Executive Secretary's Summary of Decisions
2022 Post-Season Meeting
January 10-13, 2022 (online)

The Pacific Salmon Commission held its Post Season Meeting January 10-13, 2022 via webinar, and discussed a number of topics (see attached agenda).

The Commission AGREED:

1. The minutes from October 2021 are approved as circulated.
2. The Commission accepted the report of the Chinook Interface Group (CIG), including its primary recommendations:
    a. Discontinuing the Phillips CWT indicator stock currently identified in Attachment I to Chapter 3. Canada is exploring options for an alternate indicator for mainland inlet stocks and will communicate back with CIG when a stock is proposed for consideration by the Parties. The CIG will discuss how to report this change in Chapter 3 at the February Annual meeting.
    b. Reviewing the CTC's Incidental Mortality Work Group's Catch Estimates report when published at the end of January and discuss at the February meeting.
    c. Sending forward-looking agenda items to the CTC Coordinator for development of a forward-looking agenda and finalizing during a discussion at the February Annual meeting.
3. The 2021 preliminary post-season reports are accepted as submitted.
4. The CIG is directed to liaise with the CYER Working Group and draft a letter to management entities. This letter should specify the Commission's needs for implementing the CYER metric and be provided to the Commission at the 2022 Annual Meeting for review.

ATTENDANCE

PACIFIC SALMON COMMISSION
POST SEASON MEETING
JANUARY 10-14, 2022
Via WEBINAR

COMMISSIONERS

UNITED STATES	CANADA
S. Rumsey (Chair)	R. Reid (Vice Chair)
P. Anderson	R. Jones
W.R. Allen	J. McCulloch
W. Auger	M. Ned
R. Klumph	M. Paish
D. Moore	B. Rezansoff
M. Oatman	B. Riddell
D. Vincent-Lang	A. Thomson

Draft Agenda
2022 Post-Season Meeting
January 10-14, 2022
Vancouver, BC and via webinar

1. Adoption of agenda
2. Approval of minutes: 2021 Fall Meeting
3. Executive Secretary's report

Chinook issues

4. CIG report (topics subject to change)
    a. Incidental Mortality
    b. Phillips River indicator stock
    c. COVID-19 impacts on Chapter 3 implementation in 2021

Other action items pending

5. Adoption of national post-season reports
    a. Preliminary 2021 data
    b. National reports on 2021 Chinook fisheries
6. Northern Panel Chapter 2 implementation plan (as appropriate)
7. Test Fishing Revolving Fund update from Parties (as needed)
8. Update from Committee on Scientific Cooperation and CSC Liaison Group
9. Progress reports from Panels and Committees on work plans, as needed
10. Management Entities Work Group report
11. Public comment

Annotated agenda

January 2022 Post-Season Meeting

(Executive Secretary's annotations in *italics*)

1. Adoption of Agenda

    - *Consistent with PSC bylaws, an agenda shall be adopted by the Commission at the start of each meeting. The Commission shall not ordinarily take a decision on any item that has not been included in the draft agenda for the meeting. Where circumstances warrant, supplementary decision items may be added to the agenda with the concurrence of each National Section.*

2. Approval of minutes

    - *The Parties received draft minutes from the October 2021 Fall Meeting on November 10, 2021.*

3. Executive Secretary's Report

    - *The Executive Secretary will provide a verbal report on "housekeeping" items for the current meeting and other issues needing attention. This will include a status report on the Commissioners'/Parties' deliverables under amended Annex IV, logistical considerations for the week's hybrid meetings, and identifying any public observers.*

Chinook issues

4. CIG report

    - *The Chinook Interface Group (CIG) will report on a variety of topics as determined by the Parties.*

Other action items pending

5. Adoption of national post-season reports

    - Preliminary 2021 data: *Since January 2018, the Parties have agreed to review preliminary post-season reports each January with final reports/final data accepted the following October.*

    - National reports on 2021 Chinook fisheries*: Since October 2018, the Commission has agreed the Parties will present summaries of their Treaty-area Chinook fisheries at each January Post-Season meeting.*

6. Northern Panel Chapter 2 implementation plan (as appropriate)

    - *At the October 2021 Fall Meeting, the Northern Panel had not yet approved a bilateral update to the Chapter 2 implementation plan. If available, the Commission is invited to consider its adoption.*

7. Test Fishing Revolving Fund update from Parties (as needed)

- *A subset of Commissioners last addressed the revolving fund balance on October 19. If further discussions have yielded progress on shared funding, the Commission will be informed.*

8. Update from CSC and CSC Liaison Group
    - *Effective February 2020, a CSC Liaison Group (four Commissioners) has engaged with the CSC on work planning. The present meeting will allow the participants to update the Commissioners on the CSC's 2022/2023 work plan priorities.*
9. Progress reports from Panels and Committees on work plans (as needed)
10. Management Entities Work Group (MEWG) report
    - *At the October 2021 meeting, the MEWG reported it needed more time to assess COVID implications for future management entities meetings, and to assess the best format for those meetings.*
    - *The MEWG noted it could be useful to host a series of "focus groups" or workshops on particular topics that affect the PSC and management entities, perhaps as early as fall 2022.*
    - *The MEWG planned to revisit these issues and report more fully in January 2022.*
11. Public comments
    - *When appropriate, and with the concurrence of the Vice-Chair, the chair may provide time for public visitors to speak during the meeting.*

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

Chapters 1, 2, 3, 5, and 6[1] in chronological order

Prepared by the Executive Secretary and national representatives (updated 1/6/22)

Deadline	Chapter/para	Task (emphasis added)	Status
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,	Ongoing: Addressed through TOR for CEII-CWT/R working group

[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;	See above
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…	Ongoing: Addressed through TOR for CEII-CWT/R working group
February 2019	Chapter 1, Paragraph 3(a)(iii).	Increase CWT tag rates for Stikine River Chinook salmon to achieve CTC indicator stock standards.	Addressed in TBR Panel implementation plan
February 2019	Chapter 1, Paragraph 3(b)(iii).	Increase CWT tag rates for Taku River Chinook salmon to achieve CTC indicator stock standards.	Addressed in TBR Panel implementation plan
February 2019	Chapter 3, Appendix A, paragraph 14	**The Commission shall receive the model improvements from Phase 2 and make a decision about their implementation.**	Complete January 16, 2020 with adoption of revised Tables 1-2 and Appendix C

October 2019	Chapter 3, paragraph 5(b)	**The Parties agree that for the Chapter Period:** **b) the Commission shall establish a work group to explore issues related to Okanagan Chinook, including the establishment of management objectives, enhancement and the possible use of Okanagan Chinook as an indicator stock. The work group shall report to the Commission by October 2019.**	Work group formally created October 2019
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.	Ongoing: Addressed through TOR for CEII-CWT/R working group
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]**	Completed May 21, 2020; confirmed by PSC July 2020
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.**	Completed May 21, 2020; confirmed by PSC July 2020
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. The Commission will consider the recommendation of the CTC regarding standards for the desired level of precision and accuracy of data required to estimate incidental fishing mortality.	Ongoing. Ad hoc IM Work Group expected to publish report by 1/31/22

[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.	Revised Chapter 2 implementation plan, which includes this item, is pending.
January 2022	Chapter 3, paragraph 2(a) 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. The Parties agree that in order to complete this documentation, the Commission shall direct the CIG to work with the CTC to develop a draft outline on how to document specific concerns or inconsistencies between that configuration and the management regime in 2018. The Commission will review this draft outline and direct the CTC how to prepare the report.**	In publication prep as a Technical Note by February 2022; also Base Period Calibration Vol 3 (model parameters and assessment), due February 2022
January 2022, 2025, 2028	Chapter 5, paragraph 11(b)	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. **The guidance shall also include steps and timelines for communication with Commissioners. This process will require Commission approval before implementation**	Underway via S. Panel workplan in 2021/2022
January 2022, 2025, 2028	Chapter 5, paragraph 11(c)	Any party may request increases in the MU-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. **The guidance shall also include steps and timelines for communication with Commissioners. This process will require Commission approval before implementation**	Underway via S. Panel workplan in 2021/2022

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.).	Expected to be achieved under the S. Panel workplan in 2021/22

January 2022	Chapter 2, 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.	Revised Chapter 2 implementation plan, which includes this item, is pending.
January 2022	Chapter 2, 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.	N. Panel agreed bilaterally; published as PSC Tech Report June 2021
January 2022	Chapter 2, 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.	Revised Chapter 2 implementation plan, which includes this item, is pending.
c. December 2022	Chapter 3, paragraph 5(e)	**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.	CTC will address this through 2021/2022 workplan in conjunction with the CYER WG; Commission decision after

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 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;	CTC forming ad hoc work group to outline task in 2021/2022. Review to begin in March 2023, after 2022 post-season AI's available c. 4/1/23.

January 2023	Chapter 3, paragraph 7(h) and Appendix A paragraph 13	**The Commission will consider the draft outline of the five-year review provided by the CTC and will provide direction on how to proceed with preparing the report.**	CTC to develop outline in June 2022, forming ad hoc work group to address task
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]**	
By December 2024	Chapter 1, paragraph 3(a)(i)(c). Appendix to Annex IV, Chapter 1	**Expand and initiate new bilateral sockeye salmon enhancement programs in the Canadian portion of the Stikine River watershed.**	
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.**	CTC developing 5-year outline by June 2022, ready for CIG review Jan. 2023.
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 successfully concluded prior to the expiration date, then overages and underages must be carried forward to the next Chapter period.	

[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.

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 bythe 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.	Ongoing since October 2019 through establishment of the Okanagan Work Group
Unspecified (2019 to December 2028)	Chapter 1, paragraph 3(b)(i)(h). Appendix to Annex IV, Chapter 1	Expand and initiate new bilateral sockeye salmon enhancement programs in the Canadian portion of the Taku River watershed.	TBR Panel addressing through its implementation plan
Unspecified (2020 to December 2028)	Chapter 1, paragraph 2 & paragraph 3(c)	Develop and implement an abundance-based management regime for Chinook and Sockeye salmon in the Alsek River.	TBR Panel addressing through its implementation plan
Unspecified	Chapter 3, Appendix A, paragraph 14	**The Commission shall receive the model improvements from Phase 3 and make a decision about their implementation.**	CTC developing work group for Phase 3 improvements.

[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;	Paras c and d estimates presented in TCCHINOOK 21-05 and 21-04. CTC will provide estimates of Chinook encounters by January 31, 2022
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.	MSF Fund and committee established Oct. 2020

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.	Website update complete No scheduled reviews but CohoTC workshop on use of environmental indicators (5/11/21) is related to this effort.

2021 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 3, 2022

TABLE OF CONTENTS

POST SEASON REPORT

I. PRELIMINARY 2021 SOUTHEAST ALASKA FISHERIES

INTRODUCTION

This report describes the conduct of Alaska fisheries of interest to the Pacific Salmon Commission (PSC) that occurred during 2021 in the area south and east of Cape Suckling, Alaska and north of the U.S./Canada border. These fisheries were conducted under preseason management plans that were consistent with Annex IV of the 2019 Pacific Salmon Treaty (PST) Agreement, including obligations defined within Chapter 3 for Chinook salmon aggregate abundance-based management regimes (AABM).

The 2021 season was challenging due to the continued broad impact of the COVID-19 pandemic on all aspects of society, including fisheries and fisheries management. In March 2020, the State of Alaska designated fisheries as critical infrastructure to protect the food supply chain and the economy. The Commissioner of the Alaska Department of Fish and Game (ADF&G) immediately directed staff to develop action plans to safely implement field projects to the extent practicable so that fisheries could be prosecuted with the least amount of disruption. Alaska was successful in maintaining all its domestic projects necessary for fisheries management with no incidence of COVID-19, and fisheries occurred as planned with extra safety precautions in place for vessel operators, processors, and staff. We would like to recognize the numerous ADF&G staff who put in extraordinary efforts to ensure Alaska's fisheries continued uninterrupted during this difficult time.

Bilateral projects operating on the transboundary rivers (TBR) continued to be challenging this season, due to the varied mandates put in place by both countries to stop the spread of COVID-19 and the stricter rules regarding border crossings, which are inherent to bilateral operations. Despite the challenges, there was excellent bilateral communication between ADF&G, Canadian Department of Fisheries and Oceans (DFO), and Canadian First Nations that helped ensure that TBR projects operated as close to normal as possible and provided the data critical for management of fisheries harvesting salmon originating from the Stikine, Taku, and Alsek rivers. The enhancement programs on the Taku and Stikine rivers also faced unique challenges with the transport of eggs and fry across the border, but by close coordination between Alaska and Canada, fry transports were ultimately successful. Alaska would like to thank all the Canadian personnel that made extra effort to ensure these essential projects were able to operate.

Due to these extraordinary efforts, Alaska was able to meet all its PST obligations with respect to data collection inclusive of catch accounting, sampling, escapement monitoring, and hatchery marking and tagging. All programs generally proceeded as normal and the State of Alaska does not anticipate any implications for meeting annual Treaty commitments due to the COVID-19 pandemic.

All fisheries were managed consistent with the obligations outlined in the PST. Preliminary data suggest that the harvests of sockeye salmon in Alaska were below average in most fisheries and will be below annual allowable harvests in the District 101 drift gillnet and Taku River fisheries.

The District 104 purse seine fishery was limited to three 8-hour and one 15-hour opening prior to statistical week 31 to reduce harvest of Nass and Skeena river sockeye salmon. For Chinook salmon, all fisheries were managed conservatively and monitored closely inseason to avoid exceeding the preseason catch limit defined in the 2019 PST Agreement, and the 2021 all-gear Treaty harvest of 202,842 was below the CPUE-based catch limit of 205,165.

NORTHERN BOUNDARY AREA FISHERIES

District 104 Purse Seine Fishery

The 2019 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 ADF&G statistical week 31 (referred to as the Treaty period). The AAH is calculated as the total combined run of Nass and Skeena sockeye salmon minus either the escapement requirement of 1.1 million (200,000 Nass River and 900,000 Skeena River) 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 2021, the first potential opening was July 4 (week 28). The pre-week 31 fishing plan for District 104 was based on preseason DFO forecast runs of approximately 2.13 million Nass and Skeena sockeye salmon. In the 2021 Treaty period (Alaska statistical weeks 28–30), 49,304 sockeye salmon were harvested during two 8-hour openings in week 29 and 8-hour and 15-hour openings in week 30 (Table 1). A total of 48 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 29,700 and 39,600 Nass and Skeena sockeye salmon may have been harvested in the District 104 purse seine fishery during the 2021 Treaty period. The final estimate of the number of Nass and Skeena sockeye salmon harvested during the Treaty period in District 104 will not be available until harvest, escapement, and stock composition estimates are finalized for the year.

In 2021, a total of 10,746,081 pink salmon, 496,404 sockeye salmon, 212,045 chum salmon, 97,575 coho salmon, and 6,516 Chinook salmon were harvested in the District 104 purse seine fishery (Table 1). The number of days that the fishery was open was near or above average in most weeks, but the number of boats fishing was below the 1985–2020 average (Figure 1 and 2). Purse seine fisheries were not permitted to retain Chinook salmon throughout most of the salmon season, except for a single opening in week 32. During this opening, non-retention of Chinook remained in effect in the inside waters of southern southeast, which included Districts 101, 102, 106, and 107. Sockeye salmon harvests were below average in in the first two weeks of the fishery (Figure 4) and the Treaty period (week 28–30) harvest of 49,304 fish was 54% of the long-term average (1985–2020). The total sockeye salmon harvest of 496,404 fish was 112% of the long-term average of 444,000 fish. Harvests of coho salmon were above average through late July and then dropped below average for all but the final week of the fishery (Figure 5). The overall harvest of 97,575 coho salmon was 90% of average. The overall pink salmon harvest of 10,746,081 fish was 140% of average (Figure 6) and was the largest harvest since 2014. The chum salmon harvest of 212,045 fish was 75% of 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 Treaty period in District 104 are down 57%, 64% and 85% respectively compared to averages in the pre-Treaty 1980–1984 period (Table 2). The total pre-week 31 Treaty-

period sockeye salmon harvest is also down 52%. The purse seine fleet moves freely between districts as various species are harvested, so seining opportunities elsewhere affect the effort and harvest in District 104.

Table 1. Weekly salmon harvest and fishing effort in the Alaska District 104 purse seine fishery, 2021.

Week/ Opening	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Hours
29	11-Jul	0	4,048	4,596	91,323	14,684	37	8
29B	15-Jul	0	11,201	6,880	90,327	19,651	29	8
30	18-Jul	0	7,564	3,639	80,654	10,376	22	8
30B	22-Jul	0	26,491	8,633	320,256	12,425	27	15
31	25-Jul	0	37,755	14,221	524,619	33,090	54	39
31B	29-Jul	0	79,743	16,070	2,036,995	24,483	54	39
32	2-Aug	6,400	83,714	11,931	2,656,744	26,117	85	39
32B	6-Aug	0	54,788	6,048	2,254,512	23,591	71	39
33	10-Aug	0	18,729	1,756	642,199	13,747	32	39
33B	14-Aug	93	38,533	3,191	685,651	10,102	28	39
34	18-Aug	23	41,288	3,023	444,107	9,226	20	39
35	22-Aug	0	42,888	3,040	384,911	4,728	29	39
35B	26-Aug	0	22,969	3,523	298,543	5,117	24	39
36	30-Aug	0	21,597	6,293	186,778	3,566	22	39
36B	3-Sep	0	5,096	4,731	48,462	1,142	8	39
							Permits Fished	
Weeks 28-30		0	49,304	23,748	582,560	57,136	48	39
Weeks 31-34		6,516	447,100	73,827	10,163,521	154,909	98	429
Total		6,516	496,404	97,575	10,746,081	212,045	102	468

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

Year	Hours Fished	Individual Permits Fished	Days Fished (1d=15hrs)	Approximate Boat-Days	Sockeye Harvest	Sockeye Catch per Boat-Day
2021	39	48	2.6	91	49,304	542
Avg. 80–84	139	225	9	1,487	187,647	136
Avg. 85–20	60	82	4	216	90,485	480
% Change	-57%	-64%	-58%	-85%	-52%	254%

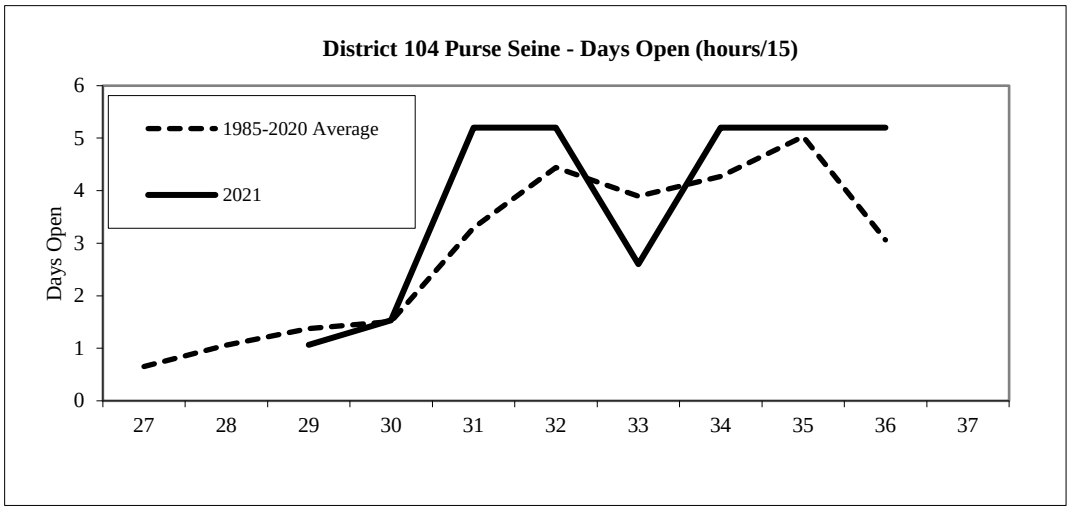


Figure 1. Days open by week in the District 104 purse seine fishery, 2021.

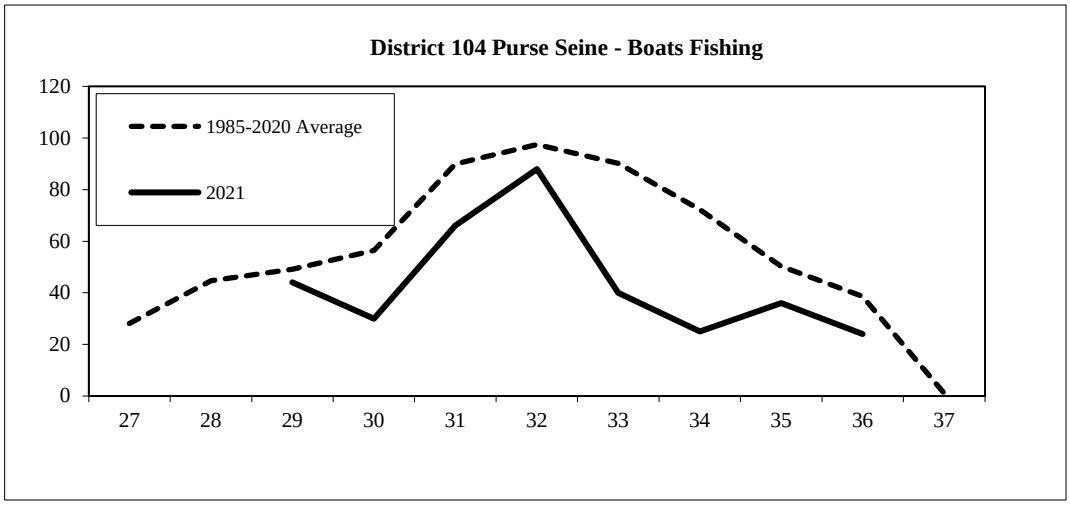


Figure 2. Number of boats fishing by week in the District 104 purse seine fishery, 2021.

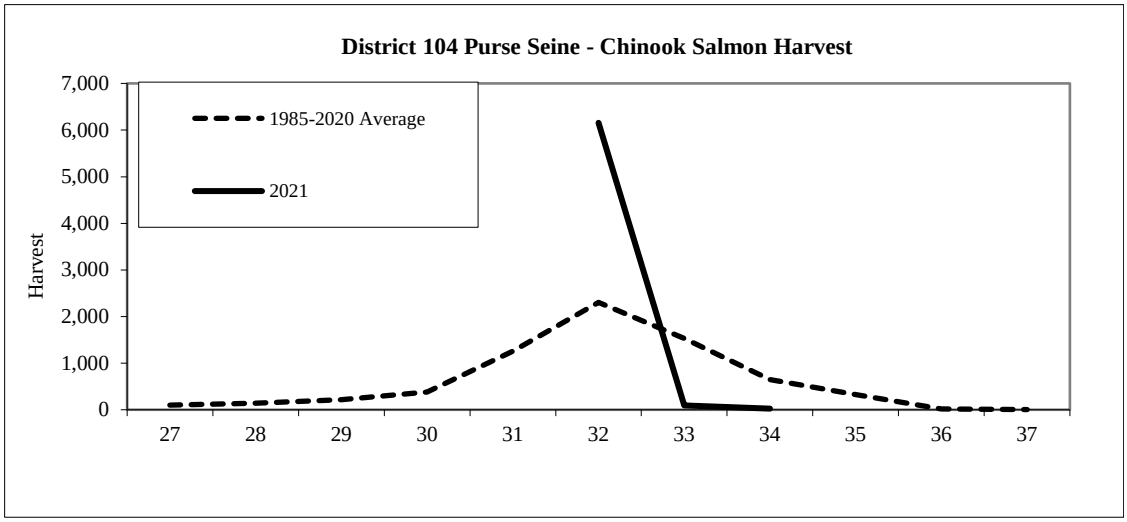


Figure 3. Chinook salmon harvest by week in the District 104 purse seine fishery, 2021.

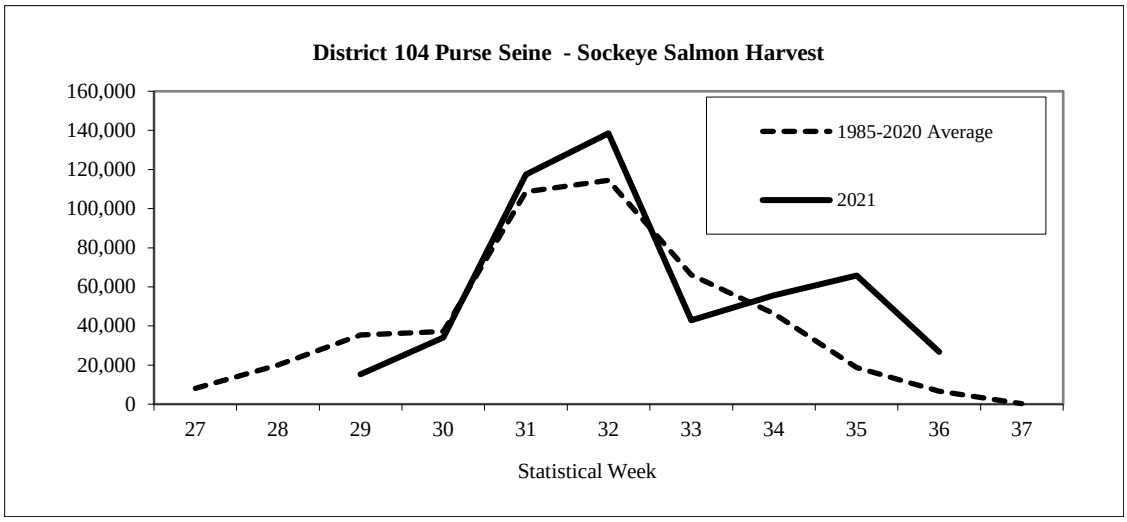


Figure 4. Sockeye salmon harvest by week in the District 104 purse seine fishery, 2021.

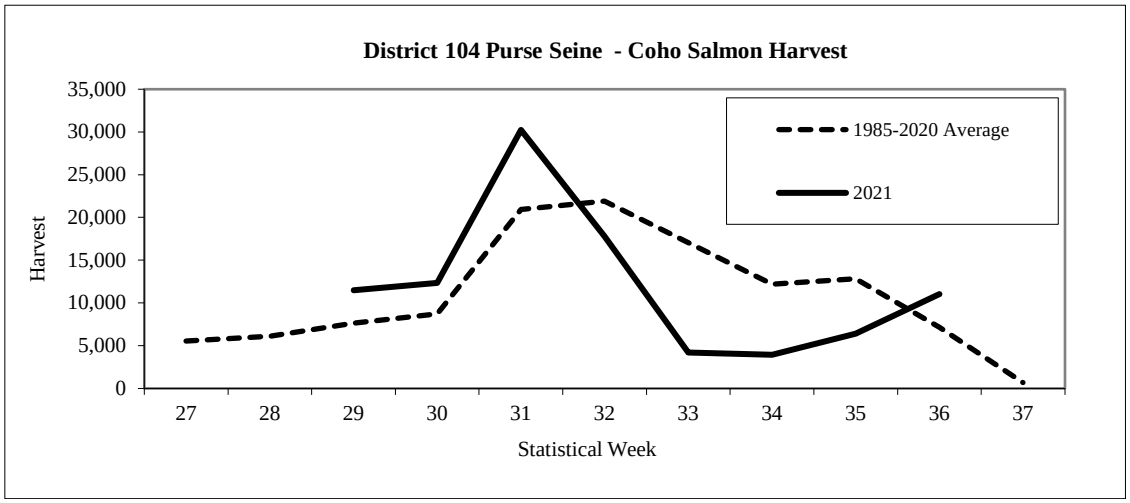


Figure 5. Coho salmon harvest by week in the District 104 purse seine fishery, 2021.

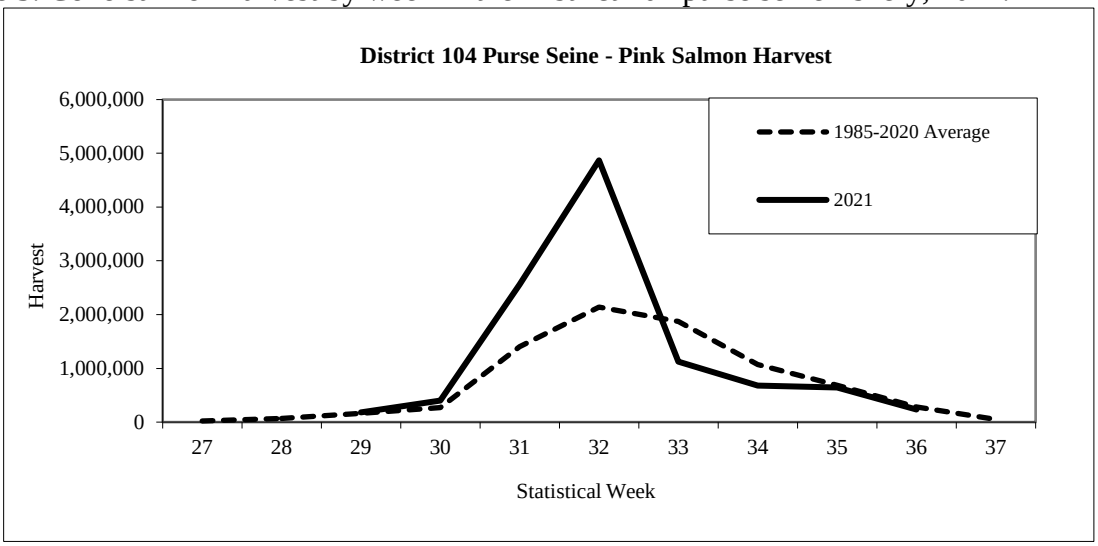


Figure 6. Pink salmon harvest by week in the District 104 purse seine fishery, 2021.

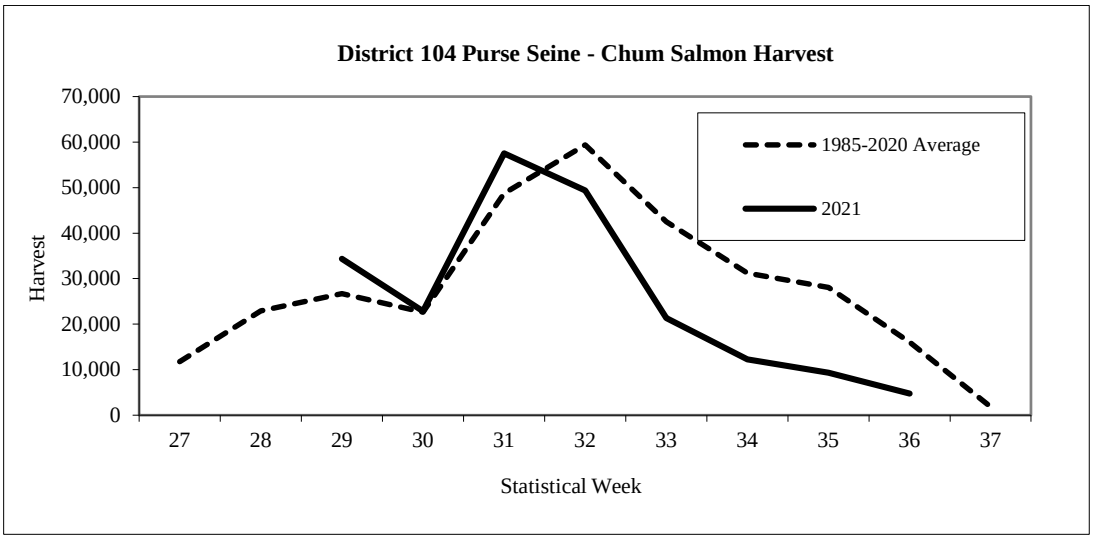


Figure 7. Chum salmon harvest by week in the District 104 purse seine fishery, 2021.

District 101 Drift Gillnet Fishery

The 2019 PST Agreement calls for abundance-based management of the District 101 (Tree Point) drift gillnet fishery. The agreement specifies that the U.S. manage for a harvest of 13.8% of the AAH of the Nass River sockeye salmon run. The AAH is calculated as the total run of Nass River sockeye salmon minus either the escapement requirement of 200,000 fish or the actual in-river escapement, whichever is less. The run of Nass River sockeye salmon was forecasted at 437,000 fish in 2021 which, minus an escapement goal of 200,000 fish, would result in an AAH of about 237,000 fish. Using this forecast, the 2021 allowable harvest in the District 101 drift gillnet fishery was approximately 33,000 Nass River sockeye salmon.

The District 101 drift gillnet fishery opens by regulation on the third Sunday in June, which was June 20 (week 26) in 2021. 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 drift gillnet fishing time in this district in relation to the District 101 purse seine fishing time. Beginning in week 37 (September 5) management was based on the strength of wild stock coho salmon.

The number of days the fishery opened was near or above average most of the 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 52, which was approximately 51% of the long-term (1985–2020) average of 102 boats. A total of 21,577 sockeye salmon were harvested, which was just 20% of the 1985–2020 average of 106,359 fish (Table 3). Harvests of sockeye salmon were well below average through most of the season (Figure 10). The cumulative sockeye salmon harvest prior to the initiation of the PSMP in week 30 was 8,059 fish, or about 37% of the season's total sockeye salmon harvest. The preliminary estimate of the 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 2021 season. In past years approximately

65% of the District 101 drift gillnet sockeye salmon harvest has been of Nass River origin, therefore we would anticipate that approximately 14,000 Nass River sockeye salmon may have been harvested in the District 101 drift gillnet fishery in 2021.

Coho salmon harvests were near average throughout the season and the total harvest of 47,362 fish was right at average (Table 3; Figure 11). Pink salmon harvests were below average most of the season, despite very large runs of pink salmon to southern Southeast Alaska, and the total harvest of 144,366 fish was 30% of average (Figure 12). Chum salmon harvests were also below average in most weeks of the fishery and the total harvest of 171,272 fish was 59% of average (Figure 13). Chinook salmon harvests were above average in most weeks of the season (Figure 14).

Table 3. Weekly salmon harvest and fishing effort in the Alaska District 101 commercial drift gillnet fishery, 2021.

Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Hours
26	6/20	390	487	150	270	3,869	26	96
27	6/27	549	2,348	723	2,841	13,828	32	96
28	7/4	406	2,984	894	4,673	27,368	38	96
29	7/11	279	2,240	1,358	11,700	34,936	42	96
30	7/18	111	3,567	1,373	23,558	27,727	43	96
31	7/25	48	3,158	2,193	16,067	20,414	35	120
32	8/1	67	1,632	4,995	29,189	16,345	36	120
33	8/8	18	2,354	4,138	20,035	8,344	29	120
34	8/15	9	1,003	3,736	15,599	5,428	26	120
35	8/22	5	633	4,727	12,751	4,687	27	120
36	8/29	7	1,052	9,717	7,587	5,521	33	120
37	9/5	1	93	5,749	88	1,447	30	96
38	9/12	0	25	6,151	8	1,227	25	96
39	9/19	0	1	1,355	0	119	16	96
40	9/26	2	0	103	0	12	4	96
Total		1,892	21,577	47,362	144,366	171,272	52	1,584
1985-2020 Avg.		1,489	106,359	47,271	473,666	290,484	104	1,371

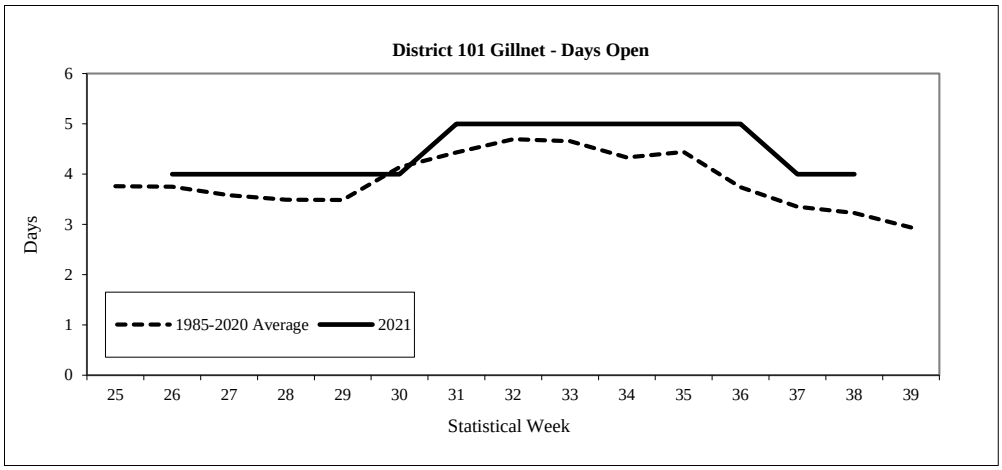


Figure 8. Days open by week in the District 101 drift gillnet fishery, 2021.

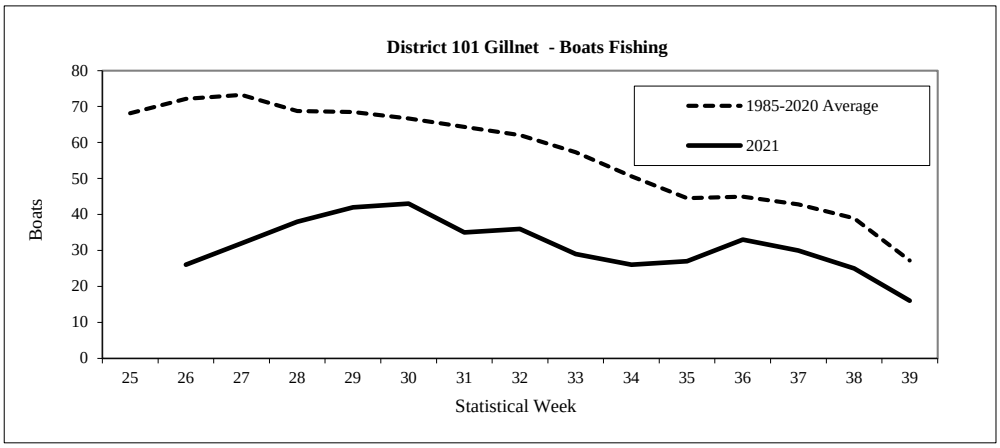


Figure 9. Number of boats fishing by week in the District 101 drift gillnet fishery, 2021.

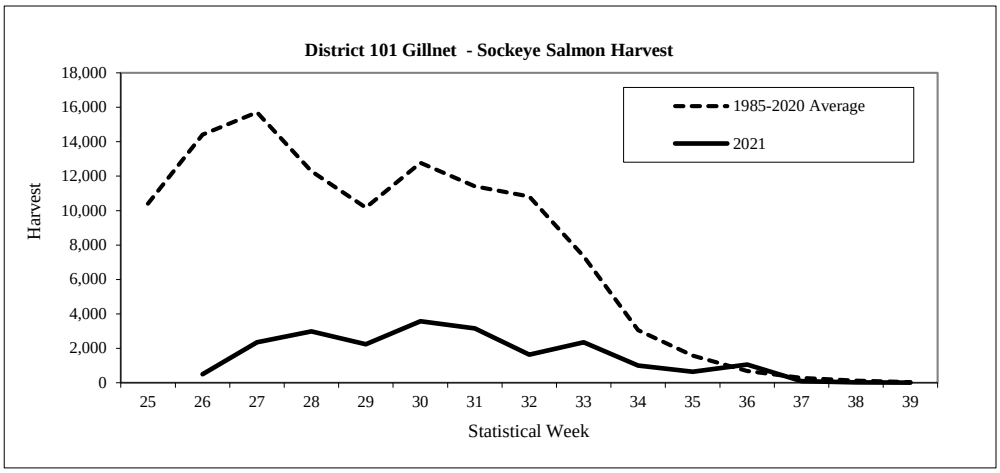


Figure 10. Sockeye salmon harvest by week in the District 101 drift gillnet fishery, 2021.

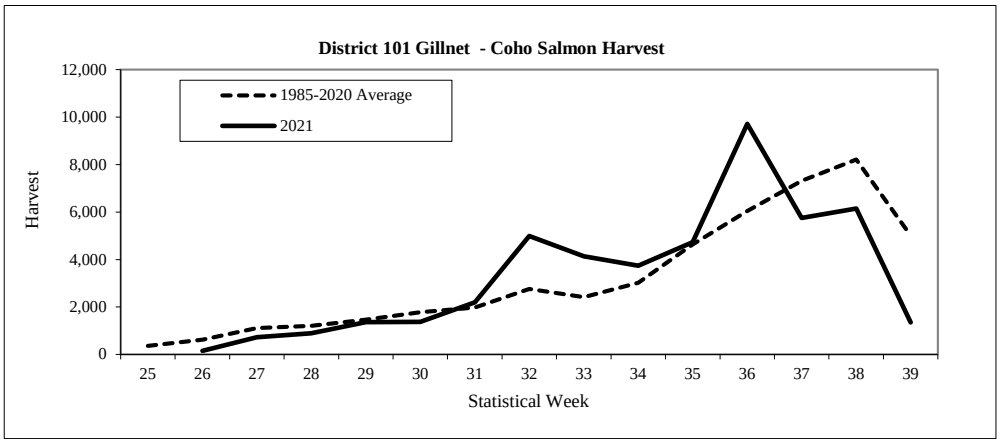


Figure 11. Coho salmon harvest by week in the District 101 drift gillnet fishery, 2021.

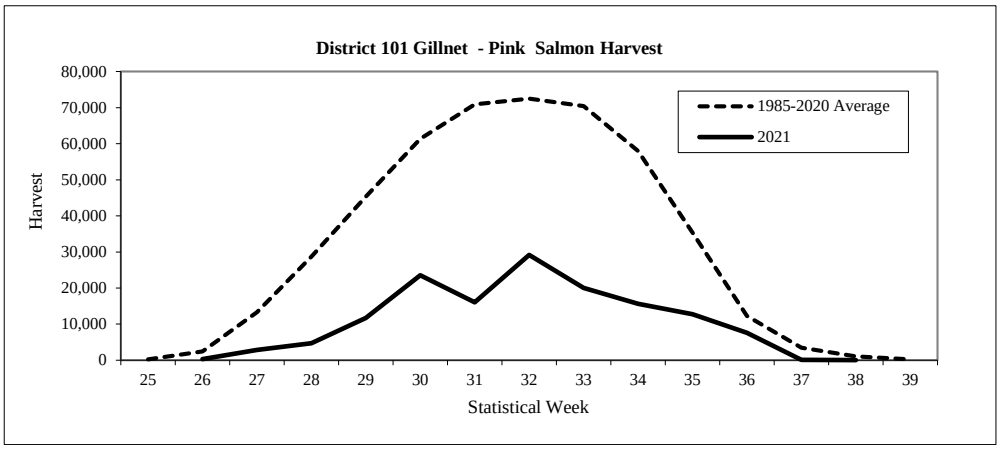


Figure 12. Pink salmon harvest by week in the District 101 drift gillnet fishery, 2021.

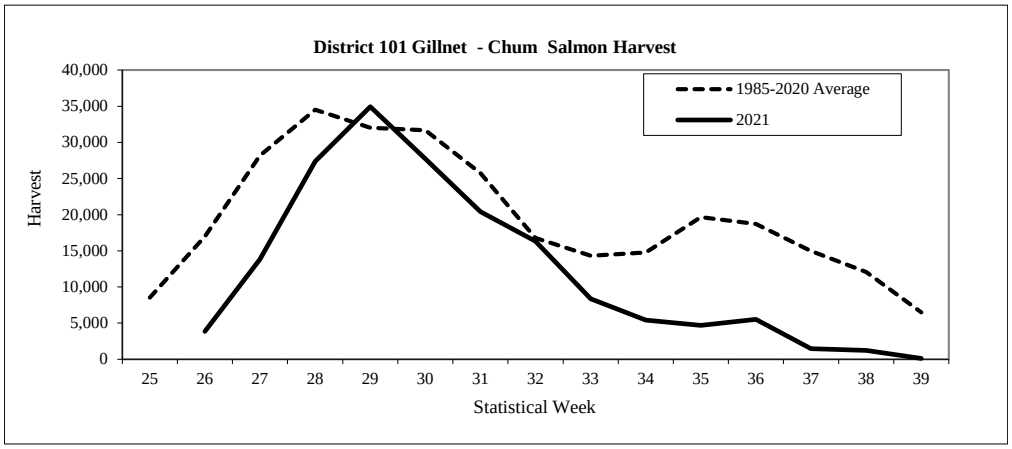


Figure 13. Chum salmon harvest by week in the District 101 drift gillnet fishery, 2021.

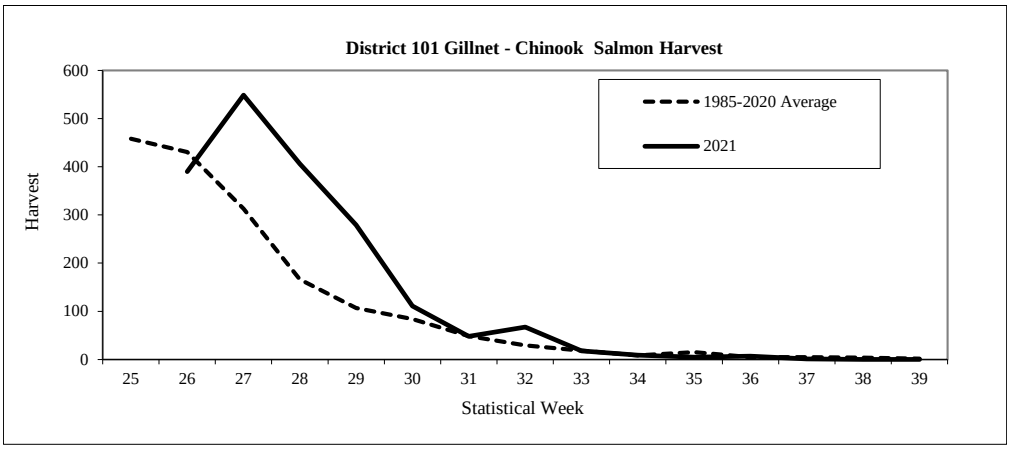


Figure 14. Chinook salmon harvest by week in the District 101 drift gillnet fishery, 2021.

Pink, Sockeye, and Chum Salmon Escapements

Escapements of pink salmon were very strong in southern Southeast Alaska (SEAK) and variable in northern SEAK. The total 2021 SEAK pink salmon escapement index of 15.67 million fish ranked 10th since 1960. Biological escapement goals were met in the Southern Southeast, Northern Southeast Inside, and Northern Southeast Outside subregions (Table 4). On a finer scale, escapements were within or above management targets for all 15 districts in the region and for 40 of the 46 pink salmon stock groups in SEAK. The Southern Southeast Subregion includes all of the area from Sumner Strait south to Dixon Entrance (Districts 101–108). The escapement index value of 9.81 million was above the escapement goal range of 3.0 to 8.0 million index fish and was the largest escapement since 2013.

Table 4. Southeast Alaska 2021 pink salmon escapement indices and biological escapement goals by subregion (in millions).

Subregion	2021 Pink Salmon Index	Biological Escapement Goal Lower Bound	Biological Escapement Goal Upper Bound
Southern Southeast	9.81	3.00	8.00
Northern Southeast Inside	3.91	2.50	6.00
Northern Southeast Outside	1.94	0.75	2.50
Total	15.67		

Sockeye salmon escapement levels throughout SEAK were mixed in 2021, and lower bounds of escapement goal ranges were achieved for at least 8 of the 12 sockeye salmon systems with formal escapement goals. The Hugh Smith Lake adult sockeye salmon escapement was 3,235 fish, 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 44,500 fish, which was below the sustainable escapement goal range of 55,000 to 120,000 fish.

For summer-run chum salmon, lower bound sustainable escapement goals were not achieved for two of the three subregions in SEAK. 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 SEAK, 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 below average at many index streams in southern SEAK, but the index of 77,000 in 2021 met the escapement goal (Figure 15).

Cholmondeley Sound is the only area in southern SEAK 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 55,000 fish was above the sustainable escapement goal range of 30,000 to 48,000 index spawners (based on the aggregate peak survey to both streams; Figure 16).

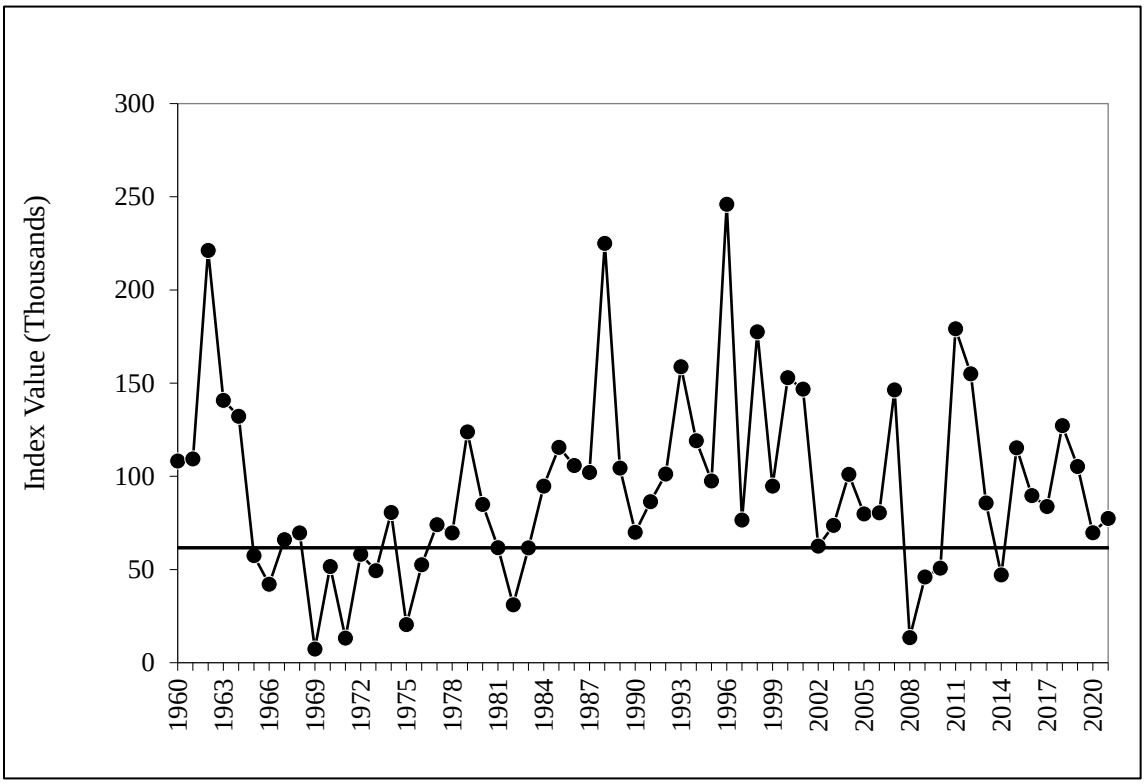


Figure 15. Observed escapement index value by year (solid circles) and the sustainable escapement goal threshold of 62,000 index spawners (horizontal line) for wild summer-run chum salmon in the Southern Southeast Subregion, 1960–2021.

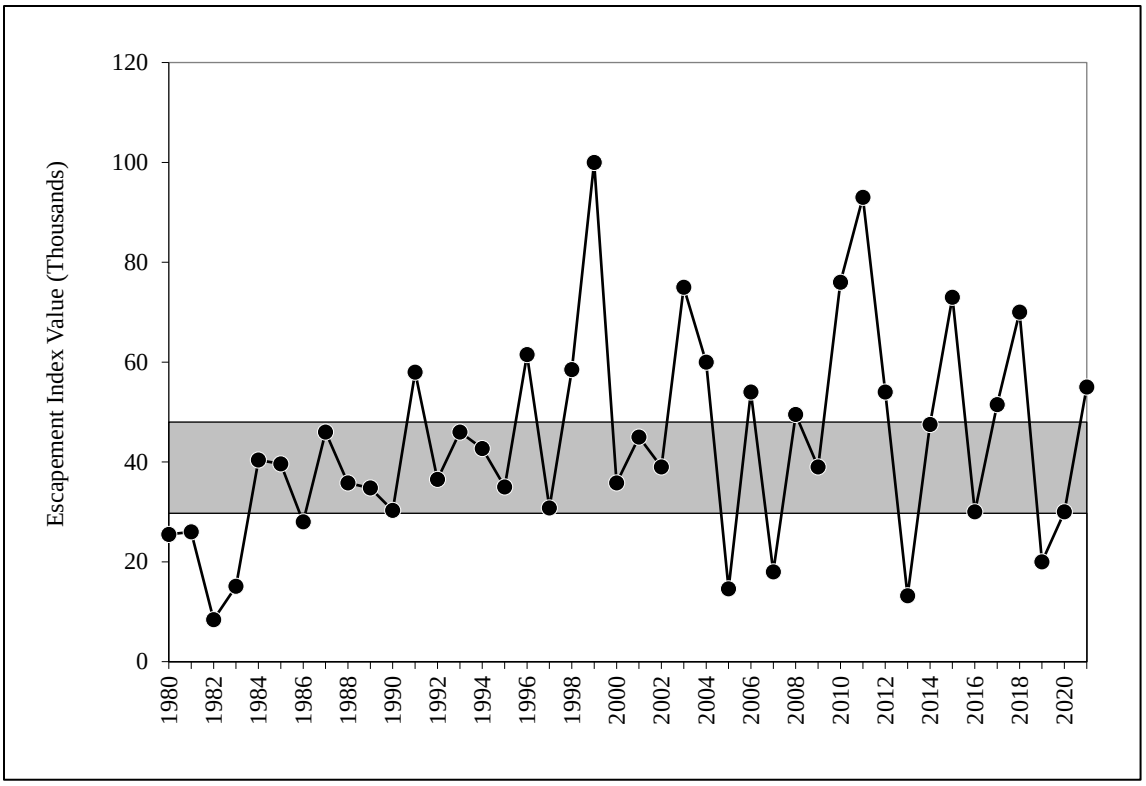


Figure 16. Observed escapement index value by year (solid circles) and the sustainable escapement goal range of 30,000 to 48,000 index spawners (shaded area) for Cholmondeley Sound fall-run chum salmon, 1980–2021.

