9	2.8%
2012	295.3	52.5	205.1	242.8	37.7	18.4%
2013	257.3	65.9	284.9	191.4	-93.5	-32.8%
2014	492.5	57.3	378.6	435.2	56.6	14.9%
2015	403.3	68.3	337.5	335.0	-2.5	-0.7%
2016	387.0	36.3	288.2	350.7	62.5	21.7%
2017	207.1	31.6	215.8	175.4	-40.4	-18.7%
2018[1]	165.1	36.4		128.6		

[1] Preliminary.

Troll Fishery

The accounting of treaty Chinook salmon harvested by trollers begins with the winter fishery and ends with the summer fishery. The winter troll fishery is managed for a guideline harvest level (GHL) of 45,000 non-Alaska hatchery-produced Chinook salmon, with a guideline harvest range of 43,000−47,000 non-Alaska hatchery-produced fish, plus the number of Alaska hatchery-produced Chinook salmon harvested during the winter fishery. The 2017–2018 winter troll fishery was open from October 11, 2017 through March 15, 2018. To help reduce encounters of wild SEAK and TBR Chinook during the winter season the fishery was closed from March 16 through April 30, prior to reaching the GHL. A total of 11,967 Chinook salmon were harvested. Of these, 744 (6%) were of Alaska hatchery origin, of which 459 counted toward the Alaska hatchery add-on, resulting in a PST harvest of 11,508 (Table 13).

The spring troll fisheries target Alaskan hatchery-produced Chinook salmon and are conducted along migration routes or close to hatchery release sites. Terminal area fisheries, which begin during the spring, occur directly in front of hatcheries or at remote release sites. While there is no ceiling on the number of Chinook salmon harvested in the spring fisheries, the take of PST Chinook salmon is limited according to the percentage of the Alaskan hatchery fish taken in the fishery. Non-Alaska hatchery fish are counted towards the annual PST harvest limit of Chinook salmon, while most of the Alaska hatchery fish are not.

In 2018, spring troll fisheries were conducted between May 1 and June 30. To help reduce encounters of wild SEAK and TBR Chinook salmon during May and June, spring troll fisheries located in known wild Chinook migration corridors did not open. A total of eight spring areas and seven terminal area fisheries opened in 2018. The combined harvest for spring and terminal troll fisheries was 8,395 Chinook salmon, of which 4,130 (49%) were of Alaska hatchery origin and 2,807 counted toward the Alaska hatchery add-on, resulting in a PST harvest of 5,588.

The 2018 summer troll fishery included two Chinook salmon retention periods, from July 1–14 and August 15–19. A total of 6,734 Chinook salmon were harvested, of which 4,329 (5%) were of Alaskan hatchery origin and 2,670 counted toward the Alaska hatchery add-on. The resulting PST harvest was 84,064 fish.

The total harvest for all troll fisheries in the 2018 accounting year was 107,565 Chinook salmon, of which 101,630 counted as PST harvest.

Table 13.–Preliminary 2018 troll fishery Chinook salmon harvest by season.

Gear/Fishery	Total Harvest	Alaska Hatchery Harvest	Alaska Hatchery Add-on	Terminal Exclusion Harvest	Total Term. Exclusion/ Alaska Hatchery Add-on	Treaty Harvest
Winter Troll	11,967	744	459	0	459	11,508
Spring Troll[a]	8,395	4,130	2,807	0	2,807	5,588
Summer Troll						
First Period[b]	58,992	3,322	2,049	0	2,049	56,943
Second Period	27,742	1,007	621	0	621	27,121
Total Summer	86,734	4,329	2,670	0	2,670	84,064
Total Traditional Troll	107,106	9,203	5,935	0	5,935	101,171
Annette Is. Troll	459	0	0	0	0	459
Total Troll Harvest	**107,565**	**9,203**	**5,935**	**0**	**5,935**	**101,630**

[a] Spring troll harvest includes all terminal and Wild Terminal Exclusion harvests for year.
[b] Total summer harvest includes confiscated harvest for year.

Net Fisheries

A total of 14,128 Chinook salmon were harvested in the drift gillnet fisheries in 2018, of which 11,198 (79%) were of Alaska hatchery origin and 10,005 counted toward the Alaska hatchery add-on, resulting in a PST harvest of 4,123 fish (Table 11). A total of 16,871 Chinook salmon were harvested in the purse seine fisheries, of which 15,613 (93%) were of Alaska hatchery origin and 15,413 counted toward the Alaska hatchery add-on, resulting in a PST harvest of 1,458 fish. A total of 86 Chinook salmon were harvested in the set gillnet fisheries, none of which were of Alaska hatchery origin, resulting in a PST harvest of 86 fish (Table 11).

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

Recreational Fisheries

The Southeast Alaska king salmon sport fishery is managed under provisions of the Southeast Alaska King Salmon Management Plan (5 AAC 47.055). This plan prescribes management measures based upon the preseason abundance index determined by the Chinook Technical Committee of the Pacific Salmon Commission. The preseason abundance index generated for the SEAK AABM fishery in 2018 was 1.07, resulting in a preseason sport allocation of 23,900 treaty Chinook salmon under the harvest management plan adopted by Alaska Board of Fisheries. Based on this preseason AI, the SEAK King Salmon Management Plan, and additional conservation measures to further reduce harvest by 10%, a resident sport fish angler was allowed to use two rods from October through March, and the bag and possession limit was one king salmon 28 inches or greater in length. The nonresident annual harvest limit was three king salmon 28 inches or greater in length from January 1 through June 30, with a daily bag and possession limit of one king salmon 28 inches or greater in length applying to the whole season. From July 1 through December 31, the annual limit is one king salmon, 28 inches or greater in length, and king salmon harvested from January 1 through June 30 will apply toward the one fish annual limit. The 2018 recreational fishery had an estimated preliminary total harvest of 26,400 Chinook salmon, of which 21,327 counted as treaty harvest. The final total and treaty harvest in the sport fishery for 2018 will be available in late fall of 2019.

SOUTHEAST ALASKA COHO SALMON FISHERIES

Attachment B of the June 30, 1999 U.S.-Canada Agreement relating to the Pacific Salmon Treaty specifies provisions for inseason conservation and information sharing for northern boundary coho salmon. In 2018, troll CPUE in Area 6 in the early weeks of the fishery averaged 28 coho/day, which was above the highest boundary area conservation trigger of 22 coho/day. The mid-July projection of region-wide total commercial harvest of 1.81 million was greater than the 1.1 million trigger for an early region-wide troll closure, specified in Alaska Board of Fisheries regulation and the PST conservation agreement.

The 2018 region-wide summer troll coho fishery began by regulation on June 1 and continued through the normal September 20. All waters of SEAK, apart from a portion of southern boundary area waters, extended to trolling through September 30. The 2018 all-gear catch of coho salmon totaled 1.65 million fish, of which 1.47 million (89%) were taken in commercial fisheries (Table 14). The troll catch of 942,400 fish was 42% below the 10-year average of 1.62 million fish and accounted for 64% of the commercial catch. Power troll wild coho CPUEs were below the 20-year average for the duration of the summer season. The overall wild stock abundance (wild troll catch divided by an index of the troll exploitation rate) was estimated at 3.21 million fish and was 22% below the 20-year average. With pink salmon abundance down throughout much of SEAK in 2018, purse seine opportunities were reduced. Consequently, the purse seine coho salmon harvest of 156,800 fish was 50% below the 10-year average, while the drift gillnet harvest of 273,000 fish was 27% below the 10-year average. The set gillnet harvest of 95,600 fish in the Yakutat area was 32% below the 10-year average, with 89% of the catch taken in the Situk-Ahrnklin Lagoon. A very preliminary estimate of the Southeast Alaska sport catch (185,400) is 29% below the 10-year average (261,400 fish).

Wild production accounted for 1.04 million fish (71%) in the commercial catch compared with a recent 10-year average of 1.88 million fish (77% wild). The hatchery percentage of the commercial catch of 29%. Of the estimated hatchery contribution of 426,100 fish, over 99% originated from facilities in Southeast Alaska, with facilities on or near the outer coast accounting for an estimated 58% of the return while inside hatchery returns contributed to the remaining 42%.

Escapement counts and estimates were within or above goal in most cases, with a few exceptions. The total escapement of 619 coho salmon to Hugh Smith Lake was within the biological escapement goal (500-1,600 spawners) for the fourth consecutive year, after consistently exceeding the goal during the prior seven years. Despite a 2017 smolt migration that was 49% above the long-term average, the estimated total run size of 1,318 adults was 68% below average and the lowest return on record since 1982. The cause of the poor return was a record low marine survival rate of 2.7% that was down by one-third from the previous low of 4.1% for the 1988 return and was 78% below the long-term average (12.5%). Escapements were within respective goal ranges for four northern Southeast inside stocks (Chilkat River, Taku River, Montana Creek, and Peterson Creek) while falling under goal for two streams (Auke Creek and Berners River). The combined peak count of 13,764 coho salmon in the 14 surveyed streams in the Ketchikan area was well-above the 1987–2017 average of 8,913 spawners, and the goal of 4,250–8,500 spawners. The combined peak count of spawners in five streams in the Sitka area (1,502 spawners) was above both the long-term average of 1,372 spawners and the escapement goal of 400–800 spawners.

In addition to the record low smolt-to-adult survival rate of 2.7% for Hugh Smith Lake, marine survival also remained low for northern inside stocks. Smolt-to-adult survival rates of 6.8% for the Berners River and 7.1% for Auke Creek represented a slight improvement over rates of 4.1–6.4% for these stocks in 2016 and 4.9–5.0% in 2017. However, they were far below historical average estimates of 16.1% for the Berners River (1990–2015) and 19.1% for Auke Creek (1980–2015). A low jack return to Auke Creek as a proportion of the 2018 smolt migration suggests that low smolt-to-adult survival similar to the past 3 years will persist in northern inside waters in 2019. Coho salmon returns have appeared proportionately stronger in outer coastal systems from southern Southeast to Yakutat for a third consecutive year, compared with inside area streams.

Preliminary all-fishery exploitation rate estimates were low to moderate for wild indicator stocks, at 44% for Auke Creek, 49% for Berners River, and 53% for Hugh Smith Lake. The all-fishery exploitation rate for the Hugh Smith Lake stock was well below the long-term average of 61%. The Alaska troll fishery exploitation rate on the Hugh Smith Lake stock (17%) was below the 25-year (1993–2017) average of 31%. Alaska troll fishery exploitation rates on northern inside stocks were estimated at only 19% for Auke Creek and 13% for the Berners River compared with 25-year averages of 26% and 27%, respectively. However, while Alaska purse seine exploitation rates were below average for all three of the wild coho salmon indicator stocks, drift gillnet exploitation rates were well above average. Compared with 25-year averages, Alaska drift gillnet fisheries accounted for an estimated 31% of the Auke Creek return (average 7%), 35% of the Berners River return (average 23%), and 21% of the Hugh Smith Lake return (average 14%).

Table 14.–Coho salmon harvest in Southeast Alaska in 2018 by gear type (preliminary).

Gear Type	Harvest
Troll	942,400
Purse Seine	156,800
Drift Gillnet	273,000
Set Gillnet	95,600
Sport (marine and freshwater)	185,400
Total	1,653,200

II. PRELIMINARY 2018 CHINOOK AND COHO SALMON FISHERIES IN WASHINGTON AND OREGON

INTRODUCTION

This report describes the conduct of United States (U.S.) fisheries of interest to the Pacific Salmon Commission (PSC) that occurred during 2018 in the area north of Cape Falcon, Oregon and south of the U.S./Canada border. These fisheries were conducted under pre-season management plans that were consistent with Annex IV of the Pacific Salmon Treaty (PST 2008) including obligations defined within Chapter 3 for Chinook individual stock based management regimes (ISBM) and Chapter 5 for Southern Coho Management.

An overview of the Chinook (*Oncorhynchus tshawytscha*) and Coho (*Oncorhynchus kisutch*) salmon conservation challenges facing managers during the 2018 pre-season planning process in this region is provided in the following section. The conduct of major fisheries is described, and estimates of landed catch, where available, are compared to pre-season catch limits or expectations for Chinook (Table 15) and Coho (Table 16). For perspective, landed catches for those fisheries since 2013 are also presented. Where available, preliminary estimates of the number of Chinook or Coho salmon released by anglers in 2018 mark-selective fisheries are also presented (Table 17). All estimates for the 2018 fisheries are preliminary and subject to change. Estimates of spawning escapements and abundance of Coho and Chinook stocks are not available at this time.

PRE-SEASON PLANNING

Pre-season planning for southern U.S. fisheries of interest to the PSC is a coordinated activity involving Tribal, State and Federal management entities, with the involvement of conservation and fishing interests. The Pacific Fishery Management Council (PFMC) conducted a series of public meetings to consider options for ocean fishery season structures while the Tribes and States conducted government-to-government and public, open meetings throughout the region to develop and analyze alternative season structures for fisheries in the inside waters of the Columbia River, coastal Washington and Puget Sound. Participants in these various planning sessions evaluated the biological and socio-economic consequences of the alternative season structures for the outside (ocean) and inside (marine and freshwater) fisheries (Figure 38) including the anticipated impacts on U.S. southern origin stocks in fisheries conducted under the PST in Canada and Southeast Alaska. Agreement was reached on season structures expected to achieve conservation goals, domestic fishery objectives and legal obligations, including the PST, assuming fisheries are conducted as planned and pre-season abundance estimates are accurate.