TRANSBOUNDARY AREA FISHERIES

Stikine River Area Fisheries

The 2021 preseason forecast for large Chinook salmon (≥660 mm mid eye to tail fork length) returning to the Stikine River was approximately 9,900 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. The preliminary escapement estimate of Stikine River large Chinook salmon is 9,900 fish, which is below the lower end of the goal range of 14,000 to 28,000 fish.

The 2021 preseason forecast for sockeye salmon returning to the Stikine River was 56,000 fish, which was below the 2011–2020 average of 108,000 fish. The 2021 forecast included approximately 9,000 wild Tahltan (16%), 19,000 enhanced Tahltan (34%), and 28,000 mainstem (50%) sockeye salmon. During the first half of the sockeye salmon management period, 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. Management actions during the second half of the sockeye salmon fishery became focused on the mainstem component of the Stikine River run in District 108, while returns to local area systems were the focus in District 106. Typically, Tahltan Lake sockeye salmon stocks exhibit peak run timing in District 106 and 108 fisheries during statistical week 26 (June 21–June 27). During an average Tahltan Lake run, significant numbers of sockeye salmon could be present as early as statistical week 24 (June 6–12) and as late as statistical week 31 (July 25–31). The 2021 runs of local area sockeye salmon stocks were improved over 2020, but still below average.

Due to the poor performance of Chinook salmon stocks in SEAK, restrictions were implemented in the Districts 106 and 108 drift gillnet fisheries to conserve Chinook salmon. In District 106, the initial opening was delayed by one week until week 26 (June 20) and a 6-inch maximum mesh restriction was in place for the first three openings. Due to conservative measures in place for sockeye salmon, the initial opening in District 108 was delayed until week 33. Because of the closure, no Stikine River origin Chinook salmon were harvested in the District 108 fishery during the reporting period. The District 108 Spring Troll hatchery access fishery was closed for 2021. Commercial trolling remained closed to Chinook salmon retention in District 108 until the second opening of the summer troll fishery. Therefore, no Stikine River origin Chinook were harvested in the troll fishery during the reporting period. The U.S. harvest of Stikine River large Chinook salmon in all District 108 fisheries was estimated to be 67 fish (58 from the sport fishery and 9 from the Federal subsistence fishery); well below the U.S. base level catch (BLC) of 3,400 fish.

The District 106 drift gillnet sockeye salmon fishery opened Sunday, June 20 (week 26) and the District 108 drift gillnet fishery first opened Sunday, August 8 (week 33). Given the below average forecast of sockeye salmon runs returning to the Stikine River and local area stocks, fishing time was limited to two or three days throughout early August in District 106, and District 108 remained closed until the second week of August based on a very poor preseason forecast for Stikine River sockeye salmon. Mesh restrictions were in place through week 28 in District 106, but were lifted for week 29. Area restrictions continued to be in place for District 108 once it opened in week 33. No commercial fishing time was allowed in District 108 during the 2021 sockeye salmon season. Open time in District 106 also experienced weekly reductions and was limited to two days per week in weeks 29 through 31 for McDonald Lake sockeye salmon conservation (Tables 5 and 6). The preliminary postseason assessment for Stikine River sockeye salmon was not available at the time of this report.

Districts 106 and 108 were managed based on pink salmon abundance during the month of August, and in late August management focus switched to coho salmon. The number of boats participating in the District 106 fishery was below average during July and near or above average in August and September (Figure 18). The seasonal number of permits fished was 95% of average (Table 5). The number of boats participating in the District 108 fishery was near average from the second week of August through late September (Figure 25). The 72 permits fished was 62% of the average of 116 permits (Figure 25; Table 7).

During the 2021 season, 156,483 pink salmon, 51,776 sockeye salmon, 136,560 chum salmon, 74,756 coho salmon, and 965 Chinook salmon were harvested in the District 106 drift gillnet fishery (Table 5). Chinook salmon harvests were below average in most weeks from late June through mid-September (Figure 19); the harvest was comprised of 66% Alaska hatchery origin fish. Sockeye salmon harvests were below average from late June to late July and then increased to above average in August (Figure 20), and the total sockeye salmon harvest of 51,776 fish was 82% of the 2011–2020 average; the number estimated to be of Stikine River origin was not available at the time of this report. Harvests of coho salmon were also below average in most weeks of the season and the overall harvest of 74,756 coho salmon was 63% of the 2011–2020 average of 118,600 fish (Figure 21). Pink salmon harvests were also below average most of the season (Figure 22), and the overall harvest of 156,483 fish was 50% of the 2011–2020 average. Chum salmon harvests were below average early in the season and increased to above average after mid-July. The overall harvest of 136,560 chum salmon was 91% of average (Figure 23).

During the 2021 season, 6,482 pink salmon, 815 sockeye salmon, 49,371 chum salmon, 12,140 coho salmon, and 93 Chinook salmon were harvested in the District 108 drift gillnet fishery (Table 6). Due to the late start of the fishery few Chinook salmon were harvested (Figure 26). An estimated 67 Stikine River large Chinook salmon were harvested in District 108 from weeks 25 through 29 by subsistence and sport fisheries. District 108 gillnet sockeye salmon harvests were near average late in the season, but the fishery was closed through most of the sockeye salmon run and the harvest of 815 fish was only 3% of the 2011–2020 average (Figure 27). The number of sockeye salmon estimated to be Stikine River origin was not available at the time of this report. The overall coho salmon harvest of 12,140 fish was 55% of the 2011–2020 average of 22,000 fish (Table 6, Figure 28). The pink salmon harvest was 17% of the 2011–2020 average (Figure 29). Chum salmon harvests were well above average when the season opened in August and the week 33 harvest of 37,986 fish was nearly four times the recent 10-year average (Figure 30).

Table 5. Weekly salmon harvest and fishing effort in the Alaskan District 106 commercial drift gillnet fisheries, 2021.

Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Days	Boat Days
26	20-Jun	151	970	153	3,923	3,123	19	2	38
27	27-Jun	107	885	338	3,131	3,202	38	2	76
28	4-Jun	176	1,905	884	2,534	6,684	39	2	78
29	11-Jul	121	946	1,749	1,598	11,875	36	2	72
30	18-Jul	136	3,084	3,427	9,799	19,842	51	2	102
31	25-Jul	65	4,202	3,879	11,290	25,874	68	2	136
32	1-Aug	75	7,246	6,930	30,823	12,326	90	3	270
33	8-Aug	38	7,820	5,548	21,040	9,584	48	4	192
34	15-Aug	24	14,328	9,016	40,188	15,028	68	5	340
35	22-Aug	32	8,333	6,810	17,405	8,691	65	4	260
36	29-Aug	17	1,823	12,167	13,790	12,418	69	4	276
37	5-Sep	3	187	11,786	904	4,690	68	3	204
38	12-Sep	7	25	8,845	47	2,693	55	3	165
39	19-Sep	9	0	2,720	11	350	23	2	46
40	26-Sep	4	22	504	0	180	13	2	26
Total		965	51,776	74,756	156,483	136,560	134	42	2,280
2011–2020 Average		2,100	63,321	118,586	314,227	149,332	141	45	2,490
2021 as % of Average		46%	82%	63%	50%	91%	95%	93%	92%

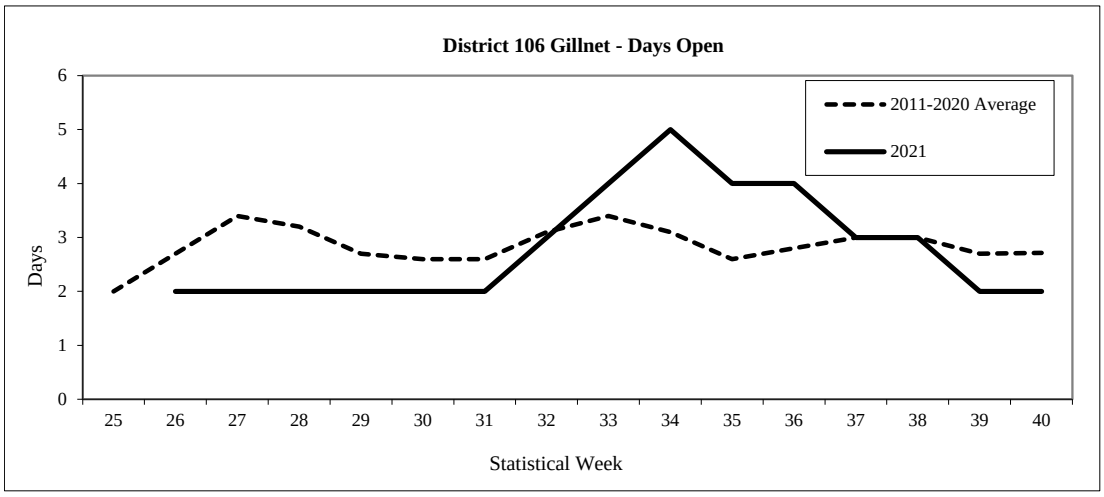


Figure 17. Days open by week in the District 106 drift gillnet fishery, 2021.

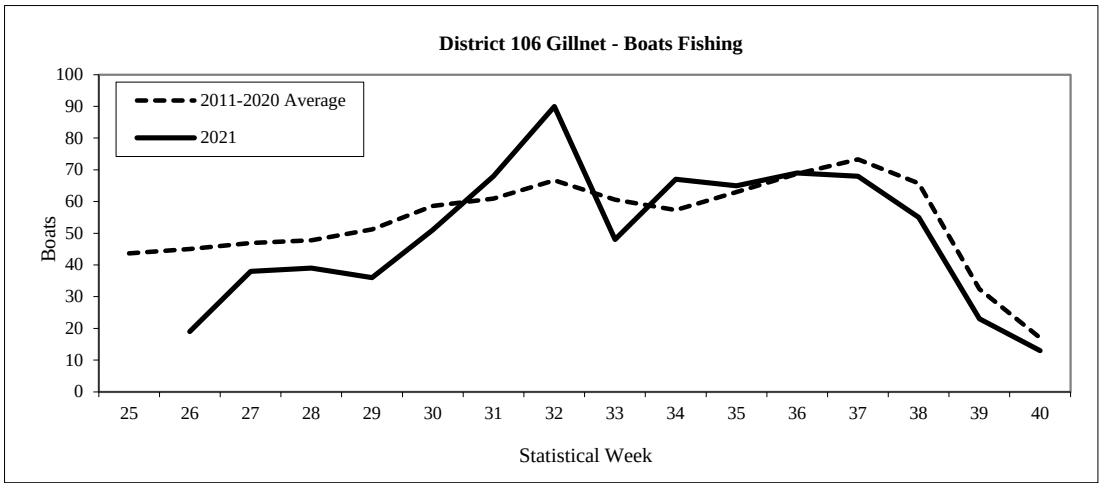


Figure 18. Number of boats fishing by week in the District 106 drift gillnet fishery, 2021.

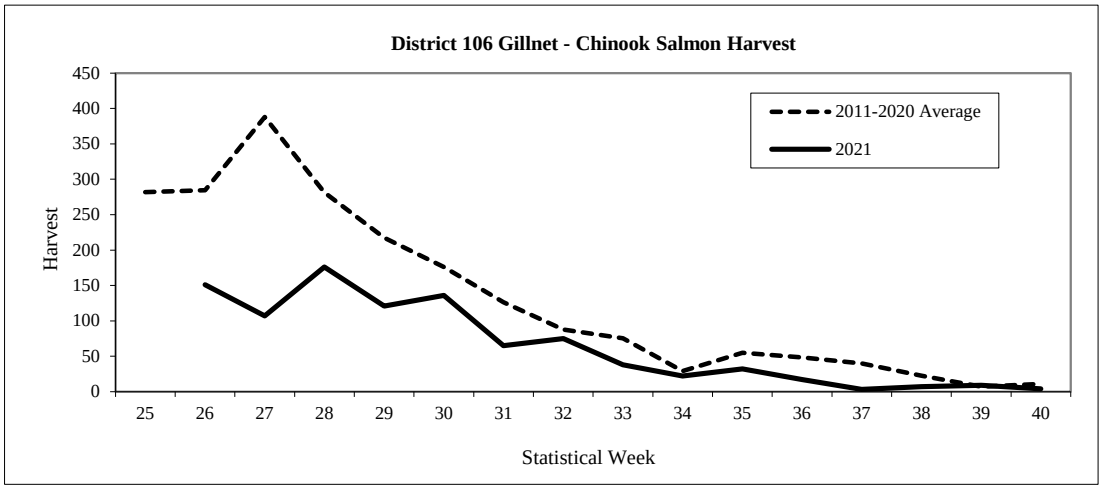


Figure 19. Chinook salmon harvest by week in the District 106 drift gillnet fishery, 2021.

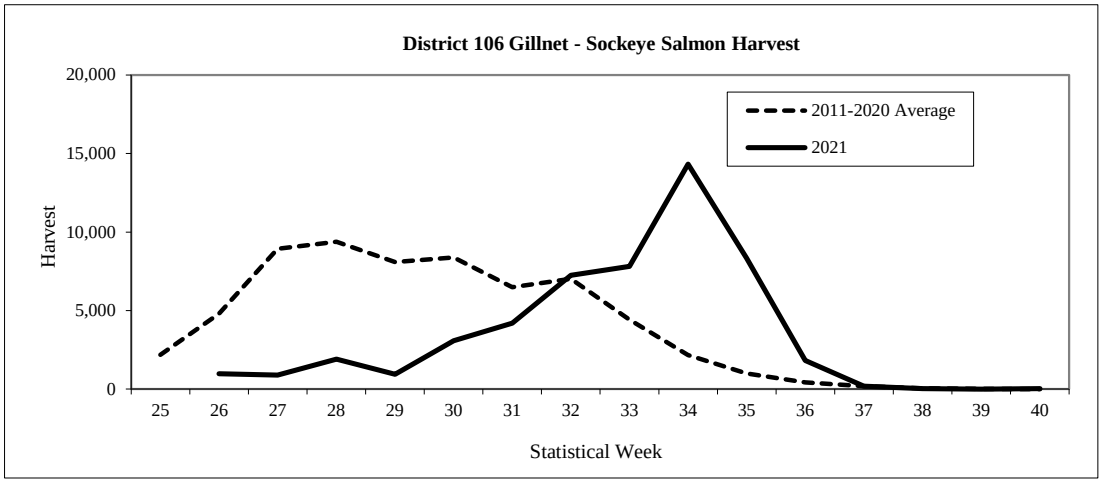


Figure 20. Sockeye salmon harvest by week in the District 106 drift gillnet fishery, 2021.

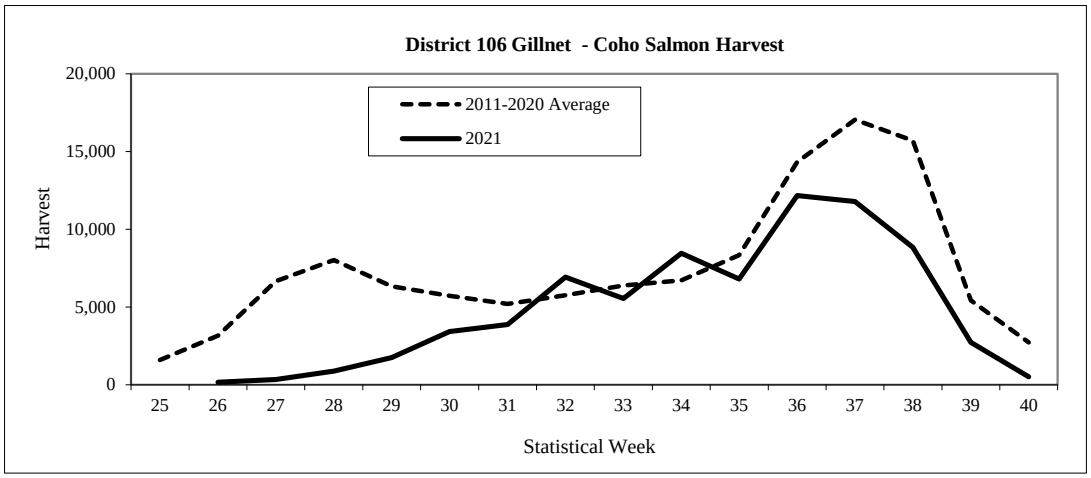


Figure 21. Coho salmon harvest by week in the District 106 drift gillnet fishery, 2021.

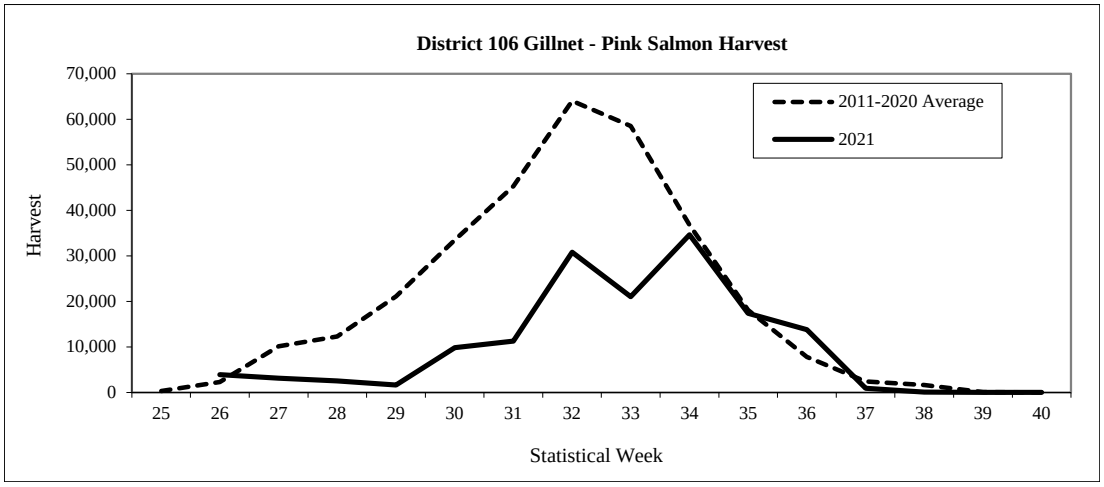


Figure 22. Pink salmon harvest by week in the District 106 drift gillnet fishery, 2021.

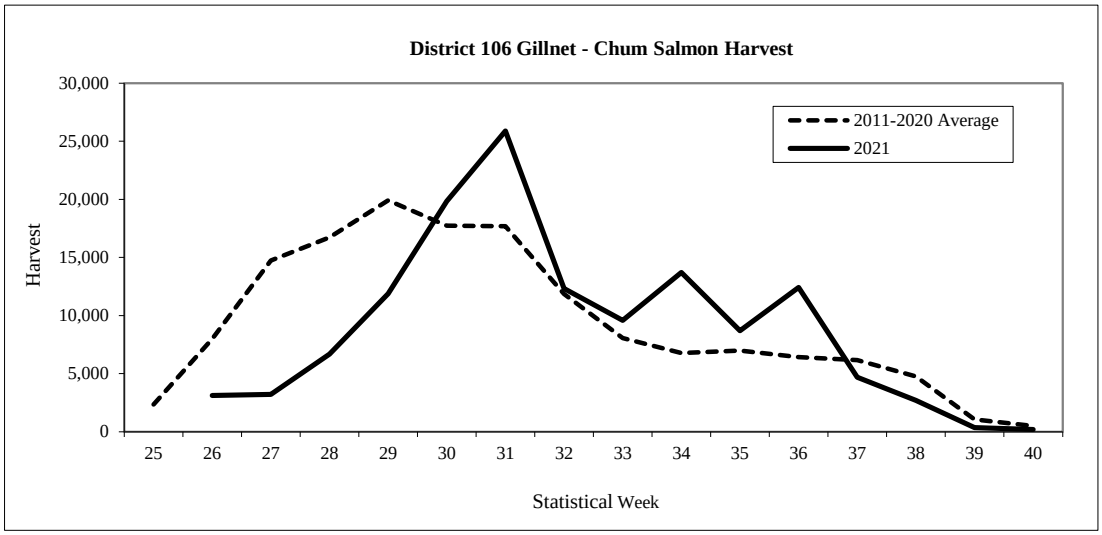


Figure 23. Chum salmon harvest by week in the District 106 drift gillnet fishery, 2021.

Table 6. Weekly salmon harvest and fishing effort in the Alaskan District 108 commercial drift gillnet fishery, 2021.

Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Days	Boat Days
26	Closed	–	–	–	–	–	–	–	–
27	Closed	–	–	–	–	–	–	–	–
28	Closed	–	–	–	–	–	–	–	–
29	Closed	–	–	–	–	–	–	–	–
30	Closed	–	–	–	–	–	–	–	–
31	Closed	–	–	–	–	–	–	–	–
32	Closed	–	–	–	–	–	–	–	–
33	8-Aug	65	381	1,119	3,321	37,986	57	4	224
34	15-Aug	18	205	1,369	2,319	7,359	24	5	125
35	22-Aug	1	77	565	93	1,918	15	4	60
36	29-Aug	1	119	1,931	551	672	19	4	76
37	5-Sep	0	32	4,929	197	1,201	27	3	81
38	12-Sep	6	0	1,260	1	186	22	3	66
39	19-Sep	2	1	902	0	49	11	2	22
40	26-Sep	0	0	65	0	0	1	2	2
Total		93	815	12,140	6,482	49,371	72	27	656
2011-2020 Average		6,939	23,632	21,984	38,978	135,284	116	46	1,566
2021 as % of Average		1%	3%	55%	17%	36%	62%	59%	42%

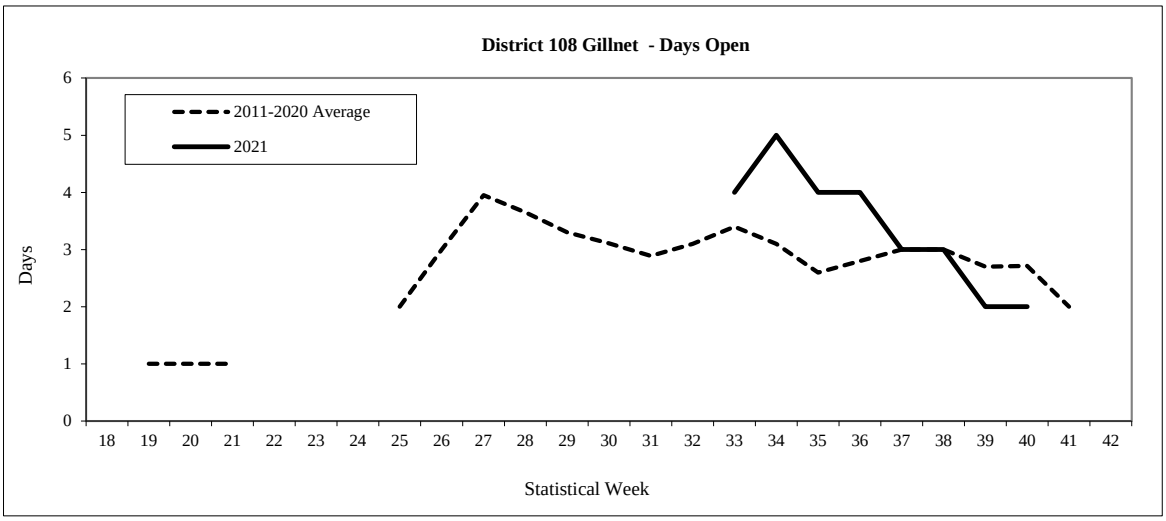


Figure 24. Days open by week in the District 108 drift gillnet fishery, 2021.

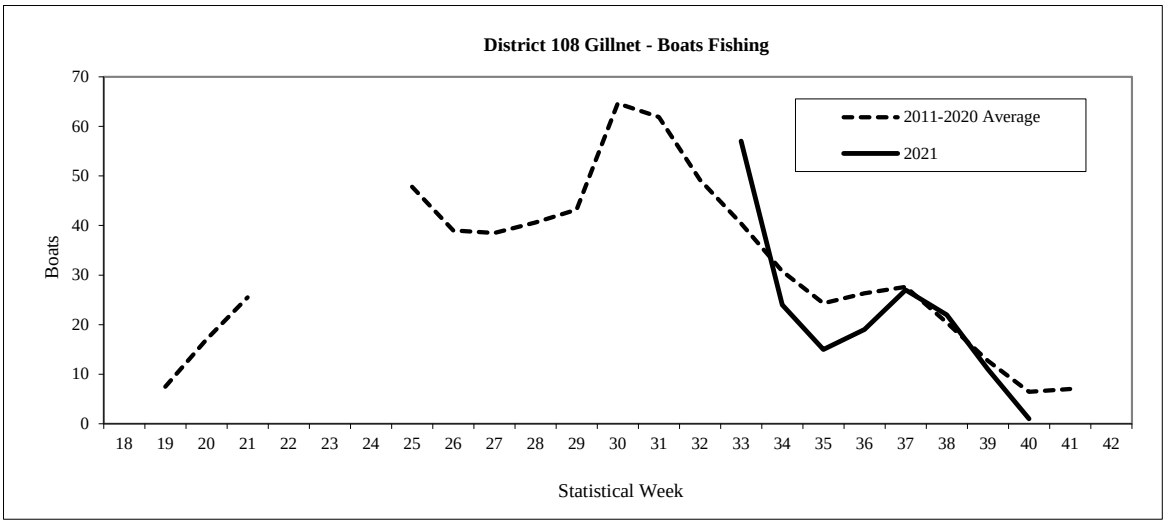


Figure 25. Number of boats fishing by week in the District 108 drift gillnet fishery, 2021.

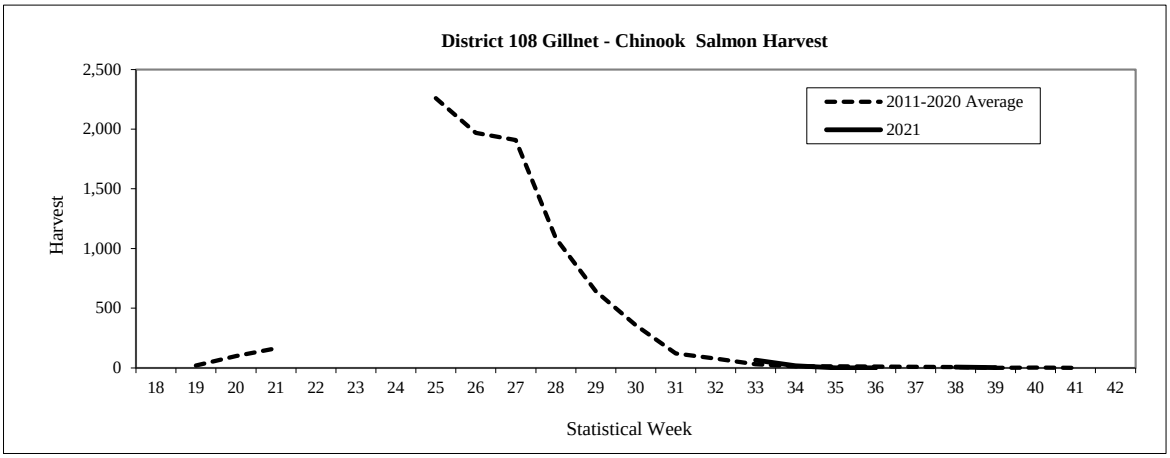


Figure 26. Chinook salmon harvest by week in the District 108 drift gillnet fishery, 2021.

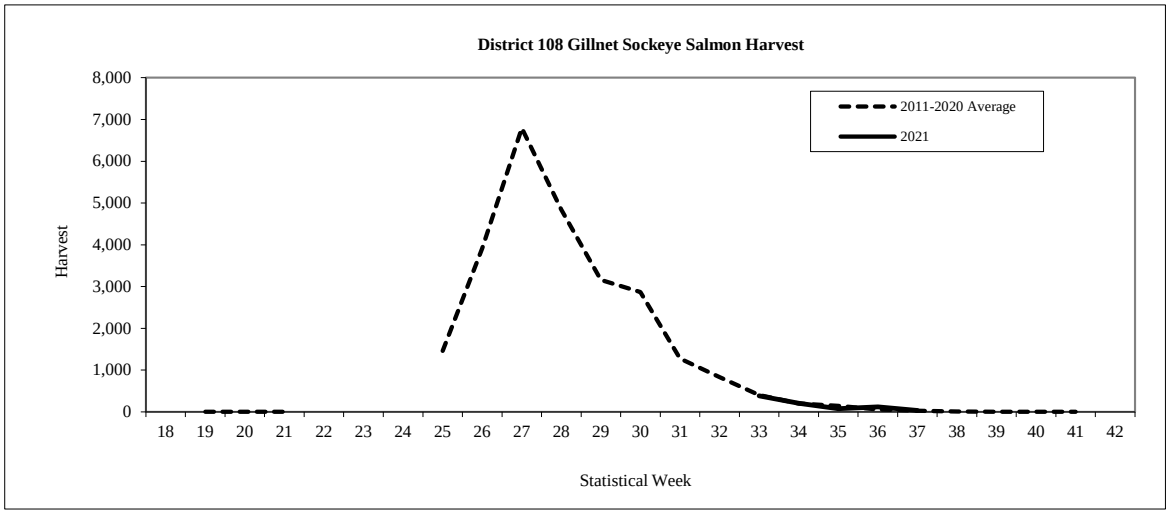


Figure 27. Sockeye salmon harvest by week in the District 108 drift gillnet fishery, 2021.

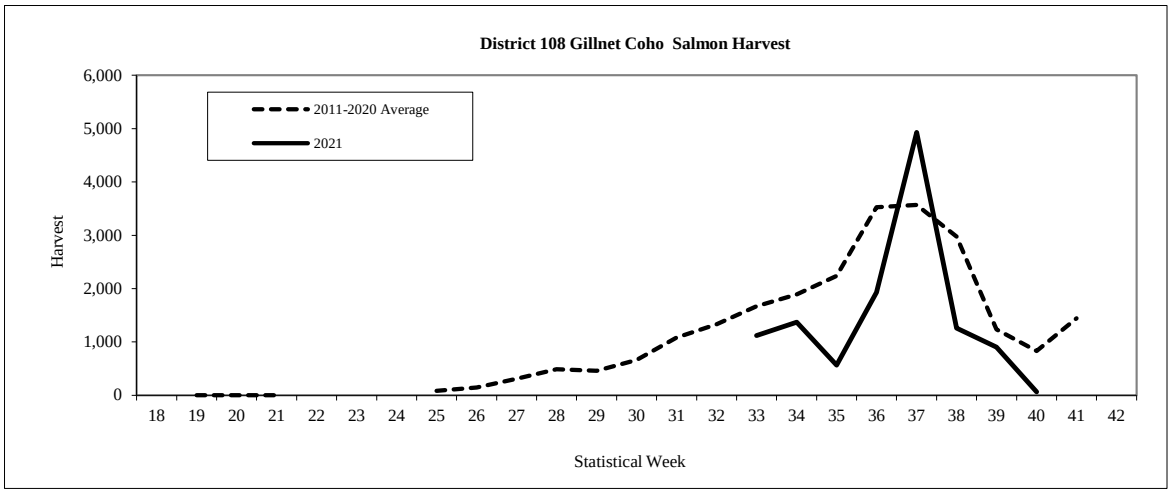


Figure 28. Coho salmon harvest by week in the District 108 drift gillnet fishery, 2021.

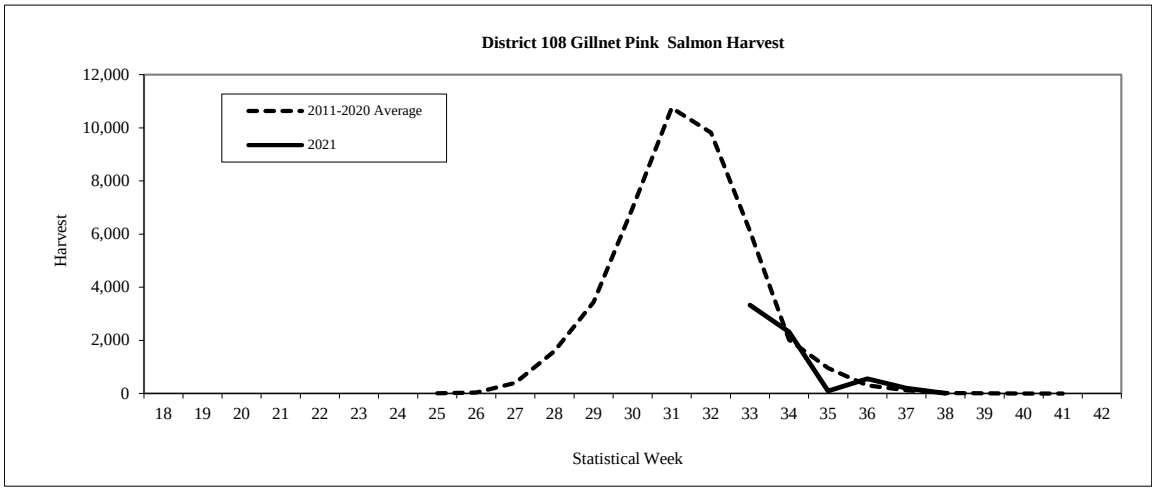


Figure 29. Pink salmon harvest by week in the District 108 drift gillnet fishery, 2021.

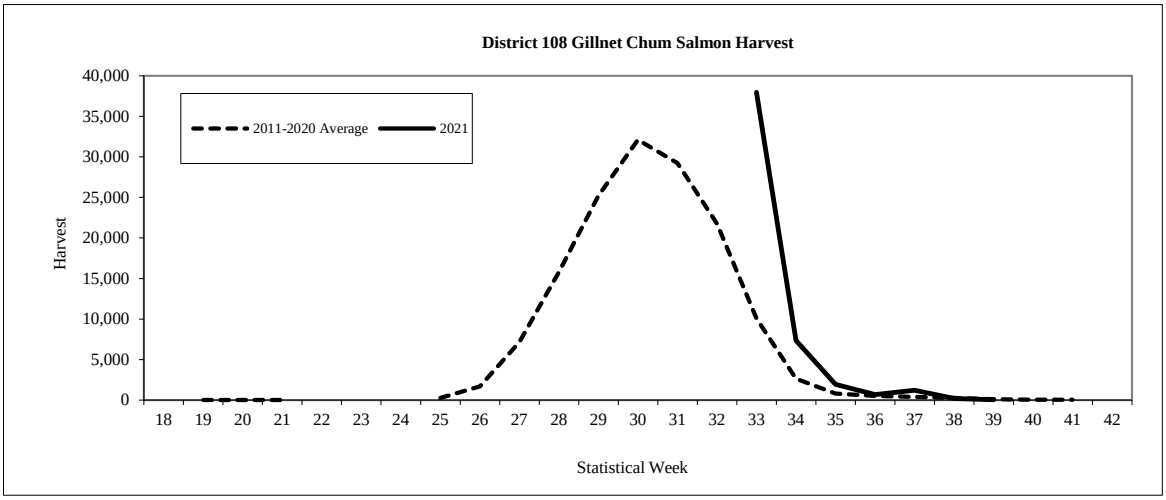


Figure 30. Chum salmon harvest by week in the District 108 drift gillnet fishery, 2021.

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 weeks 18 through 24 when there are sufficient fish surplus to escapement needs to provide for a fishery. From weeks 25 through 33 the fishery is managed for Taku River sockeye salmon, and from weeks 34 through 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 management objective of 25,500 fish. In years of high abundance, directed Chinook salmon fisheries can be implemented to harvest fish in excess of escapement needs. The 2021 preseason terminal run forecast for the Taku River of 10,300 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 26–28) to minimize Chinook salmon harvest.

A bilaterally agreed to MSY escapement goal range of 40,000 to 75,000 Taku River sockeye salmon with a management objective of 58,000 wild fish was adopted for the 2020 fishing season and the remainder of the Annex period. Inseason run size estimates, calculated by an ongoing mark-recapture project, take into account tag dropout rates established by recent radio telemetry studies as well as size selectivity in the mark (Canyon Island fish wheels) and recapture (Canada commercial drift gillnet) gear. The 2021 Taku River wild sockeye salmon terminal run forecast of 140,000 fish, based on Canadian stock-recruit and sibling forecasts, was near the 2011–2020 average of 144,000 wild fish. DIPAC forecasted 106,000 enhanced sockeye salmon returning through District 111 waters to Snettisham Hatchery.

An escapement goal range of 50,000 to 90,000 Taku River coho salmon with a management objective of 70,000 fish was adopted in early 2015. New harvest sharing provisions between the U.S. District 111 drift gillnet fishery and the Canadian inriver fisheries are in place, specified in the 2019 PST agreement, and the U.S. management intent in 2021 was to achieve the U.S. allowable catch and escapement objective. The 2021 preseason Taku River forecast was for a near average terminal run of 94,000 coho salmon, and DIPAC forecast a run of 44,000 enhanced coho salmon from releases in Gastineau Channel. DIPAC forecasted runs totaling 407,000 enhanced chum salmon returning to Gastineau Channel and Limestone Inlet, which was below the recent average.

The traditional drift gillnet fishery in District 111 began on Sunday, June 20, 2021 (week 26). The first four drift gillnet openings of the season in District 111 were for two days, and included combinations of area restriction, 6-inch maximum mesh size restriction, and night closures, intended to minimize harvest of Taku River Chinook salmon. The number of boats fishing was less than half of average in each of the first three weeks. Effort in the District 111 drift gillnet fishery remained below average throughout the season, with a peak of 98 boats fishing in week 30 (Figure 32).

Harvests of sockeye salmon were below average throughout the season and the total harvest of 45,897 fish was 47% of average (Figure 34). Weekly chum salmon harvests were well below average and approximately 185,000 fish were harvested from mid-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. The Chinook salmon harvest of 666 fish was 55% of average (excluding pre-week 25 directed Chinook fisheries; Figure 33). Pink salmon harvests were near average in most weeks of the fishery with a peak in week 30, and the harvest of 136,855 fish was 97% of average (Figure 36). The overall coho salmon harvest of 20,643 fish was below average and the peak weekly harvest of 5,852 fish occurred in week 36 (Figure 35). Fall chum salmon harvests were also below average from week 34 through the end of the season (Figure 37).

Several Chinook salmon stocks 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 in the spring is often the Taku River. Non-retention of Chinook salmon in Districts 111, 112, 115, and parts of Districts 113 and 114, from April 1 through June 14, resulted in minimal harvest of wild fish in the sport fishery. The genetic-based District 111 harvest estimates of Taku River large Chinook salmon during the accounting period are 151 fish in the drift gillnet fishery, 169 fish in the sport fishery, and an estimated 10 fish in the personal use fishery, for a total of 330 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 near the preseason forecast of 10,300 fish, which is below the escapement goal range of 19,000 to 36,000 fish.

Peak harvests of sockeye salmon occurred in weeks 28 through 32 (early July to early August; Figure 34). The Speel Arm SHA was opened minimally in 2021 with low expectations of returning Snettisham Hatchery sockeye salmon due to a near complete loss of the brood year 2017 fish (4-year-old fish in 2021) due to an IHNV outbreak in rearing fish at the hatchery. The entrance of Port Snettisham was opened in the latter portion of the sockeye salmon management period but harvest and effort were low. The Speel Lake weir was operated in 2021 and the escapement of 8,643 sockeye salmon was within the sustainable escapement goal range of 4,000 to 9,000 fish. The minimum mesh size restriction south of Circle Point was used sparingly this season due to a small fleet size and very little chance for a fishery to occur inside the Speel Arm SHA. DIPAC sockeye salmon returning to the Snettisham Hatchery contributed a minimum of 7,000 fish to the traditional District 111 harvest. The preliminary escapement estimate of Taku River sockeye salmon is 161,000 fish, which is above the escapement goal range of 40,000 to 75,000 fish.

The 2021 traditional District 111 coho salmon harvest was 68% of average (Figure 35). Approximately 83% of the coho salmon were harvested in Taku Inlet, which was above the 10-year average of 75%, and 17% were harvested from Stephens Passage and Port Snettisham. Coho salmon stocks harvested in District 111 include returns to the Taku River, Port Snettisham, Stephens Passage, and local Juneau area streams as well as Alaska hatcheries. This was the seventh year of full production for DIPAC's revitalized enhanced coho salmon program. Alaska hatchery (nearly entirely DIPAC) coho salmon first appeared in the District 111 harvest in week 33, and comprised substantial proportions of the harvest from week 35 onwards. Alaska hatchery coho salmon contributed 29% of the 2021 District 111 traditional drift gillnet harvest. The preliminary escapement estimate of Taku River coho salmon is 75,000 fish, which is within the escapement goal range of 50,000 to 90,000 fish.

Pink salmon escapements met the Northern Southeast Inside subregion escapement goal and the District 111 escapement index was just above the lower end of the management target range. The 2021 District 111 traditional fishery chum salmon harvest of 185,684 fish was 38% of average and comprised almost entirely of summer run fish (Figure 37). The summer chum salmon run continues through mid-August (week 33) and is mostly comprised 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 55% of the District 111 chum harvest was taken in Taku Inlet, and 44% in Stephens Passage. The harvest of 341 fall-run chum salmon (i.e. chum salmon caught after week 33) was 15% of average and the lowest on record. Most of these fall-run chum salmon are probably wild fish of Taku and Whiting rivers origin.

Table 7. Weekly salmon harvest and fishing effort in the Alaskan District 111 traditional commercial drift gillnet fishery, 2021.

Week	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Days	Boat Days
26	20-Jun	123	321	0	3	85	16	2	32
27	27-Jun	183	3,816	2	1,012	4,417	19	2	38
28	4-Jul	190	7,875	15	11,044	34,869	48	2	96
29	11-Jul	52	5,552	27	18,507	48,174	88	2	176
30	18-Jul	53	9,075	429	54,291	66,310	98	3	294
31	25-Jul	47	10,379	1,850	28,371	26,775	79	5	395
32	1-Aug	14	5,065	1,882	17,866	4,418	36	5	180
33	8-Aug	0	1,460	560	3,250	295	16	4	64
34	16-Aug	3	858	662	1,827	55	14	3	42
35	22-Aug	1	1,075	2,675	622	122	17	3	51
36	29-Aug	0	378	5,737	46	69	22	4	88
37	5-Sep	0	35	4,641	16	82	22	4	88
38	12-Sep	0	8	1,728	0	11	14	4	56
39–41	19-Sep	0	0	435	0	2	13	12	156
Total		666	45,897	20,643	136,855	185,684	131	55	1,756
2011–2020 Average		1,218	98,297	30,466	140,440	493,204	186	50	2,755
2021 as % of Average		55%	47%	68%	97%	38%	70%	110%	64%

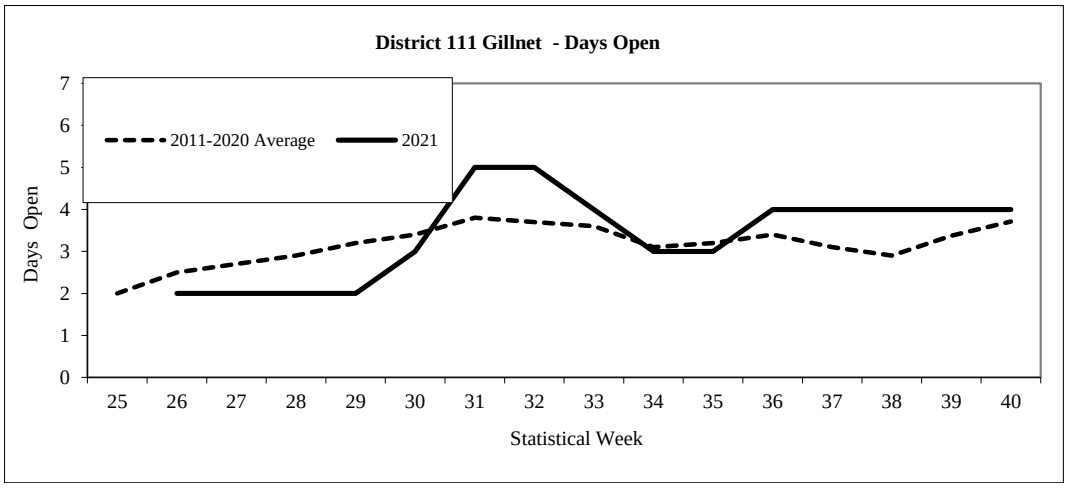


Figure 31. Days open by week in the District 111 drift gillnet fishery, 2021.

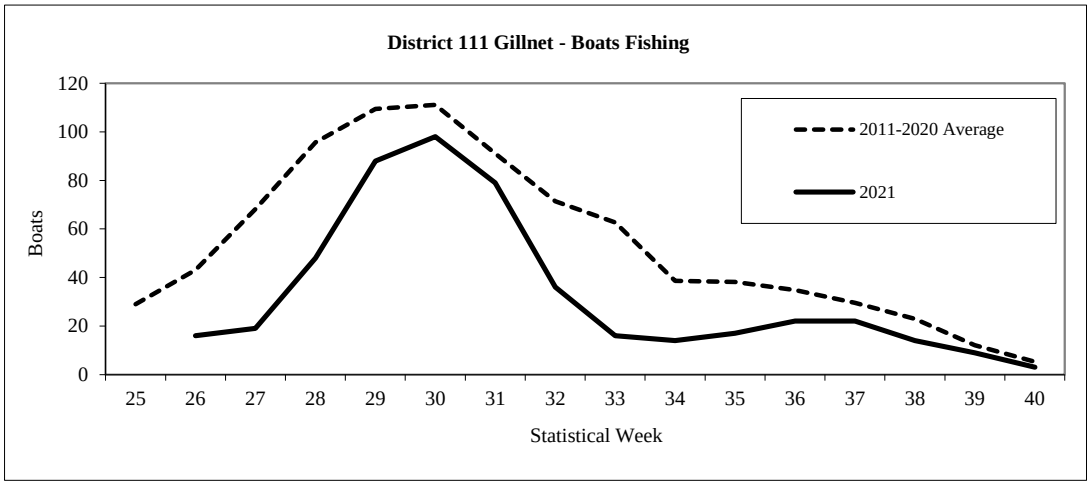


Figure 32. Number of boats fishing by week in the District 111 drift gillnet fishery, 2021.

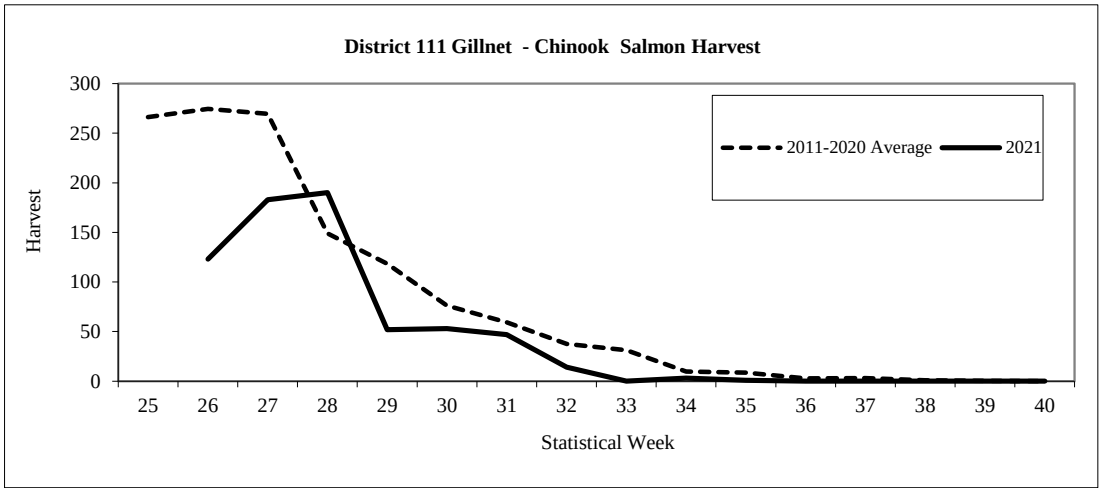


Figure 33. Chinook salmon harvest by week in the District 111 drift gillnet fishery, 2021.

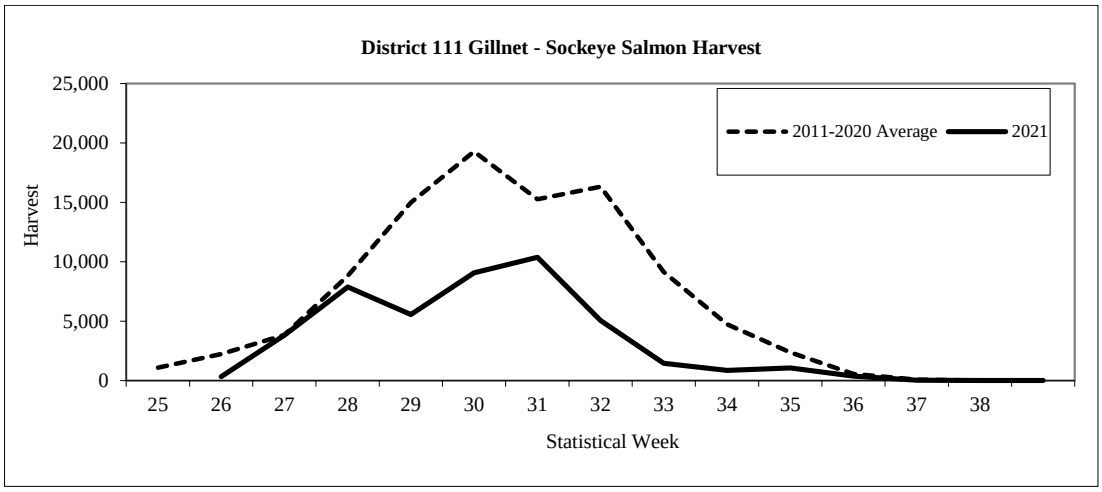


Figure 34. Sockeye salmon harvest by week in the District 111 drift gillnet fishery, 2021.

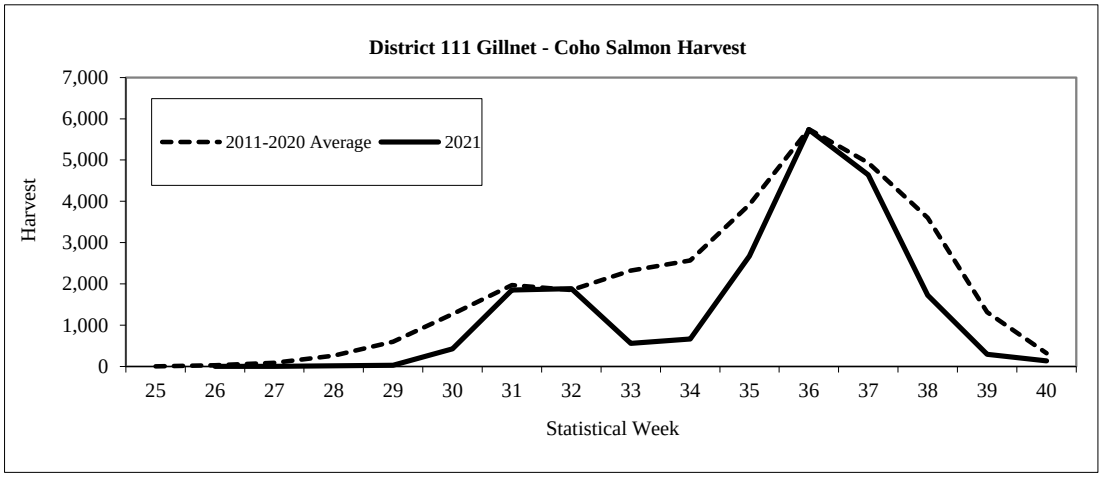


Figure 35. Coho salmon harvest by week in the District 111 drift gillnet fishery, 2021.

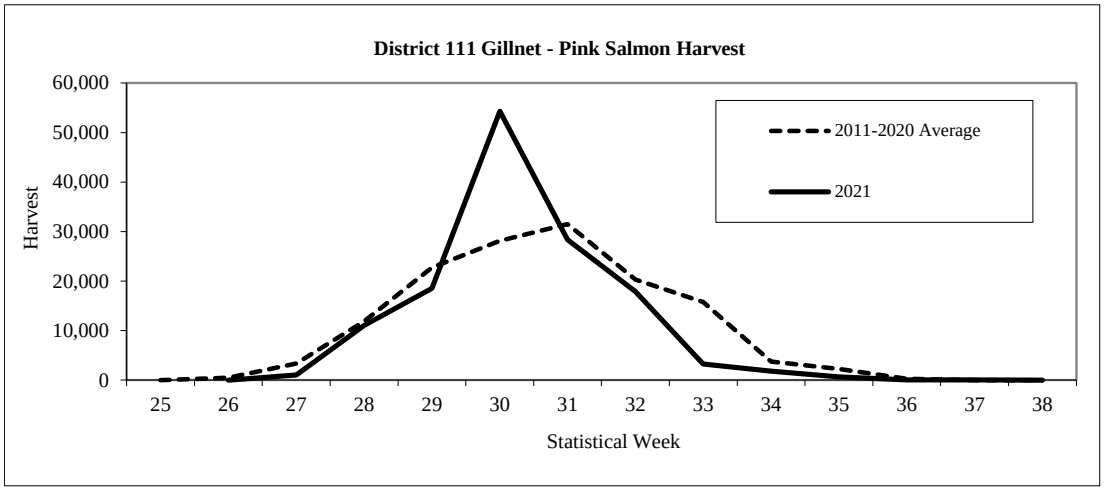


Figure 36. Pink salmon harvest by week in the District 111 drift gillnet fishery, 2020.

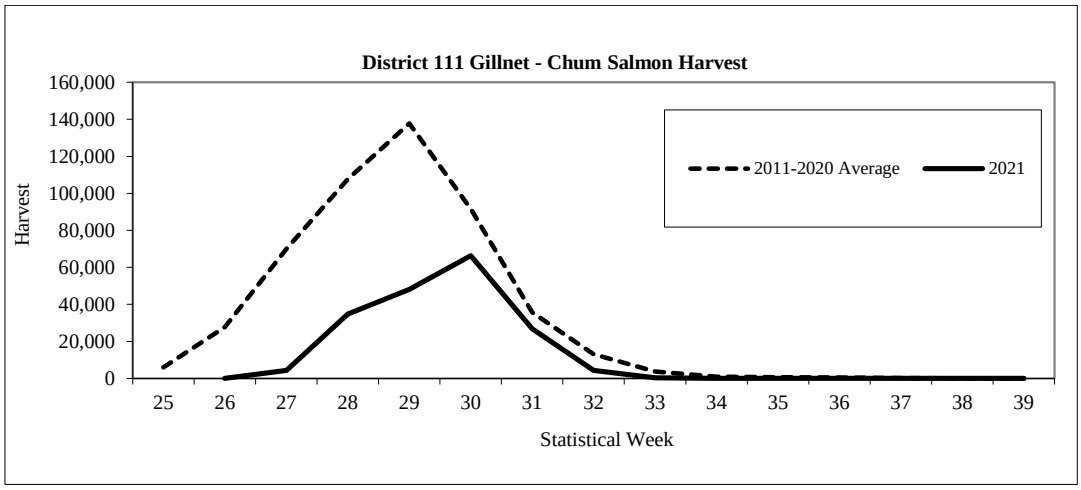


Figure 37. Chum salmon harvest by week in the District 111 drift gillnet fishery, 2021.

Transboundary River Joint Enhancement

The transport of sockeye salmon fry from the Snettisham Hatchery facility back to Canadian lakes was completed on June 8, 2021. Approximately 1.97 million fry were released in Tahltan, Tatsamenie, and Trapper lakes in Canada. The overall green egg to fry survival for brood year (BY) 2020 releases was 72% (Table 8). After transporting BY20 fry back to their respective lakes, all TBR modules, incubators, and short-term fry rearing containers were broken down, cleaned, and disinfected prior to receiving green eggs from BY21 egg takes.

Brood year 2021 egg takes began on September 1 at Trapper Lake, September 11 at Tahltan Lake, and September 15 at Tatsamenie Lake. An estimated total of 5.5 million green eggs were collected from the three donor lakes. Tahltan Lake egg takes were completed on September 17 after collecting an estimated 1.5 million eggs in 3 lots. Tatsamenie Lake egg takes were completed on October 5 after collecting 3.0 million eggs in 6 lots. Trapper Lake egg takes were completed on September 8 after collecting 1.0 million eggs in 3 lots. DFO contractors collected adult sockeye salmon tissue samples on the spawning grounds and shipped them to the ADF&G Juneau Fish Pathology laboratory via Snettisham Hatchery per the 2019 PST Agreement.

Table 8. Summary of numbers and survival rates of brood year 2020 sockeye salmon fry released May and June 2021.

Brood stock	Release site	Number of trips	Survival rate to eyed stage	Survival rate to release	Number released
Tahltan	Tahltan Lk	1	86.4%	65.7%	329,700
Tatsamenie	Upper Tatsamenie Lk	2	82.6%	72.7%	1,038,900
Tatsamenie	Upper Tatsamenie Lk Extended Rearing	2	85.9%	84.3%	241,900
Trapper	Trapper Lake	1	76.5%	68.4%	319,400
	Average/Totals	6	82.6%	71.9%	1,929,900

During the 2021 season, the ADF&G Thermal Mark Lab processed 8,700 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 12-week period. The laboratory provided estimates on hatchery contributions for 40 distinct sample collections. Estimates of the percentage contribution of hatchery fish to commercial 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 River salmon stocks between Canada and the U.S. have not been specified, the 2019 PST Agreement 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 Alsek River Chinook salmon and for sockeye salmon 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 on the Alsek River is the Klukshu River weir, operated by DFO in cooperation with the Champagne-Aishihik First Nation since 1976. In 2013, Canadian and U.S. biologists adopted a biological escapement goal range of 7,500 to 11,000 sockeye salmon through the Klukshu River weir. The current biological escapement goal range for Alsek River Chinook salmon, adopted in January 2018, is a range of 3,500 to 5,300 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). 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 commenced on June 6 with a 24-hour opener and a 6-inch maximum mesh restriction was in effect through July 12 as a Chinook salmon conservation measure.

Preseason expectations were for below average Chinook and sockeye salmon runs in 2021. The overall Alsek River drainage sockeye salmon run was expected to be approximately 44,000 fish, which was below the 2011–2020 average run size of approximately 45,300 sockeye salmon. The preseason outlook for 2021 was based on a predicted run of 10,000 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 genetic stock identification (GSI) from 2005–2006 and 2011–2014). Principal contributing brood years for the 2021 run were 2016 and 2017. The Klukshu River escapements in 2016 and 2017 were 7,400 and 3,700 sockeye salmon respectively, which were both below the 2011–2020 average of 10,800 fish.

The 2021 Alsek River set gillnet fishery opened Sunday June 6 (week 24). The total number of individual permits fished during the season was 14, which was below the 2011–2020 average of 15 permits. The commercial fishery was opened for a total of 46 days which was right at the 10-year average of 46 days. The overall effort in boat-days was 70% of the average due to low or no effort in many weeks late in the season (Table 9). Harvests of Chinook salmon through late June were near the 2011–2020 average. Harvests of sockeye salmon were below average until week 30, and the total harvest of 8,877 fish was 71% of the 2011–2020 average of 12,494 fish (Table 9). There was no 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 2021, no coho salmon were harvested (Table 9).

The Klukshu River weir count of 26,419 sockeye salmon was above the upper bound of the 7,500 to 11,000 fish escapement goal range. The Alsek River drainage estimate of 112,000 fish is above the escapement goal of 24,000 to 33,500 sockeye salmon. The Alsek River drainage escapement estimate of 5,616 Chinook salmon was above the escapement goal range of 3,500 to 5,300 fish.

Table 9. Weekly salmon harvest and fishing effort for the Alaska Alsek River commercial set gillnet fishery, 2021.

							Effort		
Statistical	Start	Catch							Boat
Week	Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Days	Days
24	6-Jun	119	142	0	0	0	11	1	11
25	13-Jun	139	344	0	0	0	11	1	11
26	20-Jun	56	416	0	0	0	12	1	12
27	27-Jun	17	634	0	0	0	11	1	11
28	4-Jul	6	1,135	0	0	0	9	2	9
29	11-Jul	2	1,004	0	0	0	11	1	11
30	18-Jul	1	2,124	0	0	0	9	1	18
31	25-Jul	0	1,630	0	0	0	4	2	8
32	1-Aug	0	1,448	0	0	0	4	1	8
33-42[a]	8-Aug	0	0	0	0	0	0	30	0
Total		340	8,877	0	0	0	14	43	99
2011-2020 Average		345	12,494	295	0	3	15	46	142
2021 as % of Average		99%	71%	0%		0%	93%	93%	70%

[a]. Weeks 33-42 opened to fishing but not fished.

SOUTHEAST ALASKA CHINOOK SALMON FISHERY

All Gear Harvest

The SEAK Chinook salmon fishery is managed to stay within the annual all-gear PST preseason allowable catch limit determined by the SEAK early winter District 113 troll fishery CPUE metric estimated from data collected in statistical weeks 41–48 and to meet escapement goals for 6 SEAK and TBR stocks. Management of the 2021 SEAK Chinook salmon fishery was configured based on a preseason winter power troll CPUE metric of 3.85 which translated into an all-gear PST allowable catch limit of 205,165 Treaty Chinook salmon. Management plans established by the Alaska Board of Fisheries allocate the CPUE-based Treaty catch limit among gear types and prescribe management measures for both commercial and sport fisheries [5AAC 29.060(b) and 47.055].

Under provisions of domestic regulatory actions plans to conserve Chilkat, King Salmon, and Unuk River stocks, as well as other SEAK and TBR wild Chinook salmon stocks, ADF&G was given direction by the Alaska Board of Fisheries, through emergency order authority, to take management actions necessary to reduce exploitation rates and pass as many SEAK and TBR Chinook salmon stocks to the spawning grounds for escapement as possible. The conservation measures for all gear types that were implemented during 2018–2020 continued for the 2021

season. The winter troll fishery closed early on March 15, spring troll fisheries were restricted to near terminal areas or areas on the outside coast, and summer troll fishery primary corridors and waters directly adjacent to the terminus of the Unuk, Chilkat and Stikine rivers were closed to the retention of Chinook salmon. Retention of Chinook salmon in the purse seine fishery outside designated terminal harvest areas was delayed until August 2. Drift gillnet fisheries in Districts 106 and 108 (near the mouth of the Stikine River) were delayed to the latter part of June and early August, respectively. Drift gillnet fisheries in Districts 111 and 115 (near the mouths of the Taku and Chilkat Rivers) were subject to time, area, and gear restrictions through mid-July. Openings in terminal harvest areas were delayed until June. Similarly, sport fisheries outside of terminal areas were delayed until mid-June or early July and were closed to nonresidents during the month of August. In addition to these conservation measures, all fisheries were managed conservatively and monitored closely inseason to avoid exceeding the harvest level defined in the 2019 PST Agreement.

The total Chinook salmon harvest by all SEAK commercial fisheries was 194,193 fish and the sport fish harvest was 41,982 fish, for a total all-gear harvest of 236,175 fish (Table 10 and Table 11). This includes an all-gear harvest of 1,311 in the Annette Island Metlakatla Indian Community tribal fishery that is not directly managed by the State of Alaska. The all-gear harvest of Treaty Chinook salmon was 202,082 fish including 1,311 fish from the Metlakatla Indian Community tribal fishery. The 2021 all-gear Treaty harvest of 202,082 fish was below the CPUE-based harvest limit of 205,165 fish.

Table 10. Estimated all-gear Chinook salmon catch in 2021**.**

Gear	Total Harvest	AK Hatchery Harvest	Wild Terminal Exclusion	Alaska Hatchery Addon	Treaty Harvest
Troll	163,210	11,538	0	7,620	155,590
Sport	41,982	6,614	0	5,047	36,935
Drift Gillnet	12,942	11,575	0	11,000	1,942
Purse Seine	17,765	10,472	0	10,426	7,339
Set Gillnet	276	0	0	0	276
Total Net	30,983	22,047	0	21,425	9,557
Total All Gear	***236,175***	***40,198***	***0***	***34,092***	***202,082***

Note: Annette Island Metlakatla Indian Community tribal harvest of 1,311 Chinook salmon are included of which 1,014 were Treaty fish. This includes a total tribal harvest of 313 troll, 520 drift gillnet, and 478 purse seine fish, of which 308 troll, 228 drift gillnet, and 478 purse seine were Treaty fish.

Note: Terminal area harvests are included.

Table 11. Southeast Alaska Chinook salmon landed catch for aggregate abundance-based management fisheries of interest to the Pacific Salmon Commission (2013–2021). Values are in thousands of fish.

Year	Total Catch	Add-on and Exclusion Catch	Treaty Catch Limit[1]	Treaty Catch	Treaty Incidental Mortality	Treaty Total Mortality
2013	257.3	65.9	176.0	191.4	59.4	250.8
2014	492.5	57.3	439.4	435.2	50.9	486.1
2015	403.3	68.3	237.0	335.0	49.1	384.1
2016	387.0	36.1	355.6	350.9	51.0	401.9
2017	207.1	31.6	209.7	175.4	46.6	222.0
2018	164.7	37.0	144.5	127.8	31.2	159.0
2019[1]	175.1	34.8	140.3	140.3	56.7	197.0
2020	234.8	30.2	205.2	204.6	39.1	243.7
2021[2]	236.2	34.1	205.2	202.1	–	–

[1] 2009–2018 Treaty Harvest Limit determined by pre-season PSC Chinook Model AI
2019–Present Treaty Harvest Limit determined by CPUE Model

[2] Incidental and total mortality are not available at the time of this report and will be updated prior to final publication in fall 2022.

Troll Fishery

The accounting of Chinook salmon harvested by trollers begins with the winter fishery in October and ends with the summer fishery in September. 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 2020–2021 winter troll fishery was open from October 11, 2020 through March 15, 2021. To help reduce encounters of wild SEAK and TBR Chinook salmon, the winter season fishery closed from March 16 through April 30, prior to reaching the GHL. A total of 15,072 Chinook salmon were harvested. Of these, 1,604 fish (11%) were of Alaska hatchery origin, of which 1,059 fish counted toward the Alaska hatchery add-on, resulting in a Treaty harvest of 14,013 fish (Table 12).

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

In 2021, spring troll fisheries occurred 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 salmon migration corridors did not open. A total of 17 spring troll fisheries opened, which is a 66% reduction from the number of areas opened prior to 2018 (when SEAK and TBR conservation measures began). The combined harvest for spring troll fisheries was 16,535 Chinook salmon, of which 5,426 fish (33%) were of Alaska hatchery origin and 3,583 fish counted toward the Alaska hatchery add-on, resulting in a Treaty harvest of 12,952 fish.

The 2021 summer troll fishery included two Chinook salmon retention periods, from July 1–8 and August 13 to September 3. On August 31, prior to the completion of the second retention period target harvest, ADF&G estimated 5,000 Chinook salmon remained on the SEAK annual all-gear Treaty catch limit. On September 1, a re-allocation of a portion of the all-gear SEAK Treaty Chinook salmon to the troll fishery was authorized. The remaining Treaty allocation included unharvested fish from the commercial net fisheries. The additional fish provided another two days of Chinook salmon retention and contributed to a total fishery length of 22 days. A total of 131,290 Chinook salmon were harvested during the summer fishery, of which 4,501 fish (3%) were of Alaska hatchery origin and 2,972 fish counted toward the Alaska hatchery add-on. The resulting Treaty Chinook salmon harvest was 128,318 fish.

The total harvest for all troll fisheries in the 2021 accounting year was 163,210 Chinook salmon, of which 155,590 fish were Treaty Chinook salmon. This includes a total harvest of 313 fish in the Annette Island Metlakatla Indian Community tribal troll fishery; all 308 were Treaty Chinook salmon.

Table 12. Troll fishery Chinook salmon harvest by season, 2021.

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	15,072	1,604	1,059	0	1,059	14,013
Spring Troll[a]	16,535	5,426	3,583	0	3,583	12,952
Summer Troll						
First Period[b]	70,465	2,564	1,693	0	1,693	68,772
Second Period	60,814	1,937	1,279	0	1,279	59,535
Total Summer	131,290	4,501	2,972	0	2,972	128,318
Total Traditional Troll	162,897	11,530	7,615	0	7,615	155,282
Annette Is. Troll	313	7	5	0	5	308
Total Troll Harvest	**163,210**	**11,538**	**7,620**	**0**	**7,620**	**155,590**

[a] Spring troll harvest includes all terminal and wild terminal exclusion harvests for year.
[b] Total summer harvest includes confiscated harvest for the year.

Net Fisheries

A total of 12,942 Chinook salmon were harvested in the drift gillnet fisheries in 2021, of which 11,575 fish (89%) were of Alaska hatchery origin and 11,000 fish counted toward the Alaska hatchery add-on, resulting in a Treaty harvest of 1,942 fish (Table 10). This includes a harvest of 520 fish in the Metlakatla Indian Community tribal drift gillnet fishery of which 228 fish were Treaty Chinook salmon. A total of 17,765 Chinook salmon were harvested in the purse seine fisheries, of which 10,472 fish (59%) were of Alaska hatchery origin and 10,426 fish counted toward the Alaska hatchery add-on, resulting in a Treaty harvest of 7,339 fish. This includes a harvest of 478 fish in the Metlakatla Indian Community tribal purse seine fishery; all 478 fish were Treaty Chinook salmon. A total of 276 Chinook salmon were harvested in the set gillnet fisheries, none of which were of Alaska hatchery origin, resulting in a Treaty harvest of 276 fish (Table 10).

With the exception of directed gillnet harvests of Chinook salmon in SEAK terminal area regulatory Districts 108 and 111, as provided in the Transboundary Rivers chapter of the PST (Chapter 1), harvests of Chinook salmon in net fisheries are primarily incidental to the harvest of other species, and in 2021 only constituted a small fraction (<1.0%) of the total net harvest of all species.

Sport Fishery

The SEAK Chinook salmon sport fishery is managed under the directives of the *Southeast Alaska King Salmon Management Plan* [5 AAC 47.055]. This plan prescribes management measures based upon the SEAK early winter troll CPUE metric and the harvest management plan adopted by the Alaska Board of Fisheries. In 2021, 37,879 Treaty Chinook salmon were allocated to the sport fishery. As directed by the *Southeast Alaska King Salmon Management Plan*, if restrictions are necessary to keep the sport fishery within its harvest allocation, nonresident anglers will be restricted first, and ADF&G shall only restrict resident anglers if nonresident angler restrictions are insufficient to keep the sport harvest within the sport harvest allocation.

The following regulations applied during the 2021 sport fishery as prescribed by the Southeast Alaska King Salmon Management Plan in conjunction with anticipated COVID-19 impacts continuing to depress sport fishery effort for a portion of the season:

Regulations effective March 2, 2021:

Alaska Resident

- The resident bag and possession limit was three Chinook salmon, 28 inches or greater in length.

Nonresident

- The nonresident bag and possession limit was one Chinook salmon, 28 inches or greater in length.
- The nonresident annual catch limit was four Chinook salmon, 28 inches or greater in length

Inseason Regulations effective June 21, 2021:

Alaska Resident

- The resident bag and possession limit was two Chinook salmon, 28 inches or greater in length.

Nonresident

- The nonresident bag and possession limit was one Chinook salmon, 28 inches or greater in length.
- From January 1 through June 30, a nonresident's annual catch limit was three Chinook salmon, 28 inches or greater in length.
- From July 1 through July 7, a nonresident's annual catch limit was two Chinook salmon, 28 inches or greater in length.
- From July 8 through December 31, a nonresident's annual catch limit was one Chinook salmon, 28 inches or greater in length, and any Chinook salmon 28 inches or greater in length harvested by a nonresident from January 1 through July 7 applied toward the one fish annual catch limit.

Inseason Regulations effective August 1, 2021:

Alaska Resident

- The resident bag and possession limit was one Chinook salmon, 28 inches or greater in length, except:
    - In those inside waters where the sport fishery for Chinook salmon was closed to retention during the spring and early summer (Juneau area, Petersburg/Wrangell area, Ketchikan area), when those waters reopened the resident bag and possession limit was two Chinook salmon 28 inches or greater in length through December 31, 2021.

Nonresident

- From August 1 through August 31, nonresidents may not retain or possess king salmon; any king salmon caught must be released immediately and returned to the water unharmed
- The nonresident bag and possession limit was one Chinook salmon, 28 inches or greater in length.
- The nonresident total harvest limit is one king salmon 28 inches or greater in length, and any king salmon harvested by a nonresident from January 1 through July 31 will apply toward the one fish nonresident total harvest limit.

The sport fishery was monitored closely throughout the 2021 season to ensure it stayed below the Treaty catch limit. The ADF&G management strategy for 2021 involved liberalized early season actions intended to offset continued reductions in sport fishery effort levels due to COVID-19 impacts. Harvest rates (HPUE) in the sport fishery were relatively high throughout the majority of the season and as nonresident participation returned to normal levels, the sport fishery was restricted inseason in order to stay below the Treaty catch limit. The 2021 sport fishery had an estimated total harvest of 41,982 Chinook salmon, of which 36,935 fish counted as Treaty harvest (Table 10).

SOUTHEAST ALASKA COHO SALMON FISHERIES

Attachment B of the 1999 PST specifies provisions for inseason conservation and information sharing for northern boundary coho salmon. In 2021, following a bilateral review of the SEAK Troll Area 6 (Southern Inside) coho salmon CPUE data for SW 27–29, which indicated a SEAK CPUE of 27 (exceeding the conservation trigger range CPUE of 15–22), it was determined a boundary area closure was not warranted. In addition to the SEAK CPUE, consideration was also given to the reduced exploitation of stocks transiting Dixon Entrance during the assessment period due to the closure of the Northern British Columbia (NBC) directed troll coho salmon fishery in 2021. Unlike 2020, when the directed coho salmon troll fishery in NBC was delayed from July 1 to August 1, DFO announced preseason that the directed troll coho salmon fishery would be closed for the season in 2021. The mid-July projection of regionwide total commercial harvest of 1.21 million was greater than the 1.1 million trigger for an early regionwide troll closure, specified in Alaska Board of Fisheries regulations and in Attachment B.

The 2021 regionwide summer troll coho salmon fishery began by regulation on June 1 and continued in all waters of SEAK through September 30. The 2021 all-gear catch of coho salmon totaled 1.7 million fish, of which 1.4 million fish (84%) were taken in commercial fisheries (Table 13). The troll harvest of 851,100 coho salmon was 42% below the 2011–2020 average of 1.46 million fish and accounted for 59% of the commercial catch. Power troll wild coho salmon CPUEs were below the 2001–2020 average for the duration of the summer season. The overall wild stock abundance (wild troll catch divided by an index of the troll harvest rate) was estimated at 3.42 million fish, 16% below the 20-year average. The purse seine coho salmon harvest of 311,000 fish was 7% above the 2011–2020 average and accounted for a record high 22% of the commercial

catch. The drift gillnet harvest of 207,700 fish was 32% below the 2011–2020 average. The set gillnet harvest of 75,000 fish in the Yakutat area was 39% below the 2011–2020 average, with 82% of the catch taken in the Situk-Ahrnklin Lagoon. A preliminary estimate of the SEAK sport catch (275,700 fish) is 9% above the 2011–2020 average (252,900 fish).

Wild production accounted for 1.07 million fish (74%) in the commercial catch compared with a recent 2011–2020 average of 1.64 million fish (75% wild). The hatchery percentage of the commercial catch was 26%. Of the estimated hatchery contribution of 374,000 fish, over 99% originated from facilities in SEAK, with facilities located within inside waters accounting for an estimated 55% of the run, while hatchery runs on or near the outer coast contributed to the remaining 45%.

Preliminary all-fishery coho salmon harvest rate estimates were below average for all three wild indicator stocks, at 25% for Auke Creek, 26% for Berners River, and 54% for Hugh Smith Lake. The all-fishery harvest rate for the Hugh Smith Lake stock was below the long-term average of 56%. Most of the reduction in the all-fishery harvest rate was driven by decreases in the troll fleet harvest rate. The troll fishery harvest rate on the Hugh Smith Lake stock (17%) was below the 25-year (1996–2020) average of 29%. Troll fishery harvest rates on northern inside stocks were near record lows, estimated at 8% for Auke Creek and 10% for the Berners River compared with 25-year averages of 23% and 24%, respectively. While troll harvest rates were well below average, drift gillnet harvest rates were within ranges of previously observed values. Compared with 25-year averages, drift gillnet fisheries accounted for an estimated 12% of the Auke Creek return (average 8%), 13% of the Berners River return (average 20%), and 14% of the Hugh Smith Lake return (average 11%).

Escapement counts and estimates were below or within goals for most coho salmon stocks. The total escapement of 903 adult coho salmon to Hugh Smith Lake was within the biological escapement goal of 500–1,600 spawners. Coho salmon escapements were within the respective goal ranges for four northern Southeast stocks (Chilkat River, Berners River, Auke Creek, and Taku River), and below the goal for two northern Southeast stocks (Montana Creek and Peterson Creek). The combined peak count of 21,006 coho salmon in the 14 surveyed streams in the Ketchikan area was the highest count on record, far above the goal of upper goal of 8,500 spawners and above the 1987–2020 average (9,025). The combined peak count of spawners in five streams in the Sitka area (1,486 spawners) was above the escapement goal of 400–800 spawners.

Coho salmon stocks monitored for CWTs all experienced a decline in total adult production. For example, at Hugh Smith Lake the estimated total run size of 1,954 adults was approximately half of 1996–2020 average (3,553). This decline in total run size is due the second lowest smolt production on record and to a long-term decline in marine survival. The preliminary Hugh Smith Lake coho salmon marine survival rate (8.9%) is historically below average (11.2%) but higher than the 5-year average (5.8%). This cycle of persistently low marine survival is the largest driver of reduced total run size in recent years.

Similar to Hugh Smith Lake, coho salmon marine survival (and associated adult total run estimates) for the northern inside stocks was below the long-term average. Smolt-to-adult survival rates of 7.2% for the Berners River and 9.9% for Auke Creek were much lower than the long-term (1996–2020 return years) mean survival rates of 13% (Berners River) and 17% (Auke Creek). The 2020 total estimated adult coho salmon run size in the Berners River was 9,977, far below the

1996–2020 average (21,483). Marine survival for Northern inside coho salmon stocks has been low in recent years: four of the lowest five years for marine survival have occurred in the past six years. While 2021 showed improvement compared to 2020, adult total runs and marine survival rates are still far below historical levels.

Table 13. Coho salmon harvest in Southeast Alaska by gear type (preliminary), 2021.

Gear Type	Harvest
Troll	851,100
Purse Seine	311,000
Drift Gillnet	207,700
Set Gillnet	75,000
Sport (marine and freshwater)	275,700
Total	1,720,500

II. PRELIMINARY 2021 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 2021 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 2019) 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 2021 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 2016 are also presented. Information on the occurrence of 2021 mark-selective fisheries (MSF) is presented in Table 17. Where available, preliminary estimates of the number of Chinook or Coho salmon released by anglers in 2021 MSFs are presented within some sections of this report, by area and fishery. All estimates for the 2021 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. (i.e., excluding Alaska) 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.

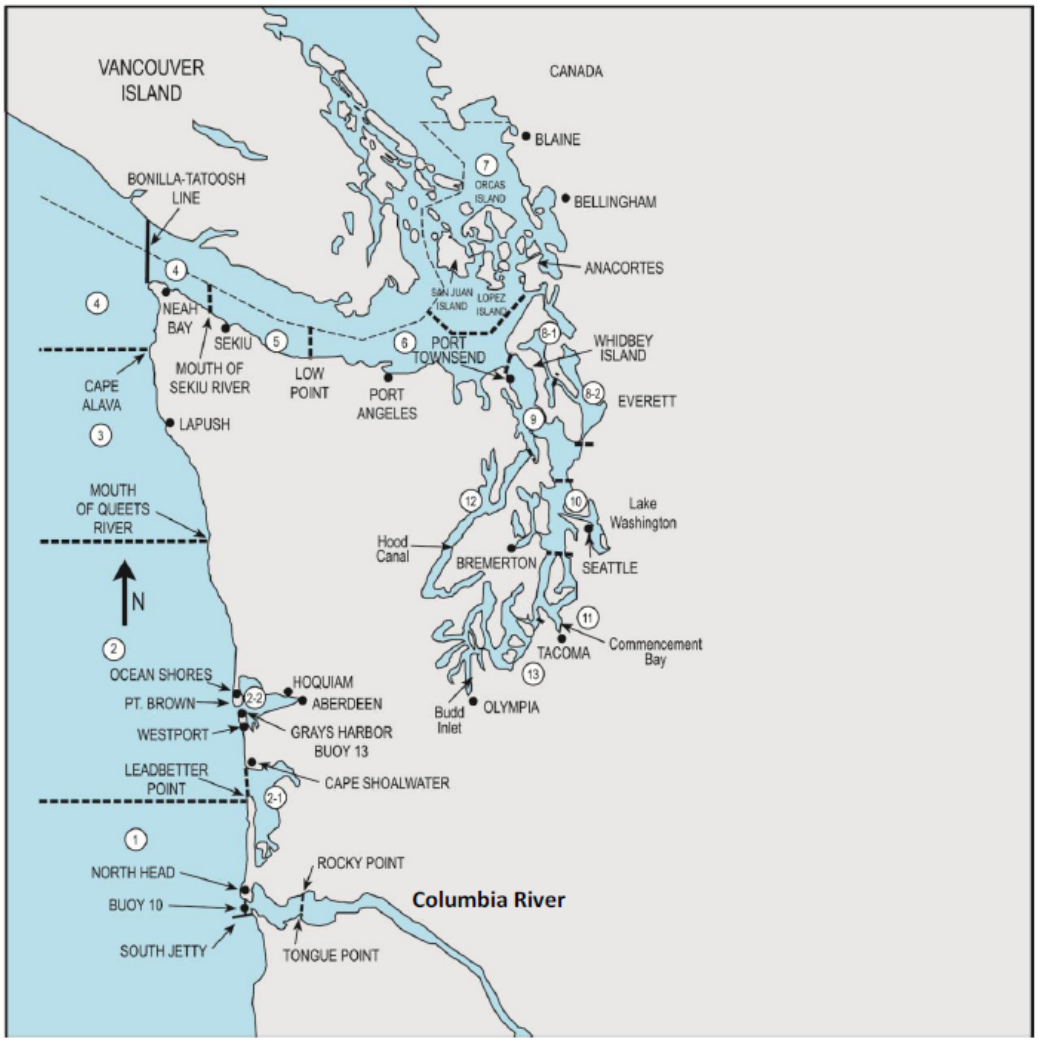


Figure 38. Map of Western Washington marine catch areas of the Washington coast (Areas 1 through 4) and Puget Sound (Areas 5 through 13) (WAC 220-22-030). Inside (Columbia River) fisheries reported in this document extend beyond the scope of this map.

Chinook Salmon Management

Under the 2019 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 that Southern U.S. fisheries on Chinook stocks shall be managed to limit the total adult equivalent mortality to the limits listed in Attachement I of Chapter 3.

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 2021 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 2021, 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, Quillayute, and Queets MUs were forecasted to be in *low* abundance status. The Hood Canal, Skagit, Snohomish, Hoh, and Grays Harbor Coho MUs were predicted to be in *moderate* status, while the Stillaguamish MU was 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 Fishery Regulation Assessment Model (FRAM; https://framverse.github.io/fram_doc/index.html). The total exploitation rate on the Interior Fraser Coho management unit was predicted to be 5.9% in Southern U.S. fisheries. Seasons and Coho quota levels for U.S. ocean fisheries were 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 2021 at: https://www.pcouncil.org/documents/2021/04/2021-preseason-report-iii.pdf/.

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 2021 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 30,750 Chinook and 5,000 Coho with a clipped adipose fin, hereinafter referred to as marked. The preliminary estimate of Non-Tribal harvest in the 2021 North of Falcon troll fishery is 19,600 Chinook (64% of the coast-wide quota) and 3,500 Coho (70% of the coast-wide Non-Tribal troll quota). Trollers harvested 10,200 Chinook in the May 1 – June 29 fishery, and the remaining 9,400 Chinook were

harvested in the summer all-species fishery between July 1 and September 30. All Coho were harvested during the summer all-species fishery.

Tribal Troll Fishery

The Makah, Quinault, Quileute, and Hoh Tribes opened their May-June Chinook Tribal Troll fisheries on May 1. The May 1 through June 30 Chinook Treaty Troll fishery harvested 2,565 Chinook or 12.8% of the 20,000 Chinook sub-quota. There were 128 landings during the May-June portion of the fishery.

The Makah, Quinault, Quileute and Hoh Tribes opened their all-species Tribal Troll fisheries on July 1. The all-species portion of the fishery ran from July 1 through September 15. The fishery harvested 5,662 Chinook and 26,411 Coho, or 28.3% of the 20,000 Chinook sub-quota and 99.7% of the 26,500 Coho quota. There were 312 landings during the all-species portion of the fishery.

Overall, the 2021 Treaty Troll fishery harvested 20.6% of the 40,000 Chinook quota and 99.7% of the 26,500 Coho quota. The total ocean salmon harvest for the 2021 Treaty Troll fishery was 8,227 Chinook and 26,411 Coho across 440 total landings. The majority of the Treaty Troll catch was taken in Area 4, with smaller amounts taken in Areas 2, 3, and 4b. Coho landings were highest in August accounting for 57% of the overall catch, followed by September at 39%. Chinook effort was highest in July, which accounted for approximately 46% of the overall Chinook catch.

Ocean Sport Fisheries

Pre-season quotas for the Washington coastal sport fishery (Ocean Areas 1 through 4) were 27,250 Chinook and 70,000 marked Coho. Preliminary total catch estimates for the ocean sport fisheries north of Cape Falcon were 17,700 Chinook (65% of the pre-season coast-wide quota) and 64,100 Coho (92% of the pre-season coast-wide sport quota). A description of the season structure and catches by management area follows.

Columbia Ocean Area (including Oregon)

Salmon sport fishing opened for all species except Coho in Ocean Area 1 (Columbia Ocean Area) on June 19. The all-species salmon sport fishing season opened on June 27. A pre-season quota of 42,400 marked Coho and a guideline of 7,200 Chinook were in place. The fishery closed on August 29 upon attainment of the Coho quota. The catch estimates for Area 1 were 6,000 Chinook (84% of the guideline) and 39,500 Coho (93% of the quota). The Chinook minimum size limit was 22 inches, and the Coho minimum size limit was 16 inches with a sub-area closure in the Columbia Control Zone. A preliminary overall legal-sized Coho mark rate of 52% was calculated from on-water data collection in this area.

Preliminary estimates of Coho encounters (retained and released) and mark rate in the Area 1 Coho mark-selective sport fishery, June 27 – August 29, 2021.

Coho retained	Coho released	Total encounters	Mark %
39,500	36,500	76,000	52%

Westport, Washington

Salmon sport fishing opened for all species except Coho in Ocean Area 2 (Westport, WA) on June 19. The all-species salmon sport fishing season opened on June 27. A pre-season quota of

20,440 marked Coho and a guideline of 12,925 Chinook were in place. The fishery closed on September 7 upon attainment of the Coho quota. The catch estimates for Area 2 were 7,000 Chinook (54% of the guideline) and 20,700 Coho (101% of the quota). The Chinook minimum size limit was 22 inches, and the Coho minimum size limit was 16 inches with a sub-area closure in the Grays Harbor Control Zone beginning August 9. A preliminary overall legal-sized Coho mark rate of 44% was calculated from on-water data collection in this area.

Preliminary estimates of Coho encounters (retained and released) and mark rate in the Area 2 Coho non-retention sport fishery, June 27 – September 7, 2021.			
Coho retained	Coho released	Total encounters	Mark %
20,700	26,300	47,000	44%

La Push, Washington

Salmon sport fishing opened for all species except Coho in Ocean Area 3 (La Push, WA) on June 19. The all-species salmon sport fishing season opened on July 4. A pre-season quota of 1,430 marked Coho and a guideline of 1,300 Chinook were in place. The fishery closed on September 3 upon attainment of the Coho quota. The port of La Push was closed to public access until July 12 due to health concerns associated with COVID-19, but anglers could access Area 3 from the ports of Westport or Sekiu, but there was no effort until the port of La Push opened. The catch estimates for Area 3 were 300 Chinook (25% of the overall guideline) and 1,300 Coho (93% of the quota). The Chinook minimum size limit was 24 inches, and the Coho minimum size limit was 16 inches. A preliminary overall legal-sized Coho mark rate of 42% was calculated from a combination of on-water data collection and dockside interviews in this area.

Preliminary estimates of Coho encounters (retained and released) and mark rate in the Area 3 Coho non-retention sport fishery, July 4 – September 3, 2021.			
Coho retained	Coho released	Total encounters	Mark %
1,300	1,800	3,100	42%

Neah Bay, Washington

Salmon sport fishing opened for all species except Coho in Ocean Area 4 (Neah Bay, WA) on June 19. The all-species salmon sport fishing season opened on July 4. A pre-season quota of 5,730 marked Coho and a guideline of 5,825 Chinook were in place. The fishery closed automatically, as scheduled, on September 15. The port of Neah Bay was closed to public access throughout the season due to health concerns associated with COVID-19, but anglers could access Area 4 from the ports of Sekiu and La Push. The catch estimates for Area 4 were 4,300 Chinook (75% of the guideline) and 2,500 Coho (44% of the quota). The Chinook minimum size limit was 24 inches, and the Coho minimum size limit was 16 inches. A preliminary overall legal-sized Coho mark rate of 52% was calculated from a combination of on-water data collection and dockside interviews in this area.

Preliminary estimates of Coho encounters (retained and released), in the Area 4 Coho non-retention sport fishery, July 4 – September 15, 2021.			
Coho retained	Coho released	Total encounters	Mark %
2,500	2,300	4,800	52%

NORTH OF CAPE FALCON INSIDE FISHERIES

WASHINGTON COASTAL RIVER FISHERIES

North Washington Coastal Rivers

Net and sport fisheries directed at salmon in this region were implemented based upon pre-season, Tribal-State agreements and subject to in-season adjustments. Tribal net harvest includes non-selective catch from the Tsoo-Yess, Quillayute, Hoh, Queets, and Quinault Rivers. The 2021 Tribal net fisheries in north coastal rivers harvested an estimated 11,300 Chinook salmon and 22,700 Coho salmon through November 15, 2021.

Recreational fisheries conducted during 2021 in the Quillayute, Hoh, and Queets River systems included mark-selective fisheries targeting hatchery Chinook and Coho in the Quillayute and Queets systems. Salmon fisheries in the Queets River system were only open in September and required the release of unmarked Coho. The Hoh River was open to salmon fishing September 16 through November 30 with a daily limit of 2 (only 1 adult, release wild Coho). In the Quillayute watershed, recreational salmon fishing was open from May 1 through July 31 on the Quillayute and Sol Duc rivers. The Bogachiel, Calawah, and Dickey rivers were open from July 1 through July 31 with a 4 fish limit (only 2 adults, and release of wild Chinook and wild Coho required). The Quillayute system was also open for fall season recreational fishing from September 16 through November 30 with a 6 fish limit (only 3 adults) on the Quillayute and Sol Duc rivers and a 3 fish limit (only one adult) on the Bogachiel, Calawah, and Dickey rivers. Angers were required to release unmarked Coho in all Quillayute tributaries. Harvest or impact estimates for these fisheries are not available at the time of this report.

Grays Harbor, Washington

Harvest numbers reported for Grays Harbor include catch from both the Humptulips and Chehalis Rivers through November 15, 2021. The non-selective Tribal net fisheries in Grays Harbor, and including fisheries in the Humptulips and Chehalis Rivers, harvested an estimated 2,400 Chinook salmon and 13,300 Coho salmon.

The Non-Tribal commercial fishery in the northern portion of Grays Harbor near the Humptulips River (Area 2C) harvested 75 Chinook, 226 Coho, and 310 Chum. There were 2 marked Chinook salmon (mark-selective fishery), 1,278 Coho, and 4,794 Chum 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. Estimates of total recreational catch in these fisheries are not available at the time of this report.

COLUMBIA RIVER FISHERIES

Tribal and Non-Tribal net and sport salmon fisheries were implemented in the winter/spring (January-June 15), summer (June 16-July) and fall (August-December) periods. All fisheries were constrained by impacts on ESA-listed stocks. Winter/spring fisheries were constrained by impacts on ESA-listed upper Columbia River spring Chinook, Snake River spring/summer Chinook, and Cowlitz spring Chinook. Summer season fisheries were constrained by harvest limits on upper Columbia summer Chinook and impacts to ESA-listed sockeye and upriver summer steelhead. Fall fisheries were constrained by impacts to ESA-listed lower Columbia tule fall Chinook, Snake River fall Chinook, and upriver summer steelhead.

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 Treaty Tribal/Non-Treaty sharing agreements. All 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 2002-16. As a result of guidance from the Oregon and Washington Fish and Wildlife commissions, winter/spring Non-Tribal commercial salmon seasons have not occurred in the mainstem Columbia River since 2016. Commercial non-MSF 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 for spring Chinook began in 2001. In 2021, the area below Bonneville Dam was open from January 1 – April 4, May 21-23, May 29, and June 1-15 for hatchery Chinook retention, and included a boat angling closure surrounding the mouth of the Cowlitz River beginning March 1. Catch estimates for this area totaled 5,279 hatchery adult spring Chinook kept and 1,377 non-adipose fin clipped Chinook released. From Bonneville Dam to the Washington-Oregon state line, Chinook retention was open March 16-May 5, May 22-23, May 29-30, June 5-6, and June 12-15, with 666 hatchery adult spring Chinook kept and 310 non-adipose fin clipped Chinook released. The Snake River fishery structure included one specific catch area open on a days-per-week rotation during May 4 through June 6. Catch in the Snake River fishery totaled 443 hatchery adult spring Chinook, 120 non-adipose fin clipped (unmarked), and 3 adipose fin clipped (marked) fish released. Fisheries also occurred in tributaries but are not reported in this document.

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

System	Area	Chinook Kept	Chinook Released	Total Handle	% Kept
Columbia River	Below Bonneville Dam	5,279	1,377	6,656	79%
Columbia River	Bonneville Dam to WA-OR state line	666	310	976	68%
Snake River	Washington waters	443	123	566	78%

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 2021, the platform and hook-and-line fishery was open for subsistence fishing throughout the winter/spring period. Commercial sales did not occur in 2021 Tribal fisheries during the spring management period. Harvest estimates from the combined ceremonial and subsistence fisheries totaled 4,403 upriver spring Chinook (includes harvest 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-Treaty commercial fisheries did not occur in the summer management timeframe. Commercial non-MSF during the summer timeframe did occur in off-channel areas (Select Areas) in the Columbia River estuary but are not reported in this document.

Sport

Summer season mark-selective Chinook recreational fisheries were open June 16 – July 5 from the Astoria-Megler Bridge, near the mouth of the Columbia River, upstream to Bonneville Dam and June 16 – July 31 from Bonneville Dam upstream to Priest Rapids Dam. An estimated 2,134 and 94 adult summer Chinook were harvested, and 998 and 51 were released below and above Bonneville Dam, respectively. The fishery (mark-selective) above Priest Rapids Dam opened on July 1 and resulted in 5,052 adult Chinook kept and 2,090 released. In-river allocation agreements dictate that a substantial share of the Non-Tribal catch be provided for fisheries upstream of Priest Rapids Dam.

Preliminary estimated encounters of adult Summer Chinook in the Upper Columbia River Chinook mark-selective sport fishery.

System	Area	Chinook Kept	Chinook Released	Total Handle	% Kept
Columbia River	Below Bonneville Dam	2,134	998	3,132	68%
Columbia River	Bonneville to Priest Rapids Dam	94	51	145	65%
Upper Columbia River	Above Priest Rapids Dam	5,052	2,090	7,142	71%

Tribal

Summer season Tribal fisheries occurred from June 16 through July 31. 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. There were six weekly commercial gillnet fishing periods conducted from June 16 – July 22.

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 10,810 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 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-mark selective. No mark-selective seine or pound net fisheries occurred due to ESA constraints; however, the mark-selective Coho tangle net fishery did occur.

The early fall season consisted of eight fishing periods August 9 – September 2 in commercial Zones 4-5 (Warrior Rock to Beacon Rock) and resulted in 21,228 Chinook and 2,768 Coho harvested. The late-fall season consisted of eight fishing periods September 19 – October 14 in the same area and resulted in 5,348 Chinook and 1,663 Coho harvested. Tangle net fisheries occurred September 27 – October 29 (19 periods) in commercial Zones 1-3 (mouth to Warrior Rock) and were mark-selective for Coho and non-mark selective for Chinook and resulted in 611 Chinook and 8,562 marked Coho (3,008 unmarked Coho were released) being harvested. Commercial non-MSF during the fall timeframe did occur in off-channel areas (Select Areas) in the Columbia River estuary but are not reported in this document.

Sport

Fall season recreational fisheries are mark-selective for Coho downstream of the Hood River Bridge, and occasionally include 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. The only MSF periods for Chinook in the mainstem Columbia River during 2021 occurred in Buoy 10 from August 1-10.

The Buoy 10 fishery was open August 1 – December 31; Chinook retention was allowed August 1-26 and October 1-31. Additional regulations for the Buoy 10 fishery included minimum size limits for Chinook (24-inches) and Coho (16-inches). 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. When Chinook retention was closed, the mark-selective Coho fishery remained open. Buoy 10 catches from August 1-10 during the Chinook MSF included 1,163 hatchery Chinook and 167 hatchery Coho kept, and released fish included 2,056 Chinook and 155 Coho. The remaining Buoy 10 catches included 19,591 Chinook and 36,411 hatchery Coho kept, and released fish included 7,813 Chinook and 27,382 Coho.

The lower Columbia River (LCR) mainstem sport fishery from Rocky Point – Tongue Point line upstream to Bonneville Dam was open August 1 – December 31, except September 4-16 downstream of the Lewis River and September 7-10 upstream of the Lewis River. The non-mark-selective Chinook retention fishery was open from the Rocky Point – Tongue Point line upstream to the Lewis River August 1 – September 3 and October 1-31, and upstream of the

Lewis River from August 1 – September 6 and September 11 – October 31. The kept catch estimate for the LCR sport fishery included 18,900 adult Chinook (1,046 released) and 5,524 hatchery Coho (2,910 released).

The mainstem sport fishery from Bonneville Dam to the Highway 395 Bridge (near Pasco, Washington; upstream of McNary Dam) was open August 1 – December 31 and is non-mark selective except for Coho downstream of the Hood River Bridge. Adult catch estimates for the Bonneville to Highway 395 Bridge totaled 5,469 fall Chinook (539 released) and 5,068 Coho (194 released). Additional fisheries occurred on the Columbia River, including tributaries, Hanford Reach area (downstream of Priest Rapids Dam), and in the Snake River, but are not reported in this document.

Preliminary estimated encounters of adult Fall Chinook and Coho Salmon in the Columbia River Fall Sport Fisheries					
System	Area	Chinook Kept	Chinook Released	Total Handle	% Kept
Columbia River	Buoy 10	20,754	9,869	30,623	68%
Columbia River	LCR Sport	18,900	1,046	19,946	95%
Columbia River	Bonneville-Hwy 395	5,469	539	6,008	91%
System	Area	Coho Kept	Coho Released	Total Handle	% Kept
Columbia River	Buoy 10	36,578	27,537	64,115	57%
Columbia River	LCR Sport	5,524	2,910	8,434	65%
Columbia River	Bonneville-Hwy 395	5,068	194	5,262	96%

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). No additional harvest occurred just downstream of Bonneville Dam in platform and hook-and-line fisheries in 2021. Platform and hook and line fisheries will remain open through December 31.

The Tribal commercial gillnet fishery consisted of eight weekly fishing periods from August 23 through October 14. Preliminary harvest estimates for all fall season fisheries total 77,761 adult fall Chinook and 23,247 adult Coho; however, some additional fish may be landed in the ongoing platform fisheries. Harvest estimates reported herein do not include catch from 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, 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 2021 pre-season planning included Mid-Hood Canal, Stillaguamish, and Nooksack Chinook. Strait of Juan de Fuca and Snohomish 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.

Strait of Juan de Fuca Sport

Marked Chinook retention was allowed for sport fishing in marine salmon management Area 5 in the winter/spring season from March 1 through April 30. Sport fishing regulations allowed retention of marked Chinook in the summer season from July 1 through July 19 in Area 5, and from July 1 through August 3 in Area 6. Marked Coho retention was also permitted from July 1 through September 30 in Area 5 and Area 6. Dungeness Bay was open for marked Coho retention during the month of October. Preliminary estimates of Chinook and Coho encounters (retained and released fish) and the legal-size mark rate in the Area 5 and Area 6 sport mark-selective fisheries are presented in the following tables.

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 – July 19, 2021.

Chinook retained	Chinook released	Total encounters	Mark % (legal size)
4,550	10,126	14,676	57.0%

Preliminary estimates of Coho retained, released (legal and sub-legal size), and the legal-size mark rate in the Area 5 sport mark-selective fishery, July 1 – September 30, 2021.

Coho retained	Coho released	Total encounters	Mark % (legal size)
16,406	24,493	40,899	43.3%

Preliminary estimates of Chinook retained, released (legal and sub-legal size), and the legal-size mark rate in the Area 6 sport mark-selective fishery, July 1 – August 3, 2021.

Chinook retained	Chinook released	Total encounters	Mark % (legal size)
5,401	6,846	12,247	75.0%

Preliminary estimates of Coho retained, released (legal and sub-legal size), and the legal-size mark rate in the Area 6 sport mark-selective fishery, July 1 – September 30, 2021.

Coho retained	Coho released	Total encounters	Mark % (legal size)
2,171	4,206	6,377	36.0%

A detailed report of this summer period sport fishery, including estimated catch, effort and other results of the sampling and monitoring programs, will be available from the Washington Department of Fish and Wildlife in early 2022.

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, 2020 – April 15, 2021), 100 Chinook and zero Coho were caught. In the summer Tribal troll fishery in Areas 5 and 6C only (June 1 – September 30, 2021), 1,600 Chinook and 900 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 2021 catch in the Strait of Juan de Fuca Tribal net fisheries (no Non-Tribal net fisheries in the Strait of Juan de Fuca) are zero Chinook and 1,500 Coho salmon.

San Juan Islands Net (Areas 6, 7, and 7A)
Preliminary estimates of the 2021 catch in the San Juan Island net fishery directed at Sockeye, or Chum salmon totaled 2 Chinook and 715 Coho salmon in the Non-Tribal fishery. Tribal fishery landings from this area for all gear types totaled 2,000 Chinook and 4,600 Coho.

San Juan Islands (Area 7) Sport
Marked Chinook retention was allowed in Area 7 during the summer season. However, the summer fishery only remained opened from July 1 through July 7, and subsequently closed, due to attainment of the marked Chinook quota in the first week of the fishery. The southern Rosario Strait and eastern portions of Area 7 were closed for the season to protect Puget Sound Chinook salmon. Additional sub-area closures are described in the 2021-22 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 – 7, 2021.

Estimated Chinook retained, released (legal and sub-legal size) and the legal-size mark rate in the Area 7 sport mark-selective fishery, July 1-7, 2021.

Chinook retained	Chinook released	Total encounters	Mark % (legal size)
2,550	2,039	4,591	72.2%

Puget Sound Marine Sport (Areas 8-13)
Mark-selective sport fisheries (MSFs) targeting adipose fin-clipped (marked) hatchery Chinook were conducted in Area 10 (Seattle-Bremerton) and Area 13 (South Puget Sound) during the winter (October 1, 2020 – June 30, 2021, with a temporary closure between May 1 and May 18, 2021). Additionally, mark-selective fisheries occurred during the summer season in Area 8.1 (Deception Pass, Hope Island, and Skagit Bay), Area 8.2 (Port Susan & Port Gardner), Area 9 (Admiralty Inlet), Area 10, Area 11 (Tacoma-Vashon Island), Area 12, and Area 13. Specific dates of these winter and summer mark-selective fishery seasons, by area, are shown in the table below.

Puget Sound Chinook mark-selective sport fisheries conducted in marine areas during 2021.