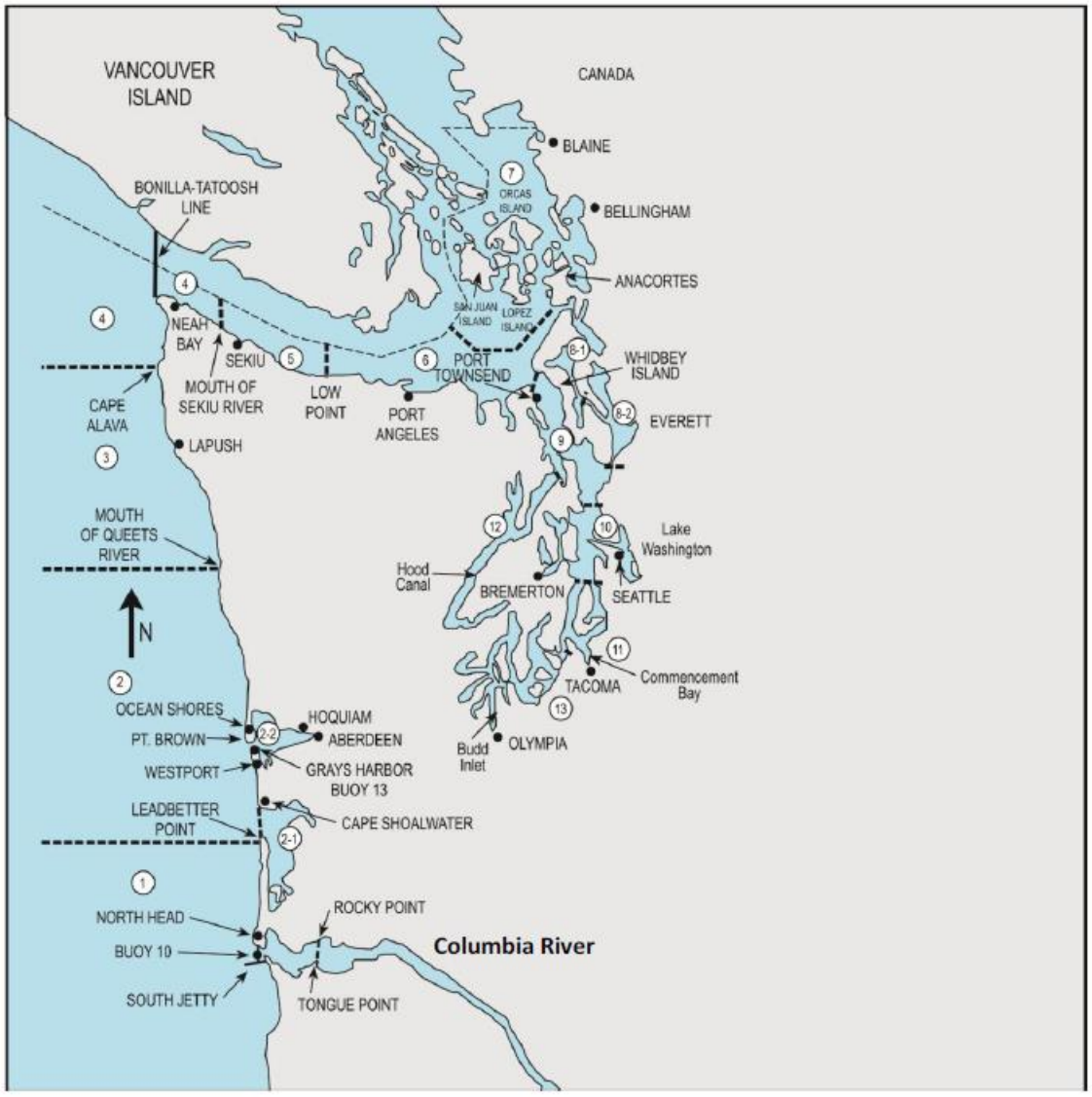


Figure 38. Map of Western Washington marine catch areas of the Washington coast (Areas 1 through 4) and Puget Sound (Areas 5 through 13) (WAC 220-22-030). Inside (Columbia River) fisheries reported in this document extend beyond the scope of this map.

Chinook Salmon Management

Under the 2008 Pacific Salmon Treaty Agreement, southern U.S. fisheries are subject to the Individual Stock Based Management provisions of Annex IV, Chapter 3. These provisions require the non-ceiling index for aggregated Southern U.S. fisheries on Chinook stocks not achieving their management objectives to be no greater than 60% of the levels estimated for the 1979 – 1982 base period.

Conservation obligations associated with the U.S. Endangered Species Act (ESA) for threatened and endangered Chinook salmon stocks originating from Puget Sound and the Columbia River have been more constraining to southern U.S. fisheries than PST obligations. Catch quotas for the 2018 U.S. ocean fisheries in the area north of Cape Falcon, Oregon, were defined by the impact limits on ESA-listed lower Columbia River natural tule fall Chinook stocks, ESA-listed Puget Sound Chinook stocks, and the abundance of other healthy, harvestable Chinook salmon

stocks contributing to fisheries in this area. Puget Sound fishing seasons were structured to provide fishing opportunity on healthy salmon species or stocks within the impact limits defined for ESA-listed Puget Sound Chinook.

Coho Salmon Management

During the pre-season fishery planning process of 2018, Canadian fishery managers informed the U.S. that the Interior Fraser management unit was again expected to be in the *low* categorical abundance status, and U.S. fisheries were constrained to ensure that the exploitation rate on this management unit did not exceed 10.0% as defined by the PST Southern Coho Management Plan. Of the U.S. natural spawning Coho management units (MUs) managed under the PST, the Strait of Juan de Fuca, Queets, and Grays Harbor Coho MUs were forecasted to be in *low* abundance status. The Skagit, Stillaguamish, and Snohomish Coho MUs were predicted to be in *moderate* status, while the Hood Canal, Quillayute, and Hoh MUs were forecasted to be in *abundant* status.

The impacts of planned Southern U.S. fisheries on natural Coho stocks, seasons, and catch limits were predicted using the Fisheries Regulation Assessment Model (FRAM). The total exploitation rate on the Interior Fraser Coho management unit was predicted to be 7.0% in Southern U.S. fisheries. Seasons and Coho quota levels for U.S. ocean fisheries were closed or severely constrained by the management objectives of Washington coastal and Puget Sound natural Coho and ESA-listed lower Columbia River natural Coho. Limits to fisheries in marine areas within northern Puget Sound and the Strait of Juan de Fuca were likewise constrained by management objectives reflecting very low forecasted returns for some Puget Sound natural Coho stocks.

NORTH OF CAPE FALCON OCEAN FISHERIES

Details regarding North of Cape Falcon ocean salmon fishing plans were reported in Preseason Report III, published by the Pacific Fishery Management Council in April 2018. https://www.pcouncil.org/salmon/stock-assessment-and-fishery-evaluation-safe-documents/preseason-reports/

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

Chinook and Coho salmon catch quotas were established for the 2018 ocean Tribal, Non-Tribal troll and sport fisheries. Ocean fishery quotas for Chinook salmon were defined by exploitation rate limits on several ESA-listed Puget Sound Chinook stocks as well as the total exploitation rate limit of 38% on ESA-listed lower Columbia River natural tule fall Chinook stocks in all fisheries.

Non-Tribal Troll Fishery

Pre-season quota levels for the non-Tribal troll fisheries were 27,500 Chinook and 5,600 Coho with a clipped adipose fin, hereinafter referred to as marked. The preliminary estimate of non-

Tribal harvest in the 2018 North of Falcon troll fishery is 24,000 Chinook (87% of the pre-season coast-wide quota; a transfer of 1,876 Chinook from the sport to the troll fishery occurred in-season, resulting in a final troll Chinook quota of 29,376) and 1,400 Coho (25% of the pre-season coast-wide non-Tribal troll quota; a transfer of 1,000 Coho from the troll to the sport fishery occurred in-season, resulting in a final troll Coho quota of 4,600). Trollers harvested 16,200 Chinook in the May 1 – June 30 fishery, and the remaining 7,800 Chinook were harvested in the summer all-species fishery between July 1 and September 19. All Coho were harvested during the summer all-species fishery.

Tribal Troll Fishery

The Tribal troll ocean fishery (also known as the Treaty troll fishery) quotas were defined by conservation concerns for ESA-listed Lower Columbia River natural tule fall Chinook and ESA-listed Puget Sound Chinook. The coho quota was based on concerns for Puget Sound coho, Thompson River coho, and ESA-listed lower Columbia River natural coho.

The Treaty troll fishery was implemented in Ocean Areas 2, 3, 4 and 4B. The 2018 quotas were set at 40,000 Chinook and 12,500 coho. The Chinook quota was split into two sub-quotas—a 16,000 sub-quota during May-June and a 24,000 sub-quota during July-September. The 12,500 coho quota could be harvested during the July-September all-species fishery.

The May-June Treaty troll Chinook-directed fishery harvested 81% of the 16,000 Chinook sub-quota. Chinook effort was highest in June, which accounted for 73% of the Chinook landings during this time period. There were 324 landings during May and June. The all-species portion of the fishery ran from July 1 until September 15. The fishery harvested 45% of the 24,000 Chinook sub-quota and 90% of the 12,500 coho quota. Coho landings were highest in August accounting for 46% of the overall catch, followed by September at 40%. Chinook effort was highest in July, which accounted for approximately 78% of the Chinook landings during this time period. There were 485 landings during the all-species portion of the fishery.

Overall the Treaty troll fishery harvested 59% of the 40,000 Chinook quota and 90% of the 12,500 coho quota. The total ocean salmon harvest for the 2018 Treaty troll fishery was 23,680 Chinook and 11,301 coho.

Ocean Sport Fisheries

Pre-season quotas for the Washington coastal sport fishery (Ocean Areas 1 through 4) were 27,500 Chinook and 42,000 marked Coho. Preliminary total catch estimates for the ocean sport fisheries north of Cape Falcon were 10,600 Chinook (39% of the pre-season coast-wide quota; a transfer of 1,876 Chinook from the sport to the troll fishery occurred in-season, resulting in a final sport Chinook quota of 25,624) and 41,800 Coho (100% of the pre-season coast-wide sport quota; a transfer of 1,000 Coho from the troll to the sport fishery occurred in-season, resulting in a final sport Coho quota of 43,000). A description of the season structure and catches by management area follows.

Columbia Ocean Area (including Oregon)

All-species salmon sport fishing opened in Ocean Area 1 (Columbia Ocean Area) on June 23 with a pre-season quota of 21,000 marked Coho and a guideline of 8,000 Chinook. The fishery closed upon projected attainment of the Coho quota on August 12, and reopened for two days on September 2 and 3. The catch estimates for Area 1 were 2,200 Chinook (28% of the guideline)

and 20,500 Coho (98% of the quota). The Chinook minimum size limit was 24 inches and the Coho minimum size limit was 16 inches with a sub-area closure in the Columbia Control Zone.

Preliminary estimates of Coho encounters (retained and released) and mark rate in the Area 1 Coho mark-selective sport fishery, June 23 – September 3, 2018.			
Coho retained	Coho released	Total encounters	Mark %
20,500	14,600	35,100	58%

Westport, Washington

Ocean Area 2 (Westport, WA) opened for all-species salmon sport fishing on July 1 with a pre-season quota of 15,540 marked Coho and a guideline of 13,100 Chinook. The fishery closed on its automatic closure date, September 3. The catch estimates for Area 2 were 4,900 Chinook (37% of the guideline) and 15,400 Coho (99% of the quota). The Chinook minimum size limit was 24 inches and the Coho minimum size limit was 16 inches with a sub-area closure in the Grays Harbor Control Zone beginning August 13.

Preliminary estimates of Coho encounters (retained and released) and mark rate in the Area 2 Coho non-retention sport fishery, July 1 – September 3, 2018.			
Coho retained	Coho released	Total encounters	Mark %
15,400	16,900	32,300	48%

La Push, Washington

Ocean Area 3 (La Push, WA) opened for all-species salmon sport fishing on June 23 with a pre-season quota of 1,090 marked Coho and a guideline of 1,500 Chinook. The fishery closed on its automatic closure date, September 3. The catch estimates for Area 3 were 400 Chinook (27% of the guideline) and 1,000 Coho (92% of the quota). The Chinook minimum size limit was 24 inches and the Coho minimum size limit was 16 inches.

Preliminary estimates of Coho encounters (retained and released) and mark rate in the Area 3 Coho non-retention sport fishery, June 23 – September 3, 2018.			
Coho retained	Coho released	Total encounters	Mark %
1,000	1,600	2,600	38%

Neah Bay, Washington

Ocean Area 4 (Neah Bay, WA) opened for all-species salmon sport fishing on June 23 with a pre-season quota of 4,370 marked Coho and a guideline of 4,900 Chinook. Following an in-season transfer from the non-Tribal troll fishery to modify the area Coho quota to 5,370 and a transfer to the troll fishery to modify the area Chinook guideline to 3,024, the fishery closed upon attainment of the Coho quota on August 12. The catch estimates for Area 4 were 3,000 Chinook (100% of the guideline) and 4,900 Coho (91% of the modified quota). The Chinook minimum size limit was 24 inches and the Coho minimum size limit was 16 inches.

Preliminary estimates of Coho encounters (retained and released), in the Area 4 Coho non-retention sport fishery, June 23 – September 3, 2018.			
Coho retained	Coho released	Total encounters	Mark %
4,900	7,900	12,800	38%

NORTH OF CAPE FALCON INSIDE FISHERIES

WASHINGTON COASTAL RIVER FISHERIES

North Washington Coastal Rivers

Net and sport fisheries targeting salmon in northern Washington coastal rivers were implemented based upon pre-season, Tribal-State agreements. The 2018 north coastal rivers net harvest (all by Tribal fisheries that are non-selective) includes catch from the Sooes, Quillayute system, Hoh, Queets, and Quinault Rivers. The 2018 commercial Tribal net fisheries in north coastal rivers harvested an estimated 11,000 Chinook salmon and 21,800 Coho salmon through November 15, 2018.

Recreational fisheries conducted during 2018 in the Quillayute, Hoh and Queets River systems included mark-selective fisheries targeting hatchery Chinook in the Quillayute and Hoh systems as well as hatchery summer and fall Coho in the Quillayute system. The Queets system had a hatchery coho sport fishery in September, but was closed to sport fishing during October and November when the wild fall coho and Chinook returned. Harvest or impact estimates for these fisheries are unavailable at this time.

Grays Harbor, Washington

Harvest numbers reported for Grays Harbor, Washington include catch from both the Humptulips and Chehalis Rivers through November 15, 2018. The non-selective Tribal net fisheries in Grays Harbor, and including fisheries in the Humptulips and Chehalis Rivers, harvested an estimated 2,600 Chinook salmon and 8,300 Coho salmon. The non-Tribal commercial fishery in the northern portion of Grays Harbor near the Humptulips River (Area 2C) was non-selective and harvested 43 Chinook and 19 Coho. There were 2 Chinook salmon (mark-selective) and 799 Coho harvested in the Non-Tribal commercial gillnet fishery in Areas 2A and 2D. Sport fisheries conducted in the Chehalis and Humptulips Rivers included mark-selective components for Chinook and Coho salmon. Harvest data for these fisheries are not available at this time.

COLUMBIA RIVER FISHERIES

Tribal and non-Tribal net and sport salmon fisheries were implemented in 2018 during the winter/spring (January – June 15), summer (June 16 – July) and fall (August – October) periods. All fisheries were constrained by impacts on ESA-listed stocks. Winter/spring fisheries were primarily constrained by impacts on ESA-listed upper Columbia River spring Chinook and Snake River spring/summer Chinook. Summer season fisheries were constrained by impacts to ESA listed sockeye and summer steelhead. Fall fisheries were mainly constrained by impacts to ESA listed Snake River fall Chinook. Additionally, careful in-season management to limit the fishery impacts on upriver summer steelhead, wild lower Columbia tule fall Chinook, and wild lower Columbia River Coho further constrained Columbia River fall fisheries during 2018.