Areas	Season
8.1	Summer: August 1 – September 19, 2021.
8.2	Summer: August 14 – September 19, 2021

9	Summer: July 16 – August 4, 2021.
10	Winter: January 1, 2021 – January 18, 2021. Summer: July 16 – August 22, 2021; Sinclair Inlet: July 16 – September 30, 2021.
11	Summer: June 16 –August 25, 2021.
12	Summer: July 1 – September 30, 2021 (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 2022.

Mark-selective sport fisheries during 2021 directed at marked Coho were conducted in the following marine areas: Areas 5 and 6 from July 1 – September 30, Area 7 from July 1 – 7, 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 28 – September 7 (on Fridays through noon, Mondays only) as well as from September 11 – September 26 (Saturdays, Sundays), in Area 10 from July 16 – October 31, in Area 11 from July 1 – October 31; and in Area 12 from October 1 – November 30, 2021 in the whole area, as well as from July 11— September 30, 2021 in the area North of Ayock Point and from July 1 – September 30, 2021 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 2021. Chinook and Coho were also intercepted in fisheries directed at Pink and Chum salmon. A total of 39,900 Chinook and 158,000 Coho were landed in the Tribal marine net fisheries in Puget Sound (Areas 8-13 & 7B-D) during 2021. Non-Tribal net fishery landings from these areas totaled 7,315 Chinook and 2,408 Coho. Chinook landings 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 32,600 Chinook and 128,200 Coho during 2021.

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 2021.	
River	Season
Nooksack River	May 29 – June 10, June 18 – July 9 from the Highway 9 bridge; August 1 – September 30 from Lummi Indian Reservation, October 1 – 15 South Fork
Cascade River	June 1 – July 15

Skagit River	May 19 – May 31 from the highway 536 bridge; July 1 – July 15 from Highway 530 bridge
Skykomish River	May 23 – July 18
Carbon River	September 1 – November 30
Puyallup River	August 16 – November 30
Nisqually River	July 1 – November 15

Chinook non-selective sport fisheries conducted in Puget Sound rivers during 2021.

River	Season
Samish River	August 1 – September 13
Green River	August 20 – December 31 from old highway 99 to South 212 St. Bridge

During the 2021 season there were 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 on the Wallace River (Skykomish tributary), from October 1 through November 30. A mark-selective fishery was open on the Samish River from August 1 - September 13, on the Dungeness River from October 16 through November 30, and on the Nisqually River from July 1 – November 15. Recreational non-selective Coho fisheries were conducted on the Nooksack River, Skagit River, Green River, Carbon River, Puyallup River, and Quilcene River.

REFERENCES

Pacific Salmon Treaty (PST) Act of 1985. 2019 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.

Table 15. Preliminary 2021 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/]

	2021			Landed				
	Preseason [5/]							
Fisheries	Total Mortality [1/]	Landed [2/]	Preliminary Landed	2020	2019	2018	2017	2016
OCEAN FISHERIES								
Commercial Troll								
Neah Bay and La Push (areas 3,4,4B) [3/]	60,200	53,100	11,900	7,600	39,100	33,700	35,200	28,100
Columbia Ocean Area and Westport (area 1,2) [4/]	27,100	17,600	15,900	6,800	3,400	13,900	24,700	14,200
Sport (see text for quota information)								
Neah Bay (area 4)	7,500	5,825	4,300	1,900	3,900	3,000	7,300	3,300
La Push (area 3)	1,300	1,300	300	20	600	400	500	300
Westport (area 2)	14,300	12,900	7,000	4,800	2,400	4,900	6,600	8,400
Columbia Ocean Area (area 1)[13/]	8,300	7,200	6,000	800	4,000	2,300	7,600	6,000
INSIDE FISHERIES								
Sport [10/]								
Strait of Juan de Fuca (area 5,6)	19,100	10,300	-	9,500	11,300	14,300	9,900	9,700
San Juan Islands (area 7)	2,400	1,400	-	4,500	7,100	7,300	11,300	6,200
Puget Sound Marine (area 8-13)	29,100	18,000	-	14,900	20,500	29,900	22,800	14,400
Puget Sound Rivers [12/]	12,100	11,800	-	11,200	9,900	13,300	18,500	8,600
North WA Coastal Rivers	-	-	-	1,600	1,500	1,600	1,500	600
Grays Harbor [7/]	2,400	2,000	-	1,200	1,700	3,700	2,700	2,800

	2021			Landed				
	Preseason [5/]							
Fisheries	Total Mortality [1/]	Landed [2/]	Preliminary Landed	2020	2019	2018	2017	2016
Columbia River (Spring) [6/]	-	-	5,900	2,000	2,000	8,100	9,100	14,100
Columbia River (Summer) [6/]	-	-	2,200	1,300	-	1,100	3,800	3,600
Columbia River (Fall) (incl. Buoy 10) [6/]	-	-	45,000	40,800	22,000	22,400	60,400	48,700
Commercial[11/]								
Strait of Juan de Fuca net and troll (area 4B,5,6C)	4,700	2,800	1,700	800	1,500	3,100	1,900	700
San Juan Islands (area 6,7, 7A)	8,500	8,400	2,000	100	3,600	3,900	2,600	100
Puget Sound Marine (8-13,7B-D)	34,100	33,500	47,200	35,400	72,700	70,600	90,600	55,800
Puget Sound Rivers[12/]	44,300	44,300	32,600	18,900	38,400	41,600	53,900	23,300
North WA Coastal Rivers	-	-	11,300	16,700	12,200	11,400	14,400	9,400
Grays Harbor (area 2A-2D) [7/]	-	-	2,400	3,600	2,400	2,700	3,700	2,100
Columbia River Net (Winter/Spring) [8/]	-	-	4,400	4,400	4,700	10,900	8,100	20,700
Columbia River Net (Summer) [8/]	-	-	10,800	8,400	5,600	9,500	16,300	23,500
Columbia River Net (Fall) [8/]	-	-	104,900	136,600	81,100	64,200	140,400	189,600

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 (https://framverse.github.io/fram_doc/index.html).

2/ For the ocean fisheries, this column shows the Chinook troll and recreational quotas used for 2021 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 OR/WA state line for spring, Priest Rapids Dam for summer, and to Hwy 395 for fall). See current Joint Staff annual report. https://wdfw.wa.gov/fishing/management/columbia-river/reports.

[7/] Includes Grays Harbor catch, as well as catch from the Chehalis and Humptulips Rivers and their tributaries for sport fisheries; includes Chehalis and Humptulips Rivers for net fishery estimates.

[8/] Tribal catch includes adult-sized Chinook and Non-Tribal catch includes retained catch (adult + jack). Includes Tribal C&S and Tribal/Non-Tribal commercial (upstream to McNary Dam). Excludes Non-Tribal Select Area commercial and seine catches. Catch data from annual Joint Staff Reports. https://wdfw.wa.gov/fishing/management/columbia-river/reports.

[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 (https://framverse.github.io/fram_doc/index.html).

[13/] Includes Oregon sport catch in Area 1.

Table 16. Preliminary 2021 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/]

	2021			Landed				
	Preseason [9/]							
Fisheries	Total Mortality [1/]	Landed [2/]	Preliminary Landed	2020	2019	2018	2017	2016
OCEAN FISHERIES								
Commercial Troll								
Neah Bay and La Push (area 3,4,4B) [3/]	30,300	27,500	25,300	14,300	55,100	11,400	13,300	-
Columbia Ocean Area and Westport (area 1,2) [10/]	6,900	4,000	4,600	800	5,900	1,300	1,800	-
Sport (see text for quota information)								
Neah Bay (area 4)	6,900	5,700	2,500	3,100	6,200	4,900	3,500	100
La Push (area 3)	1,700	1,400	1,300	200	1,800	1,000	1,750	-
Westport (area 2)	23,400	20,400	20,700	7,900	20,200	15,400	15,750	-
Columbia Ocean Area (area 1)[12/]	48,300	42,400	39,500	12,800	53,500	20,600	21,600	18,600
INSIDE FISHERIES								
Sport [7/]								
Strait of Juan de Fuca (area 5,6)	22,900	19,100	-	42,900	15,800	19,400	4,800	100
San Juan Islands (area 7)	3,200	2,500	-	10,800	5,800	4,800	100	100
Puget Sound Marine (area 8-13)	54,100	47,800	-	44,300	43,000	50,100	31,400	4,900
Puget Sound Rivers	18,400	17,300	-	21,300	25,100	19,600	16,700	11,400
North WA Coastal Rivers	1,300	1,200	-	2,700	3,900	2,000	4,900	1,600
Grays Harbor [5/]	4,900	4,700	-	4,400	13,500	4,000	9,200	3,700

	2021			Landed				
	Preseason [9/]							
Fisheries	Total Mortality [1/]	Landed [2/]	Preliminary Landed	2020	2019	2018	2017	2016
Columbia River Buoy 10[4/,11/]	95,300	80,000	36,000	7,100	22,800	6,800	18,800	9,200
Commercial [8/]								
Strait of Juan de Fuca net and troll (area 4B,5,6C)	2,500	2,400	2,400	1,700	600	5,000	1,200	700
San Juan Islands (area 6,7,7A)	10,100	6,800	9,000	5,200	1,900	3,900	3,400	4,100
Puget Sound Marine (area 8-13,7B-D)	115,900	113,400	165,600	122,900	47,400	124,600	134,400	210,900
Puget Sound Rivers	68,700	67,400	128,200	73,400	43,400	114,600	63,200	65,400
North WA Coastal Rivers	22,900	22,500	22,700	30,800	13,400	22,300	63,700	57,800
Grays Harbor (area 2A-2D) [5/]	10,700	10,500	13,300	6,500	10,200	9,800	12,700	3,200

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 (https://framverse.github.io/fram_doc/index.html).

2/ For ocean fisheries this column shows the Coho troll and recreational quotas used for 2021 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 online 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/ For Buoy 10: see Table 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	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Ocean Troll													
Cape Flattery & Quillayute (Areas 3/4)	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes
Columbia R & Grays Harbor (Areas 1 & 2)	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes
Ocean Sport													
Neah Bay (Area 4)	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes
LaPush (Area 3)	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	yes
Grays Harbor (Area 2)	yes	yes	yes	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	yes	yes	yes
Inside Fisheries													
Sport													
Juan de Fuca (Areas 5 & 6)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
San Juan Islands (7)	yes	no	no	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	yes	yes	yes
Puget Sound Rivers	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
North WA Coastal Rivers	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Grays Harbor (Areas 2-2)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes
Willapa Bay (Area 2-1)	yes	no	no	no	yes	no	yes	no	no	no	no	yes	no
Columbia River Buoy 10	yes	yes	yes	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	no	no	no
Grays Harbor (Areas 2A-2D)	no	no	no	no	no	no	no	no	no	no	yes	yes	yes
Willapa Bay (Area 2-1)	no	no	no	no	no	no	no	no	no	no	no	yes	no
Columbia River Net/ - Fall	yes	yes	yes	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	no	no	no
San Juan Islands (Areas 6, 7 & 7A)	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Puget Sound Marine (Areas 8 - 13)	no	no	no	no	no	yes	no	no	no	no	no	no	no
Puget Sound Rivers	no	no	no	no	no	no	no	no	no	no	no	no	no

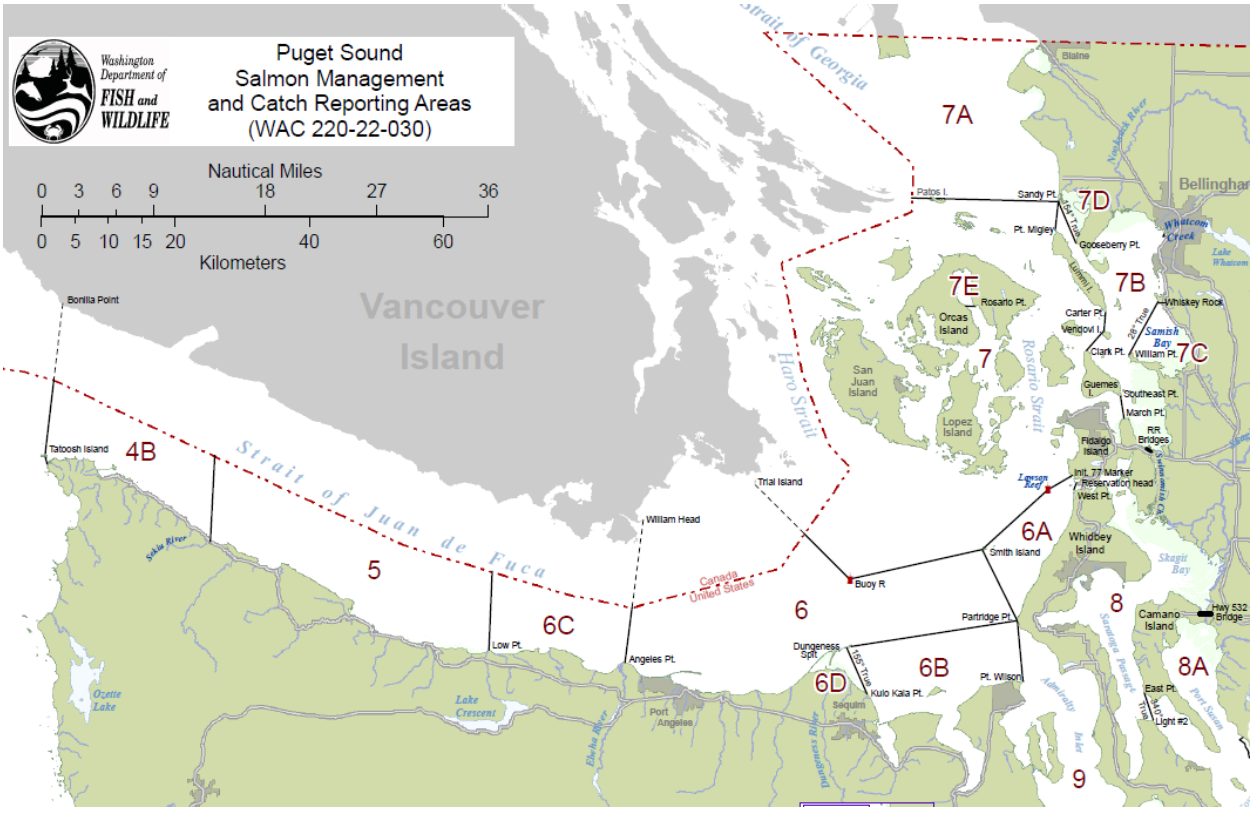
Selective Chinook	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Ocean Troll													
Cape Flattery & Quillayute (Areas 3/4/4B)	no	no	no	no	no	no	no	no	no	no	no	no	no
Columbia. R & Grays Harbor (Areas 1&2)	no	no	no	no	no	no	no	no	no	no	no	no	no
Ocean Sport													
Neah Bay (Area 4)	no	no	no	no	no	no	yes	yes	yes	yes	yes	yes	no
La Push (Area 3)	no	no	no	no	no	no	yes	yes	yes	yes	yes	yes	no
Grays Harbor/Westport (Area 2)	no	no	no	no	no	yes	yes	yes	yes	yes	yes	yes	no
Col. R./Ilwaco (Leadbetter Pt. to Cape Falcon)	no	no	no	no	no	no	yes	yes	yes	yes	yes	yes	no

Inside Fisheries													
Sport													
Juan de Fuca (Area 5&6)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
San Juan Islands (Area 7)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Puget Sound Sport (Areas 8-13)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Puget Sound Rivers	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
North WA Coastal Rivers	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Grays Harbor (Areas 2-2)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	no
Columbia River Sport - Winter/Spring	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Columbia River Sport - Summer	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no
Columbia River Sport - Fall	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	no	no	no
Willapa Bay (Area 2-1)	yes	yes	yes	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	no	no	no
Grays Harbor (Areas 2A-2D)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	no
Willapa Bay (Area 2-1)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Columbia River Net-Winter/Spring	no	no	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes
Columbia River Net - Summer	no	no	no	no	no	no	no	no	no	no	no	no	no
Columbia River Net - Fall	no	no	no	no	no	yes	yes	yes	yes	no	no	no	no
Strait of Juan de Fuca(4B/5/6C) Net & Troll	no	no	no	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	yes	yes	yes
Puget Sound Marine (Areas 7B-D,8 - 13)	yes	no	no	no	no	no	yes	no	no	no	yes	yes	no
Puget Sound Rivers	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	no	no

III. PRELIMINARY REVIEW OF THE 2021 WASHINGTON CHUM SALMON FISHERIES OF INTEREST TO THE PACIFIC SALMON COMMISSION

This summary report provides a preliminary review of the 2021 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 2019). The harvest and abundance information provided are based on preliminary data reported through November 15, 2021. 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 recent years, the 2021 Chum salmon fishery in Areas 4B, 5 and 6C was restricted to very limited effort by Tribal fishers using gillnets. The fall Chum-directed salmon fishery opened the

week of October 10, with a schedule of six days per week and continued through November 13. A total of 48 Chum salmon were harvested during this period (Table 18). During the fall Chum fisheries in Areas 4B, 5, and 6C, there was zero reported by-catch of Coho, Chinook, and Steelhead.

Table 18. Preliminary 2021 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 9/18	0
9/19-9/25	0
9/26-10/2	0
10/3-10/9	0
10/10-10/16	6
10/17-10/23	7
10/24-10/30	32
10/31-11/6	3
11/7-11/13	0
Total	48

Areas 7 and 7A

Chum salmon fisheries in Areas 7 and 7A are regulated to comply with a base harvest ceiling of 125,000 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 2019). 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. 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, 2021 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 24.

Paragraph 9 (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 1,050,000, then the U.S. will limit its fishery in Areas 7 and 7A to not exceed a catch of 20,000 additional Chum salmon from the day following notification. If the Fraser River Chum run size estimate is between 1,050,000

and 1,600,000, the U.S catch ceiling remains at 125,000. If the Fraser River run size estimate is above 1,600,000, the U.S. catch ceiling is revised to 160,000.

On October 22, 2021, Canada notified the U.S. that the Fraser River Chum run size was estimated to be 481,000 fish, well below the 1,050,000 Chum threshold prescribed in the Treaty. Therefore, the U.S. was expected to limit Chum harvest to not exceed 20,000 from the day following this notification. Areas 7 and 7A therefore remained closed to commercial Chum fisheries through the remainder of the Chum management period.

Non-Tribal reef net fisheries targeting Coho salmon were conducted following the end of Fraser Panel control on September 18, with Chum and unmarked Chinook retention prohibited prior to October 1. Retention of unmarked Coho prior to October 1 was capped at 500 fish, per the NOF List of Agreed to Fisheries.

The total 2021 Chum salmon catch by all gears in Areas 6, 7, and 7A (reported through November 15) was 750 fish (Table 19). Because no fall Chum salmon-directed fisheries occurred in Areas 6, 7, and 7A, there was no reported by-catch of Coho, Chinook, or Steelhead (Table 19).

Table 19. Preliminary 2021 Chum salmon harvest report for Puget Sound Salmon Catch Reporting Areas 6, 7 and 7A, by gear type[1/]. Bycatch[2/] numbers include both landed and estimated non-landed fish.

	Area 6	**Area 7**				**Area 7A**			**Area 6, 7, 7A Total**
Time Periods	GN	PS	GN	RN	Area Total	PS	GN	Area Total	
Through 9/18		76		3	79	9		9	88
9/19-9/25				4	4			0	4
9/26-10/2				111	111			0	111
10/3-10/9				506	506			0	506
10/10-10/16	41				0			0	41
10/17-10/23					0			0	0
10/24-10/30					0			0	0
10/31-11/6					0			0	0
11/7-11/13					0			0	0
Total	41	76	0	624	700	9	0	9	750
[1/] Gear Type Abbreviations: GN=Gill Net; PS=Purse Seine; RN=Reef Net									
[2/] Oct 10 – Nov 15 Bycatch:		Coho: 0 Chinook: 1 Steelhead: 0							

PUGET SOUND TERMINAL AREA FISHERIES AND RUN STRENGTH

Pre-season forecasts for Chum salmon returns to Puget Sound in 2021 predicted a fall Chum run size totaling approximately 525,604 fish, with 273,396 Chum predicted to return to Hood Canal

and 197,928 predicted to return to South Puget Sound. As of the date of this report, in-season estimates indicate that overall Chum returns to Puget Sound are above forecast. In-season run size estimates indicate that South Sound fall Chum is expected to return at around 269% of the pre-season forecast, while no in-season Hood Canal run size estimate was generated in 2021. Terminal fisheries in mixed-stock marine areas were executed in 2021, in Central and South Puget Sound, and to a lesser extent in Hood Canal. 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 suggest that more natural Chum stocks may meet their escapement goals than have in the recent years, particularly in South Puget Sound.

REFERENCES

Pacific Salmon Treaty (PST) Act of 1985. 2019 Agreement. U.S.-Canada. Public Law 99-5, 16 U.S.C. 3631.

III. Preliminary Review of 2021 United States Fraser River Sockeye and Pink Fisheries

INTRODUCTION

The 2021 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 2021 U.S. Fraser River salmon fisheries as authorized by the Panel. Catch and abundance information presented is considered preliminary.

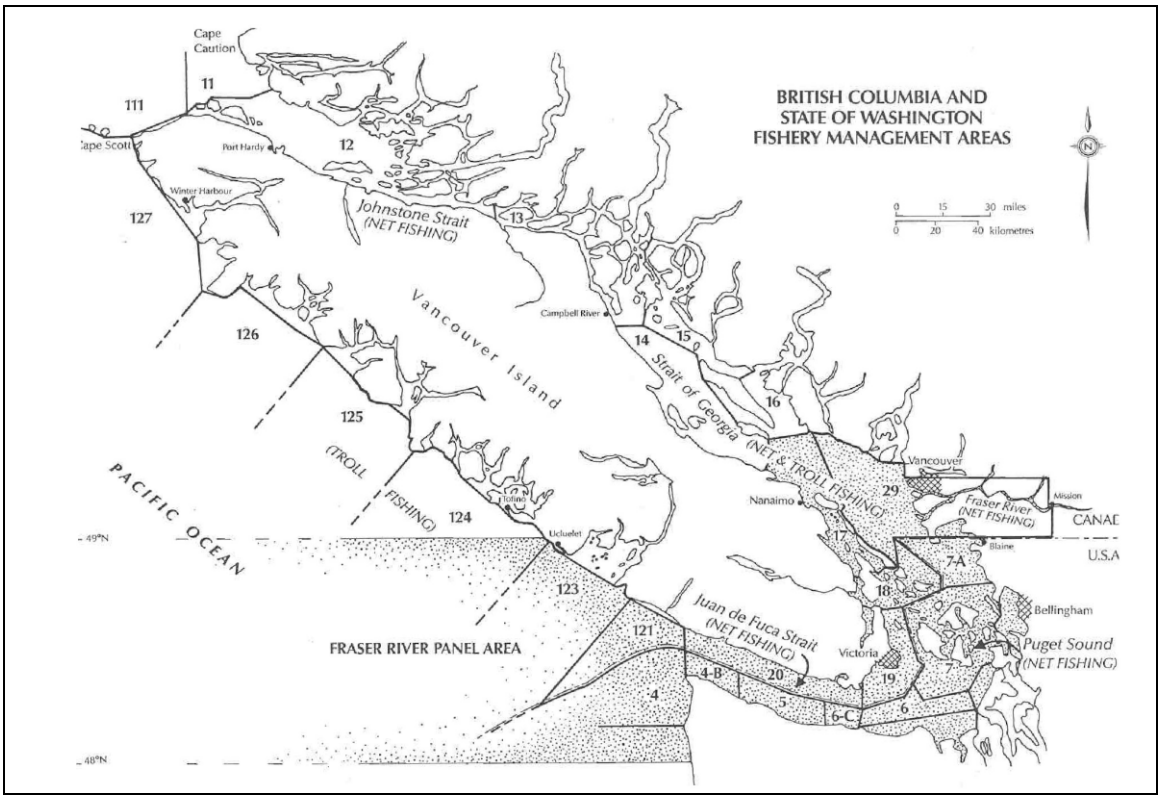


Figure 1. British Columbia and State of Washington Fishery Management Areas, 2021. The shaded area in the figure represents the marine waters managed by the Fraser River Panel.

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 1 shows the 2021 pre-season sockeye forecasts based on the 50 percent probability level, which represent the mid-point of the range of forecast run sizes. Table 1 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.

Fraser River pink salmon returns were projected pre-season at 3,009,000 fish, with an escapement goal of 2,817,000.

Table 1. 2021 pre-season Fraser River sockeye forecasts and escapement goals by run-timing group.

	Early Stuart	**Early Summer**	**Summer**	**Late**	**Total**
Forecast of Abundance	18,000	108,000	1,046,000	320,000	1,330,000
Escapement Goal	18,000	108,000	1,046,000	159,000	1,330,000

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 35% which is greater than the 1990-2020 mean diversion of 27%. For pink salmon, a pre-season northern diversion rate of 50% was adopted.

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 2 provides the pre-season projected MAs that were used for planning fisheries in 2021. 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 2. 2021 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%	0.39	-28%	0.09	-8%	0.96	-49%

[1] Early Stuart pDBE = "all years" historical median; Early Summer pDBE = "dominant/subdominant cycle" historical median; Summer pDBE = "all years" historical median; Late pDBE = weighted odd-year median for Lates excluding Birkenhead (-0.58) and all years Birkenhead (-0.28) using p50 forecast abundance.

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 3. 2021 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)[1]
Early Stuart	July 4	July 5
Early Summer	July 30	July 24
Summer	August 10	August 5
Late	August 18	August 13
Pink Salmon	August 28	August 25[2]

[1] DFO sockeye run-timing forecast used for Early Stuart. Difference of Chilko forecast timing to the median timing used to adjust all remaining components.

[2] The pink run-timing forecast from DFO was not available for the June meeting and pre-season modeling for pink salmon was based on the August 25 median.

U.S. Total Allowable Catch (TAC)

Following Annex IV of the PST, U.S. TAC is calculated as 16.5% of the TAC for international sharing for sockeye salmon and 25.7% for pink salmon. Pre-season, the U.S. TAC was established at 0 sockeye and 48,400 for pink salmon at the p50 modelled run size. The TAC available by sockeye run-timing group is shown in Table 4.

Table 4. 2021 U.S. total allowable catch (TAC) by run-timing group[1].

Run Timing Group	Pre-season U.S. TAC
Early Stuart	0
Early Summer	0
Summer	0
Late	0
Total	0

Pink Salmon	48,400

[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.

Given the constraints imposed by low returns to all management groups and the potential for adverse Fraser River conditions, pre-season plans were developed which indicated that both Canada and the United States were unlikely to have harvest opportunities at the median forecast for sockeye salmon but have some harvest opportunities at the median forecast for pink salmon. Specifically, based on pre-season forecasts, no Fraser sockeye salmon run-timing groups had pre-season U.S. TAC (Table 4). Therefore, the U.S. did not plan to fish Fraser origin sockeye or pink salmon unless an in-season adopted run-size created available TAC based on pre-season modeled management scenarios. The Fraser River sockeye management objectives based on the pre-season forecasts placed high priority on achieving Fraser sockeye escapement goals.

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 estimated by the Fraser River Panel in 2021 was 2,549,000 (Table 5), which was about 54% above the pre-season forecast. The 2021 sockeye return was a strong rebound from the historic low return observed in 2020, 72% above the brood year (1.5M) but 77% below the historical cycle-line (11M). The return of Summer-run sockeye, the group with the largest pre-season forecast, was approximately 48% above the pre-season forecast. The 2021 Pink return was much stronger than the pre-season forecast as the Fraser River Panel adopted a run size of 8,000,000, but 10% below the brood year (8.9M).

The 2021 Fraser sockeye run timing varied across run-timing groups. The Early Stuart run was right on time with the pre-season forecast, while the Early Summer run was eleven days later than expected. Summer-run sockeye also had a large discrepancy from expected pre-season forecast timing, arriving nine days later than expected (Table 6). Fraser pink salmon were six days early relative to the pre-season median timing.

Table 5. Comparison of 2021 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	18,000	70,000	289%
Early Summer	108,000	120,000	11%
Summer	1,046,000	1,762,000	68%
Late	159,000	597,000	275%
Total Sockeye	1,330,000	2,549,000	92%
Pink Salmon	3,009,000	8,300,000	176%

[1] As of September 28, 2021.

Table 6. Comparison of 2021 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 5	July 5
Early Summer	July 24	August 4
Summer	August 5	August 14
Late	August 13	August 18
Pink Salmon	August 25	August 19

Season Description

The Fraser Panel held 23 regular meetings either in-person or by conference call from July 13 through September 28 (usually on Tuesdays and Fridays) to receive updates from PSC staff on the abundance and timing of the sockeye and pink salmon returns and to review migration conditions in the Fraser River watershed. In 2019, a major landslide on the Fraser River at Big Bar (83 km north of Lillooet, B.C. by river) drastically altered flow conditions in-river limiting fish passage through the area. After the landslide and through 2021, DFO and First Nations engaged in operations to repair and monitor natural and alternative fish passage systems. During the 2021 season, water temperature and flow conditions were not a major factor affecting management decisions because of the repairs made to the landslide and low pre-season and in-season marine abundance estimates that precluded U.S. TAC for sockeye. The last Fraser Panel in-season meeting was held on September 28. Table 7 summarizes changes to run sizes made by the Fraser Panel during the 2021 season and the effect on U.S. TAC.

The following summarizes the major decisions related to U.S. fishing during the 2021 season. Based on the pre-season forecasts and in-season updates for all sockeye run-timing groups, there was no U.S. TAC for sockeye. Therefore, all U.S. commercial fisheries in 2021 were pink-directed fisheries.

Week ending August 22, 2021

The first panel-approved U.S. commercial fishery opening was from August 21 to August 25 in Areas 4B, 5, 6C and 7, 7A for Treaty Indian net fisheries. All Citizen Fisheries opened Areas 7, 7A to reef net fishing on August 23. All U.S. fisheries were sockeye non-retention. The panel adopted a run size of 115,000 and 4,000,000 for early summer-run sockeye and pink salmon, respectively, with an associated Area 20 timing of August 4 for early summer sockeye.

Week ending August 29, 2021

The Fraser River Panel met on August 24 to receive an update on the migration of Fraser River sockeye and pink salmon. The panel made no changes to the run size. Treaty Indian fisheries opened from August 24 to August 28 for drift gillnet in Areas 4B, 5, and 6C. All citizen fisheries opened to purse seine and gill net fishing August 27 in Areas 7, and 7A, excluding the apex. The apex is those waters north and west of the Iwersen Point Line, defined as a line projected 233 degrees true from the Iwersen Dock on Point Roberts to the Active Pass Light on Georgina Point, Mayn Island, British Columbia, Canada. All US fisheries were sockeye non-retention.

The Fraser River Panel met August 27 to receive an update on the migration of Fraser River sockeye and pink salmon. The panel adopted run sizes of 1,350,000 for Summer-run sockeye, with an associated Area 20 timing of August 12, and 4,800,000 for pink salmon, with an associated Areas 20 timing of August 17. Treaty Indian fisheries extended drift gillnet fishing from August 28 to September 1, in Areas 4b, 5, and 6C. Treaty Indian fisheries opened net fisheries from August 28 to 29, in Areas 6, 7, and 7A. All Citizen fisheries opened purse seine and gill net fishing August 31, in Areas 7 and 7A. All Citizen fisheries opened reef net fishing August 31, in Area 7. All U.S. fisheries were sockeye non-retention.

Week ending September 5, 2019

The Fraser River Panel met on August 30 to receive an update on the migration of Fraser River sockeye and pink salmon. The Panel adopted a late-run run size of 234,000 with an associated Area 20 timing of August 16, and a pink salmon run size of 5,700,000, with an associated Area 20 timing of August 18. Treaty Indian fisheries extended drift gillnet in 4B, 5, 6C, September 1 to 4. Treaty Indian fisheries were open for net fishing in Areas 6, 7, 7A, August 31 to September 2, in the Area southerly and easterly of a straight line drawn from the Iwersen Dock on Point Roberts in the State of Washington to the Georgina Point Light at the entrance to Active Pass in the Province of British Columbia. All Citizen purse seine and gillnet fisheries were opened in Areas 7 and 7A, August 31, in the Area southerly and easterly of a straight line drawn from Iwersen dock on Point Roberts in the State of Washington to the Georgina Point Light at the entrance to Active Pass in the Province of British Columbia. All Citizen reef net fishery was opened in Area 7, August 31 to September 1. All U.S. fisheries were sockeye non-retention.

The Fraser River Panel met September 3 to receive an update on the migration of Fraser River sockeye and pink salmon. The Panel adopted a proportional Management adjustment (pMA) of 0.19. For the Late run, the Panel adopted a run size of 300,000, with an associated Area 20 timing of August 18. There was no available harvest at this increased run size and adopted pMA. Treaty Indian fisheries were extended for drift gillnet in Areas 4B, 5, and 6C, September 4 to September 7. Treaty Indian fisheries were open for net fishing in Areas 6, 7, and 7A, September 4 to September 7. All U.S. fisheries were sockeye non-retention.

Week ending September 12

The Fraser River Panel met September 7 to receive an update on the migration of Fraser River sockeye and pink salmon. The Panel adopted run sizes of 1,550,000, with an associated Area 20 timing of August 4 and pMA of 0.18, for late-run sockeye, and 6,000,000, with an associated Area 20 timing of August 19 for pink salmon. Treaty Indian fisheries extended gillnet fishing in Areas 4B, 5, and 6C, September 8 to 10. Treaty Indian fisheries opened net fishing in Areas 6, 7, and 7A, September 8 to 10. All U.S. fisheries were sockeye non-retention.

The Fraser River Panel met September 10 to receive an update on the migration of Fraser River sockeye and pink salmon. The Panel adopted a run size of 6,500,000 for Fraser River pink salmon, and a pMA of 0.11 for Summer-run sockeye salmon. Treaty Indian fisheries were open for net fishing in Areas 6, 7, 7A in the Area southerly and easterly of a straight line drawn from the Iwersen Dock on Point Roberts in the State of Washington to the Georgina Point Light at the entrance to Active Pass in the Province of British Columbia, September 11 to 13. Treaty Indian fisheries were open for drift gillnet in 4B, 5, 6C, September 11-13. All Citizens fisheries were open to reefnet fishing, with non-retention of sockeye in Area 7, September 11-12. All U.S. fisheries were sockeye non-retention.

Week ending September 19

The Fraser River Panel met September 17 to receive an update on the migration of Fraser River sockeye and pink salmon. The panel made no changes to the run size of 6,500,000 (accounted to date was a run size of 7,035,400). No U.S. fisheries were proposed.

The Fraser Panel relinquished control of U.S. fishery Areas as follows:

- Areas 4B, 5 and 6C at 23:59 September 18, 2021
- Areas 6,6A, and 7 at 23:59 September 18, 2021
- Area 7A relinquishment at 2359 October 2, 2021
- Apex relinquishment at 2359 October 9, 2021

Week ending September 26

The Fraser River Panel met Tuesday, September 21, to receive an update on the migration of Fraser River sockeye and pink salmon and review the status of migration conditions in the Fraser River watershed. It is currently estimated that 2,172,700 and 7,526,200 sockeye and pink salmon, respectively, have passed the Mission hydroacoustics site, and 16,000 sockeye and 213,800 pink salmon have been caught downstream of Mission. The Panel adopted an increase to the Fraser River pink salmon run size to 8,000,000, and the in-season 50% run timing date remained the same at August 19.

Table 7. Summary of changes to Fraser River sockeye and pink salmon run sizes adopted by the Fraser Panel during the 2021 season and U.S. TAC.

Meeting Date	Run-Timing Group	Change Made	U.S. TAC	
			Sockeye	Pink
Pre-season			0	48,400
July 23, 2021	Early Stuart	Increased to 65,000	0	48,400
August 13, 2021	Early Stuart Early Summer	Increased to 69,000 Increased to 170,000	0	48,400
August 20, 2021	Early Summer Pink	Decreased to 115,000 Increased to 4,000,000	0	86,480
August 27, 2021	Summer Pink	Increased to 1,350,000 Increased to 4,800,000	0	124,930
August 30, 2021	Late Pink	Increased to 234,000 Increased to 5,700,000	0	176,150
September 3, 2021	Summer Late	Increased to 1,475,000 Increased to 300,000	0	176,150
September 7, 2021	Summer Late Pink	Increased to 1,550,000 Increased to 320,000 Increased to 6,000,000	0	195,320
September 10, 2021	Pink	Increased to 6,500,000	0	229,450
September 21, 2021	Pink	Increased to 8,000,000	0	512,900

[1] Despite the Early-summer run size decreasing, the TAC increased due to revised test fishing deductions.

Harvest

Based on the pre-season forecasts, U.S. harvest opportunities in 2021 were anticipated to be poor for sockeye and pink given the low forecasts for all runs, resulting in no U.S. TAC for sockeye and 48,400 for Pink at the p50 pre-season forecasted run size. From the beginning of in-season assessments, sockeye appeared to be outperforming pre-season forecasts for the Early Stuart component, and then returned well-above pre-season expectations for the remaining run components. While the run size was upgraded from 1,330,000 to 2,549,000, the Fraser River Panel did not achieve a run size that allowed for U.S. TAC for sockeye.

Pink-directed Treaty Indian and All Citizen fisheries started on 21 August and relinquished control on 18 September and requested fishers to make all efforts to release sockeye alive. In those fisheries 26 sockeye were harvested by Treaty Indian fisheries for ceremonial and subsistence (Table 8). Sockeye were required to be released from pink-directed Treaty Indian and All Citizen fisheries due to the extremely low in-season abundance of sockeye. The pink salmon run size varied throughout the season and was eventually increased to 8,000,000 on September 21, 2021. However, despite additional All Citizens and Treaty Indian fisheries following this run size increase, most of the returning pink salmon had passed through U.S. waters. A total of 195,642 Fraser pink salmon were harvested in U.S. fisheries in 2021 (Table 9). Of this, 93,642 pink salmon were harvested in the Treaty Indian fishery (48%) and 101,999 in the All Citizens fishery (52%). Treaty Indian commercial fisheries were open for 28 days in

Areas 4B, 5, 6C and 20 days in Areas 7, and 7A. All Citizens fisheries were open for 2 days for purse seines and gill nets, and 9 days of reef nets in Areas 7, and 7A.

Table 8. Preliminary summary of 2021 U.S. landed catch of Fraser River sockeye salmon in Panel area waters.

	Treaty Indian	All Citizens
Ceremonial and Subsistence (all Areas)	26	0
Commercial Catch in Areas 4B/5/6C	0	0
Commercial Catch in Areas 6/7/7A	0	0
Total Catch	26	0
% of U.S. Catch	100%	0%

Table 9. Preliminary summary of 2021 U.S. catches of Fraser River pink salmon in Panel area waters.

	Treaty Indian	All Citizens
Ceremonial and Subsistence (all Areas)	0	0
Commercial Catch in Areas 4B/5/6C	0	0
Commercial Catch in Areas 6/7/7A	93,642	101,999
Total Catch	93,642	101,999
% of U.S. Catch	48%	52%

The 2021 Fraser sockeye and pink salmon season presented many management challenges:

- The total Fraser sockeye salmon return was 92% above the pre-season forecast and 72% above the brood year (1.5M)
- Timing for Early Stuart was the same as the forecast, while all other management groups were later than forecast by as much as 11 days (Early Summer)
- The Late run sockeye were estimated to have delayed their upstream migration by 21 days
- The total Fraser pink salmon return was 176% above the pre-season forecast and 10% below the brood year return of 8.9M.
- Pink timing was earlier than the forecast by 4 days (August 21)
- Uncertainty in pink salmon pre-season forecasts, due to a lack of fry abundance data and high divergence of forecast with and without environmental covariates

- Decreased confidence in pink run size estimates due to uncertainty in the timing offset of pink salmon between the marine areas and Mission, and uncertainty in pink salmon catchability.
- Pink salmon migration was unpredictable and did not follow the box-car migration assumption, redistributing between the Area 20 test fishery, U.S. fisheries in Areas 7 and 7A, and the Mission hydroacoustic site.

POST-SEASON REPORT FOR THE 2021 CANADIAN TREATY LIMIT FISHERIES

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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. In August 2018, the PSC recommended new provisions, under Annex IV of the PST, to the Governments of Canada and the U.S. for review and ratification. Both governments agreed to the provisional application of the new agreements as of January 1, 2019 while the ratification process was completed. Effective May 3, 2019, the Annex IV amendments came fully into force through the exchange of diplomatic notes between Canada and the U.S., and will remain in place for 10 years. Chapter 4 (Fraser River Sockeye and Pink) expired on December 31, 2019. In February 2019, agreement-in-principle was reached and the proposed amendments were referred to the Governments of Canada and the U.S. for review and ratification. Both governments agreed to the provisional application of the amendments as of January 1, 2020 while the ratification process is completed. The new amendments came into force in Spring 2020 and will remain in place for 9 years, bringing Chapter 4 into alignment with the five other fishing Chapters under the PST.

Annex fisheries are reported in the order of the Chapters of Annex IV. Fishery summaries include expectations and management objectives, escapements (where available and appropriate) and catch results by species. The focus is on those stocks and fisheries covered by the Pacific Salmon Treaty, and not all Canadian domestic salmon fisheries are covered in this document.

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 at this time. 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 catches from years 2004 to 2021 in Canadian fisheries that have at some time been under limits imposed by the Pacific Salmon Treaty. More detailed catch data is provided for the current year for commercial, recreational, First Nations, Excess Salmon to Spawning Requirements (ESSR) and test fisheries in Appendices 2 to 7.

2 TRANSBOUNDARY RIVERS

2.1 STIKINE RIVER

Following the 2021 pre-season meeting of the Transboundary Panel, Canada developed its fishing strategy for Stikine River salmon fisheries based on the catch sharing and management arrangements outlined in PST Annex IV, Chapter 1. Canada's overall intent was to achieve the following objectives: 1) Ensure that fisheries were administered to achieve bilateral conservation (spawning objectives) identified for Stikine River Canadian-origin salmon stocks; 2) to harvest its share (47%) of the total allowable catch (TAC) of Stikine River Sockeye Salmon through the First Nation food, social, and ceremonial fishery; 3) to allow harvesting opportunities for Sockeye Salmon that were surplus to spawning requirements; and 4) to harvest up to 5,000 Coho Salmon through a directed fishery. The pre-season forecast of 9,900 Chinook Salmon was well below the Chapter 1 fishery forecast run size TAC allocation threshold of 24,500, and did not allow for a directed Canadian Chinook Salmon fishery. The 2021 Chinook salmon pre-forecast also resulted in the cancellation of the 2021 Chinook salmon assessment fishery. The pre-season forecast of 56,000 Sockeye Salmon was not of a magnitude to allow for initiation of a directed Canadian commercial Sockeye Salmon fishery at the start of the 2021 season. Canadian First Nation food, social, and ceremonial fisheries were permitted to occur for Sockeye Salmon on the basis of in-season run size estimates and available allocation to Canadian fisheries.

The 2021 Canadian lower Stikine River commercial Coho Salmon fishery opened on August 29 (statistical week 36) and ended September 17 (statistical week 38). Commercial fishing gear permitted for the 2021 season was limited to one 135-metre (443 ft.) gill net per licence holder. The maximum mesh size permitted was 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.

Openings in the upper Stikine River commercial fishery generally mirrors those in the lower Stikine River commercial fishery, but lagged by one week. Due to Sockeye Salmon conservation concerns, the upper Stikine commercial fishery was closed for the 2021 season. In past years, the commercial fishing area was located upstream of the Chutine River to the mouth of the Tuya River. The Canadian First Nation Food, Social and Ceremonial (FSC) fishery located near the community of Telegraph Creek, British Columbia (BC) was active from July to the first week of August, with no time or gear restrictions imposed in 2021. To facilitate Chinook Salmon conservation, efforts were implemented within the First Nation FSC to minimize Chinook Salmon catch.

Canadian recreational fishery effort was effectively absent in 2021 due to area, retention, and size restrictions for the duration of the Chinook Salmon season. Recreational fishery effort for Coho Salmon was below average in 2021. Recreational angling for Sockeye Salmon is not permitted in the Canadian portion of the Stikine River watershed.

2.1.1 CHINOOK SALMON

The pre-season forecast of 9,900 large Chinook Salmon developed by the Transboundary Technical Committee (TTC) did not provide for a TAC allocation in 2021. The current, bilaterally recognized fishery management strategy specifies that a pre-season forecast run size of <24,500 precludes either Party from administering

directed Chinook Salmon fisheries. As a result, specific fishery management measures were implemented within all Canadian fisheries to minimize the likelihood of interception of Chinook Salmon in 2021. The base level catch allocation established in Chapter 1 allows for a retention of up to 1,400 "large" Stikine River Chinook Salmon. Due to the anticipated poor abundance of Chinook salmon in 2021, base level catch harvest was limited to the FSC fishery.

The 2021 total Canadian fishery catch of Chinook salmon was 182 large Chinook salmon and 333 jacks (all of which occurred exclusively within the First Nation FSC fishery), which was well below the 10-year average of 2,100 large Chinook Salmon and 900 jacks. No Chinook Salmon were harvested within the 2021 recreational or commercial fisheries as retention was prohibited.

The preliminary post-season estimate of the 2021 Stikine River Chinook Salmon terminal run was approximately 9,100 large Chinook Salmon. Accounting for the total Canadian catch of Chinook Salmon, the spawning escapement was estimated at approximately 8,900 large Chinook Salmon. The Chinook Salmon escapement estimate of 8,900 is 49% below the management objective of 17,400 large Chinook Salmon and did not achieve the lower end of the bilateral escapement goal range of 14,000.

2.1.2 SOCKEYE SALMON

The 2021 forecast for Stikine River Sockeye Salmon as developed by the TTC was for a terminal run size[1] of 56,000 fish which was comprised of 28,000 Tahltan Lake origin Sockeye Salmon (9,000 wild and 19,000 enhanced) and 28,000 non-Tahltan wild Sockeye Salmon. The 2021 Stikine River Sockeye Salmon terminal run size forecast was below the 10-year average terminal run size of approximately 108,000 fish.

The total 2021 Canadian fishery harvest of Stikine River Sockeye Salmon was 4,705, well below the 10-year average of 44,000 fish. The lower Stikine River directed commercial fishery was closed due to conservation concerns, while 611 Sockeye Salmon were harvested idcidentally during the lower Stikine Coho Salmon directed fishery. The First Nation FSC fishery harvested a total of 4,094 Sockeye Salmon. The preliminary estimate of Canadian fishery Sockeye Salmon harvest originating from the Stikine Enhancement Production Program will be confirmed at the Transboundary Panel's 2021 post-season meeting.

A total of 43,200 Sockeye Salmon returned to Tahltan Lake in 2021. The Tahltan Lake Sockeye Salmon escapement goal range is 18,000 to 30,000 while the most recent 10-year average return is 25,400. The proportion of Sockeye Salmon returning to Tahltan Lake in 2021 originating from the Stikine Enhancement Production Program will be confirmed at the Transboundary Panel's 2021 post-season meeting. A total of 1,225 adult Sockeye Salmon were removed from Tahltan Lake in order to support provision of eggs for the 2021 Stikine Sockeye Enhancement Production Plan program. Four hundred Sockeye Salmon were removed for stock identification purposes and it is estimated that approximately 41,600 Sockeye Salmon spawned in Tahltan Lake 2021. The preliminary run size estimate of 47,300 Tahltan Lake Sockeye Salmon was approximately 68% above the pre-season forecast of 28,000.

The spawning escapement for the non-Tahltan Lake Sockeye Salmon stock group is calculated using stock identification, assessment fishery and in-river commercial catch and effort data. The escapement estimate for non-Tahltan Lake Sockeye Salmon for 2021 will be confirmed at the Transboundary Panel's 2021 post-season

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

meeting. The non-Tahltan spawning escapement goal range is 20,000 to 40,000 fish and the 10 year average abundance is 23,700 fish.

The Stikine River terminal Sockeye Salmon run size estimate will be based on the in-river run reconstruction of the Tahltan Lake Sockeye Salmon run expanded by run timing, along with stock identification data from lower river assessment projects and estimated harvests of Stikine River Sockeye Salmon in U.S. terminal gill net fisheries. The post-season estimate of the terminal Sockeye Salmon run size will be confirmed at the Transboundary Panel's 2021 post-season meeting. This estimate will include Tahltan Lake origin fish and Sockeye Salmon of the non-Tahltan stock group.

Based on in-season run size information, there was a limited allowable catch for Stikine River Sockeye Salmon in 2021, allowing for First Nation fishery harvest.

2.1.3 COHO SALMON

The total Canadian fishery harvest of Coho Salmon in 2021 was 4,521. Of the total harvest, all Coho Salmon were harvested during the directed fishery period between statistical weeks 36 to 38. The total Canadian fishery harvest was below the recent 10-year average of 5,500 fish.

A Coho Salmon assessment fishery was not conducted in 2021. The catch per unit effort (CPUE) observed in the targeted Coho Salmon fishery was near average for statistical weeks 36 to 38. Aerial surveys of the index spawning sites for Coho Salmon were successfully completed in 2021.

2.1.4 JOINT SOCKEYE SALMON ENHANCEMENT PROGRAM

In Fall 2020, 446,000 Sockeye Salmon eggs were collected from Tahltan Lake, British Columbia. All eggs were hatched and reared at Snettisham Hatchery (Alaska) during the 2020/2021 winter period. All fry were mass-marked at the Snettisham hatchery with thermally induced otolith marks for identification and assessment purposes. Green egg to released fry survival was approximately 74%. Sockeye Salmon enhancement programs have been subject to Infectious Hematopoietic Necrosis virus (IHNv) outbreaks before as the disease is naturally occurring in Stikine Sockeye Salmon stocks. Disinfection procedures are used in accordance with the World Health Organisation protocols during egg collections to limit the risk of transmission. Subsequent to the 2020 egg collection and rearing at Snettisham Hatchery no losses to IHNv occurred. On June 6, 2021 approximately 329,000 emergent Sockeye Salmon fry were transported to Tahltan Lake for release.

For 2021, the agreed bilateral Stikine River Enhancement Production Plan (SEPP) identified an egg collection objective of 5.0 million Sockeye Salmon eggs from Tahltan Lake. In-season the 2021 Sockeye Salmon egg collection target was revised to 1.5 million eggs in consideration ofrecent declines in wild egg to smolt survival. Anestimated 1.52 million Sockeye Salmon eggs were collected from Tahltan Lake in the fall of 2021.

2.2 TAKU RIVER

Following the 2021 pre-season meeting of the Transboundary Panel and the Pacific Salmon Commission (PSC), Canada developed its fishing strategy for Taku River salmon fisheries based on the catch sharing and management arrangements outlined in Annex IV, Chapter 1 of the PST. Accordingly, the Canadian fishery strategy incorporated specific conservation considerations and contained the following harvest objectives: 1)

Ensure that fisheries were administered to achieve bilateral conservation (spawning objectives) identified for Stikine River Canadian-origin salmon stocks; 2) to harvest 23% of the TAC of Taku River Sockeye Salmon (adjusted as necessary according to projections of the number of enhanced Sockeye), plus harvest any salmon in excess of spawning and brood stock needs; 3) to harvest enhanced Taku River Sockeye Salmon incidentally to wild Sockeye Salmon; and, 4) to harvest 5,000 Coho Salmon plus Canada's share of the TAC and any salmon surplus to spawning needs in a directed Coho Salmon fishery.

The 2021 commercial fishing season on the Taku River opened on July 05 (statistical week 28) and closed on September 30 (statistical week 40). Fishing gear was limited to one drift gillnet and one set net per licence, 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 area in Canada consists of the mainstem of the river from the international border upstream approximately 18 km (11 mi.), to a geological feature known locally as Yellow Bluff. Nearly all commercial fishing activity takes place in the lower half of this area, downstream of the Tulsequah River / Taku River confluence.

The First Nation Taku River FSC fishery is primarily located in the lower Taku River in the same area as the Canadian commercial fishery. Small numbers of fish are also harvested on the lower Nakina River and at the outlet of Kuthai and King Salmon lakes.

Canadian recreational fishery effort was largely absent in 2021 due to area, retention and size restrictions for the duration of the Chinook Salmon season. Restrictions were implemented within the recreational fishery to prohibit the harvest of Taku River Chinook Salmon as abundance was well below the minimum spawning escapement requirement. Recreational fishery effort for Coho Salmon was also minimal in 2021. Recreational angling for Sockeye Salmon is not permitted in the Canadian portion of the Taku River watershed.

2.2.1 CHINOOK SALMON

The bilateral pre-season forecast was for a terminal run of 10,300 large Chinook Salmon, approximately 41% below the previous 10-year average of 17,400 fish. A run size of 10,300 fish was well below the management objective of 25,500 fish (below the lower end of the escapement goal range of 19,000 to 36,000), and as a result, there was no allowable catch (AC) for either the U.S. or Canada. In response, Canada did not prosecute a directed commercial Chinook Salmon fishery. Additionally, significant efforts were made in all other fisheries to avoid the incidental catch of Chinook Salmon. For 2021, the in-river Chinook assessment fishery was not conducted to allow for the maximum number of Chinook Salmon to pass to the spawning grounds. The base level catch allocation established in Chapter 1 allows for a retention of up to 1,500 "large" Taku River Chinook Salmon. Due to the anticipated poor abundance of Chinook salmon in 2021, base level catch harvest was limited to the FSC fishery.

The catches of large Chinook Salmon in the Canadian fisheries were: 0 large Chinook Salmon harvested in the directed commercial Sockeye and Coho Salmon fisheries; 54 large Chinook Salmon in the First Nation FSC fishery; and 0 large Chinook Salmon in the recreational fishery.

The Taku River large Chinook Salmon spawning escapement estimate for 2021 was approximately 11,000 fish, which was below the management objective of 25,500 and the lower end of the escapement goal range (19,000). The most recent 10-year average spawning escapement was 15,300 large Chinook Salmon.

The total Canadian catch of large Chinook Salmon was 54, which was well below the 10-year average of approximately 400 fish.

2.2.2 SOCKEYE SALMON

The pre-season run outlook for wild Taku River Sockeye Salmon was 140,000 fish, approximately 3% below the most recent 10-year average total run size of 144,000 fish. In addition, approximately 6,000 adult enhanced Sockeye Salmon of Tatsamenie Lake origin and a small number of Trapper Lake origin Sockeye Salmon were expected to return from fry outplants associated with the Canada/U.S. joint Taku Sockeye Salmon enhancement program. The forecasted return of enhanced Tatsamenie Lake origin Sockeye Salmon was anticipated to be average.

The total Canadian fishery catch of Sockeye Salmon was 18,569 fish, of which 18,275 were taken within the commercial fishery, 294 in the First Nation FSC fishery, and 0 in assessment/test fisheries. This harvest was 22% below the 10-year average total of 23,700 fish. In addition to wild Sockeye Salmon, Canadian fisheries harvested an estimated 750 enhanced Sockeye Salmon produced through the bilateral Taku Enhancement Production Plan (3% of the total Canadian catch).

To reduce the likelihood of incidental harvest of Chinook Salmon, the directed Canadian Sockeye Salmon fishery commenced on July 05 (statistical week 28) which is three weeks later from what would have historically occurred. Additionally, retention of incidentally-caught Chinook Salmon in the directed commercial Sockeye Salmon fishery was prohibited. The maximum permissible mesh size in the first three weeks of the directed Sockeye Salmon fishery was 140 mm (5.5”), which was intended to reduce likelihood of entanglement of large Chinook Salmon and to facilitate live release. Projected estimates of the total wild Sockeye Salmon run size, TAC and total escapement were made weekly throughout the fishing season. 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. The preliminary post-season run size estimate is 211,000 fish (comprising 196,000 wild and 15,000 enhanced Sockeye Salmon). Subtracting the management objective of 58,000 from the wild run of 196,000 fish resulted in a TAC of approximately 138,000 wild fish. The 2021 Canadian allowable catch, based on a 23% harvest share (associated with an enhanced Sockeye Salmon return range of 5,001 to 15,000 fish) was 45,000 wild fish. The total 2021 Canadian Sockeye Salmon fishery harvest was 18,569, below the allowable catch limit. The estimated total spawning escapement of Canadian-origin wild Sockeye Salmon was 153,000, which is above both the management objective (58,000) and the upper end of the bilateral spawning escapement goal range of 75,000 fish.

2.2.3 COHO SALMON

The 2021 total Canadian fishery catch of 10,880 Coho Salmon (10,880 commercial and 0 First Nation FSC) was 3% below the 10-year average of 11,200 fish. The catch during the directed commercial/assessment Coho Salmon fishery (after statistical week 33) was 9,770 fish. The bilateral estimate of 2021 total Canadian-origin Coho Salmon terminal abundance is 94,300 fish. A run size of this abundance provides Canada an allocation of 5,000 Coho Salmon for assessment purposes, and a AC of 7,150 plus any surplus to spawning escapement,

estimated at 15,917 harvestable Coho salmon as of SW40. The 2021 post-season spawning escapement estimate is 74,900 Coho Salmon which is above the management target of 70,000 and within the escapement goal range of 50,000 to 90,000 fish.

2.2.4 JOINT SOCKEYE SALMON ENHANCEMENT PROGRAM

In the fall of 2020, 1.7 million Sockeye Salmon eggs were collected from Tatsamenie Lake and 467,300 Sockeye salmon eggs collected from Little Trapper Lake, British Columbia. These eggs were hatched and reared at Snettisham Hatchery (Alaska) during the 2020/21 winter period. All fry were mass-marked at the Snettisham hatchery with thermally induced otolith marks. Between May 27 and June 10, 2021 approximately 1.2 million emergent Sockeye Salmon fry were transported to Tatsamenie Lake, and 319,400 Sockeye Salmon fry were transported to Trapper Lake for release. No Infectious Hematopoietic Necrosis virus (IHNV) was observed in either Tatsamenie Lake Sockeye Salmon fry or Trapper Lake Sockeye Salmon fry in 2021. Of the 1.2 million fry transported to Tatsamenie Lake approximately 241,000 fry were released into net pens for rearing between June 10 and July 2, 2021 as part of an extended rearing evaluation project, while the remaining fry were released directly into the lake. Fry held within the extended rearing evaluation project were released into Tatsamenie Lake at approximately 1.6 grams and 1.7 grams in size on June 30 and July 2, 2021 respectively. A sub-sample of Tatsamenie Lake Sockeye Salmon smolts outmigrating in 2021 are being assessed to evaluate both enhanced contribution and survival rates. The results of this analysis will be used to inform future release strategies and enhancement programs.

For 2021, the bilateral Taku River Enhancement Production Plan (TEPP) identified collection of up to 2.5 million Sockeye Salmon eggs from Tatsamenie Lake, 1.0 million Sockeye Salmon eggs from Little Trapper Lake, and 250,000 Sockeye Salmon eggs from King Salmon Lake for transport to Snettisham Hatchery in Alaska for incubation and thermal marking. The 2021 King Salmon Lake Sockeye Salmon egg collection was subject to an availability threshold of greater than 600 and less than 4,000 returning adult Sockeye Salmon as outlined in the 2021 TEPP. No Sockeye Salmon eggs were collected at King Salmon Lake in 2021 due to the number of returning adults exceeding this threshold. Approximately 3.0 million Sockeye Salmon eggs were collected from Tatsamenie Lake, and approximately 1.0 million Sockeye Salmon eggs were collected from Little Trapper Lake, with eggs delivered for incubation to the Snettisham Hatchery in Alaska.

2.3 ALSEK RIVER

Although abundance-based catch sharing provisions for Alsek River salmon stocks have not yet been established, Annex IV, Chapter 1 of the PST obligates Canada and the U.S. to cooperatively develop and implement abundance-based management plans and programs for Alsek River Chinook and Sockeye Salmon. Thebiological escapement goal ranges for Alsek River Chinook and Sockeye Salmon are 3,500 to 5,300 for Canadian-origin Chinook Salmon and 24,000 to 33,500 for Canadian-origin Sockeye Salmon. Additionally, escapement targets for Klukshu River Chinook and Sockeye salmon wer established as: 800 to 1,200 Chinook and 7,500 to 11,000 Sockeye. The principal escapement-monitoring tool for Canadian-origin Chinook and Sockeye Salmon stocks on the Alsek River is the Klukshu assessment program, which has been operated DFO in collaboration with the Champagne and Aishihik First Nations (CAFN) since 1976.

In 2021 the Parties initiated the exploration and design of basin-wide stock assessment programs to support the development of abundance-based management and more accurately assess annual Chinook and Sockeye salmon

returns to the watershed. At this time, there are no programs in place to estimate Alsek River Coho Salmon returns or spawning escapement. Current abundance assessment and spawning escapement monitoring programs include: the Klukshu River multi-species video enumeration system; the Village Creek Sockeye Salmon video enumeration; and genetic stock identification of samples collected from U.S. terminal fisheries. The long-term comparative escapement index for Alsek River drainage salmon stocks are the Klukshu River counts. A feasibility evaluation of new Chinook Salmon abundance assessment programs on the Blanchard and Takhanne rivers has been initiated in order to seek to develop an improved understanding of Alsek River Chinook Salmon production.

The 2021 Canadian Alsek River First Nation FSC fishery harvest was 42 Chinook, 1,512 Sockeye and 0 Coho salmon. The 10-year average harvest in the Canadian First Nation FSC fishery on the Alsek River is 36 Chinook, 878 Sockeye and 15 Coho salmon (noting that this most recent 10-year period has experienced several years of very low Chinook and Sockeye Salmon returns and associated fishery harvests). In response to poor pre-season forecasts for both Chinook and early-migration Sockeye Salmon, angling for salmon was prohibited until August 15th and retention of Chinook salmon was prohibited for the 2021 season. Retention limits for both Sockeye Salmon and Coho Salmon were increased in-season due to better than expected run abundance.

The total return of Sockeye Salmon to the Klukshu River in 2021 was 26,426 while the spawning escapement was 25,670 fish. Both the return and spawning escapement were well above the most recent 10-year average of 10,900 and 10,700 respectively and significantly exceeded the upper end of the escapement goal range (11,000). The 2021 total Sockeye salmon count at Village Creek was 679 fish, which is slightly above the most recent 10-year average of 500 fish (noting that this most recent 10-year period has experienced several years of very low Sockeye Salmon returns).

The total return of Chinook Salmon to the Klukshu River in 2021 was 1,405 while the spawning escapement was 1,384 fish. Both the return and spawning escapement were slightly above the most recent 10-year average of 1,100 and 1,180 respectively while the upper end of the escapement goal range (1,200) was exceeded.

The 2021 Klukshu River Coho Salmon count was 3,559. The Klukshu River enumeration program is not operated for the full duration of the Coho Salmon run and as a result the annual count does not represent total abundance. When used as a partial indicator of run strength, the 2021 Coho Salmon count was well-above the most recent 10 year average of ~2,300.

3 NORTHERN BC

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

3.1.1 OBJECTIVES AND OVERVIEW

Escapements of Northern Chinook Salmon have declined in recent years. Reduced survival rates and reduced productivity have been observed across British Columbia and South East Alaska. Conservation measures were implemented in 2021 Salmon fisheries in response to declines in Fraser River Chinook Salmon abundance. Chinook Salmon fisheries implemented in Northern BC under the PST AABM management regime include the Northern British Columbia troll and Haida Gwaii recreational fisheries.

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.

3.1.2 STOCK STATUS

The pre-season distribution of the NBC AABM TAC by fishery is shown in Table 3-1 below. The total Chinook catch in the Area F Troll fishery and recreational fishery can be found in Appendix 3.

Table 3-1: Pre-Season Total Allowable Catch Estimate for NC AABM Chinook

	Pre-Season	Adjusted In-season TAC	In-Season Catch
NC BC Troll AABM and Haida Gwaii Sport Abundance Index	1.27	-	-
NC BC Troll AABM and Haida Gwaii Sport Chinook TAC	153,800	Note – 30% COVID reduction in rec. forecast from pre-season; 45,100 to 31,600 Therefore, Area F TAC adjusted upwards to 122,200	
NC BC Troll AABM Chinook TAC	108,700	122,200	Actual catch: 64,470
Haida Gwaii Sport Chinook TAC	45,100	31,600	Actual catch 26,517
Total NBC AABM	153,800	153,800	Actual catch: 90,987

3.1.3 RECREATIONAL FISHERIES

Due to the ongoing global COVID-19 pandemic, recreational fishing effort was markedly different than in other years. Border closures and travel restrictions significantly reduced AABM tidal sport effort, as most lodges were not in operation for much of 2021. Catch estimates are subsequently significantly lower than anticipated pre-season, but will be updated should more data become available.

Estimates of AABM 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. The recreational fishery maintained full daily limits of two daily and four possession. 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.

In Area 1, the recreational salmon fishery primarily occurs between Masset and Lanagara Island along the north shore of Graham Island. In Area 2W, the recreational salmon fishery primarily occurs between Englefield Sound and Port Louis. The Chinook Salmon fishery in east Skidegate during late winter and early spring was reported to be average. While the harvest of Chinook in Area 2E is unknown, it is assumed to be fewer than 500 pieces and a small proportion of the recreational catch in Areas 1 and 2W. Recreational effort (>99%) primarily occurs in Area 1 and 2W. The majority of the fishery normally occurs between mid-May and mid-September with little effort in the winter. In 2021 the bag limit was reduced to 1 Chinook per day from June 1, 2021 to July 10, 2021 to address ongoing concerns for Skeena Chinook.

3.1.4 COMMERCIAL FISHERIES

The North Coast BC troll fishery opening for Chinook fishing was delayed and opened from August 12 to September 30 as part of fishery restrictions designed to pass through Fraser Summer 4_1 (South Thompson) Chinook to Fraser River fisheries. The entire 2021 Northern BC troll fishery was conducted under a system of individual transferable quotas. The minimum 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 2021.

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

3.2.1 OBJECTIVES AND OVERVIEW

Northern BC Chinook Individual Stock-Based Management (ISBM) Fisheries include commercial net fisheries throughout north and central BC, marine sport fisheries along the mainland coast and in freshwater, and First Nations fisheries in 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.

3.2.2 STOCK STATUS

Since assessments of the ISBM fisheries are relative to the escapements achieved in the Chinook indicator stocks, a brief overview of the 2021 returns is provided. Chinook escapements to the upper and middle Nass River were 12,540 (based on mark-recapture data). The estimated 2021 escapement for the Skeena River aggregate is 20,277 Chinook. The Skeena River aggregate Chinook is based on a Kitsumkalum River preliminary Petersen estimate of 3,311 fish. The preliminary estimated total escapement in the Bella

Coola/Atnarko River in 2021 was 14,751 large Chinook and is based on the Petersen estimate. POPAN estimates for the Kitsumkalum and Atnarko will be available in spring 2022.

The total Chinook catch in the Tyee Test fishery on the Skeena River was 482 (378 Large Chinook and 104 Jack Chinook). ISBM catch data can be found in Appendix 3.

3.2.3 FIRST NATIONS FSC FISHERIES

A total of 7,180 large Chinook were reported caught by First Nations in the Skeena watershed. In addition, Nisga'a Treaty catch was reported at 5,410 Chinook (all in Area 3/Nass River). First Nations' catches in marine waters of Areas 4 to 6 were reported as 941 Chinook. First Nations Chinook catch in Areas 1 to 3 was reported as 299 large Chinook at the time of this document. A total of 1,593 Chinook were reported caught in Areas 7, 8 and 10.

3.2.4 RECREATIONAL FISHERIES

3.2.4.1 TIDAL WATERS

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 2021. Chinook daily limits started at 2 (two) per day, but were reduced in Areas 3, 4, and 5 to 1 (one) Chinook per day from June 1, 2021 to June 18, 2021. On June 19, 2021 to July 11, 2021 the Chinook daily limit went to 0 (zero) and returned to 1 (one) Chinook per day on July 12, 2021 to July 31, 2021. After that the daily limit increased to 2 (two) Chinook per day for the remainder of the season. These reductions were planned pre-season, and were designed to address concerns for a weak 2021 forecast for Skeena Chinook, and to support FSC priority access.

Area 6 had a daily limit of 2 per day for the 2021 season.

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

For 2021, recreational fishing lodge operations were significantly reduced by the restrictions in place due to COVID-19. Many lodges did not operate, while others operated at reduced capacity.

3.2.4.2 NON-TIDAL WATERS

The Skeena River watershed started with normal daily limits and opening times for Chinook, Coho, and Pink Salmon in 2021. Sockeye started closed on the Skeena River and opened to 1 (one) per day on Aug 18, 2021, and increased to 2 (two) per day on Sept 2, 2021.

From June 15, 2021 the Department closed the entire Skeena River watershed to fishing for Chinook salmon for the remainder of the 2021/22 season. This closure was planned pre-season, and was designed to address concerns to forecast weak returns of Skeena Chinook, and to provide for FSC priority access.

The Nass River watershed started with normal daily limits and opening times for Chinook; however, closed to all fishing for salmon on July 15, 2021 in reaction to poor Sockeye and Chinook escapements in order to

support FSC priority access. The Nass River re-opened to fishing for Chinook on July 30, 2021 after Chinook escapements improved.

3.2.5 COMMERCIAL FISHERIES

Chinook commercial fisheries remained closed in the North Coast (Areas 3-10), except for limited opportunities Area 8. In Area 8, the start of the commercial gill net season was delayed due to concerns raised over the COVID-19 pandemic and potential introduction of COVID-19 into Central Coast Communities. The Chinook targeted gill net fishery opened for 24 hours on June 14, June 21, June 28 and July 5, 2021. Due to Pacific Salmon Strategy Initiative (PSSI) closures, there were no Chum targeted fisheries within Area 8 for 2021. In total, there were 4 openings in Area 8, with a total effort of 162 boat days. Additionally, there was a small-scale economic opportunity fishery conducted on July 8, 2021 by the Nuxalk First Nation under the Commercial Salmon Allocation Framework (CSAF). The total effort was 14 vessels.

Refer to Appendix 3 for Chinook catch totals.

3.3 NORTHERN BC PINK SALMON FISHERIES

3.3.1 OBJECTIVES AND OVERVIEW

In 2021, 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 F (NBC) 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.

3.3.2 COMMERCIAL FISHERIES

Areas 3-1 to 3-4 Pink Net Catch

In the Canadian Northern Boundary Area, Pink Salmon returns were anticipated to be below average for Areas 3 and 4, based on brood year return strength. Actual returns to Area 3 were slightly improved over 2020 but still low, while the Area 4 returns were below average. Four seine openings occurred in Area 3-3 in 2021; July 12,19, 20 and 30. Effort was small and total catch was 159,017 Pink Salmon.

Area F (NBC) Pink Troll Catch

The Canadian commercial troll fishery targeting Pink Salmon with retention of Coho Salmon was open in the northern portion of Area 101 (Dixon Entrance AB Line) from July 1 to August 11. Pink retention was also permitted during the Chinook directed fishery, in Area 101 and portions of Area 1, 2W and 142, which opened from August 12 to September 30. Pink Salmon directed effort during the Chinook opening was minimal and the total Pink catch in the Area F Troll fishery and recreational fishery can be found in Appendix 3. The Area F retained catch of 82,485 Pink Salmon was considerably less than 2020 but was above the average for recent years.

4 SOUTHERN BC CHINOOK SALMON

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

4.1.1 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 PST and are 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 of October 2020 through September 2021, the forecast Chinook abundance index was 0.76 of the PST base period; therefore, under Treaty provisions, the maximum allowable catch was 88,000 Chinook for WCVI AABM fisheries, which includes a 12.5% reduction consistent with the Treaty provisions that came into effect in January 2019.

Domestic considerations for managing Chinook catch in WCVI AABM fisheries are driven by concerns regarding the low status of natural WCVI, Lower Strait of Georgia (LGS) and Fraser River Chinook, as well as Interior Fraser Coho and Interior Fraser River (IFR) Steelhead populations. Management measures in AABM Chinook fisheries to limit impacts to these domestic stocks of concern are summarized in the fishery subsections.

To protect returning Fraser Chinook stocks of concern, the Area G troll fishery was closed until August 1, 2021. Additionally, a 27-day rolling window closure was applied in portions of September/October to protect IFR Steelhead.

The pre-season planning distribution of the total WCVI AABM TAC by fishery is shown in Table 4-1 below. The Area G troll allocation was adjusted in-season based on increases to the Five Nations rights-based sale allocation and revised in-season projections of the recreational harvest.

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

Table 4-1 Pre-Season Total Allowable Catch Estimate for October 2020 to September 2021 WCVI AABM Chinook

	Pre-Season TAC	Adjusted In-season TAC	Catch
WCVI AABM Abundance Index	0.76	0.76	
WCVI AABM Chinook TAC	88,000	88,000	
AABM Recreational Harvest Projection	35,000	30,000	22,982
First Nations Harvest Projection (FSC)	5,000	5,000	3,603
Maa-nulth First Nations Domestic Allocation (FSC)	3,441	3,441	1,585
Five Nations Allocation	7,821	10,429	11,612

Area G Troll Allocation	36,738	339,130	25,225
Total AABM	88,000	88,000	65,007

4.1.2 FIRST NATIONS DOMESTIC AND FSC FISHERIES

The 2021 WCVI AABM FSC Chinook reported catch (to date) can be found in Appendix 4. Catch from Maa-nulth Nations Domestic fisheries can also be found in Appendix 4.

4.1.3 FIRST NATIONS COMMERCIAL HARVEST

Five Nations Communal Sale Fishery

In 2021, the Department provided communal sale fishery opportunities for the Five 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) that included AABM Chinook. These opportunities were categorized as Offshore Integrated Hook and Line communal sale fisheries.

The pre-season AABM Chinook allocation of 7,821 Chinook was revised in-season following the British Columbia Court of Appeal decision in April 2021 to 10,429 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 several openings from January to August. A 100% independent dockside monitoring program was in place for the entire season. Sale of Chum, Pink and hatchery marked and unmarked Coho was also permitted, as well as several groundfish species. In addition to the authorized communal sale fishery, there was unsanctioned harvest of AABM Chinook, Sockeye and Coho by the Five Nations. This included 879 AABM Chinook, 64 Sockeye and 38 Coho as reported by the Five Nations. Total salmon catch from the Five Nations AABM Chinook fishery, including unsanctioned catch, can be found in Appendix 4.

4.1.4 COMMERCIAL FISHERIES

For the 2020/2021 Chinook year (October 1, 2020 to September 30, 2021), fisheries were shaped by conservation concerns for the following domestic stocks: Fraser River Spring 4_2 Chinook, Fraser River Spring 5_2 and Summer 5_2 Chinook, WCVI wild Chinook, LGS Chinook, IFR Coho and IFR Steelhead.

The distribution of the WCVI AABM TAC between fisheries is shown above in Table 4-1.

Area G Troll

The Area G troll annual management plan is designed to maintain exploitation rates (ERs) on domestic stocks of concern within established limits through the use of fishing time and area closures in conjunction with fishing effort limits. The management plan is subject to change when required to address specific conservation concerns. For the 2021 fishing season, the following changes to the annual fishing plan were implemented similar to 2019 and 2020:

- Additional conservation measures to further protect Fraser River Chinook stocks of concern were implemented. For Area G troll this was addressed by implementing a fishery closure that remained in place until August 1, 2021.

- A 27-day rolling window closure starting in September was applied to protect IFR Steelhead.

The Area G catch in 2021 occurred in one opening from August 1 to September 15. Catch is summarized in Appendix 4.

4.1.5 RECREATIONAL FISHERIES

The WCVI AABM recreational Chinook fishery primarily takes place in offshore Areas 121 to 127 from June to September. Chinook catch from inshore Areas 21 to 27 in June and Areas 21 to 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.

Domestic Chinook management measures are in place in the near-shore AABM areas to protect migrating WCVI-origin Chinook. In 2021, management measures continued to include finfish closures in several areas, increasing terminal Chinook non-retention areas, and focussing recreational opportunities in areas where DNA samples indicated that WCVI Chinook presence is lower.

The domestic management actions designed to further protect Fraser River Chinook populations that were first implemented in 2019 continued in 2021. This includes a Chinook non-retention area in effect from April 1 to July 14 (inclusive) in Areas 121 to 127 seaward of a 1 nm surfline boundary and a maximum size to 80 cm for Chinook from July 15 – to July 31.

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 Chinook recreational catch estimate from the creel survey for the 2021 WCVI AABM fishery is provided in Appendix 4.

See Figure 4-1 below which illustrates catch and effort from 2000 through 2021.

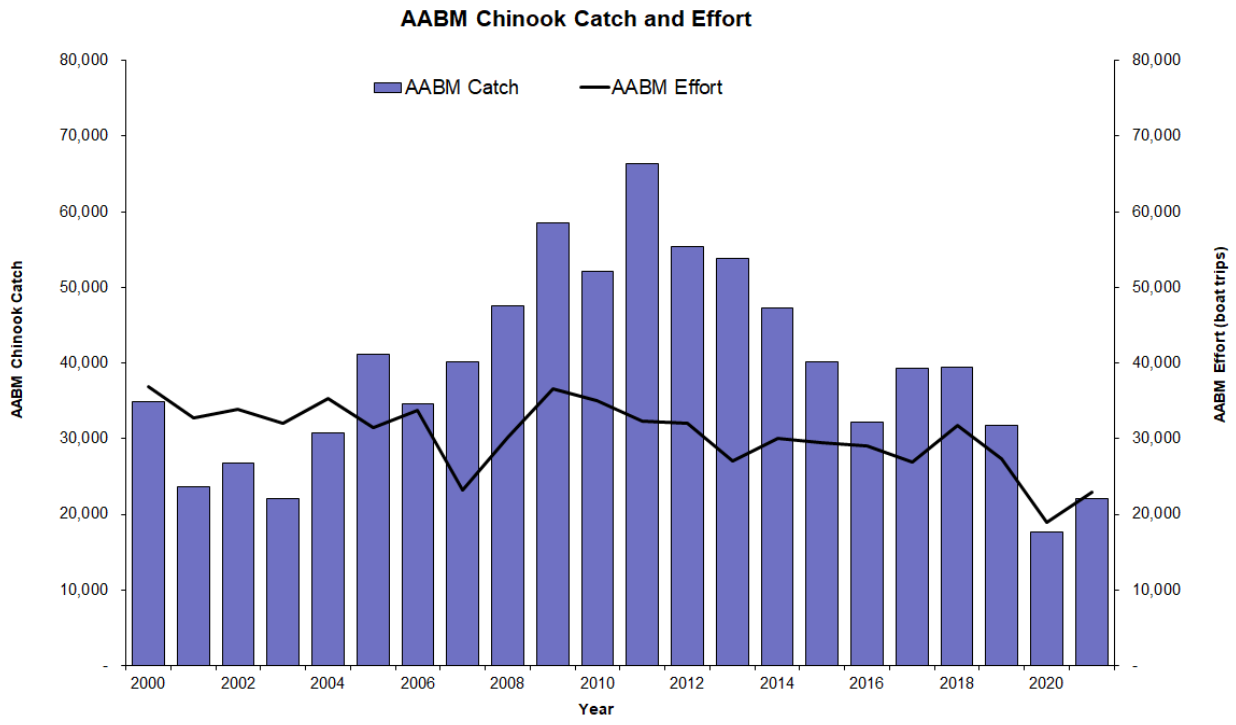


Figure 4-1 WCVI Recreational AABM Catch and Effort- Chinook, 2000-2021

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

4.2.1 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 2021 in First Nations FSC, recreational and commercial Chinook fisheries to protect West Coast Vancouver Island (WCVI), Southern Strait of Georgia and Fraser River Chinook stocks of concern.

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 ER 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 fisheries focussed on enhanced stocks.

Southern Strait of Georgia Chinook stocks are improving from historic lows seen in 2009 and are stable or 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.

A suite of precautionary fishery restrictions were intended to provide a high degree of protection to at-risk Fraser Spring 4_2, Spring 5_2 and Summer 5_2 Chinook returning in 2021. This approach was expected to reduce overall Canadian fishery mortalities on these populations to very low levels. Expected fishery mortalities were not intended to be a management target and the objective was to allow as many fish to pass through to the spawning grounds as possible.

First Nations FSC management actions in the Fraser River included time and area closures, and reduced fishing times. Specifically, Fraser River First Nations food, social and ceremonial fisheries were restricted to unplanned events (e.g. funerals) or First Fish ceremonies until July 15 followed by opportunities to target healthy Summer 4_1 Chinook primarily in August.

South Coast FSC fisheries opportunities on mixed stocks was permitted in marine areas with the exception of the approaches to the Fraser River (Subareas 29-6, 29-7, 29-9, and 29-10). To improve the collective understanding of stocks of concern, in terms of their migration routes, timing and fisheries impacts, First Nations were encouraged to collaborate with the Department on shaping a catch monitoring and biological sampling plan for fisheries between April 1 and July 15 to provide stock composition information for Chinook. Recreational fisheries in Johnstone Strait, Strait of Georgia, Juan de Fuca Strait, and the approach waters to the Fraser River were managed to Chinook non-retention between April 1 and varying dates between July 14 and August 31, with a maximum size limit of 80 cm in effect where Chinook retention was permitted before August 31. In 2021, commercial fisheries in Barkley Sound and Nootka Sound targeted ISBM Chinook. Chinook non-retention was in place for other southern BC commercial fisheries (excluding AABM Chinook).

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

4.2.2 STOCK STATUS

4.2.2.1 WEST COAST VANCOUVER ISLAND CHINOOK

Wild WCVI Chinook are identified as a stock of concern in the IFMP. The general status has been characterized as low and stable; not rebuilding. A precipitous decline in abundance occurred in the mid 1990s due in part to consecutive El Nino events from 1991-93 and again from 1997-98; ecosystem changes especially affected early marine survival of these ocean type Chinook. Two areas of the WCVI are key indicators of wild Chinook status, Kyuquot Sound (Nootka-Kyuquot Conservation Unit) and Clayoquot Sound (SWVI Conservation Unit). The abundance of Chinook returning to Clayoquot Sound continues near a lower reference point and so is the basis for DFO fishery management measures.

In other areas of the WCVI, hatchery production supports terminal fisheries directed at surplus production with extensive management measures in place to reduce impacts on wild origin stocks. These areas include Alberni/Barkley, Nootka, and Nitinat. In these areas, catch is dominated by the hatchery stock; therefore, higher ERs are permitted than in times and areas dominated by naturally produced WCVI Chinook stocks.

4.2.2.2 STRAIT OF GEORGIA CHINOOK

Fall Run

Adult returns of fall Chinook to SEP facilities south of Campbell River were above average again in 2021. Puntledge River escapements were strong with 11,193 adults returning compared to the 12 year average of 7,940. Further south, the Big Qualicum River escapement was well above the 4 year average of 8,790 with 11,827 fish. Swim counts in the Little Qualicum River were also above average at 4,127 prior to applying an area under the curve (AUC) expansion.

Chinook escapements to mid-island streams were generally average to above average in 2021. The peak count of 245 adults in the Englishman River was lower than the 12 year average of 710. Nanaimo River abundance was above the four year average of 2,940 with a count of 4,456 adults and jacks prior to AUC expansion. Cowichan River escapement estimates were above the target of 6,500 naturally spawning adults for the sixth year in a row with a preliminary estimate of 15,926. Preliminary age 2 jack returns to Cowichan were also above average at 7,812. Escapement estimates will be finalized in the next few months following bio sampling data analysis, AUC calculations and video review (Cowichan).

On the mainland side of the northern Strait of Georgia, Sliammon and Lang hatcheries continue to have variable returns; however, adult Chinook returns to Sliammon Creek were relatively strong in 2021 with 171 fish observed compared to the 12 year average of 130. Lang Creek estimates will be available in later versions of this report.

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. ERs on this stock aggregate have gradually been reduced over the last 15 years, thus the stable trend in annual returns to rivers over this period suggests a reduction in marine survival. In 2021, 16 adults and 10 jacks were counted in Theodosia and 5 Chinook were counted in Skwakwa.

Spring/Summer Run

The Puntledge, Nanaimo, Cowichan and Chemainus systems have identified early runs of Chinook in the Strait of Georgia. Efforts to recover Puntledge summers to viable levels have resulted in improved returns to the river since 1999. The 2021 escapement estimate for Puntledge was 517 fish, which is less than the four year average of 740 adults. This was not unexpected due to reduced hatchery releases in the contributing brood years. Monitoring of Nanaimo spring/summer Chinook escapement was improved in 2021 with a pilot DIDSON/video system in the lower river in addition to a series of swims from April through September. A comprehensive review of DIDSON and video data produced an estimate of 992 summer run fish for 2021 which is above the 4 year average of 460. The annual snorkel survey of the main spawning reach below First Lake combined with brood collections accounted for more than 700 fish which was encouraging given the abnormally high temperatures in late June. The Chemainus River showed a slight improvement with 33 Chinook during summer swim surveys compared to 2020. Recent counts in this system have been very low but the rockslide in the lower canyon was cleared naturally in winter 2018/2019, restoring access to a significant portion of the system. A

handful of Chinook were observed in the annual summer trout survey in the Cowichan River, but no comprehensive count was conducted.

4.2.2.3 JOHNSTONE STRAIT MAINLAND INLET CHINOOK

Currently only three systems are monitored consistently. In Area 12, the Nimpkish River is assessed using standardized swim surveys 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). Survey coverage was also increased on systems like the Adam/Eve and Salmon Rivers on Vancouver Island. In 2021, a video counting system was set up on Devereux (Mussel) Creek, which is a tributary of the Klinaklini River, flowing into Knight Inlet, although counts are not yet available. Mainland Pink coverage timing also overlaps some of the Chinook populations in the mainland inlets of Area 12. Other systems are covered using intermittent visual surveys.

Nimpkish River

In 2021, fewer Chinook were observed during snorkel surveys (peak count 261) than in 2020 (915), but weather conditions have hampered surveys during the typical peak period. Early indications are for fewer Chinook than last year, but final counts will be provided as they become available. Hatchery broodstock targets were met.

Campbell/Quinsam System

The 2021 program is still underway, but almost complete. Preliminary counts to date indicate the combined system total of Chinook returns is approximately 8,700 adults, which may be a conservative estimate. High river flows have impacted much of the program, necessitating the hatchery counting fence to be open almost continually since the third week of October, permitting migration of un-enumerated spawners to upper river areas of the Quinsam. The estimate is inclusive of in-river FSC catch, however no in-river recreational catch estimate will be available this year.

The preliminary 2021 return remains above the 5- and 10-year averages for this system, as well as the long-term (1984-2020) average (7,072). The 2017 parental brood year for the returning age-4s was approximately 9,491. The 2021 broodstock target was attained by the hatchery.

Phillips River

Preliminary results from the 2021 Phillips River program indicate a below average Chinook escapement estimate of 1,854 adults. The 5-year historic average for this system is approximately 2,350. Tagging activities were delayed by high river temperatures during late July and August, however tag application levels remained consistent with past years. Increased bear activity and intermittent high flows contributed to low carcass recovery levels during the deadpitch portion of the program. The 2019 brood was the final enhanced release of Phillips Chinook.

4.2.2.4 FRASER RIVER CHINOOK

Fraser River Chinook are assessed as five naturally spawning stock groups for PSC management under the 2019 PST agreement, including Fraser Spring 4_2, Fraser Spring 5_2, Fraser Summer 5_2, Fraser Summer 4_1 and the Harrison River (Fall 4_1).

Within the Fraser, there are four active and one discontinued CWT-indicator stocks: Nicola River (Fraser Spring 4_2), Lower Shuswap (Fraser Summer 4_1), Harrison River and Chilliwack River (Fraser Fall 4_1), and Dome Creek (Fraser Spring 5_2) that was discontinued in 2005. Two new CWT-indicator stocks are under development: Lower Chilcotin River (Fraser Spring 5_2) to replace Dome Creek and Chilko River (Fraser Summer 5_2).

In 2019, the Big Bar Landslide on the Fraser Mainstem obstructed migration of some populations in the Fraser Spring 5_2 and Fraser Summer 5_2 stock groups. For Chinook returning to rivers upstream of the landslide, 13% of the Spring and 48% of the Summer Chinook were estimated to be able to pass the landslide and return to their spawning grounds in 2019. Since there are populations within these stock groups that are downstream of the slide, the overall mortality relative to the terminal runs were 81% for the Spring 5_2 stock group and 39% for the Summer stock group. Passage of Chinook Salmon through Big Bar Landslide occurred at higher flows in 2020 compared to 2019; however, prolonged high water levels delayed passage in 2020. Big Bar Landslide passage and mortality rates are not yet available for 2020 or 2021. It is anticipated that Chinook passage was not greatly impeded in 2021, largely due to the ongoing work to mitigate the effects of the landslide over the last two winters.

The Fraser Spring 4_2 stock group spawning escapement for 2021 based on the CTC index for the aggregate is not yet available. The very preliminary escapement estimate is below the long-term (1999-2018) average (~11,700) and is near the parental brood escapement of ~5,100 in 2017. The very preliminary Nicola River escapement estimate is above the parental brood, but lower than the long-term (1999-2018) average.

The 2021 Spring 5_2 stock group spawning escapement estimate based on the CTC index for the aggregate is not yet available. The very preliminary escapement estimate indicates that on average they are near the parental brood escapement of ~13,500 in 2016, but still below the long-term (1999-2018) average (~20,100). However, there is considerable variation amongst the populations in the stock group.

The 2021 Summer 5_2 stock group spawning escapement estimate based on the CTC index for the aggregate is not yet available. The very preliminary escapement estimate indicates that on average they are near the parental escapement brood of ~9,500 in 2016 and below the long-term (1999-2018) average (~19,700). However, there is considerable variation amongst the populations in the stock group.

Escapements to the Fraser Summer 4_1 stock group increased during the 1990s and remained abundant until 2011, followed by lower years in 2012, 2014, and 2016-2018. Escapement estimates in 2019 and 2020 were both above the long-term average, with 2019 near brood and 2020 above brood. The 2021 spawning escapements are not yet available; however, very preliminary estimates indicate that the aggregate escapement will be higher than the long-term (1999-2018) average (~95,700) and parental brood of ~84,500 in 2017. One exception is Maria Slough where abundance remained extremely low. The 2021 Lower Shuswap River escapement estimate is expected to exceed the escapement goal of 12,300.

The Harrison River (Fraser wild Fall 4_1 stock group) escapement estimate for 2021 is not yet available. The very preliminary estimate is near the parental brood of ~29,800 in 2017, below the long-term (1984-2018) average of ~93,600 and below the escapement goal of 75,100. The Harrison River escapement estimate has not met the escapement goal in the last six years, and only once in the past ten years.

There have been six consecutive years (2016-2021) of low escapements to the three Fraser stock groups with yearling smolt life history (Spring 4_2, Spring 5_2; and Summer 5_2) and also to the Harrison (Fall 4_1). These four stock groups are of continuing conservation concern. Canadian marine and Fraser River fisheries were further restricted in 2021 to continue to address these conservation concerns.

4.2.3 FIRST NATIONS DOMESTIC AND FSC FISHERIES

WCVI FSC Fisheries and Treaty Domestic Fisheries

Somass First Nations (Tseshaht and Hupacasath First Nations) caught Chinook by gill net, rod and reel, and as bycatch during other salmon fisheries in Area 23. Catch reports (to date) for Maa-nulth Treaty harvest and other WCVI Nuu-chah-nulth FSC harvest can be found in Appendix 1.

Strait of Georgia FSC Fisheries and Treaty Domestic Fisheries

Chinook Salmon FSC and Treaty Domestic fisheries were not restricted in the Strait of Georgia in 2021. Effort was low in the mixed stock areas; effort almost exclusively using hook and line gear. Terminal harvests of Chinook took place in Puntledge and Qualicum Rivers in September and October, prior to ESSR harvests using hatchery brailing and hand-picking/sorting methods. FSC catch was taken during ESSR harvests and the Department will be working with the Nations to confirm numbers for the final report. Tla'amin Treaty and other First Nations catch reports in the Strait of Georgia can be found in Appendix 4.

Johnstone Strait FSC Fisheries

Chinook Salmon FSC Fisheries were not restricted in Johnstone Strait in 2021. Fisheries in the mixed stock areas were mainly with hook and line gear. First Nations catch summaries from Johnstone Strait can be found in Appendix 4.

Fraser River FSC Fisheries

FSC fisheries took place in the Lower Fraser River (LFR) between the mouth and Sawmill Creek from April through December 2021. The total number of Chinook harvested from Chinook-directed fisheries and Chum-directed FSC openings or limited participation openings, can be found in Appendix 4. No Sockeye-directed fisheries were authorized in the Lower Fraser River in 2021. Sockeye, Pink, Coho and Chum bycatch that occurred during Chinook-targeted FSC openings is also listed in those appendices. Chinook directed FSC fisheries in the Lower Fraser also occurred in the Sumas and Chilliwack River (July to October) River and Chehalis (July –August) River,

Chinook-directed FSC fisheries took place in the Fraser River and tributaries above Sawmill Creek from June through early October 2021. Sockeye directed fisheries took place in some areas above Sawmill Creek later in the season. The total of Chinook harvested, as well as bycatch estimates can be found in those appendices.

4.2.4 FIRST NATIONS COMMERCIAL HARVEST

Somass Economic Opportunity

In 2021, agreements were reached with the Hupacasath and Tseshaht First Nations for Economic Opportunity (EO) fisheries. The target for these fisheries is Robertson Creek hatchery Chinook. These terminal Chinook

fisheries occurred in portions of Subareas 23-1 and 23-2, in upper Alberni Inlet, including the tidal portion of the Somass River. The total EO Chinook catch can be found in Appendix 4.

Five Nations Communal Sale Fishery

In 2021, the Department provided communal sale fishery opportunities for the Five 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) that included ISBM Chinook. These opportunities were categorized as Nearshore Integrated Hook and Line, Terminal salmon fisheries and a Surplus to Escapement Salmon fishery.

The Nearshore Integrated Hook and Line fisheries occurred in Area 25 and targeted Conuma River enhanced Chinook using troll and gillnet gear and Coho using troll gear. Fishery openings for Conuma Chinook occurred between July 01 and October 15. The initial pre-season TAC was 2,925 Chinook, revised in-season to 6,850 following the British Columbia Court of Appeal decision in April 2021.

The Terminal fishery targeted Burman and Gold River enhanced Chinook returns in Muchalat Inlet using gillnet and troll gear. Fishery openings occurred between August 12 and August 18. The TAC for this fishery was 250 Chinook. In addition, the Five Nations reported an unsanctioned harvest of 506 Chinook from the Muchalat Inlet Terminal fishery. The Surplus to Escapement Salmon fishery targeted Conuma River enhanced Chinook in the tidal portions of the Conuma River using beach seine gear to harvest excess salmon to spawning requirements. The fishery occurred between September 15 and September 21. Surpluses to escapement were identified in-season based on Conuma Hatchery and stock assessment information.

The total Chinook catch from the Five Nations communal sale fisheries targeting Conuma, Burman and Gold River Chinook, including unsanctioned catches, can be found in Appendix 4. Coho caught in Nearshore and Terminal Chinook directed fisheries were also permitted to be sold.

Fraser River Economic Opportunity and Inland Demonstration Fisheries

EO or inland demonstration fisheries did not occur in 2021 for ISBM Chinook in either the upper or lower reaches of the Fraser River as part of additional management actions to provide protection for Fraser Chinook stocks.

In 2021, no EO or demonstration fisheries occurred for Fraser Sockeye due to extremely low returns and no available Canadian Commercial TAC (CCTAC). There is currently one Inland Commercial Fishing Enterprise (CFE) operating in the Lower Fraser: Harrison Fisheries Authority. This CFE was not authorized to conduct a demonstration fishery for Sockeye using gill nets in the Harrison River; as the run size for the Harrison River Sockeye return was not sufficient to support a fishery. Therefore, there were no incidental impacts on Chinook from these fisheries.

Economic opportunity and demonstration fisheries occurred for Pink in the lower Fraser River in 2021 and were conducted by the Harrison Fisheries Authority and Musqueam First Nations. Retention of Chinook bycatch was not permitted.

In 2021, there were no EO/ Demonstration fishery for Fraser Chum occurring in the lower reaches of the Fraser River. There are three Inland CFEs that have previously operated in the BC Interior: Okanagan Nation Alliance, Upper Fraser Commercial Fishing Enterprise and Riverfresh (Secwepemc Fisheries Commission).

1 4.2.5 COMMERCIAL FISHERIES

Area B Seine

Due to a relatively large pre-season forecast for Robertson Creek Hatchery Chinook, Area B seine fisheries occurred in Area 23. The fisheries occurred in portions of Subareas 23-1 and 23-2, upper Alberni Inlet, targeting Chinook. Due to low forecasted returns, WCVI Coho retention was not permitted in any commercial fisheries. The fisheries were operated using a pool system with only designated vessels permitted to fish. The seine Chinook catch can be found in Appendix 4.

Area D Gill Net

Area D gill net fisheries were provided in Area 23. The fisheries occurred in portions of Subareas 23-1 and 23-2, in upper Alberni Inlet, targeting Chinook with no retention of bycatch Coho permitted. The fisheries were opened one night per week in the last two weeks of August and the first week of September. Fisheries were also opened nightly from September 14-19 due to low catch rates. The total gillnet Chinook catch can be found in Appendix 4.

In 2021, gill net fisheries occurred in Tlupana Inlet (Area 25) targeting Conuma River Chinook. The Area D in-season TAC for Conuma Chinook was 5,100. There were 3 gillnet openings this season, occurring on August 12, 13 and 19. The total gillnet catch during the Chinook-directed fishery can be found in Appendix 4.

Area E Gill Net

There were no Area E gill net fisheries for ISBM Chinook in 2021.

In addition, there were no Area E gill net commercial openings in the Fraser River (Area 29) in 2021 where Chinook bycatch could have occurred.

4.2.5 RECREATIONAL FISHERIES

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

West Coast Vancouver Island

In 2021, a strong return of Chinook was observed from the Robertson Creek hatchery stock and a moderate return to the Conuma River hatchery. Actual returns were above forecast for Robertson Creek and slightly below forecast for Conuma River and provided above average recreational fishing opportunities in many areas of the WCVI.

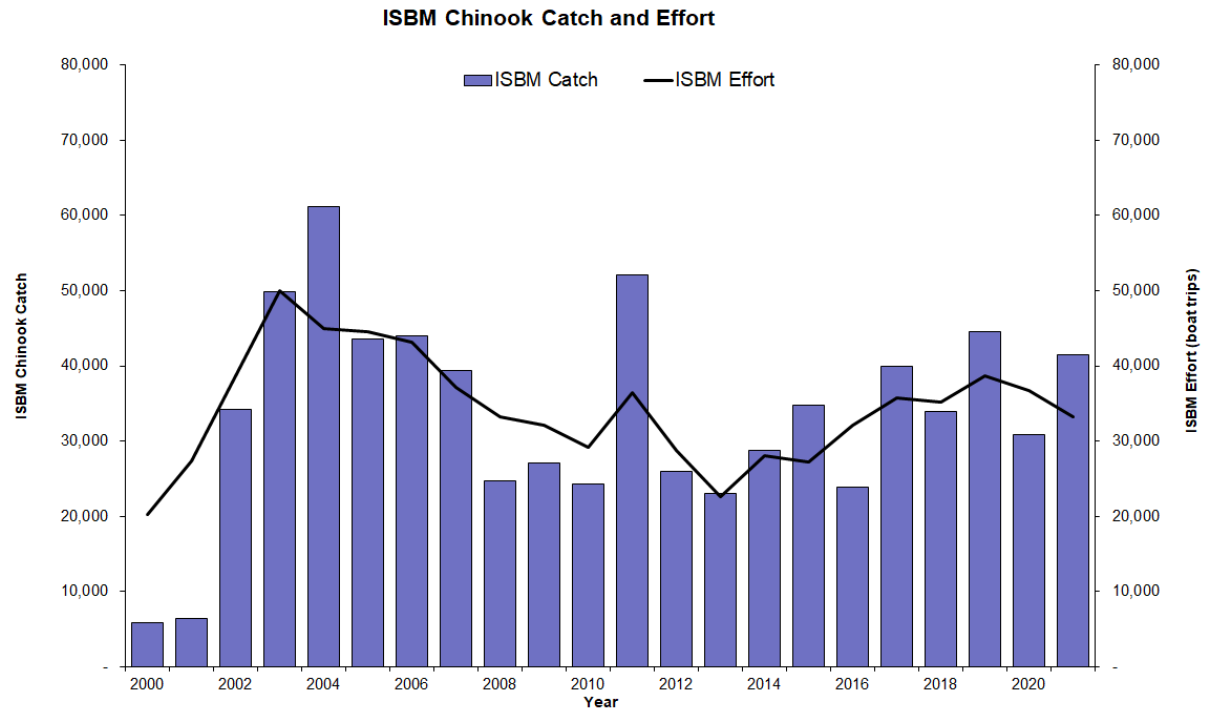


Figure 4-2 Recreational WCVI Chinook ISBM Catch and Effort, 2000 to 2021.

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

The 2021 recreational fisheries in the Inside Areas of Johnstone Strait, Strait of Georgia, Juan de Fuca Strait, and the approach waters to the Fraser River were managed to Chinook non-retention between April 1 and varying dates between July 14 and August 31. There was a maximum size limit of 80 cm in effect where Chinook retention was permitted before August 31 to minimize impacts on returning Fraser River Chinook stocks of concern. Salmon closures and Chinook non-retention areas were also implemented in portions of the Fraser River approach waters, Southern Gulf Islands and Juan de Fuca Strait to support the recovery of Southern Resident Killer Whales.

The following regulations were in place for the inside areas for 2021:

Queen Charlotte and Johnstone Straits (Subareas 12-1 to 12-13, 12-15 to 12-48):

- 00:01 hours January 1 to 23:59 hours March 31, two (2) Chinook per day;
- 00:01 hours April 1 to 23:59 hours July 14, Chinook non-retention;
- 00:01 hours July 15 to 23:59 hours August 16, one (1) Chinook per day with a maximum size limit of 80 cm;
- 00:01 hours August 17 to 23:59 hours August 31, one (1) Chinook per day;
- 00:01 hours September 1 to 23:59 hours December 31, two (2) Chinook per day.

Strait of Georgia - North - Areas 13 to 17, Area 28 and Subareas 29-1 and 29-2:

- 00:01 hours January 1 to 23:59 hours March 31, two (2) Chinook per day;
- 00:01 hours April 1 to 23:59 hours July 14, Chinook non-retention;

- 00:01 hours July 15 to 23:59 hours August 31, one (1) Chinook per day with a maximum size limit of 80 cm;
- 00:01 hours September 1 to 23:59 hours December 31, two (2) Chinook per day.

Strait of Georgia - South and Juan de Fuca - Areas 18, 19 and Subareas 20-3 to 20-7, 29-3 to 29-5 and 29-8:

- 00:01 hours January 1 to 23:59 hours March 31, two (2) Chinook per day.
- 00:01 hours April 1 to 23:59 hours July 31, Chinook non-retention;
- 00:01 hours August 1 to 23:59 hours August 31, one (1) Chinook per day with a maximum size limit of 80 cm;
- 00:01 hours September 1 to 23:59 hours December 31, two (2) Chinook per day.

In 2021 recreational Chinook fishing opportunities were also approved in the following areas:

Subareas 12-27, 12-28, 12-35, 12-38, and 12-40 and portions of Subareas 12-26 and 12-39; Subarea 13-21 and portions of Subarea 13-19; Portions of Subareas 15-5 and 15-6; Subareas 16-6, 16-9, and 16-12 and portions of Subareas 16-7, 16-8, 16-10, 16-11 and 16-13:

- 00:01 hours May 14 to 23:59 hours July 14, one (1) Chinook per day. Unmarked Chinook maximum size limit of 80 cm.

Portions of Subarea 20-5:

- 00:01 hours May 14 to 23:59 hours July 31, one (1) Chinook per day, hatchery-marked only.

New for 2021 was some changes to the management measures in Area 14 in order to provide increased protection for Puntledge Summer Chinook which included:

Subareas 14-8, 14-9, 14-10, 14-15; and that portion of Subarea 14-13 inside a line commencing at Cape Lazo, then following the PFMA boundary to a point in water (49 42.288N, 124 50.082W), then following a straight line to a point in water (49 52.297N, 125 5.360W), then due west to a point on land (49 52.300N, 125 6.933W) [near Pacific Playground Marina], and thence southeasterly following the shoreline back to the point of commencement

- 00:01 hours July 15 to 23:59 hours July 31, Chinook non-retention

Subarea 14-11

- 00:01 hours July 15 to 23:59 hours August 15, closed to fishing for finfish

In consideration of the increased management measures for Fraser Chinook implemented in the Strait of Georgia and other mixed-stock areas, the previous annual finfish closure near Cape Mudge on Quadra Island and the Chinook non-retention closures near Sentry Shoals, Harwood Island, Denman Island-Hornby Island and Kitty Coleman were no longer in effect as of the 2019 season. Reductions to the annual limit to 10 Chinook salmon per year first implemented in 2019 in BC tidal waters, including the inside areas listed above, were continued in 2020 and again in 2021. Chinook management measures also include a minimum size limit of 62 cm in the Johnstone Strait/Queen Charlotte Strait and Strait of Georgia, and Areas South to Cadboro Point

(Subarea 19-5). For the Canadian portion of Juan de Fuca Strait south of Cadboro Point, the minimum size limit is 45 cm.