Columbia River salmon fisheries are developed and regulated to meet conservation standards. Fisheries are managed to operate within the impact limits set for ESA-listed stocks, meet the objectives for healthy Columbia River natural stocks, and ensure broodstock needs are met for

hatchery salmon. Mainstem Columbia River fisheries are also developed and managed to remain within the requirements of the 2018 – 2027 *US v. Oregon* Management Agreement (MA), which includes Tribal/Non-Tribal sharing agreements. All 2018 data are preliminary and subject to change; some fisheries are still ongoing at the time of this report. The following section includes harvest numbers from Columbia River fisheries that are considered to be of the interest to PSC; therefore, the data may not match other reports that include total harvest.

Winter-Spring Fisheries

Non-Tribal Net

The mainstem winter/spring commercial fishery operated under mark-selective fishery (MSF) regulations during 2002 - 2016. As a result of recent guidance from the Oregon and Washington Fish and Wildlife commissions, there were no winter/spring non-Tribal commercial salmon seasons in the mainstem Columbia River since 2016. Commercial fisheries during the winter/spring timeframe did occur in off-channel areas (Select Areas) in the Columbia River estuary but are not reported in this document.

Sport

Mainstem Columbia River mark-selective sport fisheries began in 2001. For 2018, the area below Bonneville Dam was open from January 1 – April 7, April 14, and May 25 through June 15 for hatchery Chinook retention. Catch estimates for this area totaled 7,509 hatchery adult spring Chinook kept and 1,530 non-adipose fin clipped Chinook released. From Bonneville Dam to the Washington-Oregon state line, there were 613 hatchery adult spring Chinook kept and 100 non-adipose fin clipped Chinook released. The Snake River fishery structure included three specific catch areas open on a days-per-week rotation as was open April 20 – June 12. Catch in the Snake River fishery totaled 740 hatchery adult spring Chinook and 302 non-adipose fin clipped released. Fisheries also occurred in tributaries but are not reported in this document.

Preliminary estimated encounters of adult Spring Chinook in the 2017 Winter/Spring Columbia River mark-selective sport fishery.

System	Area	Chinook Kept	Chinook Released	Total Encounters	% Kept
Columbia River	Below BON (LCR)	7,509	1,530	9,039	83%
Columbia River	BON to WA-OR S/L	613	100	713	86%
Snake River	Washington Waters	740	302	731,072	69%

Tribal

Tribal mainstem winter/spring fisheries typically occur from January 1 through June 15. Tribal mainstem fisheries are not mark-selective. Tribal fisheries are primarily conducted in the mainstem Columbia River from Bonneville Dam upstream to McNary Dam (Zone 6). Some additional harvest occurs just downstream of Bonneville Dam in platform and hook-and-line fisheries. Spring season fisheries may include three fishery sectors, a ceremonial permit gillnet fishery, a platform and hook and line fishery and a commercial gillnet fishery (during winter and periodically in the spring, after ceremonial needs have been met).

During 2018, the platform and hook-and-line fishery was open for subsistence fishing

throughout most of the winter/spring period. Fisheries were temporarily closed for just 4 days to assess catches. Commercial sales did not occur in 2018 Tribal fisheries during the spring management period. Harvest estimates from the combined ceremonial and subsistence fisheries totaled approximately 10,870 upriver spring Chinook (includes harvest from below Bonneville Dam). Tribal harvest in tributaries is not included in this report.

Summer Fisheries

Non-Tribal Net

As a result of guidance from the Oregon and Washington Fish and Wildlife commissions, non-Tribal commercial fisheries did not occur in the 2018 summer management timeframe. Non-Tribal commercial fisheries are now restricted to non-gillnet gear and did not occur since a suitable alternative has not been identified.

Sport

Summer season recreational fisheries occurred from June 22-30 from the Astoria-Megler Bridge near the mouth of the Columbia River upstream to Bonneville Dam. The fishery was mark-selective the entire season. Catch estimates below Bonneville Dam (BON) totaled 1,027 adult Chinook kept (750 non-adipose fin clipped released). The season upstream of Bonneville Dam was open June 16-July 6. Catch estimates from Bonneville Dam upstream to McNary Dam totaled 12 adult Chinook kept (0 non-adipose fin clipped released). The majority of harvest occured in fisheries upstream of Priest Rapids Dam and in tributaries, which are not reported in this document.

Adult Summer Chinook Salmon Handle in the 2018 Sport Mark-Selective Fishery.

System	Area	Chinook Kept	Chinook Released	Total Handle	% Kept
Columbia River	Below BON (LCR)	1,027	750	1,777	58%
Columbia River	BON to PRD	12	0	12	100% [1]

[1] *The high mark rate may be an artifact of small sample size in the creel.*

Tribal

Summer season Tribal fisheries occurred from June 16 through July 28. Tribal mainstem fisheries are not mark-selective. Tribal fisheries are primarily conducted in the mainstem Columbia River from Bonneville Dam upstream to McNary Dam (Zone 6). Some additional harvest occurs just downstream of Bonneville Dam in platform and hook-and-line fisheries. Seven weekly commercial gillnet fishing periods were conducted from June 16 – July 29. Platform and hook-and-line fisheries also occurred throughout the season, and fish were sold commercially or retained for subsistence use. Tribal fisheries within the mainstem harvested a total of approximately 9,498 Upper Columbia Summer Chinook.

Fall Fisheries

Non-Tribal Net

Fall season mainstem fisheries are typically categorized into early and late fall seasons. The early fall season generally encompasses the month of August and in some years, early September,

whereas the late fall season generally begins in mid-September and may continue through October. Time, area, and gear restrictions were in place for fall season commercial gillnet fisheries. Fall gillnet fisheries are non-MSF. No seining or Coho tangle net fisheries occurred in 2018 due to ESA constraints. In 2018, the early fall season consisted of four fishing periods during August 21-30 in commercial Zones 4-5 (Warrior Rock to Beacon Rock). There were insufficient ESA impacts to open the late fall season. Harvest estimates are estimated to include 8,320 Chinook and 380 Coho Salmon.

Sport

Fall season recreational fisheries are mark-selective for Coho, and in recent years have included some mark-selective periods for Chinook in the Buoy 10 area and in the 69-mile stretch of the lower Columbia River from the Tongue Point line upstream to Warrior Rock, which is near the mouth of the Willamette River. There were no mark-selective periods for Chinook in the mainstem Columbia River during 2018 and closed to salmon fishing September 12 through the remainder of the fall season due insufficient ESA impacts remaining. The Buoy 10 fishery opened August 1 and continued through September 12; Chinook retention was allowed August 1 through August 24. Additional regulations for the Buoy 10 fishery included minimum size limits for Chinook (24-inches) and Coho (16-inches), and in 2018, steelhead retention was prohibited beginning August 18. Released Chinook typically consisted of fish that did not meet the minimum size requirement, fish released during non-retention periods, and any voluntary releases of legal-sized Chinook throughout the season.

Buoy 10 catches included 11,608 Chinook and 6,734 hatchery Coho Salmon kept. Released fish included 4,700 Chinook and 6,242 Coho Salmon. The lower Columbia River (LCR) mainstem sport fishery from the Rocky Point – Tongue Point line upstream to Bonneville Dam opened August 1 and continued September 12. In the area from the Rocky Point – Tongue Point line upstream to the Lewis River, Chinook retention was open August 1 through September 2. Chinook retention was allowed August 1-September 12 from the Lewis River upstream to Bonneville Dam. The kept catch estimate for the LCR sport fishery was 9,802 adult Chinook through September 12; an additional 877 adult Chinook were released. The mainstem sport fishery from Bonneville Dam to the Highway 395 Bridge (near Pasco, Washington) was open August 1 – September 12. Adult catch estimates for the Bonneville to McNary area totaled 958 fall Chinook and 12 Coho Salmon. Additional fisheries occurred on the Columbia River in the Hanford Reach area (downstream of Priest Rapids Dam), in tributaries and in the Snake River, but are not reported in this document.

Adult Fall Chinook and Coho Salmon Handle in the 2018 Columbia River Fall Sport Fisheries

System	Area	Chinook Kept	Chinook Released	Total Handle	% Kept
Columbia River	Buoy 10	11,608	4,700	16,308	71%
Columbia River	LCR Sport	9,802	877	10,679	92%
Columbia River	Bonneville-McNary	958	97	1,055	91%
System	Area	Coho Kept	Coho Released	Total Handle	% Kept
Columbia River	Buoy 10	6,734	6,242	12,976	52%
Columbia River	LCR Sport [1]	650	417	1,067	61%

Columbia River	Bonneville-McNary [2]	12	6	18	66%

Tribal

Fall season Tribal fisheries occur from August 1 through December 31. Tribal fisheries are not mark-selective. Tribal fisheries are primarily conducted in the mainstem Columbia River from Bonneville Dam upstream to McNary Dam (Zone 6). Some additional harvest occurs just downstream of Bonneville Dam in platform and hook-and-line fisheries. Platform and hook and line fisheries will remain open through December 31.

The Tribal commercial gillnet fishery consisted of seven weekly fishing periods from August 21 through October 5. Preliminary harvest estimates for all fall season fisheries total 53,343 adult fall Chinook and 3,705 adult Coho; however, some additional fish may be landed in the ongoing platform fisheries. Harvest estimates reported herein include catch from Zone 6 tributary fisheries.

PUGET SOUND FISHERIES

Puget Sound marine fisheries of interest to the Pacific Salmon Commission were regulated to meet conservation and allocation objectives for Chinook, Coho, Chum, Pink, and Sockeye salmon stocks, per Tribal-State agreement. For Puget Sound Chinook listed under the ESA, fisheries were managed according to the Puget Sound Chinook Harvest Management Plan (PSIT and WDFW 2010). This management plan defines limits to total exploitation rates for natural stocks and was determined by the National Marine Fisheries Service (NMFS) to be consistent with requirements specified under the ESA 4(d) Rule.

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

Puget Sound marine fisheries were constrained by the need to meet management objectives for ESA-listed Puget Sound Chinook and due to conservation concerns for some Puget Sound Coho stocks. The primary constraining Puget Sound Chinook stocks during 2018 pre-season planning included Mid-Hood Canal, Snohomish, and Nooksack Chinook. Strait of Juan de Fuca, Snohomish, and Stillaguamish Coho were the primary Coho management units of concern for developing fisheries in the Strait of Juan de Fuca, San Juan Islands, and Puget Sound.

<u>Strait of Juan de Fuca Sport</u>

Marked Chinook retention was allowed for sport fishing in salmon management Area 5 from March 16, 2018 through April 30, 2018 and in Area 6 from March 1, 2018 through April 8, 2018. Sport fishing regulations allowed retention of marked Chinook and marked Coho from July 1 through August 15 in Areas 5 and 6, with marked Coho retention also permitted through September 30 in Area 5. Dungeness Bay was open for marked Coho retention during the month of October. Preliminary estimates of Chinook encounters and the legal-size mark rate in the Area 5 sport mark-selective fishery are presented in the following table.

Preliminary estimates of Chinook retained, released (legal and sub-legal size), and the legal-size mark rate in the Area 5 sport mark-selective fishery, July 1 – August 15, 2018.			
Chinook retained	Chinook released	Total encounters	Mark % (legal size)

3,838	18,069	21,907	62.3%

A detailed report of this summer period sport fishery, including estimated catch, effort and other results of sampling and monitoring programs, will be available from the Washington Department of Fish and Wildlife in early 2019.

Strait of Juan de Fuca Tribal Troll (Area 4B, 5, and 6C)
During the winter Tribal troll fishery in Areas 4B, 5, and 6C (November 1, 2017 – April 15, 2018), 800 Chinook and zero Coho were caught. In the summer Tribal troll fishery in Areas 5 and 6C only (June 1 – September 30, 2018), 200 Chinook and 500 Coho were caught. The Tribal catch estimates from this area do not include catch from Area 4B during the May-September PFMC management period, which have been included in the North of Cape Falcon Tribal ocean troll summary.

Strait of Juan de Fuca Tribal Net
Preliminary estimates of the 2018 catch in the Strait of Juan de Fuca Tribal net fisheries (no non-Tribal net fisheries in the Strait of Juan de Fuca) are 2,200 Chinook and 4,400 Coho salmon.

San Juan Islands Net (Areas 6, 7, and 7A)
Preliminary estimates of the 2018 catch in the San Juan Island net fishery directed at Sockeye, Pink, or Chum salmon totaled 9 Chinook and 869 Coho salmon in the non-Tribal fishery. Tribal fishery landings from this area for all gear types totaled 4,000 Chinook and 2,900 Coho.

San Juan Islands (Area 7) Sport
Marked Chinook retention was allowed in the entire Area 7 during the winter/spring season from January 1, 2018 through April 30, 2018. Preliminary estimates of Chinook retained and released by anglers during this fishery were produced via an intensive sampling program and are presented in the table below. A detailed report of this fishery, including estimates of catch, effort and other results of sampling and monitoring programs, is available from the Washington Department of Fish and Wildlife.

Estimated Chinook retained, released (legal and sub-legal size) and the legal size mark rate in the Area 7 sport mark-selective fishery, January 1 through April 30, 2018.			
Chinook retained	Chinook released	Total encounters	Mark % (legal size)
2,227	4,383	6,610	72%

During the summer season in Area 7, recreational anglers were allowed to retain Chinook from July 1 through September 3. Mark-selective regulations (release of unmarked Chinook required) were implemented during the month of July only. The southern Rosario Strait and eastern portions of Area 7 were closed from July 1 – September 30 to protect Puget Sound Chinook salmon. Additional sub-area closures are described in the 2018-19 Washington State Sport Fishing Rules Pamphlet. The table below presents estimated Chinook encounters (retained and released) and the legal-size mark rate in the Area 7 sport mark-selective fishery, from July 1-31, 2018.

Estimated Chinook retained, released (legal and sub-legal size) and the legal size mark rate in the Area 7 sport mark-selective fishery, July 1-31, 2018.			
Chinook retained	Chinook released	Total encounters	Mark % (legal size)
2,349	6,744	9,093	62%

Catch estimates and sampling information for this area during the period from August 1 through September 3, 2018 are not available at this time.

Inside Puget Sound (Areas 8-13) Sport

Mark-selective sport fisheries (MSFs) targeting adipose fin-clipped (marked) hatchery Chinook were conducted in Area 8.1 (Deception Pass, Hope Island, and Skagit Bay), Area 8.2 (Port Susan & Port Gardner), Area 9 (Admiralty Inlet), Area 10 (Seattle-Bremerton), Area 11 (Tacoma-Vashon Island), Area 12 (Hood Canal), and Area 13 (South Puget Sound) during the winter (October 2017 – April 2018) period, and in Areas 9, 10, 11, 12, and 13 during the summer (May – September 2018) period. Additionally, marked and unmarked Chinook retention was permitted in the Tulalip Bay (Area 8-2) from May 26 through September 25(Fridays through noon Mondays), and from September 8 through September 30 (Saturdays and Sundays).