Salmon fishing closures were also implemented from August 1 to October 31 in the following portions of the Southern Gulf Islands and Juan de Fuca to support Southern Resident Killer Whales (SRKW):

- Subareas 18-9 and portions of 18-2, 18-4 and 18-5.
- Subareas 20-3 and 20-4.
- Subareas 29-7, 29-9 and 29-10.
- Subarea 29-6 was closed to salmon fishing from June 1 to July 31 and was Chinook non-retention from August 1 to September 30.

In 2021, 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 Subarea 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 intermittently throughout other areas in the South Coast. The Avid Angler program and the Area 13 remote lodges around Stuart Island typically provide the majority of logbook program data. However, this was reduced due to lodge closures as a result of the COVID-19 pandemic. 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 mid-June through August.

The Strait of Georgia creel survey for Areas 13 and 14 was conducted from mid-June to October, for Area 15 from mid-June to August, for Area 16 from mid-June to September, for Areas 17 and 18 from mid-June to September and for Areas 19 and the Strait of Georgia portion of Area 20 from June to October.

Effort, catch and release information from marine fisheries are summarized in Figure 4-3.

Region 1 Vancouver Island Tributaries

River conditions in most tributaries on Vancouver Island were more extreme in 2021 compared to previous years due to high temperatures in late June and low flow conditions over the summer followed by well above average precipitation during the fall. All systems in Region 1 that are typically open remained open in 2021, with the exception of Regions 1-1 to 1-6 that are managed using seasonal closures between July 15 to August 31. Many Chinook systems on the east and west coasts of Vancouver Island saw strong Chinook returns in 2021; particularly those from enhanced systems. These returns provided early and productive opportunities for recreational freshwater fisheries. The Campbell River, Qualicum River, Little Qualicum River, Puntledge River, Nitinat River, Somass River and Conuma River all provided some recreational opportunities to harvest Chinook stocks during this time period.

Fraser River and Tributaries

Fraser River Chinook stocks required additional management measures in 2021 due to continued concerns about poor stock status.

Fraser River Mouth (Subareas 29-6, 29-7, 29-9 and 29-10):

- January 1 to December 31, fishing for salmon was closed in this area.

Tidal Fraser River:

In the tidal waters of the Fraser River the following regulations were in place for 2021:

- January 1 to November 1, fishing for salmon was not permitted, with exception of Pink salmon opportunities from September 3 to September 18.
- November 15 to December 31, fishing for salmon (hatchery-marked Coho) was permitted but Chinook Salmon could not be retained.

Non-Tidal Fraser River:

Region 2:

- January 1 to November 2, fishing for salmon was not permitted, with the exception of Pink salmon opportunities from September 11 to September 21.
- November 15 to December 31, fishing for salmon (hatchery-marked Coho) was permitted but Chinook Salmon could not be retained.

Region 3: January 1 to December 31, fishing for salmon was not permitted on the Fraser River.

Region 5: January 1 to December 31, fishing for salmon was not permitted on the Fraser River.

Region 7: January 1 to December 31, fishing for salmon was not permitted on the Fraser River.

Fraser River Tributaries:

Fraser River Tributaries - Region 2

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 November 30;
- Chehalis River: daily limit of four Chinook with only one over 50 cm from August 7 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 one from July 1 until August 31, daily limit of four with two over 62 cm from September 1 to December 31; Coquitlam River: fishing for salmon was permitted but Chinook Salmon could not be retained from September 1 to December 31;
- Harrison River downstream of the Highway No. 7 Bridge, fishing for salmon was permitted but Chinook Salmon could not be retained from September 1 to December 31.

The Chilliwack/Vedder River recreational fishery was assessed from late August to late November in 2021. Catch estimates can be found in Appendix 5.

Fraser River Tributaries - Region 3

Thompson River: That portion of the Thompson River from the white triangular fishing boundary (WTFB) signs just downstream of Gold Pan Provincial Park to the easterly border of the Skihist Ecological reserve along the Thompson River located at 50°15'N, 121°31'W; this is approximately 5 km northeast of Lytton at Skihist Park.

- August 28 to September 22, daily limit of four Chinook, zero over 50 cm.

Kamloops Lake: In the waters of Kamloops Lake upstream of the fishing boundary signs at the outlet of Kamloops Lake.

- August 28 to September 22, 2021 daily limit of four Chinook, only one over 50 cm.

South Thompson River: That portion of the 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 over 50cm from the South Thompson River.

Fraser River Tributaries - Region 5

January 1 to December 31, fishing for salmon was not permitted in any portion of the Fraser watershed in Region 5, except for a Pink directed fishery on the Quesnel River that took place from September 17 to September 26, 2021.

Fraser River Tributaries - Region 7

January 1 to December 31, fishing for salmon was not permitted in any portion of the Fraser watershed in Region 7.

Fraser River Tributaries - Region 8

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

Mabel Lake: 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 Chinook, only two over 50 cm.

Middle Shuswap River: No fishing for salmon.

Lower Shuswap River: That portion of the Lower Shuswap River upstream from white triangular fishing boundary signs upstream of the Mara Bridge to Mable Lake, except no fishing in those waters 50 metres upstream and downstream of the Trinity Valley Road Bridge.

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

4.2.6 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 and Coho at the Robertson Creek Hatchery facility.

The Ditidaht First Nation was issued an ESSR Licence for Chinook, Coho and Chum at Nitinat Lake and Nitinat hatchery.

Chinook Salmon ESSR fisheries for the Qualicum First Nation took place at the Big Qualicum Hatchery and at Little Qualicum Hatchery in 2021.

The K’ómoks First Nation ESSR fishery on Fall Chinook Salmon took place in 2021.

There were ESSR fisheries at the Capilano hatchery in 2021 that harvested Chinook Salmon.

There were ESSR fisheries at the Chilliwack hatchery in 2021 that harvested Chinook Salmon.

No Johnstone Strait ESSR opportunities on Chinook occurred in 2021.

There were no Interior BC ESSR opportunities on Chinook in 2021.

There were no ESSR fisheries opportunities for either the Maa-nulth or the Tla’amin treaty nations.

All ESSR harvest information can be found in Appendix 7.

5 FRASER RIVER

5.1 SOCKEYE SALMON

5.1.1 OBJECTIVES AND OVERVIEW

In 2021 the Fraser River Panel (FRP) adopted the p50 probability run size forecast for all run timing groups (1,330,100 Fraser Sockeye) for pre-season planning purposes. There was no TAC available for international sharing until Early Summer and Summer run sizes reached the p75 or higher. The Early Stuart and Late runs did not have International TAC throughout the range of the forecast distribution. 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 and 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 Fraser River Panel (FRP) operated in accordance with Chapter 4, Annex IV of the PST.
- The U.S. share of the annual Fraser River Sockeye Salmon total allowable catch (TAC), harvested in the waters of Washington State, was set at 16.5% 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 International 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 International 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 ER is assumed to be the same as the ER 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 PST Annex generally contain stocks with similar timing in the marine area.

- 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 ER). The TAM cap was reduced to 50% for all run timing/management groups in 2021 to address recent poor productivity and the very low forecast.
- At low abundances, low abundance exploitation rates (LAERs) are implemented to protect 90% of the run timing aggregate (10% LAER) while allowing for fisheries on more abundant co-migrating run timing groups and/or other species. In 2021 Canada’s escapement plan permitted up to a 10% LAER for all stock groups.
- The allowable harvest in a LAER situation is not a target; the objective is to allow as many fish as possible to pass to the spawning grounds. In most circumstances harvests under a LAER scenario would be considered incidental harvest or bycatch only; however, in some circumstances limited directed harvest in terminal areas may be considered. All fishery impacts are to be accounted for under the LAER.
- In 2021, the Early Stuart Sockeye window closure 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 3-week rolling window closure based on the run timing of the Early Stuart Sockeye migration through the various fishing areas. The 2021 closure was extended by one week (4 weeks total) to protect the earliest of the Early Summer Run Sockeye that have conservation concerns (Bowron, Taseko); and
- Conservation concerns for other salmon species and Sockeye stocks continued to impact the planning of Sockeye fisheries. The stocks and species of concern in 2021 included: Cultus Lake Sockeye, Nimpkish River Sockeye, Sakinaw Lake Sockeye, Interior Fraser River Coho, Southern BC Chinook including Fraser River Chinook, and Interior Fraser River Steelhead.

5.1.2 STOCK STATUS

Please Note: Table 5-2 and Table 5-3 are adapted from or courtesy of the PSC.

5.1.2.1 PRE-SEASON ASSESSMENT

Pre-season expectations (Table 5-1) were for a median run size (p50 level) of 1,330,000 Fraser River Sockeye Salmon with a one-in-two chance that the run size would be between 624,360 (p25 level) and 2,774,900 (p75 level).

Table 5-1 2021 pre-season run size abundance forecast range by management group for Fraser Sockeye.

Run timing group	Probability that returns will be at/or below specified run size				
	10%	**25%**	**50%**	**75%**	**90%**
Early Stuart	8,000	12,000	18,000	30,000	47,000
Early Summer	33,430	58,760	107,500	206,900	375,300
Summer	231,890	474,300	1,045,700	2,225,000	4,502,000
Late	39,600	79,300	158,900	313,000	572,000
Total	312,920	624,360	1,330,000	2,774,900	5,496,300

The pre-season diversion rate forecast for Fraser River Sockeye through Johnstone Strait was 35%. Predicted Area 20 50% migration timing dates were July 5th for Early Stuart, July 24th for Early Summer, August 5th for Summer, and August 13th for Late-run Sockeye.

As all management units were forecast to be very low, pre-season spawning escapement goals at the p50 run size were equal to the forecast; 18,000 Early Stuart, 107,500 Early Summer, 1,045,700 Summer, and 158,900 Late-run Sockeye for a total of 1,330,000 Sockeye spawners (Table 5-2).

Table 5-2. Fraser Sockeye 2021 Pre-season (top) and Final In-season (bottom) Values for Total Allowable Catch (TAC) and Other Management Parameters.

Date		Management Group	Total Abundance	Spawning Escapement Target	TAM	pMA	Mangement Adjust.	Test Fishing	Aboriginal Fishery Exemption	Total Deductions	Total Allowable Catch	Available Harvest (includes for AFE)	50% Migration Date Area 20	JS Diversion Rate To-date
June 23	Pre-season	Early Stuart	18,000	18,000	0.00	0.69	12,420	300	0	18,000	0	0	5-Jul	
		Early Summer	108,000	108,000	0.00	0.39	42,120	1,800	0	108,000	0	0	24-Jul	
		Summer	1,046,000	1,046,000	0.00	0.09	94,140	8,900	0	1,046,000	0	0	5-Aug	
		Late	159,000	159,000	0.00	0.96	152,640	1,700	0	159,000	0	0	13-Aug	
		Sockeye	**1,330,000**	**1,330,000**			**301,320**	**12,700**	**0**	**1,330,000**	**0**	**0**		**35%**
September 28	Post-season	Early Stuart	70,000	70,000	0.00	0.69	48,300	750	0	70,000	0	0	5-Jul	
		Early Summer	120,000	120,000	0.00	0.47	56,400	1,500	0	120,000	0	0	4-Aug	
		Summer	1,763,000	1,250,000	0.21	0.11	137,500	13,700	361,800	1,763,000	0	361,800	12-Aug	
		Late	600,000	300,000	0.36	0.28	84,000	2,200	38,200	424,400	175,600	213,800	18-Aug	
		Sockeye	**2,553,000**	**1,740,000**			**326,200**	**18,150**	**400,000**	**2,377,400**		**575,600**		**27%**

*The TAC is determined by the run sizes and TAC deductions (spawning escapement targets, management adjustments, projected test fishing catches and AFE Exemptions) that were in effect when the Fraser River 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. However, the LAER is not a target and is usually by-catch in fisheries directed on the other stocks or species with some limited directed terminal harvest. All impacts from all fisheries count towards the LAER.

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, Early Summer, Summer, and Late Sockeye was constrained by a LAER limit of up to 10% at the p50 run size. Harvest rules were further constrained by a 50% TAM rate for all management groups (Table 5-3).

Table 5-3 Fraser River Sockeye Salmon 2021 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**	**Pre-season pMA @p50**
Early Stuart	10%	50%	108,000	216,000	0.69
Early Summer (w/o misc)	10%	50%	100,000	200,000	0.39
Summer (w/o misc)	10%	50%	1,250,000	2,500,000	0.09
Late (w/o misc)	10%	50%	300,000	600,000	0.96

Management Unit		**Pre-season Forecast Return**				
		p10	p25	**p50**	p75	p90
	lower ref. pt. (w misc)	108,000	108,000	**108,000**	108,000	108,000
	upper ref. pt. (w misc)	216,000	216,000	**216,000**	216,000	216,000
Early Stuart	forecast	8,000	12,000	18,000	30,000	47,000
	TAM Rule (%)	0%	0%	**0%**	0%	0%
	Escapement Target	8,000	12,000	**18,000**	30,000	47,000
	MA	5,500	8,300	**12,400**	20,700	32,400
	Esc. Target + MA	13,500	20,300	**30,400**	50,700	79,400
	LAER	10%	10%	**10%**	10%	10%
	Available ER at Return	0%	0%	**0%**	0%	0%
	Allowable ER	10%	10%	**10%**	10%	10%
	Allowable Harvest	800	1,200	**1,800**	3,000	4,700
	2021 Performance					
	Projected S (after MA)	4,200	6,400	**9,600**	15,900	25,000
	BY Spawners	15,433	15,433	**15,433**	15,433	15,433
	Proj. S as % BY S	27%	41%	**62%**	103%	162%
	cycle avg S	204,064	204,064	**204,064**	204,064	204,064
	Proj. S as % cycle S	2%	3%	**5%**	8%	12%

Management Unit		**Pre-season Forecast Return**				
		p10	p25	**p50**	p75	p90
Early Summer (w/o RNT)	*lower ref. pt. (w misc)*	126,600	128,600	**128,900**	131,200	134,000
	upper ref. pt. (w misc)	253,300	257,200	**257,800**	262,400	268,100
	forecast (incl. misc)	33,430	58,760	**107,500**	206,900	375,300
	TAM Rule (%)	0%	0%	**0%**	37%	50%
	Escapement Target	33,430	58,760	**107,500**	131,200	187,650
	MA	12,400	21,700	**41,900**	53,800	80,700
	Esc. Target + MA	45,830	80,460	**149,400**	185,000	268,350
	LAER	10%	10%	**10%**	10%	10%
	Available ER at Return	0%	0%	**0%**	11%	28%
	Allowable ER	10%	10%	**10%**	11%	28%
	Allowable Harvest	3,300	5,900	**10,800**	21,900	107,000
	2021 Performance					
	Projected S (after MA)	22,000	38,300	**69,700**	131,900	188,900
	BY Spawners	68,477	68,477	**68,477**	68,477	68,477
	Proj. S as % BY S	32%	56%	**102%**	193%	276%
	cycle avg S	94,107	94,107	**94,107**	94,107	94,107
	Proj. S as % cycle S	23%	41%	**74%**	140%	201%

Management Unit		Pre-season Forecast Return				
		p10	p25	**p50**	p75	p90
Summer	*lower ref. pt. (w misc)*	1,250,000	1,250,000	**1,250,000**	1,250,000	1,250,000
(w. RNT & Har)	*upper ref. pt. (w misc)*	2,500,000	2,500,000	**2,500,000**	2,500,000	2,500,000
	forecast	231,890	474,300	**1,045,700**	2,225,000	4,502,000
	TAM Rule (%)	0%	0%	**0%**	44%	50%
	Escapement Target	231,890	474,300	**1,045,700**	1,250,000	2,251,000
	MA	20,900	42,700	**94,100**	112,500	225,100
	Esc. Target + MA	252,790	517,000	**1,139,800**	1,362,500	2,476,100
	LAER	10%	10%	**10%**	10%	10%
	Available ER at Return	0%	0%	**0%**	39%	45%
	Allowable ER	10%	10%	**10%**	39%	45%
	Allowable Harvest	23,189	47,430	**104,570**	862,500	2,025,900
	2021 Performance					
	Projected S (after MA)	191,400	391,200	**861,900**	1,247,000	2,264,600
	BY Spawners	788,761	788,761	**788,761**	788,761	788,761
	Proj. S as % BY S	24%	50%	**109%**	158%	287%
	cycle avg S	1,611,409	1,611,409	**1,611,409**	1,611,409	1,611,409
	Proj. S as % cycle S	12%	24%	**53%**	77%	141%

Management Unit		Pre-season Forecast Return				
		p10	p25	**p50**	p75	p90
Late	*lower ref. pt. (w misc)*	300,000	300,000	**300,000**	300,000	300,000
(w/o Har)	*upper ref. pt. (w misc)*	600,000	600,000	**600,000**	600,000	600,000
	forecast	39,600	79,300	**158,900**	313,000	572,000
	TAM Rule (%)	0%	0%	**0%**	4%	48%
	Escapement Target	39,600	79,300	**158,900**	300,000	300,000
	MA	42,800	79,300	**152,500**	288,000	288,000
	Esc. Target + MA	82,400	158,600	**311,400**	588,000	588,000
	LAER	10%	10%	**10%**	10%	10%
	Available ER at Return	0%	0%	**0%**	0%	0%
	Allowable ER	10%	10%	**10%**	10%	10%
	Allowable Harvest	3,960	7,930	**15,890**	31,300	57,200
	2021 Performance					
	Projected S (after MA)	17,100	35,900	**72,800**	143,400	263,500
	BY Spawners	83,120	83,120	**83,120**	83,120	83,120
	Proj. S as % BY S	21%	43%	**88%**	173%	317%
	cycle avg S	184,910	184,910	**184,910**	184,910	184,910
	Proj. S as % cycle S	9%	19%	**39%**	78%	143%

Pre-season Management Adjustments (MAs) of 12,400 Early Stuart, 41,900 Early Summer, 94,100 Summer-run, and 152,500 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. In 2021, this was the case pre-season for Early Stuart and Late Run Sockeye, as it was apparent that for the entire range of pre-season run size forecasts LAER management was necessary. Early Summer Run Sockeye would likely remain in a LAER for returns below the p75 forecast level and Summer Run Sockeye would be in a LAER scenario for run sizes at or below the p50 forecast level.

The pre-season MAs were derived from historical proportional differences between estimates (pDBEs) as follows: Early Stuart - all years median (-0.41); Early Summer - weighted all years median (-0.36) for Early Summer excluding Pitt and Chilliwack (-0.15 for Pitt and -0.33 for Chilliwack); Summer - weighted all years

median (-0.08) for Summers excluding Harrison and -0.28 for Harrison; Lates - weighted 2021 cycle year median for Lates excluding Birkenhead (-0.58) and -0.28 for Birkenhead using p50 forecast abundance.

There was no projected TAC of Fraser River Sockeye for international sharing based on the median forecasted abundances.

Pre-season model runs indicated that there would be no international TAC unless the Summer Run Sockeye returned at abundances near the p75 or greater. In Canada, at the p50 forecast, no Sockeye TAC would be available for directed commercial, recreational, or FSC fisheries. Expected timing indicated access to one stock group without incidentally impacting another would be difficult (Figure 54).

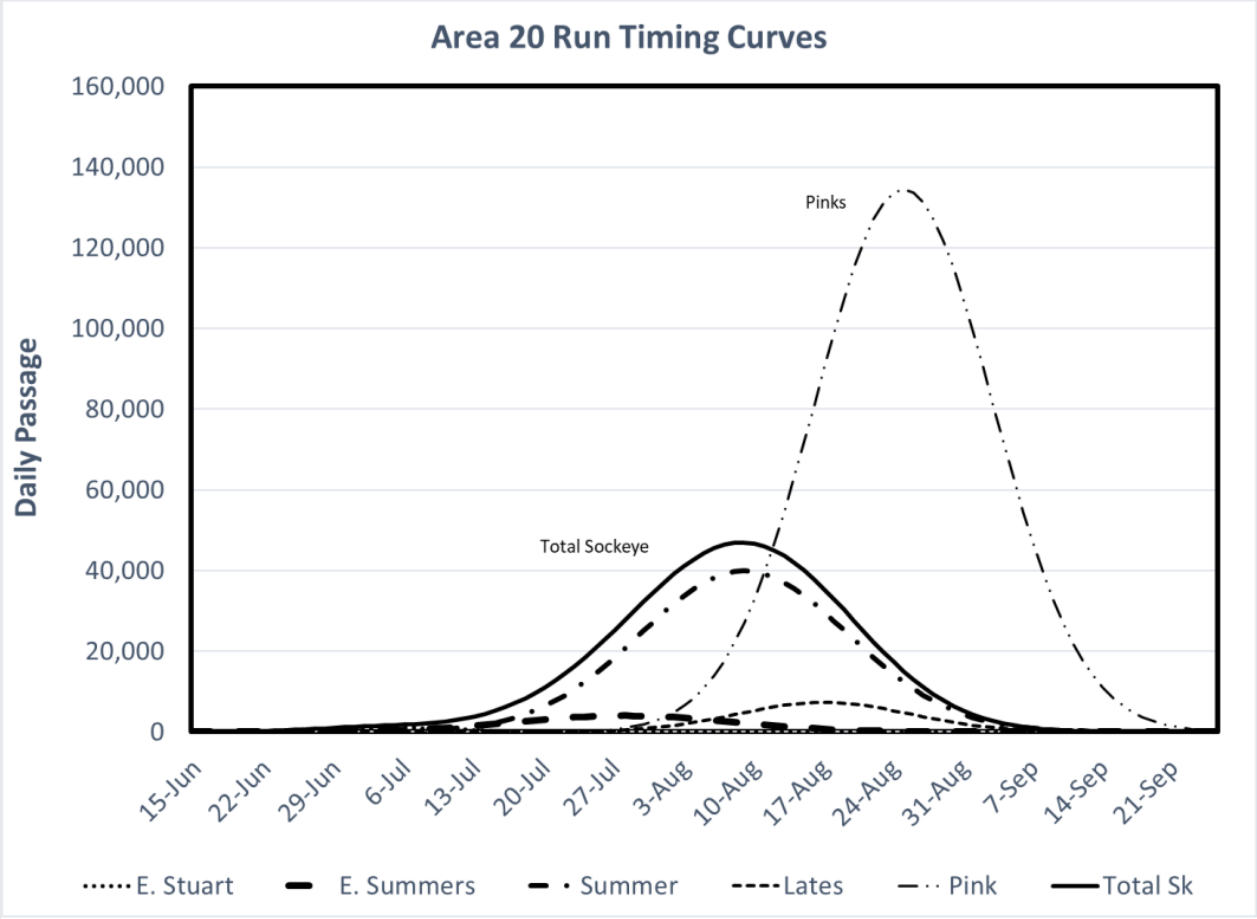


Figure 5-4 Pre-Season Projections of Daily Fraser River Sockeye and Pink Salmon Abundance by Management Group

5.1.3 IN-SEASON ASSESSMENT

Overall the marine migration timing was later than pre-season expectations for all management groups with the exception of the Early Stuart run: as forecasted for Early Stuart, 11 days later for Early Summer, 9 days later for Summer, and 5 days later for Late-run Sockeye.

The Johnstone Strait post-season diversion rate was 27% compared to a pre-season predicted value of 35%.

Returns for all management groups were above median pre-season forecast levels:

- The return of Early Stuarts was significantly higher than the expected value: 70,000 or 289% higher than the pre-season 50% probability level (p50) forecast (18,000). This was also notably higher than the p90 forecast of 47,000.
- The return of Early Summers was low, but near the expected value: 120,000 or 11% higher than the pre-season p50 forecast (108,000).
- The return of Summers was moderate: 1,762,000 or 68% higher than the pre-season p50 forecast of 1,046,000.
- The return of Lates was moderate: 597,000 or 275% higher than the pre-season p50 forecast of 159,000 and slightly higher than the p90 forecast of 572,000.

Updated mitigation measures and monitoring programs for the 2021 season were in place for the landslide in the Big Bar area on the Fraser River upstream of Lillooet. Over the winters in 2019-2021 substantial work was undertaken by a Unified Command Team consisting of representatives from First Nations, the Department of Fisheries and Oceans, and the Province of British Columbia. This work significantly improved passage at Big Bar. Mitigation measures included the installation and operation of a Whooshh Passage Portal™ (2020), the construction of a nature-like fishway along the west bank of the river, installation of a concrete fish ladder and holding area, construction of a road for truck transport of captured fish upstream of the slide site, and the implementation of emergency conservation enhancement programs for salmon populations most heavily affected by migration barriers (e.g. Early Stuarts and early-timed Early Summers). Post-season estimates of survival in 2019 indicated less than 1% survival for July and Early August Sockeye migrants (Early Stuart, some Early Summer), approximately 50% survival for late July to early September migrants (Early Summer, some Summer) and approximately 80% survival for mid-August through September migrants (mostly Summer). Estimates of survival past Big Bar for 2020 are less than 5% survival for July and Early August Sockeye migrants (Early Stuart, some Early Summer), approximately 80-100% survival for late July to early September migrants (Early Summer, some Summer) and approximately 100% survival for mid-August through September migrants (mostly Summer). Some of the impacts in 2020 can be attributed to the cumulative effects of Big Bar and Hell's Gate which was also an area of passage difficulties due to the very high freshet conditions in June and July.

Salmon passage by the Big Bar landslide was not considered an issue for the 2021 season due to mitigation efforts in the winter/spring of 2021 as well as the extremely low discharge, which aided natural salmon passage through the slide area. Estimates of survival past the slide site in 2021 are not yet available, though preliminary analysis has indicated it has considerably improved from survival in 2019 and 2020. Despite this, a migration passage problem continues to exist at Big Bar and further management actions are required to completely mitigate the impacts of the slide on migrating salmon. Risk remains especially high for early-timed stocks in years of high or moderate flow conditions. The Big Bar Joint Executive Steering Committee is utilizing a structured decision-making (SDM) process to explore a sustainable, viable solution. The SDM process will draw on existing and new analyses and incorporate expert advice from First Nations and stakeholders. Planning for the 2022 salmon migration continues, including continued monitoring, conservation enhancement, and assisted transport.

Due to uncertainty surrounding passage success at the Big Bar landslide and the low in-season return estimates, the Department decided to: (i) delay and not licence Sockeye-directed fisheries until in-season TAC was identified, and (ii) plan fisheries directed on other species in a way that allowed as many Sockeye to reach the spawning grounds as possible by minimizing bycatch impacts to levels well below the LAER limits identified in the escapement plan.

Fraser River discharge was well below the mean discharge (1981-2020) throughout the watershed for most of the 2021 season. Low river discharge early in the season allowed for successful migration to the spawning grounds for the early-timed management groups with minimal to no delays. Increased travel times were observed in the marine approach areas during the season and contributed to delayed migration into the river, however, this was not related to discharge levels. For the majority of the season, the Fraser River daily water temperatures were significantly above the historical mean; record high temperatures were observed in July and August.

5.1.4 POST-SEASON ASSESSMENT

The post-season return of adult Fraser Sockeye of 2,549,000 is estimated to be ~92% above the pre-season median forecast. (Table 5-2). The run size was ~72% above the brood year run size (1.5M) but ~64% below the historical 2021 cycle line average of (7.8M).

There were limited Sockeye-directed fisheries licensed in the Fraser River and terminal areas of the watershed. Terminal harvests were directed on abundant Late Stuart and Chilko Sockeye. In other areas, although not licenced, there was significant unsanctioned sockeye harvest particularly in the mid-Fraser River. A small amount of TAC was identified very late in the season (September 7) for Summer run Sockeye. As a result Sockeye were permitted to be retained in FSC fisheries directed on other species (e.g. Chinook and Pinks), where Summer run Sockeye were the dominant stocks. Due to the low run sizes and migration concerns for all other MUs, fisheries directed on other species when these MU's were prevalent were planned to reduce Sockeye impacts and required to release all Sockeye encountered. Overall, fisheries impacts on Sockeye were limited to levels below the LAER limit identified in the escapement plan (10%). Additionally, at the post-season meeting on September 28, as the result of updated species composition estimates, the Fraser Panel adopted a final in-season run size and timing estimates where applicable. In some cases, international TAC was unexpectedly generated well after fisheries could be considered. In the case of the Late run MU, due to a migration delay of 21 days and later upstream migration timing, the pMA for Late run Sockeye significantly decreased (0.28). The lower pMA combined with the higher adopted run size (600,000) generated TAC that was unavailable to harvest for both countries. Escapement data and updated species composition information will help to best assess the post-season run size for Late run Sockeye.

The total Canadian Fraser Sockeye catch can be found in Appendix 5 as well as Appendices 1 and 2. The post-season ER is estimated to be 3.4%. See Table 5-5 for projected post-season ERs relative to allowable ERs.

Table 5-5. 2021 Post-Season Exploitation Rate Estimates for All Fraser Sockeye Catch by Management Group

Management Group	Early Stuart	Early Summer	Summer	Late	Total
Preliminary Exploitation Rate	1.5%	1.8%	4.5%	0.6%	3.4%
Allowable Exploitation Rate*	10%	10%	21%	36%	23%
LAER?*	Yes	Yes	No	No	

* The Low Abundance Exploitation Rate (LAER) is not a target. All efforts were made to minimize fisheries impacts to Fraser Sockeye.

Preliminary escapement data for Fraser Sockeye is not yet available for the 2021 return. Continued analyses are being conducted, with final estimates anticipated in February 2022.

Ongoing post-season work continues on the following topics that were highlighted during the 2021 season:

1. **Impacts of the Big Bar landslide:** Work to mitigate the effects of the Big Bar slide is ongoing, and potential implications for passage in 2022 or in the future are still uncertain and will require ongoing evaluation.

2. **Low productivity:** In recent years there has been declining productivity, climate change and the increased variability that accompanies it, as well as low Sockeye abundances (the three lowest on record occurred in 2016, 2019, and 2020). As part of adaptive management, DFO will be reviewing potential adjustments/improvements to current harvest control rules, alternative strategies that take into account changing conditions and key uncertainties, and what implications there may be for future advice. Initial work began in 2019 through the Fraser River Sockeye Spawning Initiative (FRSSI) and is anticipated to be ongoing in 2021 and 2022. Forecast model methods may also be reviewed.

3. **Estimation of species composition and passage at Mission hydroacoustic site**: There are a variety of methods used to determine the number of Sockeye, Pink, and Chinook salmon that pass by Mission. The Mission estimates are critical to in-season estimates of run size and migration timing. For example, Sockeye escapement estimates are typically based on total salmon past Mission minus Pink and Chinook. Later in the season when Pink proportions increase, an alternate method is used instead (i.e. Sockeye CPUE at Whonnock multiplied by the expansion line). Species proportions are also derived from hydroacoustic-based length data and the previous year's species-specific average lengths. These methods and others have been reviewed by the Fraser River Panel Technical Committee but remain a considerable source of uncertainty. If numbers of one species are inaccurately or imprecisely estimated it may affect in-season estimates and expectations of catch of the other species in all fisheries.

4. **Species and stocks of concern:** In 2017, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) determined that of the 24 Fraser Sockeye designatable units (DUs), 8 were endangered, 2 were threatened, and 5 were of special concern. In 2020, one Recovery Potential

Assessment was completed, the first part of a second was completed and part two of the second is in progress and should be completed by the end of 2021.

The two completed Recovery Potential Assessments can be found here:

Cultus Lake Sockeye https://cat.fsl-bsf.scitech.gc.ca/record=b4087614~S1

Nine Designatable Units –Part 1 https://cat.fsl-bsf.scitech.gc.ca/record=b4087615~S1

5.1.5 FIRST NATIONS FSC AND TREATY DOMESTIC FISHERIES

There was no TAC for Sockeye directed fisheries until September 7, 2021, when a small amount of TAC was identified for the Summer run MU. After that date, Fraser Sockeye directed fishing opportunities took place in those times and areas with little to no access to other stocks and species. First Nations were encouraged to work with the Department to plan fisheries directed at other species (e.g. Fraser Pink Salmon) where Fraser Sockeye may be present. In the lower and mid-Fraser River (downstream of the Thompson River), Sockeye were retained in Chinook directed FSC fisheries after September 7. In the Fraser River upstream of the Thompson River Sockeye directed fisheries took place after September 7. In some portions of the Fraser River, Sockeye directed fisheries took place prior to September 7. These fisheries are broadly described below:

a. First Nations who opted to fish for Sockeye without arriving at a consensus decision with Canada. These fisheries took place in advance of in-season information suggesting sufficient run-sizes to support fisheries and were not sanctioned by Canada.
b. In the Chilcotin watershed, a fishery was authorized on Chilko Sockeye on August 19. At that time, the return to the Chiko was estimated to be in excess of 550,000 Sockeye and taking into account potential en-route losses and harvest to date in test fisheries and other fisheries, the potential spawning escapement was estimated to be in excess of spawning requirements. The fishery initially opened for one week and was extended until the end of the season when the run size increased, and the management adjustment decreased.
c. In the Stuart watershed, a fishery was authorized on Late Stuart Sockeye. 2021 is the dominant year for Late Stuart Sockeye. The return was estimated to be about 260,000 to that system which is greater than the 20-year cycle line average and the all year average. The only other Sockeye to return to the area are Early Stuart Sockeye and a decision was made by the First Nations in that area to forgo any harvest of the Early Stuart Sockeye due to the poor returns in previous years and conduct a small fishery on the later, stronger Summer run stock.

Gear-specific fishery-induced mortality estimates, as described in the Integrated Fisheries Management Plan, may be applied to all non-retained Sockeye where estimates are available. Post season total mortality estimates also include unauthorized kept catch where estimates are available.

For preliminary catch estimates, see Appendix 5.

5.1.6 COMMERCIAL FISHERIES

There were no directed commercial fisheries on Fraser River Sockeye in Canada or the United States in 2021.

5.1.7 RECREATIONAL FISHERIES

5.1.7.1 TIDAL RECREATIONAL FISHERIES

In southern BC in all areas except Area 23 (Barkley Sound), the marine recreational fishery was not permitted to retain Sockeye Salmon in 2021. The tidal waters of the Fraser River remained closed to fishing for Sockeye salmon in 2021.

5.1.7.2 NON-TIDAL RECREATIONAL FISHERIES

The non-tidal waters of the Fraser River remained closed to fishing for Sockeye salmon in 2021.

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

There was an ESSR opportunity on Weaver Creek Hatchery for Sockeye Salmon October-November 2021. All ESSR harvest information can be found in Appendix 7.

There were no other ESSR opportunities directed on Fraser River Sockeye in 2021. The ESSR fishery in the Chilcotin was licenced under an FSC licence only.

5.2 PINK SALMON

5.2.1 OBJECTIVES AND OVERVIEW

In 2021 the Fraser River Panel (FRP) adopted a pre-season fishing plan at the p50 probability run size forecast for Fraser Pink Salmon (3,009,000) for pre-season planning purposes. At the p50 run size forecast 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 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 Pink Salmon total allowable catch (TAC), harvested in the waters of Washington State shall not exceed 25.7% of the TAC.
- Canada’s escapement plan specified escapement requirements that varied with run size.
- The escapement target varies with run size and the maximum exploitation rate cap was 70%.
- Harvest of Fraser Pink Salmon may be constrained by the management objectives for Fraser Sockeye and for stocks of concern, particularly Interior Fraser River (IFR) Coho Salmon and IFR Steelhead.
- Due to conservation concerns alternative fishing gear and fishing strategies may be employed to access Fraser Pink TAC. Alternative gears used in the past have included beach seines, shallow seines, and fish

wheels in the Fraser River. In the marine areas, varying fishing strategies and gear are considered such as allowing purse seines with independent observer coverage to access areas at the mouth of the river and possibly within the river.

- Further, when Pink TAC is available and there are bycatch constraints for other species (i.e. Fraser Sockeye) the Department may consider decision rules similar to recent years where the total Sockeye mortalities associated with a gear specific Pink fishery is 1% or less for Sockeye. This calculation takes into account the release mortality rate of the gear being used to harvest Pink Salmon as well as the estimated proportion of Sockeye expected to be encountered in the fishery.

5.2.2 STOCK STATUS

Please Note: Figure 5-7 and Table 5-8 are adapted from or courtesy of the Pacific Salmon Commission.

5.2.2.1 PRE-SEASON ASSESSMENT

Pre-season expectations were for a median run size (p50 level) of 3,009,000 Fraser River Pink Salmon with a 50% chance that the run size would be between 2,229,000 (at p25) and 4,051,000 (p75).

Pre-season expectations of diversion rate for Fraser River Pink through Johnstone Strait were 50% and the expected Area 20 50% migration timing date was August 25th.

The pre-season spawning escapement target was 2,817,000 Fraser River Pink spawners at the median forecast (p50).

Due to restrictions in place in response to the COVID-19 pandemic in early 2020, the out-migration of Pink salmon fry from the brood year (2019) was not assessed. As the brood year fry abundance is typically used to forecast the returning adult abundance, a different methodology was required to forecast returns for 2021.

Harvest constraints were established by applying Canada’s Fraser Pink Escapement Plan to the forecasted pre-season run size distribution. The harvest rate for Fraser River Pink Salmon varied with abundance and was constrained by a 70% exploitation rate.

The projected Total Allowable Catch (TAC) of Fraser River Pink for international sharing based on the median forecasted abundance and bilaterally agreed deductions was 192,000 Fraser Pink, of which 25.7% were allocated to the United States (U.S.).

Table 5-4 2021 Fraser Pink Escapement Plan and Application across a Range of 2021 Forecast Abundances

2021 Fraser Pink Escapement Plan					
Run Size	**Escapement Plan**				
Less than 7.059M	Exploitation rate increases linearly from 0% at run size =0 to 15% at run size = 7.059M				
Between 7.059M-20M	Fixed Escapement. Escapement goal = 6,000,000				
Greater than 20M	Exploitation Rate Cap = 70%				
	2019 Pre-season Forecast Return				
	p10	p25	**p50**	p75	p90
forecast	1,701,000	2,229,000	**3,009,000**	4,051,000	5,375,000
escapement target	1,640,000	2,123,000	**2,817,000**	3,702,000	4,761,000
allowable ER	4%	5%	**6%**	9%	11%
Available Harvest (TF, US, CDN)	61,000	106,000	**192,000**	349,000	614,000

5.2.2.2 IN-SEASON ASSESSMENT

Marine migration timing was 4 days earlier than pre-season expectations which created more run timing overlap with the Sockeye returns. The Pink Area 20 peak return timing of August 21 was much earlier than the historical Area 20 timing of August 28(1959 to 2019).

Based on the marine test fishery information, the Pink Salmon return was bimodal with a larger second mode and an elongated travel time of 22 days from Area 20 to Mission, both of which contributed to challenges in estimating return abundance in season.

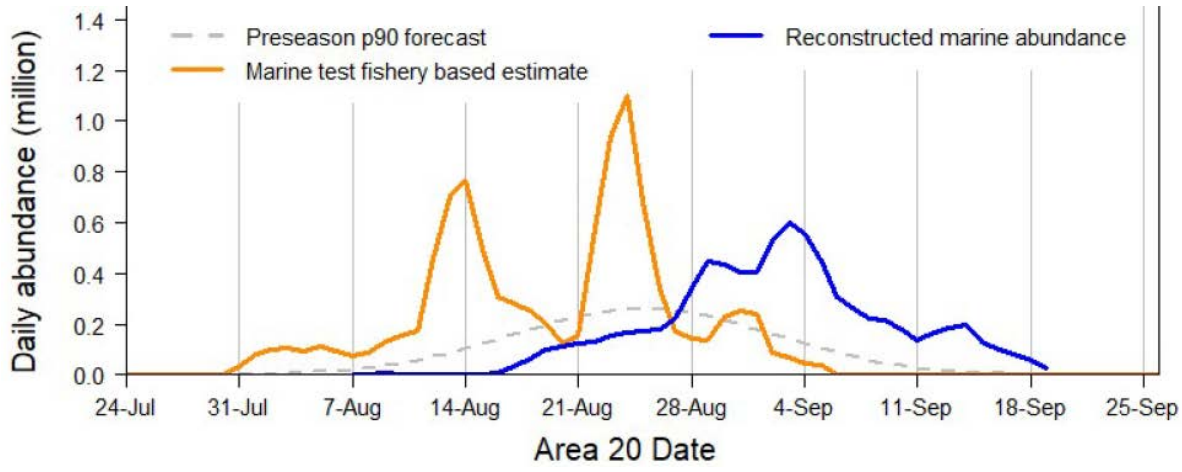


Figure 5-7 Pre-Season Projections and In-Season Reconstruction of Daily Fraser River Pink Salmon Abundance

The Johnstone Strait diversion rate was 23%, much lower than the pre-season forecast of 50%.

The Pink return (Table 5-7) was substantially above the median pre-season forecasts (approximately 165% above the median forecast). The TAC of Fraser River Pink for international sharing based on the final Fraser River Panel adopted in-season run size (8,000,000) was 1,995,730 Pinks, of which 25.7% (512,900) were allocated to the U.S. and the remainder to Canada (1,482,830).

Table 5-5 2021 Pre-Season (top) and Most Recent In-Season (bottom) Values for TAC and Other Management Parameters. Post-season values are not available at this time.

Date	Management Group	Total Abundance	Spawning Escapement Target	Test Fishing	Total Deductions	Total Allowable Catch	Available Harvest (includes for AFE)	Catch to Date	50% Migration Date Area 20	JS Diversion Rate
June-23 Pre-season	Pink	3,009,000	2,816,600	3,500	2,820,100	188,900	188,900	0	25-Aug	50%
September-29 Post-Season	Pink	8,000,000	6,000,000	5,000	6,005,000	1,995,000	1,995,000	223,781	19-Aug	23%

*The TAC is determined by the run size and TAC deductions (spawning escapement targets, management adjustments, projected test fishing catches and Aboriginal Fishery Exemptions) that were in effect when the Fraser River Panel control of the last U.S. fishery area was relinquished.
**Available Harvest = Total abundance minus spawning escapement target.
***The Fraser River Panel relinquished control of U.S. Panel Area waters on Sept. 18.

A landslide in the Big Bar area on the Fraser River upstream of Lillooet was discovered on June 23, 2019 and is thought to have occurred sometime between October and November 2018. It created a 5 metre high waterfall/cascade that posed a migration passage challenge to salmon migrating to rivers and streams upstream of the slide. The Big Bar landslide had notable impacts to fish passage to the spawning grounds, especially prior to late August when water flow decreased enough to enable greater natural migration above the slide. It is unknown what proportion of Fraser Pinks were expected to migrate past the Big Bar slide, however expert opinion suggests the range could be as low as 5 and as high as 30%. Due to uncertainty surrounding the implications of the Big Bar landslide and the very low pre-season Sockeye return estimates, the Department decided to plan fisheries directed on species other than Sockeye, including Pink fisheries, in a way that allowed as many Sockeye to reach the spawning grounds as possible. This included measures to minimize bycatch impacts such as requiring the use of selective fishing gear like shallow seines, beach seines, and fish wheels.

A Unified Command that includes all levels of government (First Nations, provincial, federal) came together to lead response operations. Information about the Big Bar Slide was communicated through DFO fishery notices on Fraser River Sockeye Updates, Fraser River Panel meetings, the Province of BC's website (https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/fish/aquatic-habitat-management/fish-passage/big-bar-landslide-incident), and the Fraser River Aboriginal Fisheries Secretariat (https://www.frafs.ca/node/75).

Fraser River discharge was above the mean discharge (1981 to 2020) through most of June, considerably below for most of July, near the historical minimum for August, and near the mean for September. For the majority of the season, the Fraser River daily water temperatures were significantly above the historical mean in July and near the mean for August and September. Although the Fraser River discharge and temperature can have effects on salmon migration, environmental conditions rarely play the same kind of role in Pink management as they do for Fraser Sockeye given timing and migration differences between the species.

5.2.2.3 POST-SEASON ASSESSMENT

The post season return of Fraser Pink is estimated in Table 5-7. The 2021 Fraser Pink return was ~165% higher than the median forecast (3,009,000) and ~10% lower than the brood year (8,900,000).

Fraser River Pink Salmon catch numbers are available in Appendix 5. Canadian catch occurred in Pink-directed First Nations Food, Social and Ceremonial (FSC), economic opportunity, and demonstration fisheries, as well as recreational fisheries and very limited commercial fisheries. A small amount of Fraser Pink bycatch in fisheries directed at other species has yet to be included as the stock of origin is uncertain. Final catch estimates

will be available in January 2022. The preliminary post-season exploitation rate is approximately 2.8%, which is well below the preliminary post-season allowable exploitation rate of 25%.

DFO spawning escapement enumeration programs have not been conducted on Fraser Pink Salmon since 2001. Spawner abundance is estimated indirectly by subtracting the total catch from the projected run size.

Total Allowable Catch (TAC) calculated for Fraser Pink was based on the calculation method set out in Annex IV, Chapter 4 of the Pacific Salmon Treaty and the July 7, 2017 Commission Guidance. In these calculations, the TAC is fixed on the date that Panel control of the last U.S. Panel Area was relinquished (October 2 and October 9 for the U.S. area 7 apex).

Ongoing post-season work will continue to review 2021 assessment challenges, some of which include:

- **Impacts of the Big Bar landslide:** Work to mitigate the effects of the Big Bar slide going forward are ongoing, and potential implications for passage in the future are still uncertain and will require ongoing evaluation.
- **In-season data used to estimate the daily abundance of Pink Salmon, including**: Test fishery expansion lines and the incorporation of various data sources (e.g. U.S. Area 7 commercial fishery data has proven useful), daily passage of Pink Salmon past the Mission hydroacoustic site including high density passage days, and the incorporation of behaviour anomalies observed (spread of the run and migration speed) into assessment tools.

5.2.3 FIRST NATIONS DOMESTIC AND FSC FISHERIES

The Marine area was open for First Nations directed FSC harvest on Fraser Pink Salmon. First Nations were encouraged to work with the Department to plan fisheries using selective gear and to fish in areas that would have reduced impact on co-migrating Fraser River Sockeye. There was very little effort and catch in marine area FSC fisheries targeting Fraser Pink in 2021.

There were directed harvest opportunities for Fraser Pinks in First Nations FSC fisheries in the Fraser River where only selective gear was permitted (e.g. modified shallow seines, beach seines, fish wheels, dip nets). Incidentally caught Pink were also licensed for retention in fisheries directed at other species of salmon.

There were no provisions for directed Pink harvest for FSC-type purposes in any Final Agreements.

See Appendix 5 for estimates of kept Fraser Pink catch.

5.2.4 FIRST NATIONS COMMERCIAL HARVEST

There were Comprehensive Fisheries Agreements (CFAs) signed for Pink Salmon for commercial purposes in the Fraser River. Limited First Nations commercial Economic Opportunity (EO), demonstration beach seine, and fish wheel fisheries occurred September 11th to 27th. See Appendix 5 for catch estimates.

5.2.5 COMMERCIAL FISHERIES

Fraser Pink Commercial TAC was identified in-season and this resulted in limited commercial fishery openings in Canada. Commercial Area B seine and Area H troll Fraser Pink ITQ demonstration fisheries occurred in Area

29 from September 12th to 22nd with very minimal catch as the commercial Pink TAC was identified late in the season. (See Appendix 5 for catch estimates).

5.2.6 RECREATIONAL FISHERIES

5.2.6.1 TIDAL RECREATIONAL FISHERIES

Fraser River Pink harvest opportunities were available in marine tidal areas with a daily limit of four Pink Salmon in 2021.

It is unknown how many Fraser Pink were harvested in mixed-stock marine tidal recreational fisheries as the stock of origin is currently unknown. Final estimates will be available in January 2022.

In the tidal waters of the Fraser River, the retention of Pink Salmon was permitted from September 3 to September 18 with a daily limit of four. From September 19 until November 1 the window closure to protect Interior Fraser Steelhead was in place and fishing for all species of salmon was closed.

The in-river tidal Fraser River recreational fishery was assessed from September 3 to September 18. Catch estimates can be found in Appendix 5.

5.2.6.2 NON-TIDAL RECREATIONAL FISHERIES

Region 2:

Non-tidal Fraser River – from September 11 to September 21, the retention of two Pink salmon per day was permitted from the CPR Bridge at Mission upstream to the Highway 1 Bridge at Hope.

Chilliwack River – From September 8 to September 30, the retention of two Pink salmon per day was permitted from a line between two fishing boundary signs on either side of the Chilliwack River 100 m from the confluence of the Chilliwack River and Slesse Creek downstream including that portion of the Sumas River from the Barrow Town Pump Station downstream to fishing boundary signs near the confluence with the Fraser River.

Harrison River – From September 8 to September 30, the retention of two Pink salmon per day was permitted in those waters from the Hwy 7 bridge downstream to the confluence with the Fraser River.

Stave River – From September 8 to September 30, the retention of two Pink salmon per day was permitted in the waters downstream of the BC hydro dam to the CPR railway bridge.

In 2021, the non-tidal Fraser River and Chilliwack River recreational fishery were assessed. Catch estimates can be found in Appendix 4.

Region 3:

Thompson River – From September 11 to September 22, the retention of two Pink salmon per day was permitted in the Thompson River from the white triangle fishing boundary signs just downstream of Gold Pan Provincial Park to the easterly border of the Skihist Ecological reserve along the Thompson River and in the 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.

Region 5:

Quesnel – From September 17 to September 26, the retention of two Pink salmon per day was permitted in the Quesnel River downstream from boundary signs at the mouth of Quesnel Canyon to the Johnston Subdivision bridge.

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

There were no ESSR opportunities directed on Fraser River Pink in 2021.

6 SOUTHERN BC COHO

6.1 OBJECTIVES AND OVERVIEW

Management of Southern BC Coho stocks is subject to Abundance Based Management provisions outlined in Chapter 5 of the Pacific Salmon Treaty, which defines allowable exploitation rates (ERs) for Canada and the US based on the status of Coho Management Units (MUs). There are three Canadian Coho MUs identified within the Southern Coho Management Plan section of Chapter 5. These are: Interior Fraser River Coho, Lower Fraser River Coho, and Strait of Georgia Coho.

Given the limited stock assessment data available for Strait of Georgia and Lower Fraser River Coho MUs, Canada's management approach is currently driven by the status of the Interior Fraser River (IFR) Coho MU. IFR Coho status determination is based on an integration of marine survival rates and spawner abundance. Under this approach, bilateral ER caps are set at 20%, 30% and 45% for Low, Moderate and Abundant status. The Canadian ER caps are 10%, 12%, and 15% for those same status levels. Canada is required to confirm the status of Interior Fraser River Coho MU to the US in March of each year and to provide estimates of the expected fishery impacts on US and Canadian MUs for the upcoming fishing season by June 30 annually.

IFR Coho have been in a low productivity regime since the mid 1990s and were assessed to be within the Low status level in 2021, which limited the Canadian ER on IFR Coho to 10%. However, given the ongoing low productivity of this MU, Canada has opted to manage domestic fisheries to achieve an exploitation rate cap of 3% to 5% for this MU in recent years.

While Chapter 5 includes three Canadian MUs under the provisions of the PST, domestically, Southern BC Coho management includes two additional MUs: Johnstone Strait and West Coast Vancouver Island (WCVI). For completeness in reporting and understanding of Canadian Coho fisheries management and stock status, details for these additional MUs are contained within this report.

6.2 STOCK STATUS

6.2.1 STOCK STATUS - INTERIOR FRASER RIVER

The preliminary 2021 escapement estimate for Interior Fraser River Coho is not yet available but will be provided in the final report.

6.2.2 STOCK STATUS – LOWER FRASER RIVER

Canada will be applying the IFR Coho status determination method, which is based on an integration of marine survival rates and spawner abundance, to the Lower Fraser MU as well. Currently there is no whole system escapement estimate available for Lower Fraser River Coho. A pilot mark-recapture program was initiated in 2020 to provide an escapement estimate for this system, funded in part by the PST. If successful, this program will provide annual escapement estimates for LFR Coho in the near future, although published estimates are not expected in the pilot years. Further details of the LFR Coho escapement program can be obtained through the PST Coho Technical Committee.

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 produces data for survival information. Survival estimates for coded-wire-tag marked LFR Coho from the 2018 brood year for fish that return in 2021 are not available yet, but will be provided in the final report.

6.2.3 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 in the 1 to 4% range. 2021 Coho escapement estimates were average to above average in East Coast Vancouver Island systems while forecasts based on recent returns and ocean conditions throughout the Strait of Georgia were conservative in some systems.