Puget Sound Chinook mark-selective sport fisheries conducted in marine areas during 2017-2018.	
Areas	Season
8.1 & 8.2	Winter: November 1, 2017 – November 12, 2017; February 16, 2018 - April 30, 2018.
9	Winter: November 1 – November 12, 2017; February 16, 2017 – April 15, 2018. Summer: July 16 – July 22, 2018; July 26 – July 29, 2018.
10	Winter: November 1, 2017 – February 28, 2018. Summer: July 16 – August 16, 2018; Sinclair Inlet: July 1 – September 30, 2018.
11	Winter: October 1, 2017 – April 30, 2018. Summer: June 1 – August 25, 2018 (only Fridays – Mondays from July 17 – July 30).
12	Winter: October 1, 2017 – April 30, 2018. Summer: July 1 – September 30 (South of Ayock Point).
13	Year round: January 1 – December 31

Post-season reports detailing results of these Chinook MSFs, including estimates of retained and released encounters, effort and mark rates from sampling and monitoring programs, will be available from the Washington Department of Fish and Wildlife in the spring of 2019.

Mark-selective sport fisheries during 2018 directed at marked Coho were conducted in the following marine catch areas: Area 9 from July 16 – September 30 and in Area 13 from January 1 – December 31. Marked and unmarked Coho retention was permitted in Tulalip Bay from May 25 – September 3 (on Fridays through noon, Mondays only) as well as from September 8 – September 30 (Saturdays, Sundays); in Area 11 from June 1 – December 31; and in Area 12 from January 1 – April 30, 2018 in the whole area, as well as from September 1 – December 31, 2018 in the areas North of Ayock Point and from July 1 – December 31, 2018 in the area South of Ayock Point.

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

To achieve conservation objectives for natural Puget Sound Chinook, limited marine net fishing opportunities directed at returns of hatchery Chinook and both hatchery and natural Coho were planned for 2018. Chinook and Coho were also intercepted in fisheries directed at Pink and Chum salmon. A total of 56,700 Chinook and 116,300 Coho were landed in the Tribal marine net fisheries in Puget Sound (Areas 8-13 & 7B-D) during 2018. Non-Tribal net fishery landings from these areas totaled 12,100 Chinook and 10,900 Coho. Nearly all Chinook landed in the non-Tribal net fishery occurred during Chinook-directed fisheries in Areas 7B, 7C, and 12C.

Puget Sound Rivers Fisheries

Tribal net and non-Tribal sport fisheries were implemented in freshwater systems based upon pre-season, Tribal-State agreements and subject in part to in-season adjustment. Harvest of Chinook and Coho in the Tribal in-river net fisheries (includes catch from river systems in the Strait of Juan de Fuca, Hood Canal, and Puget Sound) totaled 40,500 Chinook and 112,000 Coho during 2018.

Also, recreational fisheries targeting Chinook salmon were conducted in nine Puget Sound Rivers that have PSC Chinook coded wire tag (CWT) exploitation rate indicator stocks or double index tag (DIT) groups, as listed in the table below. Of these, seven rivers had mark-selective fisheries and two rivers had non-selective fisheries, as follows:

Chinook mark-selective sport fisheries conducted in Puget Sound rivers during 2018.	
River	Season
Nooksack River	September 1 - 30
Cascade River	June 1 – July 15
Skagit River	June 1 – July 15
Skykomish River	June 1 – July 31
Carbon River	September 1 – November 30
Puyallup River	August 15 – December 31
Nisqually River	July 1 – September 30
Chinook non-selective sport fisheries conducted in Puget Sound rivers during 2018.	
River	Season
Samish River	August 1 – October 31
Green River	September 1 – December 31

During the 2018 season there were no mark-selective sport fisheries targeting hatchery Coho in the rivers of Puget Sound that have PSC Coho CWT exploitation rate indicator stocks or DIT groups. However, recreational non-selective Coho fisheries were conducted on the Skykomish River, Green River, Carbon River, Puyallup River, and Quilcene River.

REFERENCES

Pacific Salmon Treaty (PST) Act of 1985. 2008 Agreement. U.S.-Canada. Public Law 99-5, 16 U.S.C. 3631.

Puget Sound Indian Tribes and Washington Department of Fish & Wildlife (PSIT and WDFW). 2010. Comprehensive Management Plan for Puget Sound Chinook: Harvest Management

Component. Northwest Indian Fisheries Commission, Olympia, Washington. 237 p.

Pacific Fishery Management Council (PFMC). 2008. Fishery Regulation Assessment Model (FRAM): An Overview for Coho and Chinook v3.0. Pacific Fishery Management Council, Portland, Oregon. 43 p.

Table 15. Preliminary 2018 Landed Chinook Catch for Washington and Oregon Fisheries of Interest to the Pacific Salmon Commission. Values are presented in number of fish rounded to the nearest 100. [9/]

	2018			Landed					
	Preseason [5/]								
Fisheries	Total Mortality [1/]	Landed [2/]	Preliminary Landed	2017	2016	2015	2014	2013	2012
OCEAN FISHERIES									
Commercial Troll									
Neah Bay and La Push (areas 3,4,4B) [3/]	54,600	48,100	33,700	35,200	28,100	73,600	77,100	63,700	79,400
Columbia Ocean Area and Westport (area 1,2) [4/]	30,600	19,400	13,900	24,700	14,200	50,900	39,100	28,300	20,600
Sport (see text for quota information)									
Neah Bay (area 4)	5,500	4,900	3,000	7,300	3,300	8,500	5,900	6,200	5,600
La Push (area 3)	1,700	1,500	400	500	300	2,400	1,600	2,400	1,300
Westport (area 2)	14,600	13,100	4,900	6,600	8,400	19,100	23,500	13,700	19,500
Columbia Ocean Area (area 1)[13/]	10,300	8,000	2,200	7,600	6,000	12,200	11,300	8,500	9,100
INSIDE FISHERIES									
Sport [10/]									
Strait of Juan de Fuca (area 5,6)	16,300	10,300	na	9,810	15,000	11,800	11,100	14,900	13,900
San Juan Islands (area 7)	11,000	7,600	na	7,000	5,900	8,600	9,200	9,500	5,800
Puget Sound Marine (area 8-13)	36,500	29,500	na	21,600	16,700	9,000	12,100	16,600	22,000
Puget Sound Rivers [12/]	12,500	12,000	na	23,700	9,600	11,100	11,800	19,600	23,200
North WA Coastal Rivers	-	-	na	1,600	600	2,200	1,200	2,700	1,600

Grays Harbor [7/]	1,700	1,500	na	2,200	2,800	3,800	1,200	3,800	4,600
Columbia River (Spring) [6/]	-	-	8,200	9,100	14,100	23,100	21,400	8,400	17,000
Columbia River (Summer) [6/]	2,800	2,600	1,000	3,800	6,800	6,700	2,300	2,100	3,200
Columbia River (Fall) (incl. Buoy 10) [6/]	25,900	24,800	21,900	60,400	65,600	91,300	63,000	74,500	47,000
Commercial[11/]									
Strait of Juan de Fuca net and troll (area 4B,5,6C)	7,200	4,500	3,200	1,900	700	5,900	6,100	4,000	3,900
San Juan Islands (area 6,7, 7A)	8,000	7,900	4,000	2,600	100	4,800	6,900	3,800	400
Puget Sound Marine (8-13,7B-D)	45,500	44,700	70,400	90,600	55,800	33,100	28,400	70,100	75,700
Puget Sound Rivers[12/]	35,900	35,900	40,500	53,900	23,300	21,200	19,900	26,800	39,500
North WA Coastal Rivers	-	-	11,000	14,200	9,400	17,300	20,200	14,400	12,800
Grays Harbor (area 2A-2D) [7/]	1,000	1,000	2,600	3,700	2,100	10,500	5,100	2,900	4,000
Columbia River Net (Winter/Spring) [8/]	-	-	8,700	8,100	20,400	37,600	28,200	11,200	23,800
Columbia River Net (Summer) [8/]	-	-	10,600	16,300	23,400	41,700	22,200	15,300	9,500
Columbia River Net (Fall) [8/]	-	-	61,700	140,600	188,900	343,900	365,900	312,500	119,800

Table 15 Footnotes:

[1/] Estimates of total mortality (not adjusted for adult equivalents) include non-retention mortality. Total Mortality is estimated by Fishery Regulation Assessment Model (FRAM) as catch + incidental mortality, where incidental mortality = drop off + non-retention mortality (PFMC 2008).

[2/] For the ocean fisheries, this column shows the Chinook troll and recreational quotas used for 2018 pre-season fishery planning as distributed by ocean area (Landing Quotas = Landed). See text for any in-season adjustments.

[3/] Includes Area 4B catch during the PFMC management period (May 1 – September 15); Area 4B Treaty troll catch outside PFMC period included under Strait of Juan de Fuca net and troll (October-April).

[4/] Includes Oregon troll catch in Area 1.

[5/] FRAM modeled pre-season fishery impacts cover the current fishery planning year, for Chinook defined as May 1 through April 30.

[6/] Mainstem retained adult sport catch only (upstream to McNary Dam for spring, Priest Rapids Dam for summer and to Hwy 395 for fall). See tables 10, 22-23 in the current Joint Staff Report regarding spring and summer Chinook and tables 25-27 in the annual fall report. http://wdfw.wa.gov/fishing/crc/staff_reports.html.

[7/] Includes Grays Harbor catch, as well as catch from the Chehalis and Humptulips Rivers and their tributaries for sport and Chehalis and Humptulips Rivers for net estimates.

[8/] Mainstem retained catch only, includes tribal C&S and Commercial from all gear types and non-tribal (Columbia River mouth upstream to McNary Dam). Catch data from annual Joint Staff Reports. Winter and spring catch Tables 7 (Tribal) and T18 (non-Tribal). Summer catch is in Table10. Fall catch from annual fall report T21, 23 and 29. http://wdfw.wa.gov/fishing/crc/staff_reports.html.

[9/] Includes catch from mark-selective fisheries as shown in table 3.

[10/] Sport data for the most recent two years are preliminary. All data subject to change.

[11/] Includes non-tribal & tribal commercial, as well as tribal C&S for all gear types.

[12/] Chinook fisheries in Puget Sound Rivers are modeled using the Terminal Area Management Module (TAMM), based upon FRAM output of terminal run sizes. Total Mortality is estimated in TAMM as catch + non-retention mortality (PFMC 2008).

[13/] Includes Oregon sport catch in Area 1.

Table 16. Preliminary 2018 Landed Coho Catch for Washington and Oregon Fisheries of Interest to the Pacific Salmon Commission. Values are presented in number of fish rounded to the nearest 100. [6/]

	2018			Landed					
	Preseason [9/]								
Fisheries	Total Mortality [1/]	Landed [2/]	Preliminary Landed	2017	2016	2015	2014	2013	2012
OCEAN FISHERIES									
Commercial Troll									
Neah Bay and La Push (area 3,4,4B) [3/]	15,000	13,600	11,300	13,300	-	4,100	60,100	48,500	38,600
Columbia Ocean Area and Westport (area 1,2) [10/]	8,000	4,500	1,200	1,800	-	4,800	19,000	5,400	2,800
Sport (see text for quota information)									
Neah Bay (area 4)	5,300	4,400	4,900	3,500	100	7,800	5,600	6,500	7,500
La Push (area 3)	1,300	1,100	1,000	1,750	-	600	4,600	2,800	2,200
Westport (area 2)	18,100	15,500	15,400	15,750	-	30,700	54,500	20,400	11,900
Columbia Ocean Area (area 1)[12/]	23,900	21,000	20,500	21,600	18,600	44,600	75,100	20,500	11,400
INSIDE FISHERIES									
Sport [7/]									
Strait of Juan de Fuca (area 5,6)	23,400	19,600	na	5,450	200	62,900	63,000	41,300	76,200
San Juan Islands (area 7)	1,400	1,300	na	100	100	3,700	2,000	2,600	2,200
Puget Sound Marine (area 8-13)	45,900	40,900	na	35,200	5,200	77,200	59,200	72,100	91,300
Puget Sound Rivers	21,200	20,200	na	9,000	11,300	18,600	17,900	70,000	43,500
North WA Coastal Rivers	2,500	2,300	na	4,900	1,600	3,600	8,800	7,200	2,700

Grays Harbor [5/]	5,700	5,400	na	7,400	4,300	8,200	27,300	21,200	18,300
Columbia River Buoy 10 [4/,11/]	29,300	25,000	6,700	18,800	9,200	36,900	57,700	7,600	7,400
Commercial [8/]									
Strait of Juan de Fuca net and troll (area 4B,5,6C)	1,600	1,600	4,900	1,200	700	1,700	2,300	2,700	3,500
San Juan Islands (area 6,7,7A)	13,000	9,800	3,800	3,400	4,100	3,900	19,800	19,400	10,500
Puget Sound Marine (area 8-13,7B-D)	125,900	123,000	125,100	134,400	210,900	28,800	108,400	168,500	236,300
Puget Sound Rivers	62,300	61,100	112,000	63,200	65,400	17,800	73,400	136,000	132,400
North WA Coastal Rivers	50,200	49,200	21,800	63,400	57,200	18,400	101,500	44,800	39,700
Grays Harbor (area 2A-2D) [5/]	13,100	12,800	8,300	22,800	3,200	12,600	67,200	22,000	30,700

Table 16 Footnotes:

1/ Estimates of total mortality include non-retention mortality. Total Mortality is estimated by Fishery Regulation Assessment Model (FRAM) as catch + incidental mortality, where incidental mortality = drop off + non-retention mortality (PFMC 2008).

2/ For ocean fisheries this column shows the Coho troll and recreational quotas used for 2018 pre-season fishery planning as distributed by ocean area (Landing Quotas = Landed). See text for any in-season adjustments.

3/ Includes area 4B catch during the PFMC management period (May 1 – September 15); area 4B Treaty troll catch outside the PFMC period included under Strait Juan de Fuca net and troll (October-April).

4/ Retained catch only. See table 26 in the current Fall Joint Staff report available on line at http://wdfw.wa.gov/fishing/crc/staff_reports.html.

5/ Includes Grays Harbor catch, as well as catch from the Chehalis and Humptulips Rivers; their tributaries are included in sport estimates only.

6/ Includes catch from mark-selective fisheries where estimates are available.

7/ Sport data for the most recent two years are preliminary. All data subject to change.

8/ Includes Non-Tribal and Tribal commercial and take home, as well as Tribal ceremonial and subsistence (C&S) for all gear types. Starting in 2012, the Copalis, Moclips, and Ozette Rivers have been removed from landed catch.

9/ FRAM modeled pre-season fishery impacts cover the current fishery planning year, for Coho defined as January 1 through December 31.

10/ Includes Oregon troll catch in Area 1.

[11/] Sport data after March 2013 are preliminary. For Buoy 10, see tables 25 in the annual fall report.

[12/] Includes Oregon sport catch in Area 1.

Table 17. Mark-Selective Chinook and Coho Fisheries by Area and Year. "Yes" denotes that a mark selective fishery occurred, even if it only occurred in a subset of the fishing area, season, gear type, or user group.