Hatchery stocks

Coho returns to most hatcheries north of Nanaimo were above average in 2021. Escapement to the Puntledge River was above the 12-year average at 8,025. The Big Qualicum River had fewer adults than in 2020 but was still above average with 13,802 fish compared to the 12-year average of 12,010. Swim surveys of the Little Qualicum River indicated abundance for this system was modest with a peak count of 2,150 fish compared to the recent 4 year average of 1,950. Nanaimo River returns were difficult to enumerate due to challenging flow conditions. Snorkel based counts will be expanded using AUC methodology post-season.

Wild stocks

Area Under the Curve (AUC) expanded counts on the Englishman River have averaged 4,705 in the last 4 years. The 2021 peak count was 455 adults on October 4 with high flows hampering later surveys. Counts in the Colquitz River (near Victoria) up to October 11 were 11 adults compared to the 12-year average of 490 fish. Gates were opened due to predation issues at the trap box so counts are considered incomplete. Returns to Craigflower Creek were above the 4-year average of 330 with 359, and Shawnigan Creek saw a record return of 7,317 which was well above the 12-year average of 1,760.

New Coho escapement and survival indicators are currently under development in several systems with PST funding. A camera and PIT tag system operated at the Sakinaw Lake fence for the first time in 2019 producing a count of 270 jacks and 570 adults. 2021 returns were similar with 234 jacks and 560 adults returning to the lake through November 10. A summary of PIT tag detections and survival estimates will be provided at the end of the season.

A camera has been operated in the Skutz Falls fishway at Cowichan River since 2019 in conjunction with a PIT tag antenna system. Skutz fishway counts were 4,240 adults and 232 jacks, while 100 PIT tagged adults returned across the lower river array. As with previous years, the PIT tag program was used to expand fishway counts for a preliminary population estimate of 28,000 Coho in 2021.The smolt to adult return rate for fish tagged in the upper river in spring 2020 is currently 6.7% compared to 4.6% for the 2019 cohort. Similar methodology produced an escapement estimate of 17,700 adults in 2020 suggesting improved returns which is consistent with the higher survival estimate and record returns to the neighboring Shawnigan Creek watershed.

Black Creek is the primary wild stock indicator in the Strait of Georgia. The preliminary return of 2,605 adults is an improvement over the 1,991 in 2020. Jack abundance was moderate at 1,759 and similar to last season’s

estimate of 1,743. The parental brood year (2018) estimate was 2702 adults, and 1873 jacks. The smolt production contributing to 2021 return was 83,190. This is nearly double the smolt output in 2019, and well above the long term average of 52,392 smolts.

6.2.4 STOCK STATUS - WEST COAST VANCOUVER ISLAND

Until recently, spawning abundances for wild WCVI Coho populations have been near historic levels. However, it appears that productivity of wild WCVI Coho has likely fallen from historic highs given observed decreases in spawning abundances despite reductions in harvest of these stocks. There were some modest improvements in returns in 2020. In addition, there have been decreases in hatchery production. Continuing low marine survival of Robertson Creek Hatchery (RCH) (4-5%) and Carnation Creek wild Coho (~1%) indicators led to a low 2021 pre-season expectation for WCVI Coho stocks. With a low categorical return, marine survival forecasted in the second quartile (25-50%) of survival data from brood years 1996-2017 for RCH and Carnation Creek Coho.

Under the expected 'Low' categorical return inshore recreational Coho fisheries were managed to a daily limit of 1 wild (unmarked) per day. Outside the surfline on the WCVI, the recreational fishery for Coho was hatchery mark only during the migration period of Interior Fraser Coho. There have been some years when wild retention was allowed in September and October.

The marine survival forecast for 2021 was 5.5% for RCH and 1.3% for Carnation Creek. Preliminary 2021 escapement counts, including at Carnation Creek, are higher than recent-year averages in most WCVI systems. Final escapement estimates are not yet available.

6.2.5 STOCK STATUS - JOHNSTONE STRAIT AND MAINLAND INLETS

The Keogh River plays an important role as the wild Coho indicator stock for the upper Johnstone Strait area. Historically, the Keogh River adult Coho Salmon return has averaged 2,700 (range: 230 to 9,465), while the juvenile abundance has averaged 62,213 (range 26,940 to 129231). Following a peak in adult abundance in 2014 (9,465), annual escapement decreased to reach its lowest level in 2016 (230). Returns have increased each year, and the final estimate of adult Keogh River Coho Salmon in 2020 was 2,593 fish. . The number of migrant Coho smolts in 2021 (129,231), is the highest smolt count since the project started in 1977, suggesting continuation of high freshwater productivity that first began in 2011. 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 per spawner, brood years 1998 to 2015). We expect escapement in 2021 to be approximately average, despite extremely poor adult abundance on the Keogh in recent years.

Quinsam River Hatchery is the Coho marine survival indicator for Area 13. The hatchery program for 2021 is almost complete. So far, preliminary counts of 6,739 adults enumerated at the hatchery and through the counting fence, indicate the Quinsam Coho return will be well above the 4-year average (5,443). The current jack tally is at 2,965. Coho counts may be conservative this year, as the fence has been open almost continuously since the third week of October due to high river flows. In-river recreational catch has also not yet been included. In 2020, Village Bay Creek on Quadra Island continued with video monitoring of returning Coho. A total of 650 adults have been counted through the fence, with a small portion of jacks contributing to

that number. The escapement in 2021 continues the trend of improving abundance for this system. The 2021 return was higher than expected, exceeding the 4-year average and is similar to the 12-year escapement average.

Heydon Bay Creek in Loughborough Inlet is in the process of being developed into a mainland inlet Coho indicator system. In 2021, a total of 304 Coho (172 adults and 132 jacks) were counted through the fence, which is an improvement over 2020 (142 adults and 132 jacks) but still well below the historical average of 839 (adults and jacks combined) from 1998-2003, and 2009-2012 when the fence was previously operational.

Extensive escapement reports for Coho in many systems are indicating large variation in escapements for 2021. As anticipated, Coho marine survivals continue to be low with some improvement evident in the consistently monitored populations. Similar conditions are expected through 2022; consequently, a continued trend of low escapement is anticipated next year.

6.3 First Nations Domestic and FSC Fisheries

WCVI FSC and Treaty Fisheries

First Nations Coho catch reports are preliminary at this time. Estimates based on catch reports from Maa-nulth Treaty harvest and WCVI Nuu-chah-nulth FSC harvest can be found in Appendix 4.

Lower Fraser FSC Fisheries

There were no Coho-directed fisheries in the Lower Fraser in 2021. Hatchery-marked Coho were authorized to be retained in FSC fisheries. There was hatchery marked Coho retention on the Sumas and Chilliwack River systems using selective gear from September 15 to late October. The total hatchery-marked and wild Coho harvested and released during Chinook, Pink and Chum FSC fisheries can be found in Appendix 5.

Interior Fraser FSC Fisheries

Most FSC fisheries in the area target Sockeye, Chinook or Pink salmon. In 2021, First Nations harvesters were requested to release unharmed any incidentally caught Coho.

Directed opportunities on Coho are permitted in terminal areas subject to abundance. In 2021, small fisheries occurred at Dunn Creek, Bonaparte River, Deadman River, Louis Creek, Lion Creek, Coldwater River, Lemieux Creek and McKinley Creek. The total Coho catch (either directed or bycatch) in First Nations fisheries can be found in Appendix 5.

Strait of Georgia FSC Fisheries and Treaty Domestic Fisheries

Coho Salmon FSC fisheries of very limited effort occurred in the Strait of Georgia from late July to early October using primarily hook and line in 2021. Coho salmon were harvested terminally in the Puntledge and Qualicum Rivers using hatchery brailing and hand-picking/sorting methods. Estimates based on catch reports from Tla'amin Treaty harvest and non-treaty First Nations harvest can be found in Appendix 4.

Johnstone Strait FSC Fisheries

Very low numbers of Coho salmon were harvested in Johnstone Strait by hook and line and net gear in 2021. Terminal harvests also took place in the Campbell River. Estimates for the Johnstone Strait are found in Appendix 4.

6.4 First Nations Commercial Harvest

WCVI Economic Opportunity Fisheries

In 2021, Economic Opportunity agreements were in place with Hupacasath and Tseshaht First Nations however, abundance did not permit an EO opportunity.

Five Nations Communal Sale Fishery

In 2021, communal sale fishery opportunities for the Five 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) included southern BC Coho. These opportunities are categorized as: offshore integrated hook-and-line communal sale fisheries; nearshore integrated hook-and-line communal sale fisheries; and terminal communal sale fisheries. Hatchery-marked Coho were permitted for sale as bycatch in Chinook and groundfish directed fisheries. After September 15, a Coho directed fishery was authorized with a TAC of 2,000 Coho, for both hatchery-marked and unmarked Coho to be retained for sale. Additionally, hatchery-marked and unmarked Coho were permitted for sale in the Nearshore hook and line fishery targeting Conuma Chinook and the terminal fishery targeting Burman and Gold River Chinook. The nearshore Coho allocation in Area 25 was 2,000 including both hatchery-marked and unmarked Coho. Total Coho catch in these fisheries can be found in Appendix 4.

Lower Fraser First Nations Commercial Fisheries

There were no directed Coho fisheries authorized in the Lower Fraser in 2021.

Interior Fraser First Nations Commercial Fisheries

There were no EO or demonstration fisheries in the BC Interior (Fraser River above Sawmill Creek) targeting Coho in 2021.

6.5 Commercial Fisheries

Southern BC commercial fisheries are regulated so that impacts on Coho, in particular Interior Fraser River Coho stocks, are minimized. Retention of Coho bycatch was not permitted in most of these fisheries, including the Fraser River. Some limited opportunities for Coho retention occurred in terminal fisheries targeting Chinook and Sockeye in areas where IFR Coho were not present.

WCVI Offshore Area Commercial Coho Fisheries

Coho retention was not permitted in the 2021 Area G WCVI AABM Chinook troll fishery.

WCVI Terminal Area Commercial Coho Fisheries

In 2021, Chinook-targeted commercial gill net and seine fisheries occurred in Area 23 (Alberni Inlet). Retention of Coho was not permitted.

A Chinook targeted fishery in Area 25 (Tlupana Inlet) and Chum targeted fisheries in Area 25 and 26 also occurred. Coho retention was not permitted in these fisheries in 2021. The total WCVI Coho bycatch in commercial terminal fisheries can be found in Appendix 4.

6.6 RECREATIONAL FISHERIES

6.6.1 TIDAL RECREATIONAL FISHERIES

Tidal recreational fisheries can be categorized as occurring in either mixed-stock areas, where multiple stocks are found concurrently, or 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 River Coho stocks. In terminal areas, opportunities may be permitted based on expectations of wild abundance and production from local Coho enhancement programs. Table 6-1 below outlines the mixed-stock fishing areas in Southern BC and the general Coho regulations pertaining to them.

Table 6-1 General Southern BC Coho Fishery Regulations for mixed-stock areas in 2021

Mixed stock fishing area	Daily limit (marked or unmarked)	Minimum size limit (cm)	Coho Season
Johnstone Strait	2, 1 may be unmarked	30	June 1 – July 31
Johnstone Strait	2 marked	30	Aug – Dec 31
Strait of Georgia - north	2 marked	30	June 1 – Dec 31
Strait of Georgia - south	2 marked	30	June 1 – Dec 31
Strait of Georgia (19)	2, 1 may be unmarked	30	Oct 1 – Dec 31
Juan de Fuca Strait	2 marked	30	June 1 – Dec 31
Juan de Fuca Strait (20-5 to 20-7)	4, 1 may be unmarked	30	Oct 1 – Dec 31
WCVI – Inshore	2, 1 may be unmarked	30	June 1 – Dec 31
WCVI- Offshore	2 marked	30	June 1 – Dec 31

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

**some terminal portions of Areas 23 and 25 had higher daily limits of hatchery Coho (4) from August 1 – Dec 31 (portions of Area 23) and from July 15 – Dec 31 (portions of Area 25).

In 2021 the Department allowed retention of some unmarked Coho in Area 13, 14 and 15 (excluding Subarea 15-1) from September 14 to September 30 in order to gather samples to better understand the status information of Georgia Basin Coho.

Catch and release information for Coho from these fishing areas can be found in Appendix 4.

WCVI – Inshore Recreational Fisheries

In 2021, hatchery-marked Coho retention was limited to 2 per day (with unmarked retention remaining 1 per day) in Areas 23 to 27. Some terminal areas in portions of Area 23 (23-1 to 23-3) and 25 (25-4 to 25-5) had daily limits of 4 per day, with unmarked retention remaining at 1 to target hatchery stocks.

Fraser River – Tidal Water Recreational Fisheries

In the tidal waters of the Fraser River downstream of the CPR Bridge at Mission, BC, from November 15 to December 31, the retention of two hatchery-marked Coho per day was permitted.

The recreational fishery in this area was assessed from September 3 to September 18 and from November 20 to November 30, 2021. Catch estimates can be found in Appendix 5.

6.6.2 NON-TIDAL RECREATIONAL FISHERIES

Vancouver Island Tributary Recreational Fisheries

Fresh water conditions continued to remain favourable in 2021 compared to past years and no additional restrictions were in effect on Vancouver Island due to drought-like conditions.

Northern Vancouver Island Tributary Recreational Fisheries

Typical non-tidal openings for Coho were available on:

- Campbell/Quinsam River from October 1 to December 31 for four hatchery-marked only per day, only two of which could be marked over 40 cm;
- Cayeghle River (including the Colonial River) from April 1 to March 31 for one per day;
- 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 freshwater fisheries.

Strait of Georgia Tributary Recreational Fisheries

In 2021 Coho openings were provided on:

- Cowichan River from November 1 to December 31 for one Coho per day, minimum size limit of 25 cm;
- Nanaimo River from November 1 to December 31 for 2 hatchery-marked only Coho per day, minimum size limit of 25 cm;
- Puntledge River from October 1 to November 30 for 1 hatchery-marked only Coho per day, minimum size limit of 25 cm; and

- Chemainus River from October 15 to March 31 for one per day, maximum size limit of 35 cm.
- Qualicum River from September 15 to December 31 for four hatchery-marked only per day, only two of which could be marked over 40 cm.

Catch is not estimated in these freshwater fisheries.

WCVI Tributary Recreational Fisheries

Typical non-tidal openings for Coho were available on:

- Somass/Stamp River from August 25 to December 31 the daily limit was two, hatchery-marked or unmarked. A single, barbless hook restriction is in effect all year and there was a bait restriction in the Upper Somass and Stamp rivers from May 1 to October 31.
- Nitinat River from October 15 to December 31 the daily limit for Coho was two, hatchery-marked or unmarked. A two-week closure occurred between October 1 and October 14 to protect Chinook Salmon during their peak spawning period. The area above Parker Creek is closed to fishing. A single barbless hook restriction and bait restriction is in effect all year.
- Conuma River from August 25 to December 31with a daily limit of two Coho, hatchery-marked or unmarked.
- Washlawlis River and Waukwass River and other west coast rivers are open year-round with a daily limit of one Coho, hatchery-marked or unmarked. Barbless hooks are required. No creel survey information is collected. Other rivers receiving some directed catch and release 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 freshwater fisheries.

Fraser River and Tributaries – Non-tidal Recreational Fisheries

Region 2: The retention of two hatchery-marked Coho per day was permitted following Interior Fraser wild Coho and Interior Fraser Steelhead window closure dates and once the majority of Fraser Chum migration completed in the following area:

- From the CPR Bridge at Mission, BC upstream to the Highway #1 Bridge at Hope - November 15 to December 31.

In 2021, this lower Fraser River recreational fishery in Region 2 was assessed from September 11 through September 21. Catch estimates can be found in Appendix 5.

There are no directed Coho openings in the Fraser River or tributaries upstream of the Highway #1 Bridge at Hope, BC. This includes all of Regions 3, 5, 7 and 8.

The following tributaries to the Fraser River in Region 2 were open during the dates stated below:

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

In 2021, the Chilliwack/Vedder recreational fishery was assessed from September 1 to November 30 and the Nicomen/Norrish fishery was assessed from October 1 to December 15. Catch estimates can be found in Appendix 5. No assessments were conducted on the recreational fisheries occurring on the remaining rivers listed above.

During 2021, 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 hatchery-marked Coho per day from September 1 to December 31.
- These recreational fisheries were not assessed in 2021.

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

WCVI ESSR Fisheries

The Somass First Nations were issued an ESSR licence at the Robertson Creek Hatchery in 2021 that included Coho salmon.

The Ditidaht First Nation was issued an ESSR Licence for Nitinat hatchery Coho.

All ESSR harvest information can be found in Appendix 7.

Lower Fraser ESSR Fisheries

In 2021, there were ESSR fisheries at the Capilano, Chilliwack and Inch Creek hatcheries; harvest of Coho Salmon was permitted. All ESSR harvest information can be found in Appendix 7.

Strait of Georgia ESSR Fisheries

A Coho Salmon ESSR fishery for Qualicum First Nation took place at Big Qualicum Hatchery in 2021.

For 2021, there were no ESSR opportunities on hatchery-marked Coho in Nanaimo River.

All ESSR harvest information can be found in Appendix 7.

Johnstone Strait ESSR Fisheries

For 2021, there were no ESSR opportunities on Coho in Johnstone Strait.

7 SOUTHERN BC CHUM

7.1 JOHNSTONE STRAIT CHUM SALMON

7.1.1 OBJECTIVES AND OVERVIEW

The Johnstone Strait Chum Salmon fishery targets Southern BC Chum that spawn primarily in the Fraser River and in tributaries of Johnstone Strait and the Strait of Georgia. This fishery also intercepts a small proportion of Puget Sound Chum. Since 2002, the Johnstone Strait Chum fishery has been managed using a 20% fixed ER strategy. This approach has provided predictable harvest opportunities for the commercial sector and has increased the probability of meeting escapement goals across the many populations contributing to this fishery. Of the 20% ER, 15% is allocated to 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.

On July 11th 2019, the Government of Canada and the Province of British Columbia announced a joint Steelhead Action Plan identifying new conservation measures for Thompson and Chilcotin Steelhead Trout (two population components of the Interior Fraser River (IFR) Steelhead aggregate). Based on our current understanding, there is considerable overlap in the timing and location of the return migration of IFR Steelhead and several South Coast salmon fisheries. The timing of this stock of concern is particularly overlapped with that of Fraser River Chum. Given the potential for salmon fisheries to incidentally harvest co-migrating IFR Steelhead, the Department of Fisheries and Oceans implemented a series of window closures for fisheries occurring in times and areas that overlap with the IFR Steelhead migration, in both marine and freshwater fishing areas.

The announcement of these closures precipitated significant changes to the 20% fixed ER strategy for the Johnstone Strait Chum fishery. In 2021, the pre-season commercial fishing plan was modified to maintain opportunity in Johnstone Strait, while ensuring that fishing did not occur within the outlined IFR Steelhead closure times and areas. With the window closures reducing access to the earlier timed components of the Inside Southern Chum (ISC) run, fisheries were planned at a reduced ER (below the typical 20% ER).

In 2021, the Minister announced the Pacific Salmon Strategy Initiative (PSSI), which included immediate conservation measures that resulted in commercial salmon fishery closures for the 2021 season to protect stocks of conservation concern. As a result of these closures, the Area D gill net Johnstone Strait mixed stock Chum fishery was closed for the 2021 season.

As outlined in Chapter 6 of the PST, 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. In 2021, abundance estimates did not exceed 1 million Chum salmon and commercial fisheries did not proceed.

7.1.2 STOCK STATUS

Johnstone Strait In-season Assessment

In 2021, the main components of the Inside Southern Chum (ISC) return assessed by the Johnstone Strait test fishery were expected to be both Fraser and non-Fraser stocks. These stocks are typically dominated by four-year-old fish, and the abundance of the 2017 brood return that out-migrated in 2018 was below average. Expectations for 2021 were below average for Inner South Coast Chum. These expectations were based on a below average 2017 return, recent Chum declines seen in 2017-2020 and indications of poor marine conditions during the 2017-2019 outmigration (2016-2018 brood years). It was also expected that Age 4_1 Chum would dominate the 2021 return.

The Johnstone Strait test fishery, which ran from September 21st through October 27th, provided timing and abundance information for the 2021 return, which is important in assessing the performance of the 20% fixed ER 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). From the onset of the program, the Chum CPUE in the test fishery was tracking much lower than the 2017 brood year and only slightly better than the very low return in 2019. On October 8th it was determined that the ISC index of abundance was likely below the 1.0 million critical level (Figure 11-1) and any planned Johnstone Strait commercial mixed stock fisheries were suspended. The Chum CPUE from the test fishery continued to be monitored but there was little improvement to the ISC return. The 2021 preliminary ISC Chum abundance data demonstrates a continued trend of reduced Chum productivity since the 2016 return year. The age composition derived from the test fishery samples exhibited a much lower than average contribution of 4-year-olds throughout the season along with a general reduction in fish size.

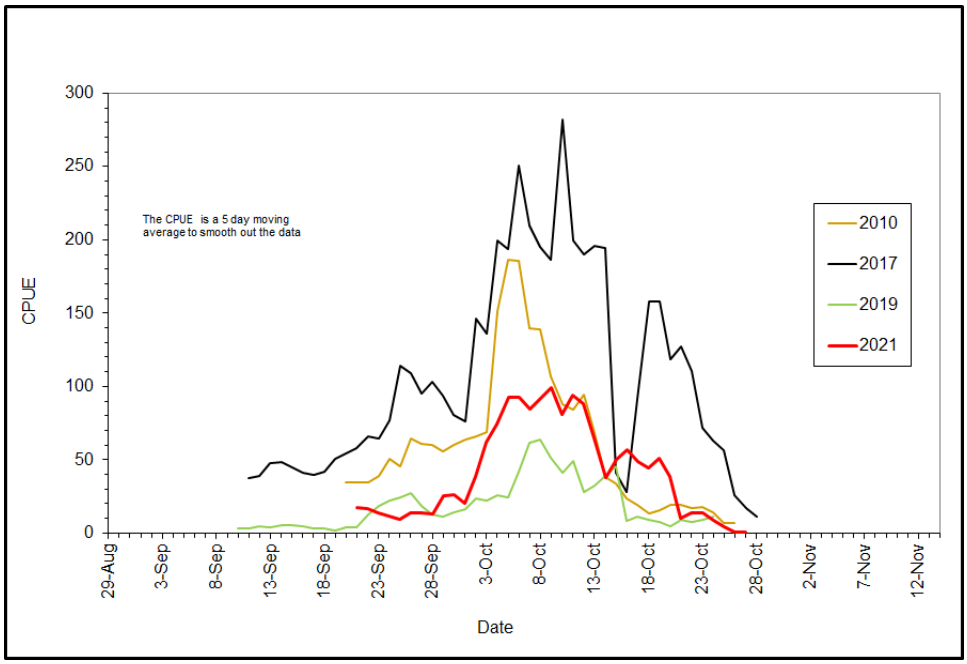


Figure 11-7-1 2021 Johnstone Strait Chum Test Fishery CPUE compared to 2017 (dominant brood year), 2010 and 2019(two of the lowest returns in recent years).

Terminal returns

Although escapement monitoring is limited, Summer Chum preliminary escapement were well below average.

Escapements to ISC aggregate populations (Johnstone Strait, Strait of Georgia and Fraser combined) are still being collected at the time of this report. Preliminary information suggest that most systems were below average, and many populations were well below their respective escapement goals throughout the ISC area. ISC productivity has declined over the last 5 years.

7.1.3 FIRST NATIONS DOMESTIC AND FSC FISHERIES

Johnstone Strait First Nations fisheries for Chum Salmon were not subject to IFR Steelhead restrictions in 2021. Chum Salmon harvests took place using gill nets and seine nets in Johnstone Strait in 2021.The total Chum Salmon catch in the Johnstone Strait FSC fishery can be found in Appendix 4.

7.1.4 FIRST NATIONS COMMERCIAL HARVEST

There was no First Nations commercial harvest of Johnstone Strait Chum in 2021.

7.1.5 COMMERCIAL FISHERIES

Commercial Chum fisheries in 2021 were planned as per the PST, however a modified approach was taken to maintain opportunity in Johnstone Strait while aligning with the intent of the Interior Fraser Steelhead rolling window closure. Fisheries are usually scheduled to achieve a 20% fixed ER on ISC stocks passing through Johnstone Strait with 15% ER for commercial and 5% ER for test, FSC, recreational and a commercial buffer. Shares of the 15% commercial ER are usually shared among the Area B seine (11.56%), Area D gill net (2.54%) and Area H troll fleets (0.90%). In 2021, Area D participation in the Johnstone Strait commercial fishery was closed under the Pacific Salmon Strategy Initiative. With the Steelhead window closure reducing access to a portion of the ISC and the closure of the Area D fishery, the 2021 fisheries were planned pre-season to a reduced commercial ER of 6.68%, shared between the Area B seine (5.78%), Area D gill net (0.00%) and Area H troll (0.90%) fleets.

Johnstone Strait mixed stock commercial Chum fisheries did not proceed in 2021 as a result of the 1 million critical threshold not being met.

Area B Seine Fisheries

In 2021 the pre-season plan for seines was to have one 10-hour opening, followed by one 3-hour opening for Chum Salmon in portions of Areas 12 and 13. The openings were scheduled to occur October 21st and 22nd.

Area D Gill Net Fisheries

In 2021, the Area D gill net fishery in Johnstone Strait was closed pre-season under the Pacific Salmon Strategy Initiative.

Area H Troll Fisheries

In 2021 the pre-season plan for Area H troll Individual Transferrable Effort (ITE) demonstration fishery was to proceed with one fishing period from October 12 to October 31. The fishery would be closed during the first

day of the Area B Seine fishery on October 22. Each licence was allocated five boat days during fishing period, which could be transferred between licences and fished at any time within the fishing period.

7.1.6 RECREATIONAL FISHERIES

7.1.6.1 TIDAL RECREATIONAL FISHERIES

The tidal recreational daily limits for Chum are four (4) with a possession limit of eight (8) salmon. Chum opportunities are typically opened at full limits in the Johnstone Strait area, but may be reduced if Chum returns are low which did occur in 2021 and Chum was closed to retention effective October 27. Peak participation in the recreational Chum fishery typically occurs over the Thanksgiving weekend in mid-October and activity is usually driven by abundance. The Strait of Georgia creel survey for Areas 13 and 14 was conducted from July to October. Recreational catches were reported as very low, as Chum abundance in the marine area was below average in 2021. The majority of the recreational Chum Salmon fishing effort occurs in Area 13, which is included in the Strait of Georgia catch estimate.

7.1.6.2 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 be very minimal.

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

There were no ESSR opportunities for Johnstone Strait Chum in 2021.

7.2 FRASER RIVER CHUM

7.2.1 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 populations 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 six years; escapement to spawning grounds in 2009, 2010, and 2017 through 2020 did not meet the escapement goal.

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 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.

In 2021, the Department continued with management measures to reduce the incidental impacts of Chum fisheries on co-migrating IFR Steelhead (including Thomson and Chilcotin River populations). Measures that were implemented in 2021 were the same as those introduced in 2019, with additional restrictions for set gillnet fisheries in the Fraser River introduced in 2020. Moving window closures 42 days in duration were put in place for commercial gillnet and seine salmon fisheries located along the migratory route of IFR Steelhead, including Southern BC marine waters and the Fraser River downstream of Thompson and Chilcotin River Steelhead spawning areas. This 42-day rolling window closure also applied to recreational salmon fisheries within the Fraser River (including areas immediately off the Fraser River mouth). Commercial troll fisheries in the marine area and First Nations' FSC salmon fisheries occurring within the Fraser River downstream of Thompson and Chilcotin River Steelhead spawning areas were subjected to a 27-day moving window closure. As of 2020, following the closure window, set gillnet gear was further restricted to operate during daylight hours only, while attended by a harvester.

7.2.2 STOCK STATUS

The number of adult Chum Salmon arriving at the mouth of the Fraser River each fall (terminal return) is estimated in-season with a Bayesian model based on Albion test fishery 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 9, the Chum net fished every day and then every other day from November 11 until November 23. Total Chum catch for the Albion test fishery can be found in Appendix 2.

DFO provided an in-season terminal return estimate on October 15 of 519,000 Chum Salmon. The estimated 50% migration date of the run was October 20.

A subsequent estimate of Fraser River Chum terminal return was provided on October 22. The estimated terminal return on that date was 481,000 (80% probability that the run is between 400,000- to 577,000), with a 50% migration date through the lower river of October 17. This return is approximately half of the brood year return and the second lowest return in a decade. It was estimated the run was almost certain to not exceed the escapement goal of 800,000.Fraser River Chum Salmon return to numerous spawning locations in the Lower Fraser River and its tributaries. Spawning escapement for Fraser River Chum Salmon is currently assessed 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). However, estimates of spawning escapement in 2017 (660,000), 2018 (680,000), 2019 (300,000), and 2020 (610,000) were below the escapement goal of 800,000 Chum Salmon spawners. Chum Salmon assessments are ongoing; the preliminary escapement estimate for 2021 is not yet available.

7.2.3 FIRST NATIONS DOMESTIC AND FSC FISHERIES

First Nations Food, Social and Ceremonial (FSC) Chum-directed gill net fisheries commenced October 23 (below Port Mann Bridge), October 25 (Port Mann Bridge to Mission Bridge) and October 26 (Mission Bridge to Hope Bridge), following closures to protect co-migrating IFR Coho and IFR Steelhead. There was Chum directed FSC fisheries in the Sumas and Chilliwack Rivers using selective gear September 23 until October 25.

The total Fraser River Chum catch (either directed or bycatch) in First Nations FSC fisheries can be found in Appendix 5.

7.2.4 FIRST NATIONS COMMERCIAL HARVEST

In 2021, there were no Chum-directed EO or demonstration fisheries in the LFR due to the low estimated run size. The total Fraser River Chum catch (either directed or bycatch) in First Nations Commercial fisheries can be found in Appendix 5.

7.2.5 COMMERCIAL FISHERIES

Area B Seine Fisheries

There were no Area B fisheries in Area 29 for Sockeye or Chum salmon in 2021 and, therefore, no catch of Chum Salmon to report.

Area E Gill Net Fisheries

Commercial salmon fisheries in the Lower Fraser River (below Mission) remained closed in 2021 as part of the pre-season plan/decision, per Pacific Salmon Strategy Initiative directives.

Area H Troll Fisheries

There were no Area H fisheries in Area 29 for Sockeye or Chum salmon in 2021 and, therefore, no catch of Chum Salmon to report.

7.2.6 RECREATIONAL FISHERIES

7.2.6.1 TIDAL RECREATIONAL FISHERIES

In most southern BC tidal waters, the daily limit for Chum Salmon was four (4) in 2021.

Fraser River – Tidal Recreational Fisheries

January 1 to November 1, 2020, this area was closed to fishing for salmon (with exception of short-duration Pink salmon fishing opportunity).

November 15 to December 31, 2021, open to the retention of hatchery-marked Coho salmon only.

An assessment of the in-river tidal Fraser River recreational fishery occurred from September 3 to September 18 and from November 20 to November 30, 2021. Catch estimates can be found in Appendix 5.

7.2.6.2 NON-TIDAL RECREATIONAL FISHERIES

Although non-tidal recreational fisheries are usually authorized in the Fraser River in Region 2 between Mission and Hope BC, the impact of these mainstem fisheries on Chum Salmon is extremely small when compared to the impact of recreational fisheries occurring in the Fraser River tributaries in Region 2. Chum Salmon are not known to migrate into Regions 3, 5, 7 or 8.

Fraser River – Non-Tidal Recreational Fisheries

January 1 to November 14, 2021, area closed to fishing for salmon (with exception of short duration Pink salmon opening in September).

November 15 to December 31, the Region 2 non-tidal Fraser River from the CPR Bridge at Mission, BC to the Highway No. 1 Bridge at Hope, BC was open to retention of hatchery-marked Coho salmon only with non-retention of all other species, including Chum salmon.

An assessment of the non-tidal Fraser River recreational fishery occurred from September 11 through September 21, 2021. Catch estimates can be found in Appendix 5.

Fraser River Tributaries Recreational Fisheries

The following Fraser River tributaries were open to Chum Salmon retention during the dates noted in 2021.

- Alouette River – October 1 to December 31, daily limit of one (1) Chum Salmon.
- Chilliwack and Vedder Rivers – October 1 to December 31, daily limit of one (1) Chum Salmon.
- Harrison River – October 1 to December 31, daily limit of two (2) Chum Salmon.
- Nicomen Slough – October 1 to December 31, daily limit of two (2) Chum Salmon.
- Stave River – October 1 to December 31, daily limit of two (2) Chum Salmon.

In 2021, the Chilliwack/Vedder recreational fishery was assessed from September 1 to November 30 and the Nicomen/Norrish fishery was assessed from October 1 to December 15. Catch estimates can be found in Appendix 5. No assessments were conducted on the recreational fisheries occurring on the remaining rivers listed above.

The following systems that flow into Boundary Bay were open to Chum Salmon retention during the dates noted.

- Serpentine River – October 1 to October 31, 20201, daily limit of one (1) Chum Salmon.

This recreational fishery was not assessed in 2021.

7.2.7 EXCESS-TO-SPAWNING REQUIREMENT (ESSR) FISHERIES

There were ESSR fisheries in 2021 that harvested Chum Salmon at:

- Chilliwack Hatchery;

- Inch Creek Hatchery; and,
- Chehalis Hatchery.

All ESSR harvest information can be found in Appendix 7.

7.3 STRAIT OF GEORGIA CHUM

7.3.1 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.

7.3.2 STOCK STATUS

In 2021 escapement was forecast to be above target in Nanaimo, Cowichan and Goldstream, and below target in Puntledge, Big Qualicum and Little Qualicum (Table 7-1). However, the adjusted “Like Last Year” forecast model estimated returns to be below both the normal forecast and target escapement given poor survival in recent years. In 2021 no system on the SEVI or Mainland Inlets reached target escapement. Nanaimo River was below the escapement target of 40,000 at 25,580 Chum. This was also well below the low-range forecast of 103,700 for 2021, and the escapement of 47,556 in 2020. Cowichan River was significantly below the escapement target of 160,000 at 23,081 Chum. This was also well below the 2020 escapement of 153,570, and the low-range forecast of 191,400. Goldstream River was below the escapement target of 15,000with a peak count of 3,931 prior to AUC expansion. This is also below the 2021 low range forecast of 20,500, and 2020 escapement of 16,843. End of season surveys in many systems were compromised by the flood levels experienced on November 15th which may affect some of the final estimates.

Mid-Vancouver Island rivers, which include Puntledge, Big Qualicum and Little Qualicum with a combined escapement target of 230,000 had a low-range forecast of 105,000 for 2021. Returns to these mid-Vancouver Island systems were well below the escapement target and forecast at 33,167 Chum. Puntledge River escapement was 17,287, Big Qualicum 14,520 and Little Qualicum had 1,360.

Combined escapement estimates for Jervis/Narrows Inlet rivers were 2,236 compared to the escapement target of 85,000. By system, there were 31 Chum counted in Vancouver River, 244 in Brittain River, 114 in Skwakwa River, 419 in Deserted River and 1,428 in Tzoonie River. Counts will be subject to AUC expansions at the end of the season and should be considered preliminary at this point. The escapement total for all of the systems was substantially below the low-range forecast of 50,600 and like last year model (12,200).

Escapement in Sliammon Creek exceeded the count of 6,822 Chum in 2020 at 8,640, which included fish counted at the fence, in the spawning channel, brood stock and an estimate of fish below the fence. While

escapement was higher than 2020, the 2021 count was slightly below the target of 11,000. In Theodosia, a peak count of 1,823 Chum in 2021 was considerably lower than 19,396 in 2020 and the escapement target of 21,000. Okeover Creek peak abundance was estimated at 56 fish, which is significantly below the 4-year average (630), the escapement target (6,000) and low-range forecast of 1,300. Estimates for Lang Creek will be available in later versions of this report.

Table 7-1: Preliminary 2021 escapement of Chum in Strait of Georgia Rivers along with the low and high forecast values for 2021, the like last year model forecast for 2021, the 2020 escapement and the 2021 escapement targets.

Forecast Area	2021 Forecast		2021 Like Last Year Forecast	2020 Escapement	2021 Escapement Target	2021 Escapement
	Low	High				
Mid-Vancouver Island	105,000	157,400	23,500	62,481	230,000	33,167
• Puntledge	39,700	59,500	22,600	27,675	60,000	17,287
• Big Qualicum	41,600	62,400	3,300	11,868	85,000	14,520
• Little Qualicum	24,300	36,500	6,600	22,938	85,000	1,360
Jervis/Narrows Inlets	50,600	75,800	12,200	28,151	85,000	2,236
Nanaimo River	103,700	155,500	43,900	47,556	40,000	25,580
Cowichan River	191,400	287,000	157,300	153,570	160,000	23,081
Goldstream River	20,500	30,700	22,300	16,843	15,000	3,931
Sliammon Creek	8,300	12,500	2,300	6,822	11,000	8,640
Theodosia River	10,900	16,300	7,200	19,396	21,000	1,823
Okeover Creek	1,300	1,900	600	2,832	6,000	56
Lang Creek	5,800	8,600	3,000	2,364	2,500	TBD

7.3.3 FIRST NATIONS DOMESTIC AND FSC FISHERIES

Strait of Georgia First Nations FSC fisheries for Chum Salmon were not restricted in 2021. Effort in this fishery was extremely low in 2021. Chum Salmon catch summaries from Tla'amin Treaty and non-Treaty First Nations FSC fisheries in the Strait of Georgia can be found in Appendix 4.

7.3.4 FIRST NATIONS COMMERCIAL HARVEST

Area 14 First Nations Commercial Fisheries

No commercial demonstration fisheries occurred.

Area 17 First Nations Commercial Fisheries

Pre-season discussions with the Nanaimo First Nation occurred to identify potential triggers and develop fishing plans to harvest surplus Nanaimo River Chum. During the season communication happened on weekly basis to discuss stock status and potential fishing opportunities. In 2021 the Area 17 Demonstration did not occur as the timing benchmarks were not achieved.

Area 18 First Nations Commercial Fisheries

A weekly conference call was held with the Cowichan Fisheries Harvest Roundtable to discuss stock status and potential fishing opportunities in Area 18. The Area 18 Demonstration Fishery was triggered was not triggered in 2021 because timing and escapement benchmarks were not achieved.

Area 19 First Nations Commercial Fisheries

Pre-season meetings occurred with Saanich Tribes to discuss potential triggers and fishing plans to harvest surplus Goldstream Chum. In 2021 escapement and timing benchmarks were not achieved and no commercial fishery occurred.

7.3.5 COMMERCIAL FISHERIES

Area 14 Commercial Fisheries

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 size is assessed by escapement counts to the three major river systems and DFO hatcheries contributing to the stock aggregate.

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 depending on whether the pre-season forecast is greater than or less than 340,000 Chum. When the pre-season forecast is greater than 340,000, early Chum openings can target up to 65% of the anticipated surplus above 340,000. When pre-season forecast is less than 340,000, an early-timed limited effort gillnet fishery may be used to augment in-season escapement information and evaluate the mid-Vancouver Island (MVI) aggregate abundance. Full fleet fisheries targeting MVI stocks were not anticipated in 2021 due to the Salmon Outlook; however, the assessment fishery was planned to proceed to determine the likelihood of escapement targets being met. An Area D gill net assessment fishery was planned in the pre-season consisting of two (2) 50-hour openings. The first opening was planned to occur from October 13 to 15 and the second from October 20 to 22. Given the forecasted escapement for the MVI aggregate was well below the escapement target for the stock group, a precautionary approach was applied to the fishery to align management decisions with conservation priorities. The opening was delayed two weeks in response to low Chum abundance observed in the Johnstone Strait test fishery and low escapement to the MVI aggregate systems. Following the third week of delaying, the fishery was cancelled due to poor escapement and low likelihood of achieving escapement targets.

Area 16 Commercial Fisheries

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. Terminal fisheries may occur in these areas when the individual or combined escapement goals have

been assured, but fishing opportunities do not occur on a regular basis. There were no fisheries in Area 16 in 2021.

Area 17 Commercial Fisheries

This fishery is a terminal fishery targeting Nanaimo River stocks. The Nanaimo River Chum stocks are supplemented by the Nanaimo River hatchery. Hatchery supplementation occurs 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 and a sonar counting system (DIDSON). There were no commercial fisheries in the Nanaimo Area in 2021 because escapement and timing benchmarks were not reached.

Area 18 Commercial Fisheries

This fishery is directed at Cowichan River stocks, with some incidental harvest of Goldstream-bound Chum. Fishery openings in early to mid-November are limited to Satellite Channel, to minimize impacts on Goldstream stocks. Chemainus River stocks may also be impacted if fisheries occur 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 weekly conference call was held with the Cowichan Fisheries Roundtable to discuss stock status and potential fishing opportunities in Area 18. In 2021 there were no commercial fisheries for Cowichan River Chum.

Area 19 Commercial Fisheries

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. Bi-weekly stream walks are conducted on Goldstream River by Goldstream Hatchery staff to estimate Chum escapement. Enumeration began in the second week of October. In 2021, there were no commercial fisheries in Area 19.

7.3.6 RECREATIONAL FISHERIES

7.3.6.1 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. Most of the recreational effort directed at Chum Salmon in the Strait of Georgia occurs in the upper portions of Discovery Passage between Seymour Narrows and Chatham Point, not far from Campbell River, however in 2021 the retention of Chum was closed effective October 27 The annual Brown’s Bay Charity Chum derby was also suspended again in

2021 due to the Covid-19 pandemic but it is usually the most active Chum recreational fishery in the area. There was a creel survey during the month of October in the Strait of Georgia (Areas 13 and14).

Marine recreational 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, with effort increasing with Chum abundance. Due to below average Chum abundances observed in the marine area north of Nanaimo and average abundances south of Nanaimo, recreational effort in 2020 was minimal. Catch estimates for Chum in the marine recreational fisheries can be found in Appendix 4.

7.3.6.2 NON-TIDAL RECREATIONAL FISHERIES

Chum retention fisheries in Region 1 (Vancouver Island) on the Courtenay, Puntledge, Qualicum, Nanaimo and Cowichan Rivers on Vancouver Island did not occur in 2021 due to low returns. . 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.

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

There were no Chum ESSR fisheries in the Qualicum, Puntledge, Nanaimo, Cowichan, or Goldstream Rivers in 2021.

There were no ESSR fisheries at the Capilano hatchery in 2021 that included Chum Salmon.

ESSR fisheries took place early November 2021 at the Chehalis hatchery, Chilliwack hatchery and Inch Creek hatchery that included Chum Salmon. Chum catch for the ESSR fisheries can be found in Appendix 7.

7.4 WEST COAST VANCOUVER ISLAND CHUM

7.4.1 OBJECTIVES AND OVERVIEW

Commercial Chum Salmon fisheries normally occur in West Coast Vancouver Island (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 some years there have been limited-effort 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 managing harvest; either a constant harvest rate strategy or a surplus-to-escapement goal strategy.

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 to 20% is implemented. The maximum harvest rate is set at a precautionary level relative to stock-recruit derived optimal ER for WCVI Chum; which are in the order of 30 to 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 production 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).

Commercial fisheries for Nitinat Chum were closed in 2021 as part of the salmon fishery closures announced through the Pacific Salmon Strategy Initiative.

7.4.2 STOCK STATUS

The recent stock status of wild WCVI Chum has generally been poor relative to historic levels, with spawning abundance for wild indicator stocks frequently below Lower Fishery Reference Points (LRPs) despite the implementation of a precautionary harvest regime (fixed harvest rate). Hatchery production has declined in recent years, particularly at the Nitinat Hatchery in Area 21/22 with very low Chum returns in 2021. The ~1.5 million brood egg collection at Nitinat was well short of the 12 million egg target. Conuma Hatchery in Area 25 (Tluplana Inlet) was able to secure its egg target even though escapement was also low. . In 2021, only two of the six WCVI Chum management areas had forecasted returns above the Lower Fishery Reference Points. In these two areas Stage 2 limited effort fisheries were implemented (Esperanza, Area 25 and Kyuquot, Area 26) and reported low CPUEs. Observed preliminary returns in 2021suggest a continued low stock abundance across most of WCVI.

7.4.3 FIRST NATIONS FSC AND TREATY FISHERIES

The 2021 WCVI FSC Chum reported catch (to date) can be found in Appendix 4 which includes fish retained for food, social and ceremonial purposes from Nuu-chah-nulth First Nations and Treaty harvests from Maa-nulth Nations.

7.4.4 FIRST NATIONS COMMERCIAL HARVEST

WCVI Economic Opportunity Fisheries

In 2021, EO agreements were in place with Hupacasath and Tseshaht First Nations during the Chum season however abundance did not permit a targeted opportunity.

Five Nations Communal Sale Fishery

In 2021, the Department provided communal sale fishery opportunities for the Five 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).

Nearshore and terminal Chum fishery planning discussions occurred between the Five Nations and DFO during pre-season and in-season meetings. Implementation of nearshore Chum fisheries did not occur and no terminal harvest opportunities for Chum were identified in-season.

7.4.5 COMMERCIAL FISHERIES

Commercial fisheries on the WCVI targeted two Chum stocks in 2021: Esperanza (Area 25) and Kyuquot (Area 26).

Nitinat (Area 21/121) Commercial Fisheries

In 2021, commercial fisheries targeting Nitinat Chum were closed as part of the Pacific Salmon Strategy Initiative.

Nootka Sound (Area 25) Commercial Fisheries

Based on pre-season forecasts no fisheries were planned in Nootka Sound.

Esperanza Inlet (Area 25) Commercial Fisheries

Based on pre-season forecasts, a limited effort gill net Chum fishery opened in Esperanza Inlet on September 28, 2021. Effort was limited to a maximum of five vessels. 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 net limited effort fishery can be found in Appendix 4.

Kyuquot Sound (Area 26) Commercial Fisheries

Based on pre-season forecasts, a limited effort gill net Chum fishery opened in Kyuquot Sound on September 27, 2021. Effort was limited to a maximum of four vessels. The fishery was open for 1.5 days per week during daylight hours for 3 weeks. The total catch for the Kyuquot Sound Area D gillnet limited effort fishery can be found in Appendix 4.

7.4.6 RECREATIONAL FISHERIES

7.4.6.1 TIDAL RECREATIONAL FISHERIES

Daily limits of Chum in the WCVI recreational fishery are dependent on pre-season abundance forecasts relative to biologically based targets. In areas where the forecast was above target reference points (Area 25, Esperanza and Area 26, Kyuquot), the daily limit was four (4). In areas where the forecast was below target reference points (Area 23, Barkley, Area 24, Clayoquot and Area 25, Nootka), the daily limit was zero (0). At Nitinat (Areas 21, 22), the daily limit was two (2). Anglers are restricted to the use of barbless hooks and there is a minimum size limit of 30 cm.

7.4.7 EXCESS SALMON TO SPAWNING REQUIREMENTS (ESSR) FISHERIES

The Ditidaht First Nation was issued an ESSR Licence for Nitinat hatchery Chum.

The total Chum ESSR catch can be found in Appendix 7.

There were no other Chum ESSR fisheries on the WCVI in 2021.