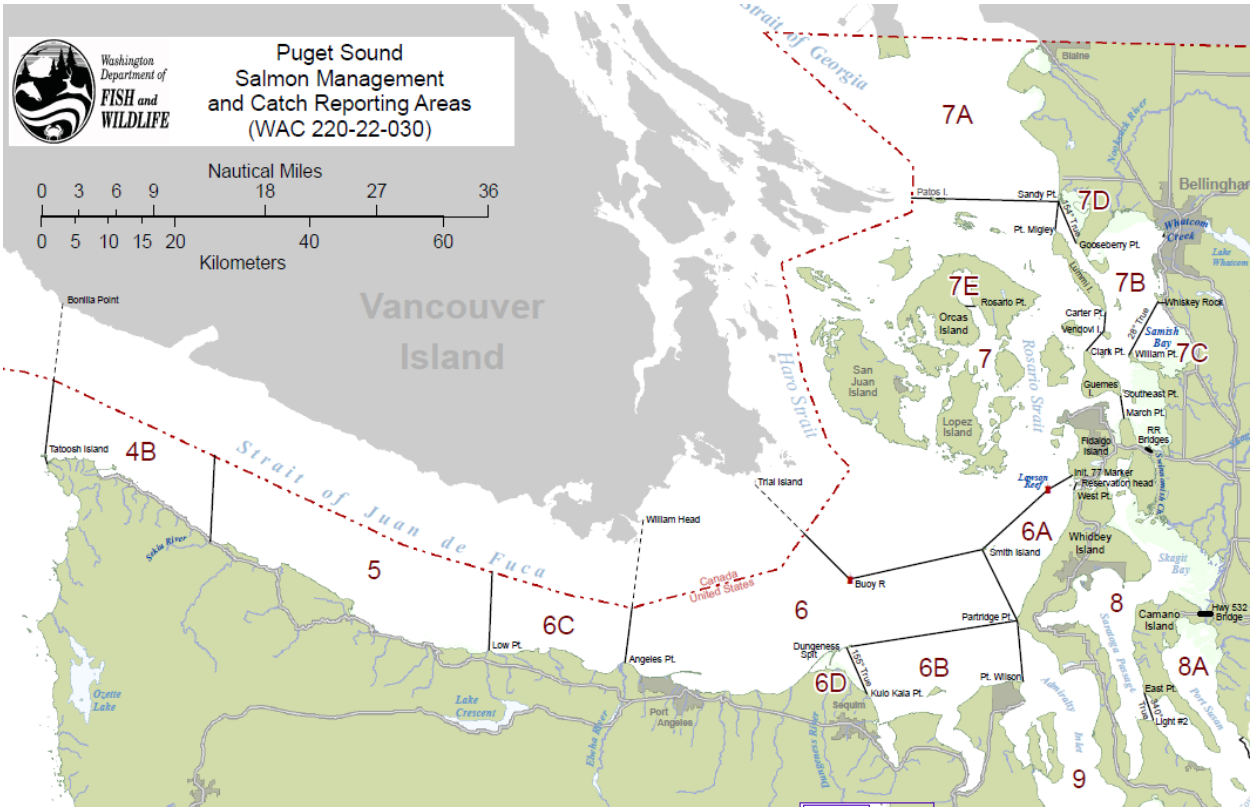
Selective Coho	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Ocean Troll										
Cape Flattery & Quillayute (Areas 3/4)	yes	yes	no	yes	yes	yes	yes	yes	yes	yes
Columbia R & Grays Harbor (Areas 1 & 2)	yes	yes	no	yes	yes	yes	yes	yes	yes	yes
Ocean Sport										
Neah Bay (Area 4)	yes	yes	no	yes	yes	yes	yes	yes	yes	yes
LaPush (Area 3)	yes	yes	no	yes	yes	yes	yes	yes	yes	yes
Grays Harbor (Area 2)	yes	yes	no	yes	yes	yes	yes	yes	yes	yes
Col. R. (Leadbetter Pt. to Cape Falcon)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Inside Fisheries										
Sport										
Juan de Fuca (Areas 5 & 6)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
San Juan Islands (7)	no	no	no	yes	yes	yes	yes	yes	yes	yes
Puget Sound Sport (Areas 8-13 all year)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Puget Sound Rivers	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
North WA Coastal Rivers	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Grays Harbor (Areas 2-2)	yes	yes	yes	yes	yes	yes	yes	no	yes	yes
Willapa Bay (Area 2-1)	no	yes	no	yes	no	no	no	no	yes	no
Columbia River Buoy 10	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Commercial										
North WA Coastal Rivers	no	no	no	no	no	no	no	no	no	no
Grays Harbor (Areas 2A-2D)	yes	yes	yes	yes	yes	no	no	yes	yes	yes
Willapa Bay (Area 2-1)	no	no	no	no	no	no	no	no	yes	no
Columbia River Net/ - Fall	no	no	no	yes	yes	yes	no	no	no	no
Strait of Juan de Fuca (Areas 4B/5/6C) Net & Troll	no	no	no	no	no	no	no	no	no	no
San Juan Islands (Areas 6, 7 & 7A)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Puget Sound Marine (Areas 8 - 13)	no	no	yes	no	no	no	no	no	no	no

Puget Sound Rivers	no	no	no	no	no	no	no	no	no	no

III. PRELIMINARY REVIEW OF THE 2018 WASHINGTON CHUM SALMON FISHERIES OF INTEREST TO THE PACIFIC SALMON COMMISSION

This summary report provides a preliminary review of the 2018 U.S. Chum salmon (*Oncorhynchus keta*) fisheries conducted by Puget Sound salmon co-managers (Puget Sound Treaty fishing tribes and the State of Washington) in the Strait of Juan de Fuca (Salmon Management and Catch Reporting Areas 4B, 5 and 6C), the San Juan Islands and the Point Roberts area (Areas 7 and 7A) (Figure 39), conducted in compliance with provisions of Chapter 6 of Annex IV of the Pacific Salmon Treaty (PST 2008). The harvest and abundance information provided are based on preliminary data reported through November 20, 2018. These preliminary data are subject to correction and revision as additional information becomes available.

Figure 39. Puget Sound Salmon Management and Catch Reporting Areas with Chum salmon fisheries of interest to the Pacific Salmon Commission.



MIXED STOCK FISHERIES

Areas 4B, 5 and 6C

As in previous years, the Chum salmon fishery in Areas 4B, 5 and 6C was restricted to Tribal fishers using gillnets. The fall Chum-directed salmon fishery opened the week of October 14, with a schedule of six days per week and continued through November 10. A total of 4,519 Chum salmon were harvested during this period (Table 18). During the fall Chum fisheries in

Areas 4B, 5, and 6C, there was a reported by-catch of 656 Coho, 23 Chinook, and zero Steelhead.

Table 18. Preliminary 2018 Chum salmon harvest report for Washington Salmon Catch Reporting Areas 4B, 5, and 6C.

Areas 4B, 5, 6C	
Tribal Gill Net Only	
Time Periods	GN
Through 9/22	224
9/23-9/29	9
9/30-10/6	0
10/7-10/13	161
10/14-10/20	289
10/21-10/27	33
10/28-11/3	1,550
11/4-11/10	2,253
11/11-11/17	0
Total	4,519

Areas 7 and 7A

Chum salmon fisheries in Areas 7 and 7A are regulated to comply with a base harvest ceiling of 130,000 Chum salmon, unless Canada estimates chum stocks migrating through Johnstone Strait ("Inside Southern Chum salmon") are below the critical threshold of 1.0 million (PST 2008). Chapter 6 of Annex IV specifies that U.S. commercial fisheries for Chum salmon in Areas 7 and 7A will not occur prior to October 10. Paragraph 10 (a) specifies run sizes below 1.0 million as critical (estimated by Canada). For Inside Southern Chum run sizes below the critical threshold, Paragraph 10 (b) states the U.S. catch of Chum salmon in Areas 7 and 7A will be limited to those taken incidentally to other species and in other minor fisheries, and shall not exceed 20,000.

On October 8, 2018 Canada notified the U.S. that the Inside Southern Chum aggregate was estimated to be below the critical threshold of 1.0 million and the U.S. was expected to limit chum harvest to incidental and minor fisheries not exceeding 20,000. Following this notification, the U.S. cancelled Area 7 and 7A commercial chum fisheries that were scheduled to open on October 10. Additionally, beginning October 10, the U.S. required chum release from reef net fisheries targeting coho and scheduled the reef net fishery to close on October 13. On October 10, 2018 Canada notified the U.S. that the Inside Southern Chum aggregate abundance was now estimated to exceed the 1.0 million critical threshold that allowed the U.S. to target the 130,000 chum ceiling in Area 7 and 7A fisheries. Following notification from Canada that the U.S. fishery could now open, the Tribal fishery first opened October 12; the non-Tribal purse seine and gillnet fisheries first opened October 13; and the non-Tribal reef net fishery resumed chum retention on October 11.

Paragraph 10 (d) states that Canada will provide an in-season estimate of Fraser River Chum salmon run size no later than October 22. If that estimate is below 900,000, then the U.S. will limit its fishery to not exceed a catch of 20,000 additional Chum salmon from the day following notification. On October 19, 2018, Canada notified the U.S. that the Fraser River chum run size was estimated to be below the 900,000 fish threshold. Therefore, the U.S. was expected to limit chum harvest to not exceed 20,000 from the day following this notification. The U.S. closed Area 7 and 7A commercial chum fisheries on October 20. The Tribal fishery opened on October 12 and ran continuously through October 20. Non-Tribal purse seine and gillnet fisheries were open daily October 13, 14, 16. Non-Tribal reef net fisheries resumed retention of chum on October 11 and was open daily through October 20.

Non-Tribal reef net fisheries targeting Coho salmon were conducted from the end of Fraser Panel control in Area 7 (September 17) until October 9 with chum salmon and unmarked coho retention prohibited prior to October 1. Chum salmon by-catch in this fishery was 1,661. Following the initial prohibition of chum salmon retention on October 10, reef net effort was minimal with most reef net gears being removed from the water during this chum closure. An additional 307 chum were caught by reef nets after October 10.

The total 2018 Chum salmon catch by all gears in Areas 6, 7, and 7A (reported through November 20) was 66,445 (Table 19). Catch distribution, between Areas 7 and 7A, was 69% and 31% respectively. It should be noted that these catch reports may be incomplete as of the date of this report. Multiple notices regarding Inside Southern Chum abundance estimates delayed the start of chum directed fisheries and reduced purse seine and gill net effort during the first days of the fishery, which historically are the most productive. During the fall Chum salmon-directed fisheries in Areas 6, 7, and 7A, there was a reported by-catch of 2,496 Coho, 23 Chinook, and zero Steelhead (Table 19).

Table 19. Preliminary 2018 Chum salmon harvest report for Washington Salmon Catch Reporting Areas 6, 7 and 7A.

	Area 6	Area 7				Area 7A			Areas 6,7,7A
Time Periods	GN	PS	GN	RN	Area Total	PS	GN	Area Total	Total
Through 9/22	1	5	2		7	17	1	18	26
9/23-9/29									0
9/30-10/6				1,522	1,522			0	1,522
10/7-10/13		3,823	143	139	4,105	756	1,903	2,659	6,764
10/14-10/20		38,440	1,791	307	40,538	6,013	11,574	17,587	58,125
10/21-10/27	8				0			0	8
10/28-11/3					0			0	0
11/4-11/10					0			0	0
11/11-11/17									0
Total	9	42,268	1,936	1,968	46,172	6,786	13,478	20,264	66,445
Gear Type Abbreviations: GN=Gill Net; PS=Purse Seine; RN=Reef Net									
10/10- 10/20 By-catch	Coho: 2,496		Chinook: 23		Steelhead: 0				

PUGET SOUND TERMINAL AREA FISHERIES AND RUN STRENGTH

Pre-season forecasts for Chum salmon returns to Puget Sound predicted a fall Chum run size totaling approximately 1,214,900 fish, with 497,400 Chum predicted to return to Hood Canal and 543,600 predicted to return to South Puget Sound. As of the date of this report, in-season estimates indicate that Chum returns to Puget Sound are generally at or above forecast with some exceptions. In-season run size estimates from the 2018 fall Chum fisheries in Hood Canal and South Puget Sound indicate that South Sound is near forecast and Hood Canal is slightly above. Some Puget Sound Chum fisheries are still underway and additional in-season estimates of abundance may occur. As of the date of this report, spawning escapement surveys are in progress for most Puget Sound stocks and therefore escapement estimates are not yet available. Early indications from these surveys do, however, suggest that nearly all stocks will meet escapement goals; although, some central Puget Sound fall Chum stocks appear to be below escapement (as forecasted) again this year.

REFERENCES

Pacific Salmon Treaty (PST) Act of 1985. 2008 Agreement. U.S.-Canada. Public Law 99-5, 16 U.S.C. 3631.

IV. PRELIMINARY REVIEW OF 2018 UNITED STATES FRASER RIVER SOCKEYE FISHERIES

INTRODUCTION

The 2018 Fraser River Panel fishing season was implemented under Annex IV of the Pacific Salmon Treaty (PST), and guidelines provided by the Pacific Salmon Commission to the Fraser River Panel. The treaty establishes a bilateral (U.S. and Canada) Fraser River Panel (Panel) that develops a pre-season management plan and approves in-season fisheries within Panel Area waters directed at sockeye and pink salmon bound for the Fraser River (Figure 1). In partial fulfillment of Article IV, paragraph 1 of the PST, this document provides a season review of the 2018 U.S. Fraser River salmon fisheries as authorized by the Panel. Catch and abundance information presented is considered preliminary.

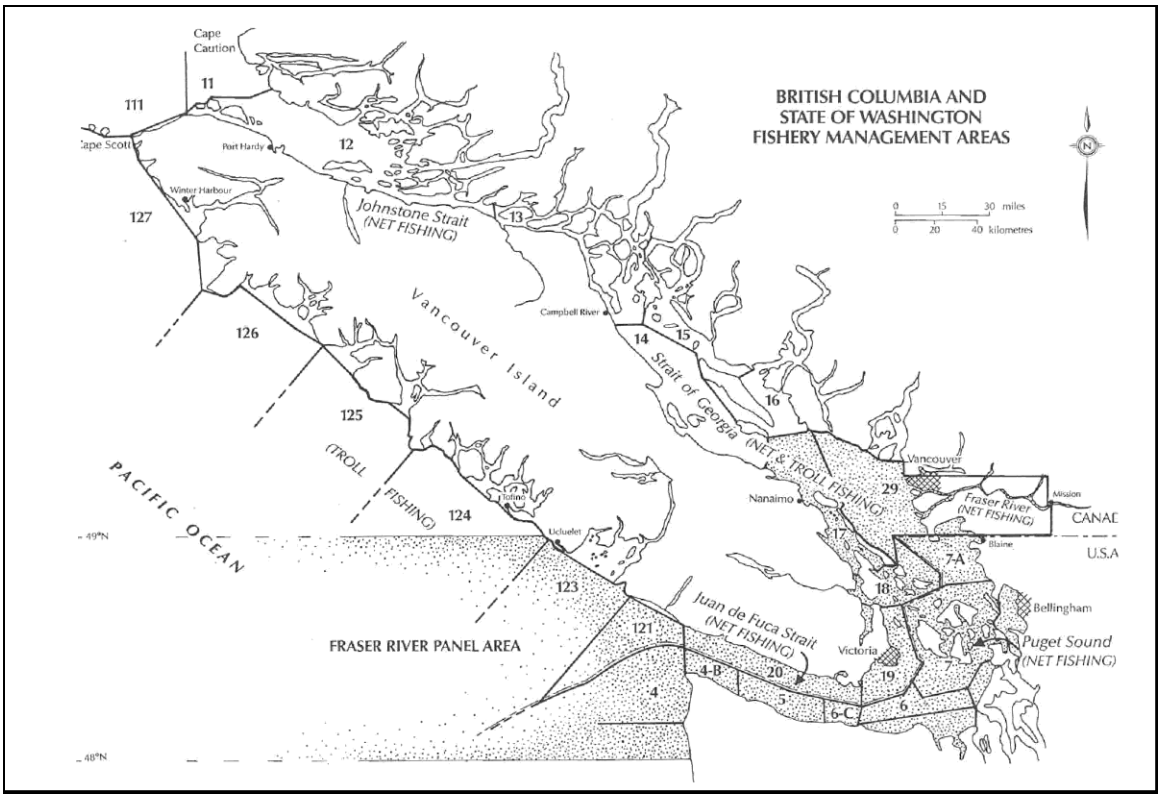


Figure 40. British Columbia and State of Washington Fishery Management Areas, 2018. The shaded area in the figure represents the marine waters managed by the Fraser River Panel.

PRE-SEASON EXPECTATIONS AND PLANS

Forecasts and Escapement Goals

Pre-season run size forecasts and escapement goals by run-timing group (run) at various probability levels were provided to the Panel by the Department of Fisheries and Oceans, Canada (DFO). Table 20 shows the 2018 pre-season sockeye forecasts based on the 50 percent probability level, which represent the mid-point of the range of forecast run sizes. Table 20 also provides the escapement goals for the sockeye run-timing groups based on the pre-season forecast of abundance. The escapement goals for all runs can change in-season as the run size estimates are updated.

Table 20**.** 2018 pre-season Fraser River sockeye forecasts and escapement goals by run-timing group.

	Early Stuart	Early Summer	Summer	Late	Total
Forecast of Abundance	84,000	2,155,000	4,344,000	7,398,000	13,981,000
Escapement Goal	84,000	862,000	1,737,600	2,959,200	5,642,800

Northern Diversion Rate

Northern diversion rate is defined as the percentage of Fraser sockeye migrating through Johnstone Strait (rather than the Strait of Juan de Fuca) in their approach to the Fraser River. The pre-season forecast for diversion was 56% which is less than the 1990-2017 median diversion of 63%.

Management Adjustment (MA) and Environmental Conditions

Management adjustments (MA) for sockeye salmon reflect the anticipated difference between escapement estimates at Mission (minus catch above Mission) and actual spawning escapements. Adjustments adopted by the Panel are added to the gross escapement goal, effectively increasing the spawner escapement goal for that run-timing group. MAs are modeled using forecasts of environmental conditions and return timing or median historical differences between estimates. Table 21 provides the pre-season projected MAs that were used for planning fisheries in 2018. In-season management adjustments use MA models that are based on both measured and forecasted temperatures and discharges or, for Late-run sockeye, upstream migration timing.

Table 21. 2018 pre-season proportional management adjustment (pMA) and corresponding proportional difference between estimates (pDBE[1]) for each run-timing group.

Early Stuart		Early Summer		Summer		Late	
pMA	pDBE	pMA	pDBE	pMA	pDBE	pMA	pDBE
0.69	-41%	0.23	-19%	0.10	-9%	0.43	-30%

1 Early Stuart pDBE = "all years" historical median; Early Summer pDBE = "dominant cycle" historical median; Summer pDBE = "all years" historical median; Late pDBE = "dominant cycle" historical median if timing is September 15 or earlier and the all years "run-timing" model if timing later than September 15.

Run Timing

Run timing is temporal information about the presence of a salmon stock in a specific time and area. Run timing is an important variable when planning fisheries and updating run sizes in-season. The following Area 20 50% dates (the dates when 50% of the run is forecast to have passed through Area 20) were predicted pre-season for the major Fraser River sockeye run groups.

Table 22. 2018 Area 20 median 50% run timing dates and updated pre-season timing forecasts in June.

Run Timing Group	Area 20 50% Run Timing Median Date	Area 20 50% Run Timing (June)
Early Stuart	July 4	July 2
Early Summer	August 7	August 8
Summer	August 11	August 11
Late	August 16	August 17

U.S. Total Allowable Catch (TAC)

Pre-season, the U.S. TAC was established at 1,020,300 sockeye. The TAC available by sockeye run-timing group is shown in Table 23.

Table 23. 2018 total U.S. total allowable catch (TAC) by run-timing group[1].

Run Timing Group	Pre-season U.S. TAC
Early Stuart	0
Early Summer	164,600
Summer	369,000
Late	486,700
Total	1,020,300

[1] Based on Panel-approved final pre-season model run.

Pre-season Management Plans

During the pre-season planning process the Panel evaluates and adopts management approaches for Fraser sockeye that address conservation and harvest objectives for each major run-timing group. The Panel develops fishing plans and in-season decision rules with the objective of

meeting management goals. Managing Fraser River sockeye salmon involves a trade-off between catching abundant runs while meeting escapement objectives for less abundant run-timing groups.

In 2018, the pre-season forecast of ~14 million sockeye resulted in available U.S. TAC in the Early Summer, Summer, and Late run-timing groups (Table 23) with the majority of TAC (~48%) in the Late-run group. Although the Late run was the largest component of the TAC, the U.S. planned to begin fishing relatively early because of concerns about the diversion rate and the extremely high diversion rate that occurred with this cycle in 2014. U.S. fisheries were planned to commence in late July in areas 4B/5/6C and in early August in areas 6/7/7A and target the peak of the summer run while also harvesting co-migrating components of the Early Summer and Late run-timing groups.

IN-SEASON MANAGEMENT

In-season, the Pacific Salmon Commission staff analyzes a variety of information to produce best estimates of northern diversion, management adjustments, timing, abundance, and harvest by run-timing group. Stock identification information (both genetic data and scales), age data, test fishing data, escapement counts past Mission, harvest data, and environmental information are all used to provide in-season estimates that are critical to the Fraser Panel for making management decisions.

Run Assessment

The final in-season total sockeye abundance estimate adopted by the Fraser River Panel in 2018 (Table 24) was 10,725,000, which was 77% of the pre-season forecast. This represents the lowest sockeye return to the Fraser River for this four-year cycle (the Adam's dominant cycle) since 1998. Only the Early Stuart run returned above the pre-season forecast in 2018. The other run-timing groups returned below their pre-season forecasts. The return of Late-run sockeye, the group with the largest pre-season forecast, was 64% of the pre-season forecast. In 2018, the length of delay by the Late run (sockeye holding off the mouth of the Fraser River before migrating upstream) was unusually long and relatively large numbers of Late-run sockeye were migrating upstream through September and into October. This pattern of delayed migration had not been seen since the 1990s.

The 2018 Fraser sockeye run timing was very similar to the pre-season forecasts. The Early Stuart run was two days later than the pre-season forecast, while the Early Summer and Summer runs were two and one days earlier than forecast, respectively. The Late run timing date was the same as the pre-season forecast.

Table 24. Comparison of 2018 pre-season to final adopted in-season abundance estimates for Fraser River sockeye salmon, by run-timing group.

Run Timing Group	Pre-Season 50% Probability Forecast	In-Season Run Size Estimate[1]	Comparison: In-Season / Pre-Season
Early Stuart	84,000	125,000	149%
Early Summer	2,155,000	1,800,000	84%
Summer	4,344,000	4,100,000	94%
Late	7,398,000	4,700,000	64%
Total Sockeye	13,981,000	10,725,000	77%

[1] As of October 12, 2018.

Table 25. Comparison of 2018 preliminary 50% run timing dates through Area 20 to in-season estimates.

Run Timing Group	Pre-season 50% Run Timing Date	In-season 50% Run Timing Date
Early Stuart	July 2	July 4
Early Summer	August 8	August 6
Summer	August 11	August 10
Late	August 17	August 17

Season Description

The Fraser Panel held regular meetings either in-person or by conference call between July 6 and September 28 (usually on Tuesdays and Fridays) to receive updates on the abundance and timing of the sockeye return from PSC staff and to review migration conditions in the Fraser River watershed. In-river environmental conditions were not a major factor affecting management decisions in 2018. The last Fraser Panel in-season meeting was held on October 12. Table 26 summarizes changes to run sizes made by the Fraser Panel during the 2018 season and the effect on U.S. TAC. The following summarizes the major decisions related to U.S. fishing during the 2018 season.

Week ending July 27, 2018

The first Panel approved U.S. commercial fishery was conducted from July 27 to July 31 for Treaty fishers in areas 4B/5/6C. Estimated Early Summer run abundances were tracking ahead of model expectations based on the pre-season forecast. Estimated Summer run abundances were also tracking slightly above expectations. There was not sufficient information to update either the Early Summer or Summer run sizes.

The Panel extended the Treaty fishery in areas 4B/5/6C through August 1 on July 27.

The All Citizens fishery remained closed.

Week ending August 3, 2018
The Treaty fishery in areas 4B/5/6C was extended through August 4. The Panel approved Treaty fisheries in areas 6/7/7A for August 2-3, August 4-5, and August 7-9. All Citizens purse seine and gillnet fisheries were scheduled for August 3 and 6; the reef net fishery was scheduled for August 6 and 8. The estimated diversion rate remained low at 37%.

Week ending August 10, 2018
Early Summer and Summer run in-season abundance assessments were close to pre-season model expectations. The Treaty fishery in areas 4B/5/6C was extended through August 11. The Panel approved All Citizens purse seine, gillnet, and reefnet fisheries for August 9. The estimated diversion rate remained low at 30%.

Week ending August 17, 2018
Early Summer and Summer run in-season abundance assessments continued to follow pre-season model expectations. The Treaty fishery in areas 4B/5/6C was extended through August 18. The Panel approved Treaty fisheries in areas 6/7/7A for August 15-17. All Citizens purse seine and gillnet fisheries were scheduled for August 17; the reef net fishery was scheduled for August 18. The estimated diversion rate remained low at 29%.

Week ending August 24, 2018
Early Summer run abundance expected at Mission did not materialize and the run appeared to be returning below forecast. The Summer run in-season abundance assessment continued to follow pre-season model expectations. Late run abundance was not building as expected given its pre-season forecast. The Treaty fishery in areas 4B/5/6C was extended through midnight August 24. The Panel approved Treaty fisheries in areas 6/7/7A for August 22-24. The estimated diversion rate remained low at 29%.

Week ending August 31, 2018
On August 28, the Fraser Panel decreased the Early Summer run size to 1.8 million and adopted a provisional run size for the Late run of 6,000,000 sockeye. This effectively removed any remaining U.S. TAC. U.S. fisheries remained closed for the remainder of the season. The estimated diversion rate increased to 58%. On August 31, the Fraser Panel decreased the Early Summer run size further to 1.7 million.

Week ending September 7, 2018
Estimated Late-run abundance continued to be considerably below expectations. There was considerable uncertainty about the number of Late-run sockeye holding in the Gulf of Georgia.

Week ending September 14, 2018
The Fraser Panel increased the Early Summer run size to 1.8 million and formally adopted a run size of 6 million for the Late run. There was still considerable uncertainty about the number of Late-run sockeye holding in the Gulf of Georgia and the timing of the Late run.

Week ending September 21, 2018

The Fraser Panel decreased the Summer run size to 4.1 million and provisionally adopted a run size of 5 million for the Late run with marine timing of August 18. There was still considerable uncertainty about the number of Late-run sockeye holding in the Gulf of Georgia and the timing of the Late run.

Weeks ending September 28 and October 5, 2018

No changes were made to run sizes during this period. The Panel continued to monitor the number of Late-run sockeye migrating past the Mission hydro-acoustic site and the estimates of the number of Late-run sockeye holding in the Gulf of Georgia and in the river below Mission.

Week ending October 12, 2018

As its final in-season action the Fraser Panel adopted a run size of 4.7 million sockeye for the Late run.

Table 26. Summary of changes to Fraser River sockeye run sizes adopted by the Fraser Panel during the 2018 season.

Meeting Date	Run-Timing Group	Change Made[1]	U.S. TAC
Pre-season			1,023,200
July 17, 2018	Early Stuart	increased to106,000	1,023,200
July 20, 2018	Early Stuart	increased to120,000	1,023,200
July 27, 2018	Early Stuart	increased to135,000	1,023,200
August 7, 2018	Early Stuart	decreased to125,000	1,023,200
August 28, 2018	Early Summer Summer Late	decreased to 1,800,000 adopted 4,344,000 decreased to 6,000,000 (p)	891,700
August 31, 2018	Early Summer Late	decreased to 1,700,000 decreased to 5,800,000 (p)	869,300
September 11, 2018	Early Summer Late	increased to 1,800,000 adopted 6,000,000	962,100
September 19, 2018	Summer Late	decreased to 4,100,000 decreased to 5,000,000 (p)	926,100
October 12, 2018	Late	adopted 4,700,000	899,600

[1] (p) indicates a run size that was provisionally adopted for management purposes.

HARVEST

U.S. harvest opportunities in 2018 were expected to be the greatest since 2014 (the last return on the Adam's-dominant cycle) with a pre-season U.S. TAC of approximately one million sockeye. U.S. fisheries were conducted similar to pre-season planning expectations through late August. On August 28, 2018, the in-season assessment of abundance decreased the Early Summer run size from 2.2 million to 1.8 million and the Late run size from 7.4 million to 6.0 million which eliminated any remaining U.S. TAC. There were no additional U.S. fisheries conducted after the Tribal fisheries conducted on August 24, 2018. A total of 989,459 Fraser sockeye were harvested in U.S. fisheries in 2018 (Table 27). Of this total, 596,318 sockeye (60%) were harvested by Treaty fishers and 393,141 sockeye (40%) in the All Citizens fishery. Treaty commercial fisheries were open on 29 days in areas 4B/5/6C and 11 days in areas 6/7/7A. All Citizens purse seine, gillnet, and reef net fisheries were open on four days in areas 7/7A.

Although the total U.S. sockeye catch (989,459 sockeye) exceeded the final U.S. TAC (899,600, see Table 26), the U.S. does not owe Canada any payback because the total U.S. catch did not exceed the U.S. TAC available when the last U.S. fishery was scheduled on August 23, 2018.

Table 27. Preliminary summary of 2018 U.S. catches of Fraser River sockeye salmon in Panel area waters.

	Treaty Indian	All Citizens
Ceremonial and Subsistence (all areas)	9,290	0
Commercial Catch in Areas 4B/5/6C	54,164	0
Commercial Catch in Areas 6/7/7A	532,864	393,141
Total Catch	596,318	393,141
% of U.S. Catch	60.3%	39.7

Pacific Salmon Treaty – Chapter 1 Implementation Plan
Report to PSC Commissioners - January 17, 2019

The renewal of Chapter 1 of the Pacific Salmon Treaty effective in January 2019 includes a number of new and renewed commitments to improve assessment, management, and enhancement of Canadian-origin Transboundary Chinook, sockeye and coho salmon stocks. The implementation plan is provided below.

Activity	Timeline	Anticipated Process and Outcome
Paragraph 2. & Paragraph 3(c). Develop and implement an abundance-based management regime for Chinook and sockeye salmon in the Alsek River. Design and implement Alsek Chinook and sockeye salmon adult assessment programs that can be used for active fishery management.	Initiate stock assessments in 2020 provided funding is secured from the agencies and/or the NEF.	The intent is to provide the Parties with the scientific basis to manage Alsek River Chinook and sockeye salmon based on abundance and therefore provide appropriate spawning escapements and allow fishers to harvest surplus production.
Paragraph 2. Develop and implement abundance-based management regime for coho salmon in the Stikine River. **Paragraph 3(a)(ii).** Assessment programs need to be further developed before a biologically based escapement goal can be established. The design and implementation of a Stikine River coho salmon adult assessment program that can be used for active fishery management is needed.	Initiate program development in 2019 with refinement in 2020 and for the duration of the annex period. Review of progress concerning this obligation in 2024 is required.	The outcome is to provide the Parties with the scientific basis to manage Stikine River coho salmon based on abundance. Intent is to provide appropriate spawning escapements and allow fishers to harvest surplus production.
Paragraph 3(a)(i)(a & b). Continue the abundance based management program for Stikine River sockeye salmon.	Maintain existing annual approach.	Meet escapement goals for Tahltan Lake and river stocks of sockeye salmon while allowing fishers to harvest surplus production.
Paragraph 3(a)(i)(c). Expand and initiate new bilateral sockeye salmon enhancement programs in the Canadian portion of the Stikine River watershed.	Initiate new sockeye salmon enhancement program(s) by 2024.	Annually produce 100,000 enhanced sockeye salmon returning to the Stikine River watershed. Canada to identify suitable sockeye fry release or rearing locations.
Paragraph 3(a)(iii). Continue the abundance based management regime for Stikine River Chinook salmon. Expand/improve the CWT and GSI programs used to implement the existing program.	CWT expansion to be initiated in 2019 and continue for duration of annex period. Conversion of GSI program from microsatellites to SNPs initiated in 2019.	Increase CWT tag rates for Stikine River Chinook salmon to achieve CTC indicator stock standards. Improvement of accuracy and decrease in cost of GSI program by conversion to a SNP based approach.

Activity	Timeline	Anticipated Process and Outcome
Paragraph 3(b)(i). Deliver an abundance based management program for Taku River sockeye salmon.	Annual delivery of abundance based assessment and management program.	Intent is to meet escapement goal for Taku sockeye salmon while allowing fishers to harvest surplus production.
Paragraph 3(b)(i)(b). Complete bilateral review of Taku River sockeye salmon MSY escapement goal.	Complete in advance of 2020 fishing season.	The Parties to establish a bilaterally approved MSY escapement goal for Taku River sockeye salmon to be implemented in 2020 and for the remainder of the annex period.
Paragraph 3(b)(i)(c). Complete bilateral review of joint Taku River sockeye salmon assessment program.	Complete in advance of 2020 fishing season.	The Parties to receive and implement recommendations to improve the bilateral Taku River sockeye salmon assessment program prior to the start of the 2020 fishing season.
Paragraph 3(b)(i)(h). Expand and initiate new bilateral sockeye salmon enhancement programs within the Taku River watershed.	Initiate sockeye salmon enhancement expansions and new programs as soon as practical (post 2019).	Annually produce 100,000 enhanced sockeye salmon returning to the Taku River watershed.
Paragraph 3(b)(ii). Implement a Taku River coho salmon abundance based management smolt and adult assessment program.	Initiate program implementation in 2019 and continue for duration of annex period.	Implement annual coho smolt tagging and adult terminal abundance estimate program on the Taku River.
Paragraph 3(b)(iii). Continue the abundance based management program for Taku River Chinook salmon. Expand/improve the CWT and GSI programs used to implement the existing program.	CWT expansion to be initiated in 2019 and continue for duration of annex period. Conversion of GSI program from microsatellites to SNPs initiated in 2019.	Increase CWT tag rates for Taku River Chinook salmon to achieve CTC indicator stock standards. Improvement of accuracy and decrease in cost of GSI program by conversion to a SNP based approach.
Paragraph 4. Continue to evaluate accountability measures associated with Chapter One.	Maintain annual process.	Intent is to provide annual accountability measures of performance of Chapter One provisions.
Paragraph 5. Review of Chapter to determine if renewal or renegotiation is requested by the Parties.	2024 PSC annual meeting.	Identify each parties interests pertaining to renewal or renegotiation of Chapter 1 following 5 years of implementation of current annex.

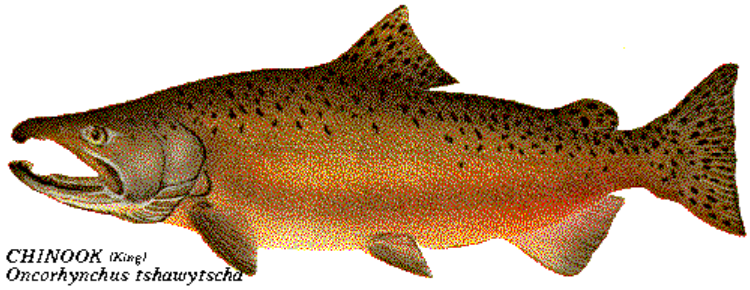
Pacific Salmon Treaty Joint Implementation Workplan-Chapter 2

Activity	Anticipated Process and Outcome	Internal Milestone Due Date (DD/MM/YY)
Introduction: Review of the results of the implementation of Chapter 2 identifying management actions taken to support the conservations of Nass River and Skeena River sockeye consistent with obligations of the chapter.	Terms of Reference for Chapter performance evaluation	Jan/Feb 2021
	CSAS Review of Skeena and Nass sockeye benchmarks	Spring 2021
	Review of D104 Pink Fishery	Spring 2021
	Initial report to Commissioners	October 2021
	Final Panel report to Commissioners	January 2022
Paragraph 10. Canada agrees to complete a comprehensive escapement goal analysis (prior to the 2023 fishing season) for Nass and Skeena river sockeye salmon that shall be peer-reviewed by an independent contractor and then submitted to the Committee and Northern Panel for further review	NBTC to develop the Terms of Reference with input and approval from the Northern Panel, and to recommend independent consultants	Jan/Feb 2019
	Northern Panel to recommend independent consultant to lead process; identification of contributors, team members and scope of project. Initial domestic meetings with Indigenous groups and Stakeholders	May 2019
	Canada to conduct data compilation and biological benchmarks analysis; second domestic workshop	April/May 2019-2020
	Panel submission for Northern Endowment Fund Stage 1 proposal to fund contractors in 2020–21	June 2019
	Bilateral NBTC and panel agreement on source data for escapement goal analysis	July 2020
	CSAS Review of escapement goal analysis; 3rd domestic workshop and development of revised management reference points	April 2021

Activity	Anticipated Process and Outcome	Internal Milestone Due Date (DD/MM/YY)
	Independent Reviewer to review recommendations from CSAS and overall process Independent Reviewer presents review and recommendations to bilateral NBTC and Northern Panel Commission review of Independent Reviewer's report and recommendations	July-September 2021 November 2021 January 2022
Paragraph 11. (a) To (e) The Northern Panel and the Committee shall co-develop the Terms of Reference for the (biological or MSY-based) escapement goal analysis and shall include a review of….	As above; terms of reference for escapement goal analysis for Skeena and Nass sockeye salmon	January/February 2019
Paragraph 12. The U.S. agrees to complete a harvest pattern analysis of the pink salmon fishery in District 104 salmon that shall be peer-reviewed by an independent contractor and then submitted to the Committee and the Northern Panel for further review.	NBTC to develop the Terms of Reference with input and approval from the Northern Panel, and to recommend independent consultants Panel submission for Northern Endowment Fund Stage 1 proposal to fund contractors in 2020–21 US report completed and submitted to independent contractor for review Report submission to bilateral NBTC and panel for review Report submitted to commission for review	Jan/Feb 2019 June 2019 July 2021 November 2021 January 2022
Paragraph 13. (a) To (d) The Northern Panel and the Committee shall co-develop the Terms of Reference for the harvest pattern analysis and shall include a	As above; terms of reference for harvest pattern analysis of the pink salmon fishery in District 104	January/February 2019

Activity	Anticipated Process and Outcome	Internal Milestone Due Date (DD/MM/YY)
review of…		
Paragraph 14. The Committee shall review the sockeye run reconstruction model to provide recommendations to the Northern Panel at or before the January 2022 Commission post-season meeting, regarding the creation of a simpler run reconstruction model using genetic data and to provide recommendations on any improvements to the program, if needed.	NBTC to review the run reconstruction model and identify any issues or concerns NBTC to present recommendations regarding changes to the NBRR to the Northern Panel Panel report to Commissioners on results of NBRR review and recommendations	January 2019 January/February 2019 January 2022 (or before)
Appendix to Annex IV, Chapter 2; Paragraph 5. The Parties agree to review this Chapter a minimum of two years prior to its expiration with a view to renewing it.	Parties begin Chapter review Final Panel report to Commissioners	January 2026 January/February 2028

January 17, 2019



PSC Chinook Technical Committee

CHAPTER 3 IMPLEMENTATION PLAN 2019-2028

The CTC has organized the Chapter 3 Appendix A tasks into 4 categories: legacy annual tasks, new annual tasks, ad-hoc tasks, and conditional tasks. A 10-year plan is also provided.

1. ***Legacy Annual Tasks.*** The CTC will discuss changes to the structure of annual reports to reflect new obligations in the 2019 PST Agreement. We will also strive to reduce the size of annual reports, improve readability, and explore strategies to expedite production.

App A	Task	When
9	Report fishery performance at Annual Meeting	Feb
1(h), 8, 6	Provide annual calibration, post-season AIs, pre-season comparisons, and catch deviations for AABM fisheries	1 Apr
1(b), 3(a), 3(b)	Report on catches, terminal exclusions, hatchery add-ons, HRIs, IMs, and ERs	June
4, 11	Evaluate ISBM fishery performance, and starting in 2023, CYER average, and overages	
1(c)	Report escapements, and evaluate stock status	

2. ***New Annual Tasks***

App A	Task	When
1(g)	Report stock-specific MSF impacts, starting 2020	May
1(i)	Summarize CEII and CWT&R programs, starting 2020	June
3(c)	Describe the causes of significant changes in IMs	June
7	Report data underlying the hatchery add-on calculations	June

3. ***Ad-hoc Tasks***

App A	Task	When
14	Complete BPC Phase 2	Feb 2019
2	Standards for IM data	Feb 2020
5	Complete Data Generation Model	2020
5	Evaluate alternative metrics for ISBM	2021
	*Investigate and implement MSF algorithms in the annual ERA**	Jun 2019

App A	Task	When
	*Evaluate representativeness of CWT indicator stocks of wild/hatchery stocks they are intended to represent**	
5	Procedures to adjust CYERS for MSFs by 2021. Add to Annual Report.	2021
5	Describe adjustments of terminal fishery impacts for ER stocks	2021
13	Draft outline for 5 year review	Jan 2023
14	Complete BPC Phase 3	2023
1(e)	Recommend standards for the minimum assessment program required to effectively implement Chapter 3	TBD
1(f)	Recommend research 3(c), 7, and associated costs, to improve implementation of Chapter	TBD

** Workplan tasks not included in App. A.*

4. Conditional Tasks

App A	Task
11(b)	If ISBM overage, provide plan to improve performance in meeting objectives
10(b)	If AABM overage, provide plan to improve performance in meeting objectives
1(a)	ID concerns with Chapter or effectiveness of actions in reaching objectives, as requested
1(d)	Evaluate, review or recommend escapement objectives; as requested
12	Up to 2 review(s) of CPUE based approach, if requested

2019 Meeting Schedule:

Additional CTC meetings may be required, depending on the number and scope of additional tasks assigned.

Meeting	Dates	Meeting Objectives
PSC Post-season (& CTC)	Jan	Phase 2 BPC; C&E
CTC-AWG+	*Jan*	*Phase 2 BPC*
PSC Annual (& CTC)	Feb	Phase 2 BPC assessment
CTC-AWG	Feb	ERA
CTC-AWG	Mar	Model Calibration
CTC Bilateral Meeting	Apr	C&E; Clb&ERA, DGM
CTC Bilateral/SFEC Meeting	*May*	*Address new assignments, MSF algorithms*
CTC Bilateral Meeting	Jun	C&E, MSF algorithms
CTC Bilateral Meeting	Sep	Clb&ER report
US CTC-LOA	Nov	LOA project presentations, RFP
PSC Fall Session	Oct	CTC co-chairs attend

**Tasks in 2019 Workplan*

10-Year Implementation Plan:

The CTC has made a preliminary assessment of tasks listed in Appendix A of Annex IV, Chapter 3 of the recently completed 2019 PST Agreement to assess timelines and workload. The table following on the next page is the CTC's understanding of the timeline for completion of CTC tasks identified in Appendix A.

Appx A	Task	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
9	Report to PSC @ Annual meeting on (a) and (b) AABM performance, (c) recommendations for minimizing deviations between pre- and post-season fishery limits, and (d) status towards achieving stock-specific management objectives.	Feb	Feb	Feb	Feb	Feb	Feb	Feb	Feb	Feb	Feb
1 (h)	Provide annual calibrations of the Chinook model with pre-season and post-season abundance indexes by April 1 of each year;	1-Apr	1-Apr	1-Apr	1-Apr	1-Apr	1-Apr	1-Apr	1-Apr	1-Apr	1-Apr
8	Provide the first post-season AI estimates for AABM fisheries using the Chinook model and compare (a) CPUE-based tiers for SEAK and (b) AIs for NBC and WCVI AABM fisheries	X	X	X	X	X	X	X	X	X	X
6	Determine annually if deviations have occurred between the observed catches and both the pre-season and post-season allowable catches for the SEAK, NBC, and WCVI AABM Treaty Chinook catches.	X	X	X	X	X	X	X	X	X	X
1(b)	Report annually on catches, terminal exclusions, hatchery add-ons, harvest rate indices, estimates of incidental mortality, and exploitation rates that apply best available information to account for MSF impacts for all Chinook fisheries and stocks harvested within the Treaty area;	X	X	X	X	X	X	X	X	X	X
1(c)	Report annually on naturally spawning Chinook stocks in relation to the agreed MSY or other agreed biologically-based escapement objectives, rebuilding exploitation rate objectives, or other metrics and evaluate trends in the status of stocks and report on progress in the rebuilding of naturally spawning Chinook stocks;	X	X	X	X	X	X	X	X	X	X
1 (g)	Annual report on stock-specific MSF impacts		X	X	X	X	X	X	X	X	X
1 (i)	Annual summary of CEII and CWT&R programs		X	X	X	X	X	X	X	X	X
3 (a)	An evaluation of estimates of encounters and incidental mortalities in all fisheries subject to this Treaty;	X	X	X	X	X	X	X	X	X	X
3 (b)	Post-season estimates of incidental mortality that includes incidental mortality from MSF, and total mortality; and	X	X	X	X	X	X	X	X	X	X
3 (c)	Description of the causes (if identifiable) of significant changes in rates or patterns of incidental mortalities in fisheries relative to paragraph 4(a) and 4(f) of this Chapter for AABM fisheries (1999-2016) and paragraph 5 of this Chapter for ISBM fisheries (1999-2015).	X	X	X	X	X	X	X	X	X	X
4	Evaluate the ISBM fishery performance relative to the obligations set forth in paragraph 5 of this Chapter and report annually to the Commission.	X	X	X	X	X	X	X	X	X	X
7	Provide detailed information concerning any catches of Chinook associated with paragraphs 6(i) and 6(j), and a summary of information used to determine the allowable exclusion or hatchery add-on, in the annual catch and escapement report.	X	X	X	X	X	X	X	X	X	X
11	For ISBM fisheries, the CTC shall annually compute and report metrics	X	X	X	X	X	X	X	X	X	X

Appx A	Task	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	described in paragraph 5 (a) and										
	Provide 3-year running avg for CYERs and evaluate performance (by 2023)				TBD	X	X	X	X	X	X
11 (b)	If ISBM overage, shall provide to the Commission a plan to improve the performance of pre-season, in-season and other management tools so that the deviations between the CYERs and the CYER limits are narrowed to a maximum level of 10% when limits apply (Attachment I)				TBD	TBD	TBD	TBD	TBD	TBD	TBD
10 (b)	If AABM fisheries have overages for 2 consecutive years, the CTC shall recommend to the Commission a plan to improve the performance of pre-season, in-season and other management tools so that the deviations between catches and post-season fishery limits to AABM fisheries are narrowed to a maximum level of 10%.	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
14	Complete BPC Phase II by February 2019	Feb									
14	Complete BPC Phase III by 2023	X	X	X	X	X					
2	Standards for the desired level of precision and accuracy of data required to estimate IM		Feb								
5	Complete the Data Generation Model		X								
	Complete evaluation of alternative metrics for the evaluation of ISBM fisheries			X							
	Develop data standards for the application of CYER as metric			X							
	Description of procedures used to adjust CYERS in order to capture MSFs (by 2021). Add to Annual Report.			X							
	Describe any adjustments of terminal fishery impacts for the exploitation rate indicator stock			X							
13	By January 2023, develop a draft outline for a five-year review to evaluate the effectiveness of harvest reduction measures that are taken for AABM and ISBM fisheries				X						
1 (a)(i)	Upon request, ID concerns with consistency in Chapter.	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
1 (a)(ii)	Upon request, ID concerns on the effectiveness of the actions in attaining the specified objectives.	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
1 (d)	Evaluate and review existing escapement objectives; when requested, recommend goals	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
1 (e)	Recommend standards for the minimum assessment program required to effectively implement Chapter	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
1 (f)	Recommend research projects, and associated costs, to improve implementation of Chapter	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
12	Up to 2 review(s) of CPUE based approach, if requested	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

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Chapter 5

Key work item (from summary of chapter changes document or other work planning documents)	Chapter Reference	Category (1,2,3)	Required By/ Bilateral Due Date (DD/MM/YY)	Key Milestones/ Products	Accountability (i.e. Lead, Input, Review)	Approval	Reporting Timeline and Required Approvals	Other considerations
The Parties shall maintain a joint Coho Technical Committee. The Committee, *inter alia,* at the direction of the Panel	7	1	Ongoing structure	*Incorporate key elements of CoTC workplan. For further discussion in February session.*				
Devise analytical methods or recommendations to develop alternative regulatory and production strategies and to address uncertainties caused by data limitations and	7 e)	3	TBD	Recommendations to So. Panel and/or Coho WG on production strategies or regulatory responses regarding climate change effects on Coho stocks.	CoTC	Bilateral Coho Working Group and Southern Panel	CoTC provides work plan to So. Panel with details of how the work will be accomplished (CoTC subcommittee tasks, etc.), and then approved by So. Panel, & incorporated into	

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variation in environmental conditions.							overall So Panel work plan. So. Panel needs a week minimum to review, comment prior to submitting work plan to PSC Commissioners. So. Panel work plan ultimately approved by PSC Commission at October Executive Session.	
Bilateral technical investigations and recommend methods to address data uncertainty and the impact of environmental change	7 l)	3	TBD	Technical methods and models – tools to understand climate change effects on Coho stocks.	CoTC	Bilateral Coho Working Group and Southern Panel	CoTC provides work plan to So. Panel with details of how the work will be accomplished (CoTC subcommittee tasks, etc.), and then approved by So. Panel, & incorporated into overall So Panel work plan. So. Panel work plan ultimately approved by PSC Commission at October Executive Session.	

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Environmental variability	general	3	Initiate planning work in 2019	Develop 10 yr strategy (could be part of a CoTC strategic plan)	Southern Panel CoTC to develop initial cut, CoWG to oversee and contribute to work			Requirement for a tiered approach based on available resources. Needs to be linked into workplans of other panels / CSC / other committees working on this subject.
Shift in MU structure for Canada (merging of GS MUs)	8 a)	3	Discuss with CoTC – TBD	Update technical tools and models used to estimate ER and / or assess other MU parameters to reflect change	Lead – Coho Technical Committee. Support – Stock Assessment Biologists, FRAM modelling experts.	Southern Panel		
The Parties shall establish and document the derivation of ER targets for MUs that originate within their respective jurisdictions at three status levels (low, moderate, abundant)	8 b)	1	U.S. has established these targets for all MUs In 2018, Canada completed this work for IF Coho (see below)		Each Party to the Southern Panel, bilateral input through Southern Panel, CoTC, CoWG			

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New status determination methods	8 c) i)	1,3	July 2019 – Bilateral CoTC meeting to discuss, review, implementation plan	CSAS paper documenting methods Canadian domestic consultation process Letter to Bilateral Commission	Canadian Co-chair of Southern Panel, bilateral input through CSAS process, CoTC, Southern Panel	Cdn Chief Commissioner		Current data only sufficient for application to IF Coho
Bilateral discussion of implementation approaches for status determination	8 c) ii)	3	February 2020 for IF status approach.	Documentation of implementation approaches	Southern Panel, with input from CoTC, CoWG			
Completion of MUs not yet implemented under this chapter (non-IF coho)	8 c) iii)	3	Anticipate using methods established for IF coho. No date for implementation stipulated in treaty language, but is highly desirable to achieve overall chapter	-For Canadian MUs, Canada to determine timing by which this work can likely be done. -Intention to manage for other MUs is communicated. - Confirm process for bilateral scientific review of MU-specific parameters (e.g. underlying data, specific reference points, ERs)	Canadian section of Southern Panel / DFO Canadian section of Southern Panel Canadian section of Southern Panel with input from CoTC		Fall PSC session preceding proposed year of implementation.	May need language to update workplan to reflect that U.S. may also pursue status determination and ER modifications.

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			objectives of sustainable abundance-based management of S. Coho.	- Decision on application of status determination framework to non-IF MUs - Conduct bilateral implementation discussion, including timing	Canada with input from CDN Southern Panel Bilateral Southern Panel with input from CoTC and CoWG			
maintain capabilities and programs to conduct stock assessments, evaluate fishery impacts, and meet this Plan's objectives;	8 e)	1	Ongoing	Parties to share list of priority stock assessment programming improvements to inform application of implementation funding – specifics TBD	Respective parties		Suggest initial and mid-cycle (*specific timing TBC)* assessment of stock assessment capabilities against *CoTC 2012 Assessment Framework*.	This is a priority for future funding opportunities.
In mid-March every year, the Parties shall exchange information on the status of each MU, the associated ER that applies to each MU and other factors, including preliminary fishery expectations, that are relevant to the development of plans for their respective fisheries, including those that may result in domestic	8 g)	1	Annually – Mid March 2019 and each year thereafter		Co-Chairs of respective countries, with support from CoTC members CoWG can be engaged in any year where co-chairs deem it necessary.			Consider revisions to approach based on ongoing work to explore impact of environmental conditions

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constraints below the ER caps specified in this Chapter to facilitate domestic fishery planning processes.								
In any given year, the Parties shall not change the status or associated ER caps for an MU after March 31.	8 g)	3	End of March 2019 and every year thereafter	Respective countries declare status for the mid-March exchange. Notification only required by end of March if there is a change from mid-March notification.	Panel co-chairs of respective countries.			Changes in status and ER between mid March and end of March unlikely within Canadian planning.
By June 30 of each year, through Canadian and U.S. domestic management authorities, exchange information on the implementation of management measures to ensure that the cumulative ERs do not exceed allowable levels for MUs …… Specifically: (i) By April 30 of each year, the U.S. shall provide Canada with projected ERs for its fisheries on Interior Fraser MU for the coming season,				**Short term** – relying on existing approach (i.e. use ER from recent years with similar fishing patterns as proxy for upcoming year's Canadian ER on US stocks) Key parameter provided in June would be updated scalars for Canadian fisheries. To prepare for potential changes in Canadian fishing plans, hypothetical modelling approaches can be used to assess potential impacts on U.S. and Canadian MUs. Lower priority work item in current	Panel co-chairs of respective countries, with support from CoTC			

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(ii) When methodologies to establish status benchmarks and associated ER caps have been established for other Canadian MUs, the U.S. shall provide Canada with estimates of the impact of its fisheries on the Canadian MUs by April 30 in addition to the Interior Fraser MU, (iii) By June 30 of each year, Canada shall provide the U.S. with projected ERs for its fisheries on U.S. MUs specified in paragraph 8(a) for the coming season.				context of Low IF Coho productivity.				
If a producing country identifies concerns about increasing trends in ER on the producing country's MU by the intercepting country over two or more	9 g)	3		No specific implementation actions proposed at this time. Robust bilateral pre-season planning process and information exchange will help				Need to be clear that the two year pattern is not required to trigger discussions if a party exceeds the established ER caps in the treaty.

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consecutive years, bilateral discussion of the appropriate response will be initiated for implementation in the following year**.**				minimize need to invoke this provision.				Immediate post-season discussions would be required as per s10. Relates to discrepancy between planned and actual ERs.
Each Party May request additional reductions in ERs to meet critical conservation concerns not adequately addressed by the ER caps. The Southern Panel shall develop bilateral guidance to indicate how this could be implemented in a responsible and timely manner during a Party's domestic preseason planning;	11 b)	3		Establish bilateral sub-committee of the Southern Panel (Feb 2019) Identify work items (including any technical input and tools for Coho TC) required to complete guidance language (July 2019) Sub-cttee submits draft guidance language to bilateral Southern Panel for review (TBD) Panel approval of guidance (TBD)	Coho Working Group?	Southern Panel		Potential interactions with other fisheries Biological considerations: - Impacts on all MUs. - Impacts on management objectives for stocks (including rebuilding)
Any party may request increases in the MU-	11 c)	3		Same process as above for development of guidance				

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specific ER caps determined under paragraphs 9(b) to (d) if the Party can demonstrate that the ER caps prevent it from accessing its own stocks to meet its fishery management objectives or from harvesting other allocations provided under this Treaty. The Southern Panel shall develop bilateral guidance to indicate how this could be implemented in a responsible and timely manner during a Party's domestic preseason planning								
Periodic review (every three years)	12	1		Work is underway to modify format for Report (online, updated annually) Need additional report element on a periodic basis (every three years) that interprets	Southern Panel with support from CoTC			Should be a check-in on progress of workplan items. Opportunity to revise workplan based on results of review.

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				information in light of chapter workplan and objectives.				

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Chapter 6									
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1	If the Fraser River run size estimate is between 1,050,000 and 1,600,000, the U.S catch ceiling shall remain at 125,000. If the Fraser River run size estimate is above 1,600,000, the U.S. catch	9 d)	3		Development of in-season stock assessment capabilities with sufficient precision to support the use of two breakpoints for management of U.S. fisheries.	Canada U.S.			Increasing precision of in-season estimate will reduce management and biological risk.

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	ceiling shall be revised to 160,000;				**Assessment requirements to achieve this capability are detailed under items 2-5**				
2	The Chum TC shall maintain and present to the Panel historical catch and escapement information	1 a) – catch element	2,3		Establishment and maintenance of comprehensive **catch** estimation programs to support in-season management tools required under Section 9 d)	Canada U.S.			
3	The Chum TC shall maintain and present to the Panel historical catch and escapement information	1 a) – escapement element	2,3		Establishment and maintenance of comprehensive **escapement** estimation programs to support in-season management tools required under Section 9 d)	Canada U.S.			Southern Endowment Fund has supported recent improvements to these programs but cannot provide ongoing funding.

Chapter 6									
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4	The Chum TC shall use available information to estimate and document stock composition and exploitation rates	1 b) – stock composition element	2,3		Establishment and maintenance of comprehensive programs to estimate **stock composition** as required to support in-season management tools required under Section 9 d)	Canada U.S.			Southern Endowment Fund has supported these programs but cannot provide ongoing funding.
5	The Chum TC shall use available information to estimate and document stock composition and exploitation rates	1 b)	2,3	January 2021	Completion of a run-reconstruction model that estimates exploitation rates and pre-fishery abundance of stocks as required to support in-season management tools required under Section 9 d)	Chum TC			Southern Endowment Funding will be requested to complete development of the model. Required ongoing support will not be provided by Southern Endowment Fund.
6	Southern Panel requests update on assessment work being done bilaterally to support	1 e)	2	February 2021 February 2024	Completion of a report on bilateral Chum TC activities. February 2021 reporting to focus on those elements of the Chum TC workplan that	Southern Panel Chum TC (Lead)			

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	evaluation of management strategies				support development of the run-reconstruction model. Additional reporting in February 2024 to check-in on progress of remaining workplan items.				