8 APPENDICES

8.1 APPENDIX 1: CATCHES IN CANADIAN TREATY LIMIT FISHERIES, 2004 TO 2021

Fisheries/Stocks	Species	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
	Sockeye	4,705	11,576	16,213	16,915	41,749	86,729	60,046	42,800	36,146	30,352	55,623	50,543	48,049	33,614
	Coho	4,521	5,103	5,228	3,685	5,502	5,346	5,619	4,992	4,835	5,748	4,703	4,952	5,061	2,398
	Chinook-lg	515	389	570	-	593	2,731	4,157	3,308	3,415	4,573	2,307	1,766	2,330	7,860
Stikine River (all gears)	Chinook-jk	-	-	-	-	788	794	1,537	759	1,594	1,213	1,165	1,001	714	1,067
	Sockeye	18,569	11,793	21,500	17,948	30,209	37,624	19,747	17,872	21,163	30,209	24,012	20,211	11,057	19,445
	Coho	10,880	7,036	12,252	9,503	7,726	9,513	7,886	14,568	10,374	8,689	6,102	10,349	5,649	4,866
Taku River	Chinook-lg	341	94	10	-	246	1,021	868	2,472	738	1,909	2,333	4,658	7,031	1,184
(commercial gill net)	Chinook-jk	-	-	-	-	88	205	-	657	N/A	478	514	697	1,183	330
	Sockeye	1,512	218	653	-	644	815	1,084	1,140	508	1,786	2,110	1,716	717	-
	Coho	-	6	10	-	-	-	-	-	29	N/A	29	7	3	34
Alsek River (all gear)	Chinook	42	22	37	-	74	10	87	39	73	85	214	294	125	7
Areas 3 (1-4)* (commercial net)****	Pink	105,049	1,816	-	101,267	704,450	430,435	80,266	450,671	1,249,570	118,164	160,757	30,686	404,460	8,330
Area 1 (commercial troll)****	Pink	91,777	136,890	60,003	266	38,763	32,343	41,551	31,775	84,216	57,013	52,221	19,948	60,402	29,295
	Chinook	114,936	38,104	88,001	106,976	143,330	190,180	158,903	221,001	115,914	120,305	122,660	136,613	109,470	95,647
North Coast** (troll + sport)		76,565 + 38,802	30,096+8,008	42,801+ 45,200	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
	Chinook	260,486	80,385	67,635	76,958	103,260	93,294	113,293	178,558	108,710	130,719	206,569	137,660	125,488	143,817
West Coast Vancouver Island (troll + sport + FN)		26,692 + 172,434 + 61,360	11,350+ 56,539+ 12,676	23,195+ 35,867+ 8,573	28,840 + 45,233 + 2,885	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
	Sockeye	465	-	-	3,682,561	-	-	-	7,945,474	2,124	-	443,000	9,305,104	-	16,942
Fraser River Canadian Commercial Catch	Pink	30,508	-	-	91,337	-	-	452	-	2,855,441	-	4,751,800	-	1,442,840	-
	Sockeye	-		-	989,459	-	-	44,100	691,000	4,609	105,100	266,000	1,970,000	-	49,800
Fraser River U.S. Commercial Catch	Pink	TBC		232,904	-	105,930	-	334,700	-	3,057,222	-	2,893,400	-	2,726,230	-
West Coast Vancouver Island (commercial troll)	Coho	15,172	5	-	-	331	774	18,126	32,992	5,499	1,988	-	458	-	369
Johnstone Strait (commercial catch)***	Chum	-	149,199	-	52,139	401,957	1,333,478	492,841	318,984	597,003	391,324	751,560	62,510	510,708	298,931

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

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

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

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

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

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

8.2 APPENDIX 2: TRANSBOUNDARY CATCH TABLE

Licence Group	Fishing Area	Sockeye Kept	Sockeye Released	Coho Kept	Coho Released	Pink Kept	Pink Released	Chum Kept	Chum Released	Chinook Kept	Chinook Released
First Nations FSC and Treaty											
	Stikine	4,094	-	-	-	-	-	-	-	515	
	Taku	294	-	-	-	-	-	-	-	54	
	Alsek	1,512	-	-	-	-	-	-	-	42	
Total First Nations FSC Catch		**5,900**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**611**	**-**
Commercial											
	Stikine	611	-	4,521	-	2	-	58	-	-	-
	Taku	18,275	-	10,880	-	-	-	-	-	-	287
Total Commercial Catch		**18,886**	**-**	**15,401**	**-**	**2**	**-**	**58**	**-**	**-**	**287**
Recreational											
Total Recreational Catch		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
TOTALS		**24,786**	**-**	**15,401**	**-**	**2**	**-**	**58**	**-**	**611**	**287**

8.3 APPENDIX 3: NORTHERN BC CATCH TABLE

Licence Group	Fishing Area	Sockeye Kept	Sockeye Released	Coho Kept	Coho Released	Pink Kept	Pink Released	Chum Kept	Chum Released	Chinook Kept	Chinook Released
First Nations FSC and Treaty											
	Skeena	130,034	-	3,017	-	14,547	2,007	237	10	7,180	-
	Nass	39,284	1	1,376	40	2,301	1,633	12	11	5,410	182
	Central Coast	1,831	-	199	-	109	-	350	-	1,593	-
Total First Nations FSC Catch		**171,149**	**1**	**4,592**	**40**	**16,957**	**3,640**	**599**	**21**	**14,183**	**182**
Commercial											
Area C Gillnet	Central Coast	-	1	-	-	-	-	603	1	1,895	2
Area F Troll	Haida Gwaii AABM	4	1,387	41,337	60	12,903	7,623	4	4,009	64,470	7,821
Area F Troll	Haida Gwaii Pink/Coho	69	21	26,023	19	69,582	1,669	-	320	-	4,274
Area A Seine	Nass	-	2,678	-	707	105,049	-	9,178	1,586	-	102
Total Commercial Catch		**73**	**4,087**	**67,360**	**786**	**187,534**	**9,292**	**9,785**	**5,916**	**66,365**	**12,199**
Recreational											
	Skeena/Nass	84	461	593	164	130	922	-	-	-	431
	Central Coast	-	-	4,610	7	81	-	16	-	2,339	-
	Haida Gwaii	331	-	22,407	6,339	858	-	839	-	26,517	9,515
Total Recreational Catch		**415**	**461**	**27,610**	**6,510**	**1,069**	**922**	**855**	**-**	**28,856**	**9,946**
TOTALS		**171,637**	**4,549**	**99,562**	**7,336**	**205,560**	**13,854**	**11,239**	**5,937**	**109,404**	**22,327**

8.4 APPENDIX 4: SOUTHERN BC CATCH TABLE

Licence Group	Fishing Area	Sockeye Kept	Sockeye Released	Coho Kept	Coho Released	Pink Kept	Pink Released	Chum Kept	Chum Released	Chinook Kept	Chinook Released
First Nations FSC and Treaty											
	WCVI - Inshore ISBM	-	-	3,674	-	-	-	665		4,608	11
	WCVI - Offshore AABM	-	-	23,372	-	-	-	3		5,188	
	Strait of Georgia	-	-	2,595	-	939	-	123		261	3
	Johnstone Strait	-	-	26	-	-	-	2,922		843	
Total First Nations FSC Catch		**-**	**-**	**29,667**	**-**	**939**	**-**	**3,713**	**-**	**10,900**	**14**
First Nations Commercial											
EO	WCVI - Inshore ISBM	-	-	-	-	-	-	-	-	32,248	-
Total First Nations Commercial Catch		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**32,248**	**-**
Five Nations*											
	WCVI - Offshore AABM	64	172	1,042	1,713	-	735	-	-	11,612	508
	WCVI - Inshore ISBM	-	-	10	4	-	-	-	-	7,183	2
Total Five Nations Catch		**-**	**172**	**1,052**	**1,717**	**-**	**735**	**-**	**-**	**18,795**	**510**
Commercial											
Area B		9	13,298	52	583	-	-	-	4	9,970	76
Area D		-	145	-	400	-	1	5,787	17	21,663	45
Area E		-	-	-	-	-	-	-	-	-	-
Area G		-	261	99	15,073	357	779	421	76	25,225	1,467
Area H		-	-	-	-	-	-	-	-	-	-
Total Commercial Catch		**9**	**13,704**	**151**	**16,056**	**357**	**780**	**6,208**	**97**	**56,858**	**1,588**
Recreational											
	Johnstone Strait	-	10	3,778	2,980	3,464	2,541	-	12	8,391	11,983
	Strait of Georgia	30	660	3,451	12,448	21,105	9,577	2,081	440	41,389	161,192
	Juan de Fuca	-	574	11,298	29,566	24,895	13,460	47	24	9,331	28,351
	WCVI - Inshore ISBM	79	2,166	15,368	15,837	512	987	191	397	47,909	48,434
	WCVI - Inshore AABM	34,168	3,473	6,235	4,976	67	59	2	-	13,679	44,023
	WCVI - Offshore AABM	9	2	8,378	17,544	905	686	38	50	9,303	9,086
Total Recreational Catch		**34,286**	**6,885**	**48,508**	**83,351**	**50,948**	**27,310**	**2,359**	**923**	**130,002**	**303,069**
TOTALS		**34,295**	**20,761**	**79,378**	**101,124**	**52,244**	**28,825**	**12,280**	**1,020**	**248,803**	**305,181**

**reported as "T'aaq-whiihak" fisheries in previous Post-Season Reports.*

8.5 APPENDIX 5: FRASER RIVER CATCH TABLE

Licence Group	Fishing Area	Sockeye Kept	Sockeye Released	Coho Kept	Coho Released	Pink Kept	Pink Released	Chum Kept	Chum Released	Chinook Kept	Chinook Released
First Nations FSC and Treaty											
	Fraser	61,360	27,199	502	840	13,670	20,317	21,587	321	27,257	1,425
Total First Nations FSC Catch		**61,360**	**27,199**	**502**	**840**	**13,670**	**20,317**	**21,587**	**321**	**27,257**	**1,425**
First Nations Commercial											
	Fraser	2	810	1	394	23,753	-	-	215	1	565
Total First Nations Commercial Catch		**2**	**810**	**1**	**394**	**23,753**	**-**	**-**	**215**	**1**	**565**
Commercial											
	Fraser	-	465	-	678	30,508	-	-	100	-	81
Total Commercial Catch		**-**	**465**	**-**	**678**	**30,508**	**-**	**-**	**100**	**-**	**81**
Recreational											
	Fraser	-	5	-	-	7	65	-	-	10,734	2,798
Total Recreational Catch		**-**	**5**	**-**	**-**	**7**	**65**	**-**	**-**	**10,734**	**2,798**
TOTALS		**61,362**	**28,479**	**503**	**1,912**	**67,938**	**20,382**	**21,587**	**636**	**37,992**	**4,869**

8.6 APPENDIX 6: TEST FISHING CATCH TABLE

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	GRAND TOTAL
Albion Chinook Gillnet	18-Apr-21	20-Oct-21	160	442	0	24	0	72	0	319	0	1409	0	**2266**
Area 23 Sockeye Seine	7-Jun-21	3-Aug-21	19	7,622	15,707	0	11	0	0	0	0	0	526	**23,866**
Skeena Tyee	10-Jun-21	26-Sep-21	107	2849	32	313	6	1548	35	22	21	317	3	**5146**
Whonnock Gillnet	28-Jun-21	3-Oct-21	98	2,143	47	331	10	1,306	90	466	12	998	47	**5,450**
Round Island Sockeye Gillnet	9-Jul-21	9-Aug-21	32	126	0	15	54	109	0	5	0	9	45	**363**
Round Island Sockeye Gillnet AT 90 Mesh Net Study	9-Jul-21	7-Aug-21	30	183	0	27	111	221	0	13	0	7	62	**624**
San Juan Sockeye Gillnet	11-Jul-21	11-Aug-21	62	1,324	0	209	78	902	1	17	1	329	159	**3,020**
Cottonwood Gillnet	12-Jul-21	14-Sep-21	65	1,647	16	30	35	969	6	15	0	342	66	**3,126**
**Brownsville Bar Gillnet	14-Jul-21	16-Aug-21	34	1,988	7	0	0	21	0	0	0	216	1	**2,233**
Blinkhorn Sockeye Seine	26-Jul-21	3-Sep-21	40	3,648	13,682	1	369	2,370	146,641	0	618	0	369	**167,698**
San Juan Sockeye Seine	27-Jul-21	4-Sep-21	40	4,835	30,972	0	1,520	1,546	104,608	0	9	0	2,089	**145,579**
**Area 23 Chinook Seine	23-Aug-21	9-Sep-21	6	112	1,798	0	384	0	0	0	3	688	855	**3,840**
Albion Chum Gillnet	1-Sep-21	23-11-2021	51	77	0	230	0	229	0	2672	0	259	0	**3467**
Area 12 Chum Seine	21-Sep-21	27-Oct-21	61	0	8	0	107	20	22	15,334	0	0	1	**15,492**
Juan de Fuca Chum Seine	27-Sep-21	3-Nov-21	24	0	0	0	443	0	2	884	40	0	12	**1,381**
Qualark Gillnet														**0**
**LFFA Lower Fraser CO Assessment														**0**
* Mquqwin / Brooks Chinook Troll	N/A	N/A	N/A											**0**
* Naka Creek Sockeye Gillnet	N/A	N/A	N/A											**0**
* Area 13 Sockeye Seine	N/A	N/A	N/A											**0**
*GST Troll Coho Sampling	N/A	N/A	N/A											**0**
Grand Total				**26,996**	**62,269**	**1,180**	**3,128**	**9,313**	**251,405**	**19,747**	**704**	**4,574**	**4,235**	**383,551**

Notes

All test fish catches include assessment and non-assessment sets

* Did not operate in 2021

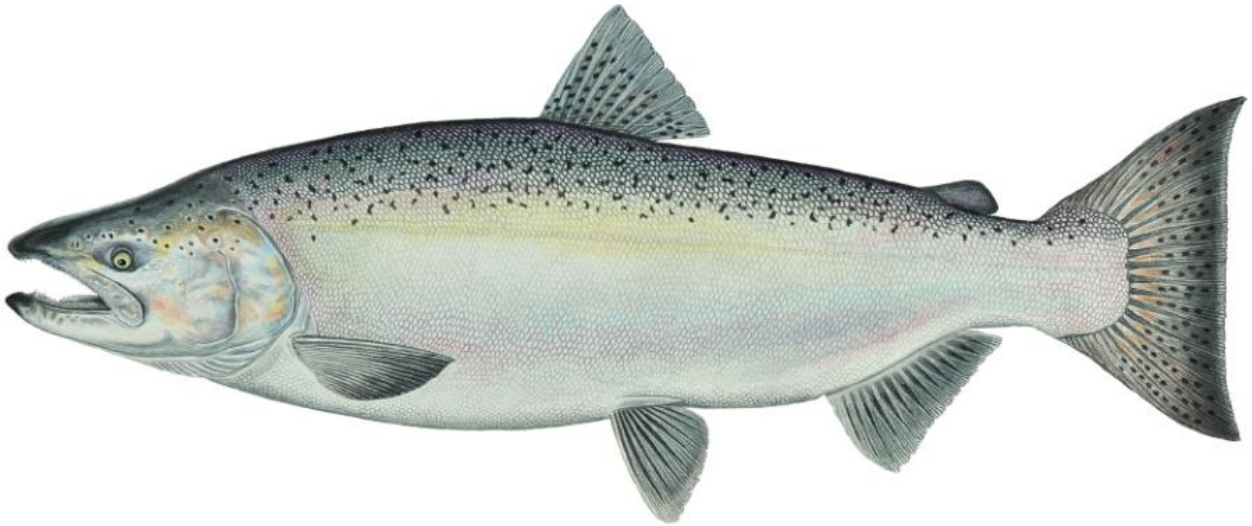
** New for 2021

Note: Jacks are included in the above test fishing catches, if encountered

8.7 APPENDIX 7: ESSR CATCH TABLE

Hatcheries	Sockeye kept	Sockeye released	Coho kept	Coho released	Pink kept	Pink released	Chum kept	Chum released	Chinook kept	Chinook released	GRAND TOTAL
Quinsam					297,233						**297,233**
Puntledge									2,225		**2,225**
Big Qualicum			7,475						7,005		**14,480**
Little Qualicum									1,338		**1,338**
Weaver Spawning Ch.	10,000	-									**10,000**
Chehalis Hatchery							-	**-**	-	-	**-**
Inch Hatchery			452	-			1,053	-	7,970	-	**9,475**
Chilliwack Hatchery			18,950	-			268	-	1,218	-	**20,436**
Capilano Hatchery			7,950	-							**7,950**
Robertson Creek			7,262						16,376		**23,638**
Nitinat			100				11,564		9,443		**21,107**
Grand Total	**10,000**	**-**	**42,189**	**-**	**297,233**	**-**	**12,885**	**-**	**45,575**	**-**	**407,882**

2021 Canadian Chinook Fishery – Post-season Review



PSC Post-season -January 2022

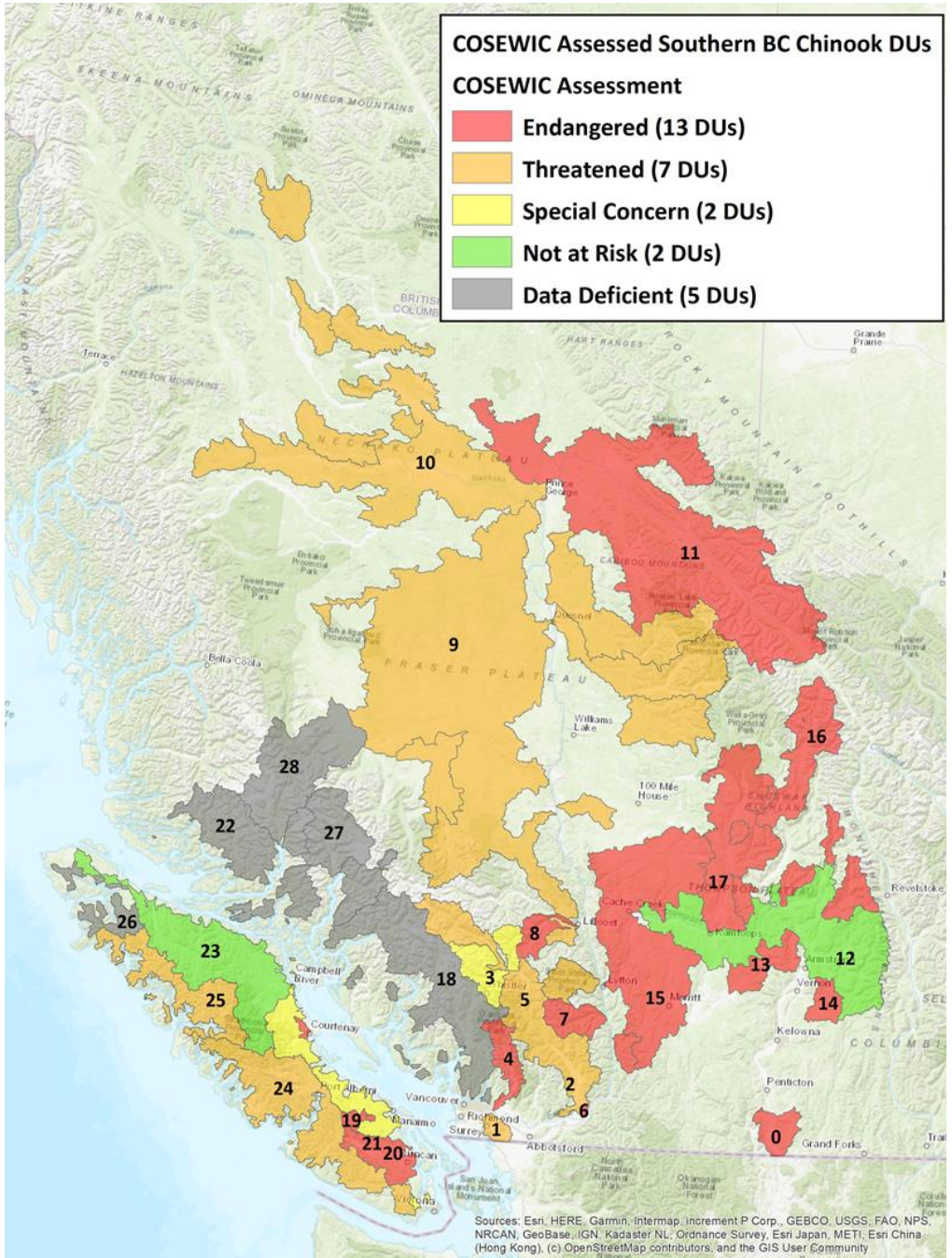
Canadian Domestic Considerations

Key drivers for management of Canadian Chinook fisheries in 2021:

- Conservation measures for Fraser stream-type Chinook; also measures for WCVI, and Skeena Chinook.
- Big Bar rockslide.
- COVID-19: travel restrictions and reductions in fishing effort in some times/areas.
- Management measures designed to support Southern Resident Killer Whales (food availability and reducing physical/acoustic disturbance).

Chinook Status Assessment

- The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessed southern BC Chinook in two batches in November 2018 and November 2020.
- 29 Southern BC Chinook Designatable Units (DUs) assessed by COSEWIC with many at risk, including 16 Fraser Chinook DUs (10 endangered; 4 threatened; 1 special concern; 1 not at risk).
- Management objective for Spring 4_2, Spring 5_2 and Summer 5_2 Chinook to manage Canadian fisheries in highly precautionary manner to allow as many fish to pass through to spawning grounds as possible.
- Restrictions for Fraser Chinook covering wide times/areas of southern BC and parts of northern BC also benefit other co-migrating Chinook; additional stock specific measures are identified in IFMPs.
- Improving returns for some wild (e.g. Cowichan) and hatchery populations



2021 Chinook Management

- Provision of priority access for First Nations FSC harvests in south coast and Fraser River.
  - South Coast FSC fisheries opportunities on mixed stocks were permitted in marine areas with the exception of the approaches to Fraser River (Subareas 29-6, 29-7, 29-9 and 29-10).
  - Very limited Fraser River FSC fisheries opportunities were permitted into July to limit impacts on at-risk Fraser Chinook, with opportunities to target healthy Summer 4_1 Chinook in August.
- Commercial troll fisheries delayed into August to avoid Fraser Chinook encounters.
  - Area F (Northern BC) – Chinook non-retention until August 12 (directed Coho fishery also closed)
  - Area G (WCVI) – Delayed start until August 1
- Recreational measures are summarized in Appendix:
  - A small number of terminal and non-Fraser Chinook retention MSF opportunities also provided;
  - Additional details to be provided by Fishery Notice and maps on DFO web-site: https://www.pac.dfo-mpo.gc.ca/fm-gp/salmon-saumon/fraser-chin-mgmt-gest-quin-eng.html .
- Area-based fishery closures and other measures designed to support Southern Resident Killer Whales in their critical habitat.

Northern BC AABM Catch Summary

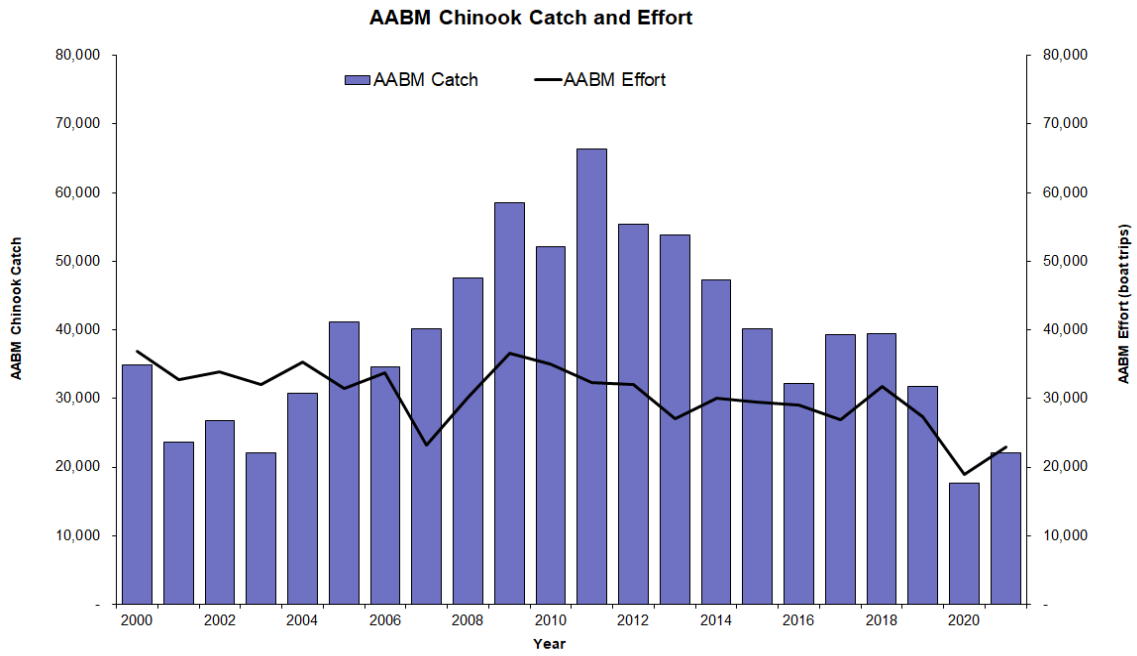
	Pre-Season	Adjusted In-season TAC	In-Season Catch
NC BC Troll AABM and Haida Gwaii Sport Abundance Index	1.27	-	-
NC BC Troll AABM and Haida Gwaii Sport Chinook TAC	153,800	Note – 30% COVID reduction in rec. forecast from pre-season; 45,100 to 31,600 Therefore, Area F TAC adjusted upwards to 122,200	
NC BC Troll AABM Chinook TAC	108,700	122,200	Actual catch: 64,470
Haida Gwaii Sport Chinook TAC	45,100	31,600	Actual catch 26,517
Total NBC AABM	**153,800**	**153,800**	**Actual catch: 90,987**

WCVI AABM Catch Summary

	Pre-Season TAC	In-Season TAC	Preliminary Catch
WCVI AABM Abundance Index	0.76	0.76	n/a
Maa-nulth Treaty	3,441	3,441	1,585*
First Nations (FSC)	5,000	5,000	3,603*
Five Nations	7,821	10,429	11,612**
AABM Recreational	35,000	30,000	22,982
Area G Troll	36,738	39,130	25,225
Total AABM Chinook	**88,000**	**88,000**	**65,007**

*First Nations FSC preliminary catch records and Maa-nulth catch being compiled.
**Includes unsanctioned catch of 879

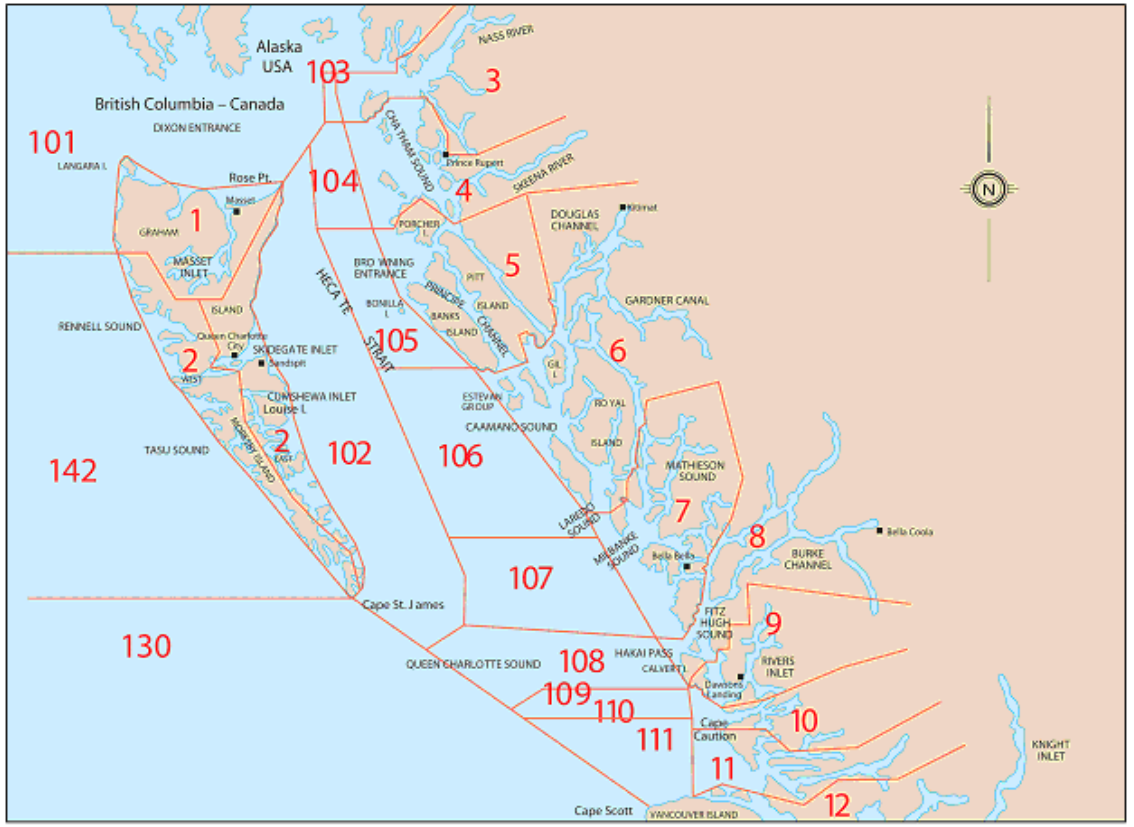
Recreational



Canada

Summary of ISBM Catch – Northern BC

Licence Group	Catch
First Nations FSC & Treaty	14,183
Commercial	1,895
Recreational	9,722
Total	**25,800**



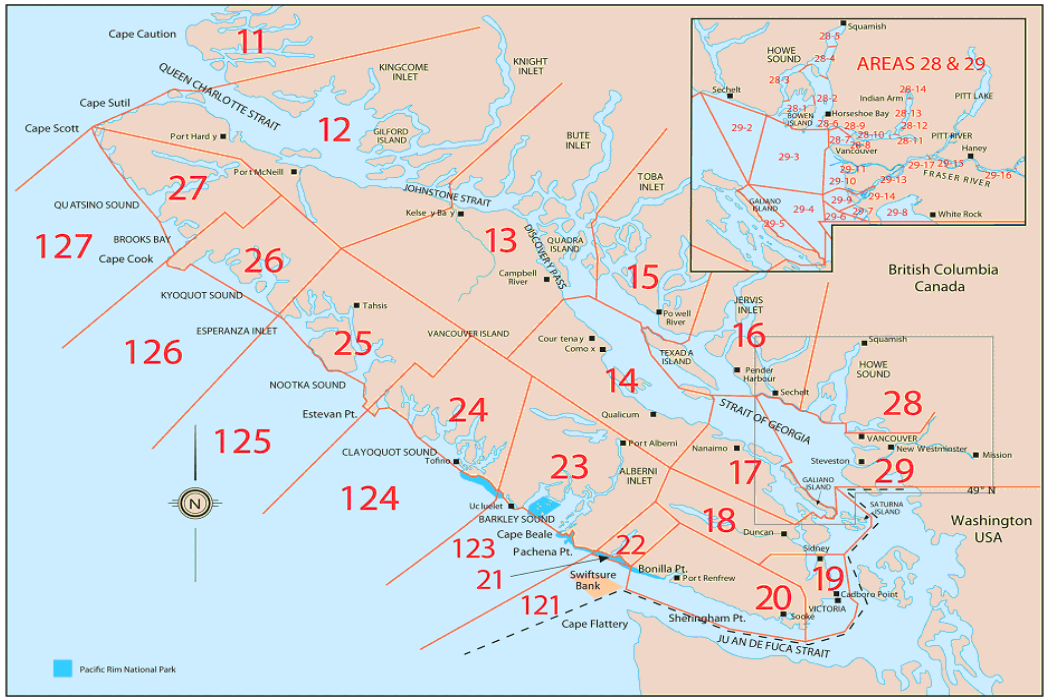
Notes:

1. First Nations: 5,410 (Nass); 7,180 (Skeena); 1,593 (Central Coast)
2. Commercial catch: 1,895 (Area 8)
3. Recreational catch: 0 (Skeena/Nass In-river); 7,383 (Area 3+4 Tidal); 2,339 (Central Coast)
4. Further details on ISBM fisheries and stock status provided in the CDN post-season report

Canada

Summary of ISBM Catch – Southern BC

Licence Group	Catch
First Nations FSC & Treaty	32,969
First Nations Commercial	32,248
Five Nations - WCVI	7,183
Commercial	31,633
Recreational	117,754
Total	**221,787**



Notes:

1. First Nations FSC: 4,608 (WCVI); 261(Strait of Georgia); 843 (Johnstone Strait); 27,257 (Fraser watershed)
2. First Nations Commercial: 32,248 (Area 23); Five Nations – WCVI: 7,183 (Area 25)
3. Commercial: 31,633 (Area 23 and 25)
4. Recreational: 8,391 (Johnstone Strait-Areas 11/12); 41,389 (Strait of Georgia-Areas 13-19); 9,331 (Juan de Fuca - portion Areas 19 and 20); 47,909 (WCVI ISBM-Areas 21-27); 10,734 Fraser watershed
5. Further details on ISBM fisheries and stock status provided in the CDN post-season report.

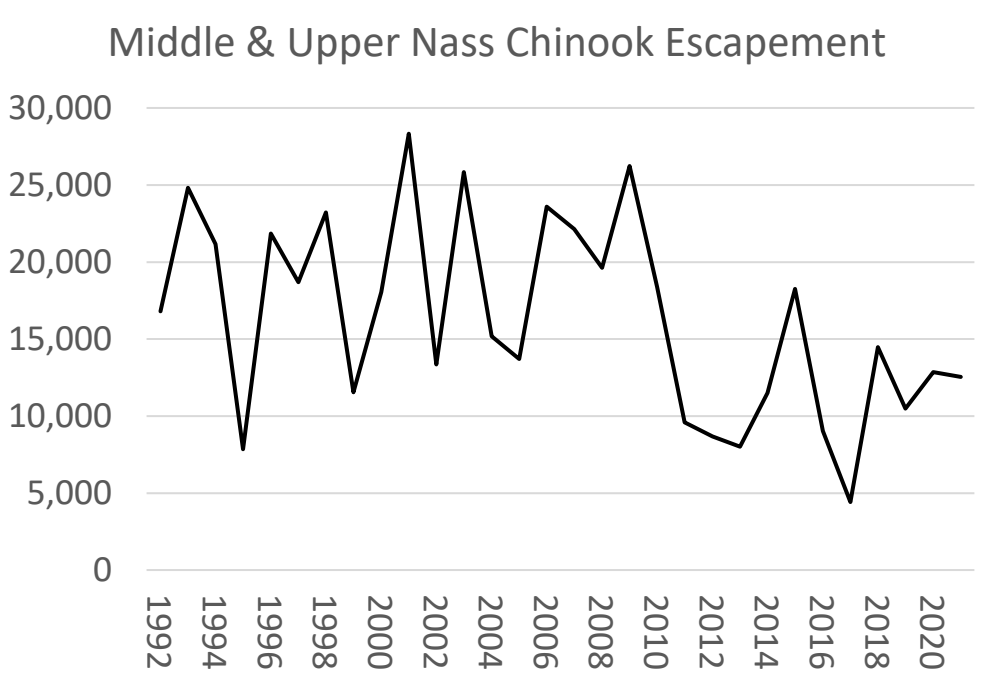
Canada

Big Bar Landslide

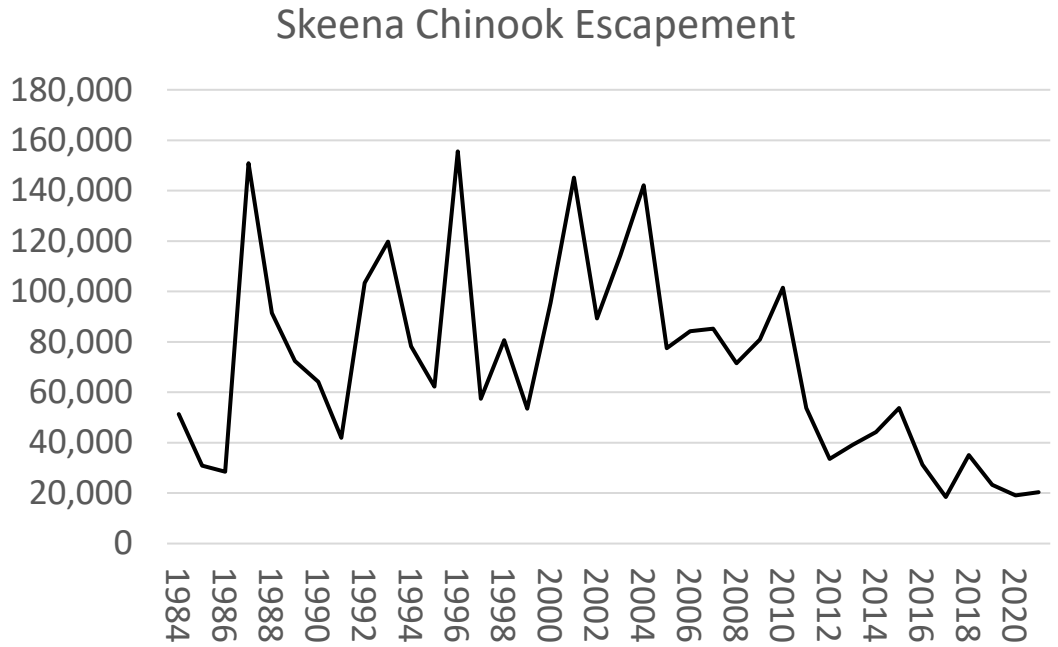
During the 2021 Fraser salmon migration, two types of monitoring methods were used above and below the Big Bar landslide site to track fish passage – hydroacoustic sonars and radio tagging.

- Most Spring 5_2 and Summer 5_2 populations (>80% based on historic abundance) typically spawn upstream of Big Bar in the Upper Fraser.
- ~360 radio-tags were applied to Chinook to assess movements through the slide
- ~500,000 eggs were taken for enhancement from Spring 5_2 DUs upstream of Big Bar.
- 2021 Fish Counts can be found at: https://www.pac.dfo-mpo.gc.ca/pacific-smon-pacifique/big-bar-landslide-eboulement/smon-count-denombrement-eng.html
- In 2021, increased threshold flow for Chinook passage at flows below 4650 m^3/s compared with approx. 3800 m^3/s in 2020 and 2400m^3/s in 2019 due to the installation of the nature-like fishway structure.
- Final Chinook spawner estimates will be available later this winter.

Nass and Skeena Chinook



Nass Upper and Middle escapement below average based on fishwheel M-R estimator and accounting for upstream harvest removals
2021 = 12,540 preliminary
1992-2021 average = 16,473



Skeena escapement well below average based on GSI from the Tyee Test Fishery and the preliminary Petersen estimates of the Kitsumkalum escapement
2021 = 20,277 preliminary
1984-2021 Average = 71,080

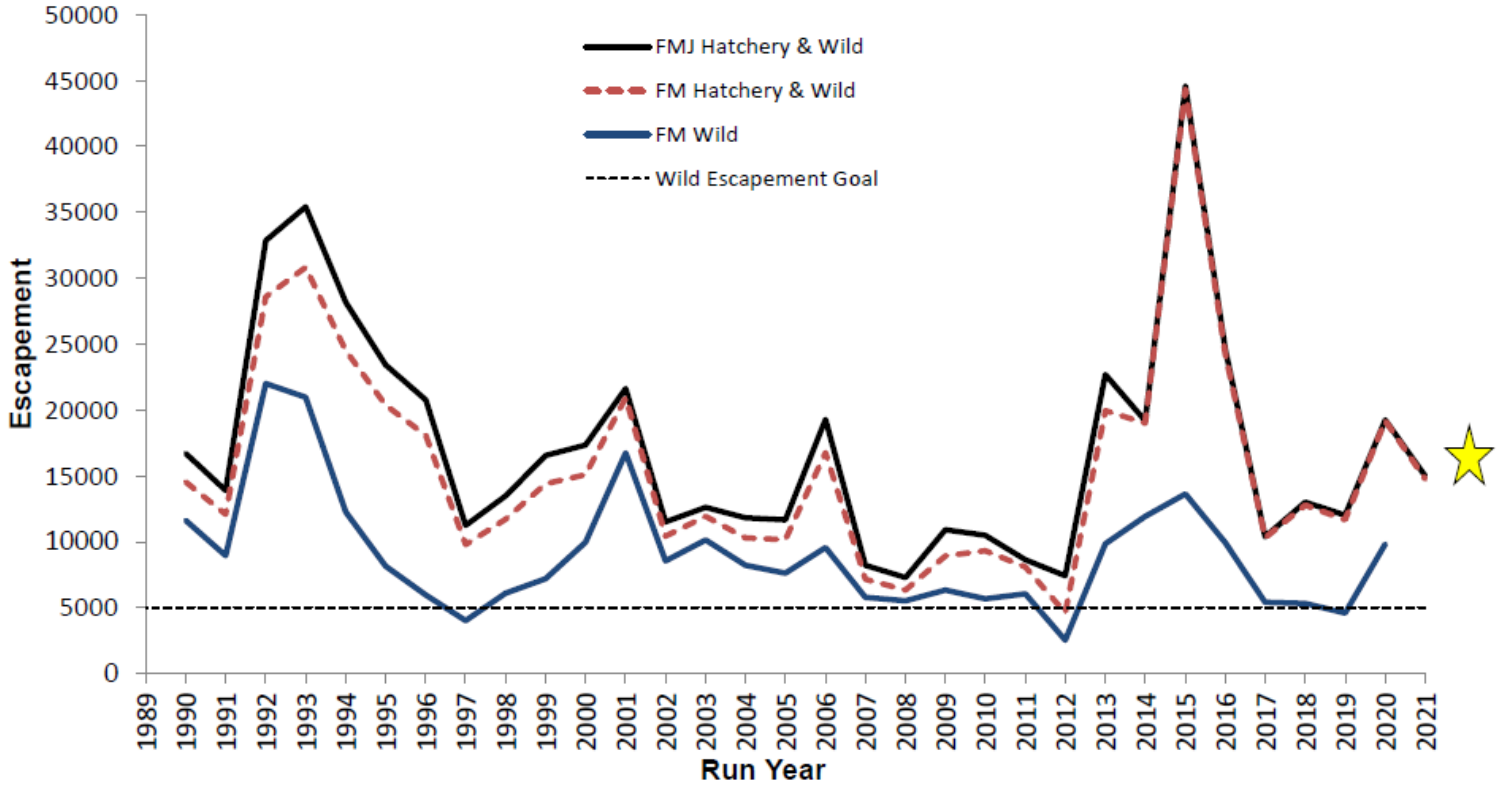
Canada

Canadian Chinook Indicators with Defined Objectives

Stock Country	CWT Indicator	Escapement Indicator	Management Objective	Preliminary 2021 Escapement
CAN	ATN	Atnarko	5,009	>5,009 TBC*
CAN	COW	Cowichan	6,500	15,926
CAN	SHU	Lower Shuswap	12,300	29,500**
CAN	HAR	Harrison	75,100	36,000+

*Hatchery + Wild escapement = 14, 751 Chinook. Wild component not yet available but hatchery component in recent years was approx. 50-60%.
**Preliminary estimate not yet available; but expected to exceed escapement goal.
+ Preliminary estimate, subject to change.

Atnarko River Escapement



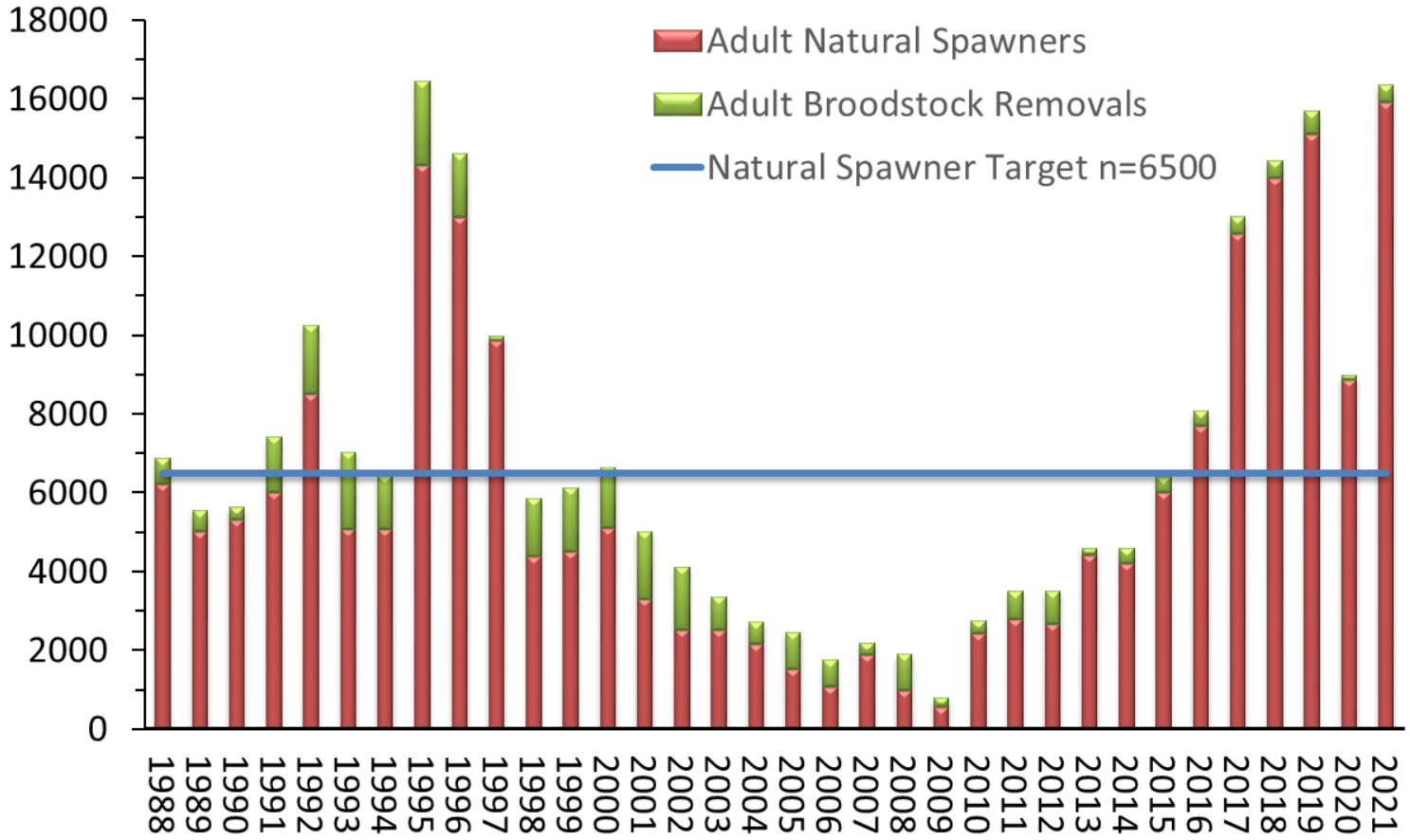
★ 2021 Petersen estimate = 14,751 POPAN estimate in progress

F=female M=male J=jacks

S_{msy} = 5,009 large wild (Velez-Espino et. al. 2014)

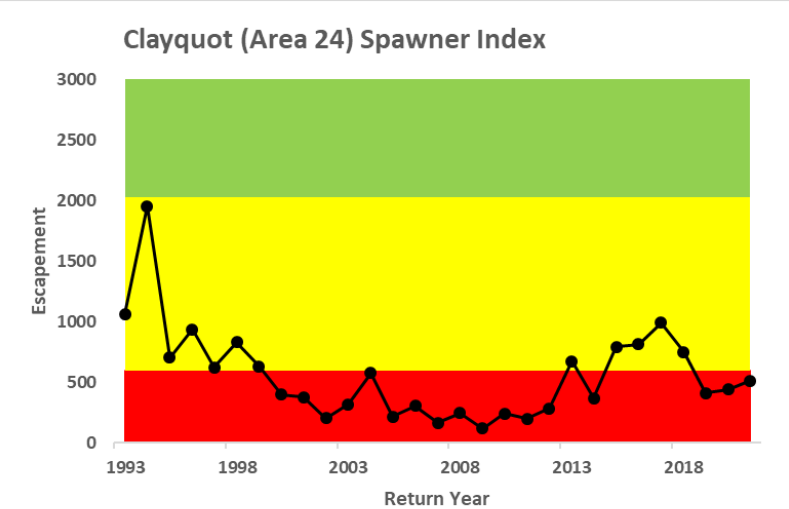
Canada

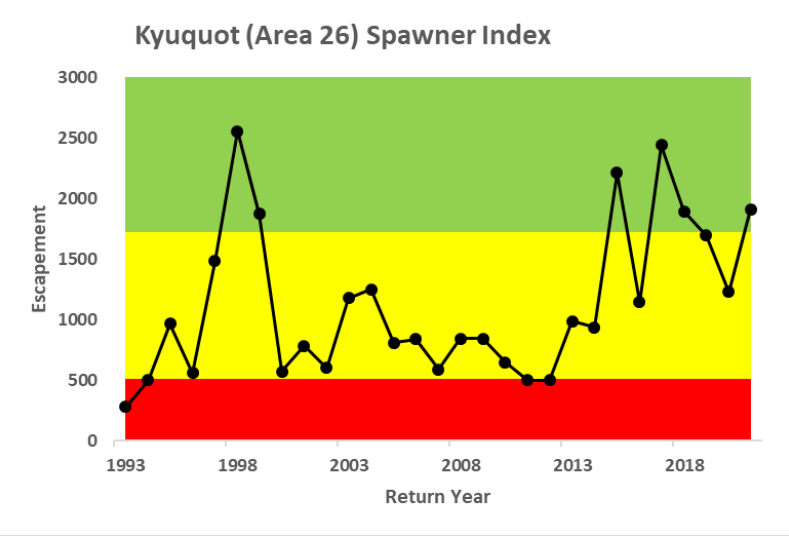
Cowichan River Escapement



Cowichan adult returns were strong with a large escapement of 15K similar to 2019 and well above the target of 6.5K.

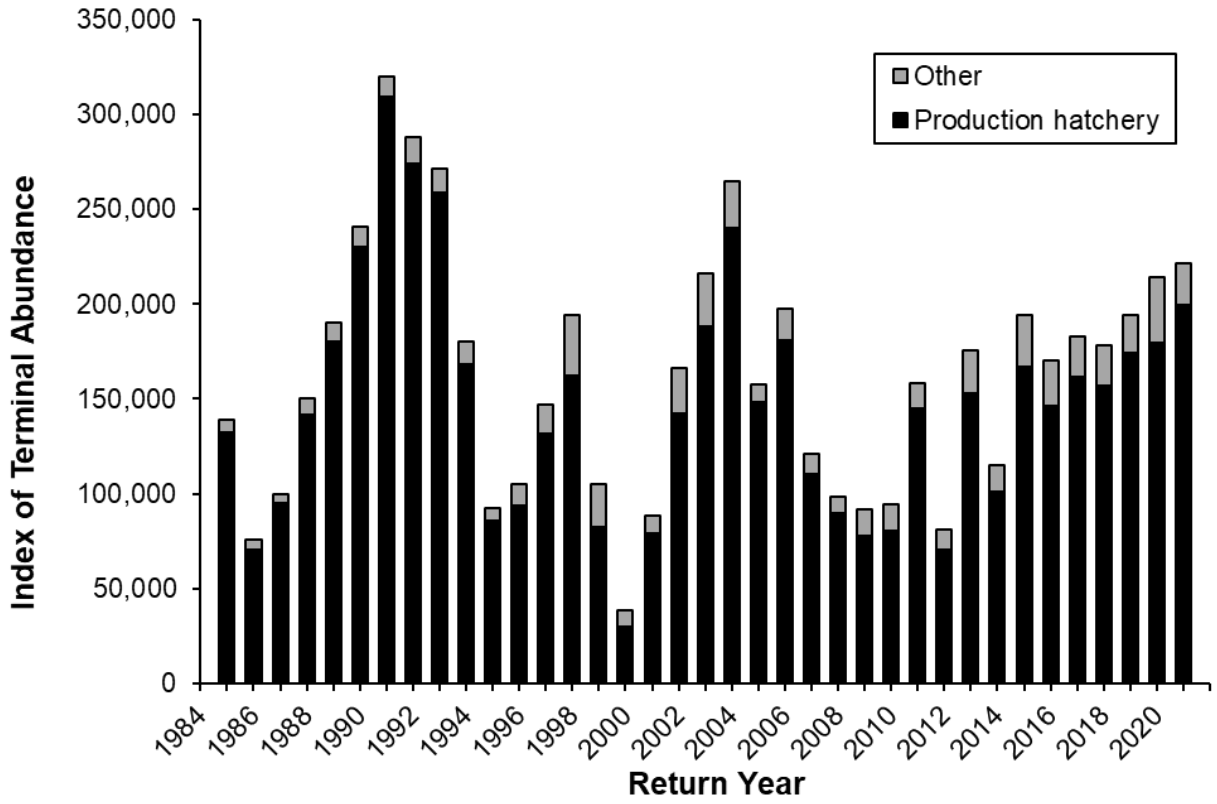
Chinook– Wild/Natural Populations





- **Wild/Natural** WCVI Chinook remain a stock of concern.
  - SWVI: These stocks have been relatively stable over time, but remain below target and have seen only a very slight improvement in trajectory from a decline in productivity observed during the early- to mid-1990's.
  - NWVI: These stocks have seen an improving trend in escapement from the low returns in the early 2000's through 2012.
- 2021 escapement estimates are preliminary:
  - •abundance of "natural" populations remains low in SWVI.
  - •Improving trend continues for the NWVI

WCVI Chinook Hatchery Contribution to Total Production



- Graph shows indexed terminal return. Hatchery origin fish are the main component (RCH, CON, NIT).
- The **Robertson Creek Hatchery (RCH)** return (~139K) was slightly higher than forecast and 60% higher than the long-term average (88K)
- The **Nitinat Hatchery (NIT)** return (~27K) was slightly higher than the long-term average (25K) and similar to the 2021 forecast (27K).
- The **Conuma Hatchery (CON)** return (~34K)was slightly below the long-term average (37K), but aligned with the 2021 forecast (33K).
- "Other" includes "natural" abundance and production from smaller hatcheries
- The 2021 estimate is preliminary

2021 Fraser Chinook Escapement Summary

Management Unit	2021 Escapement Estimate*	Brood Year Escapement**	2021 Comparisons
Spring 4_2	~6,000	5,000	Well below S_{MSY}
Spring 5_2	~15,100	13,500	Below S_{MSY}
Summer 5_2	~13,900	9,500	Below S_{MSY}
Summer 4_1	~175,700	84,500	Above S_{MSY}
Fall 4_1 (Harrison)	~36,000	30,000	Below escapement goal

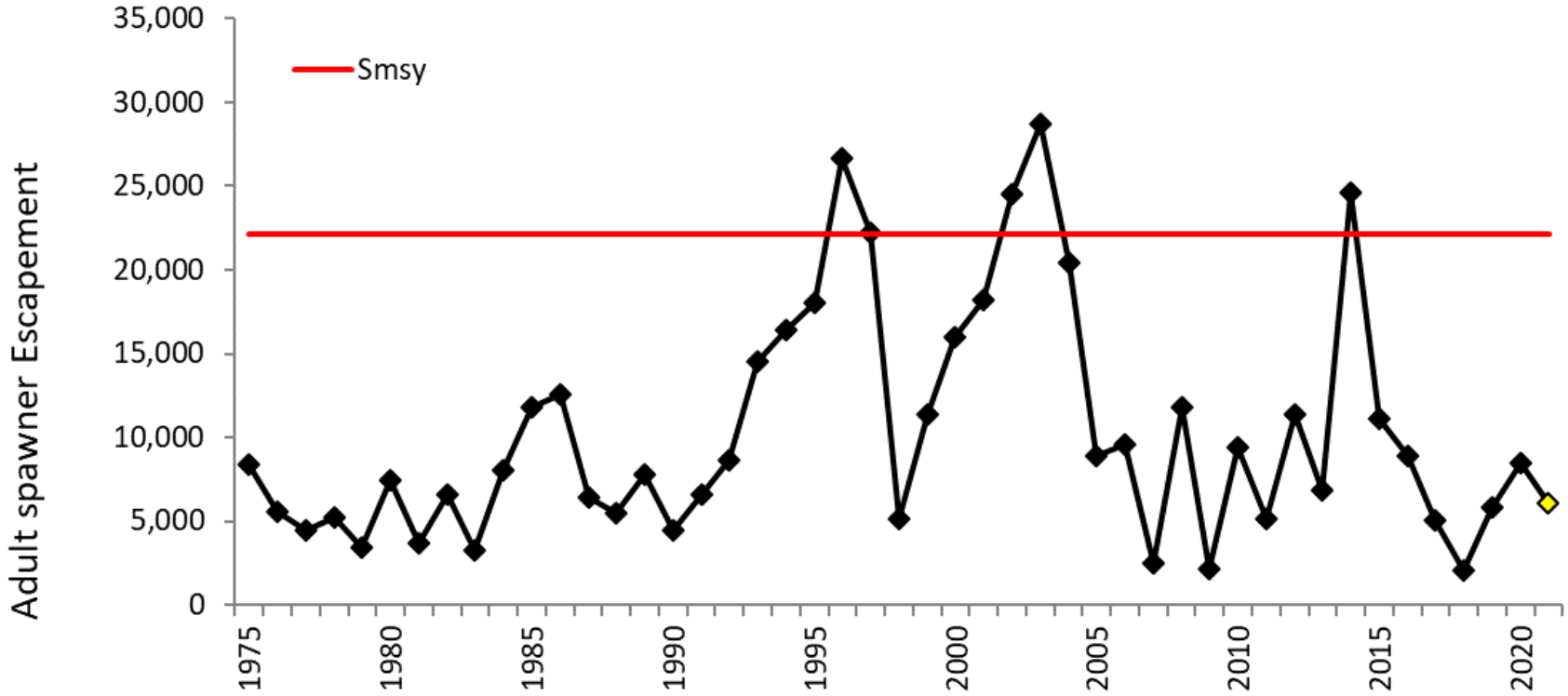
*Estimates are **preliminary** and subject to change

** Estimates are subject to change due to infilling and calibration methods

Productivity near replacement levels for most management units

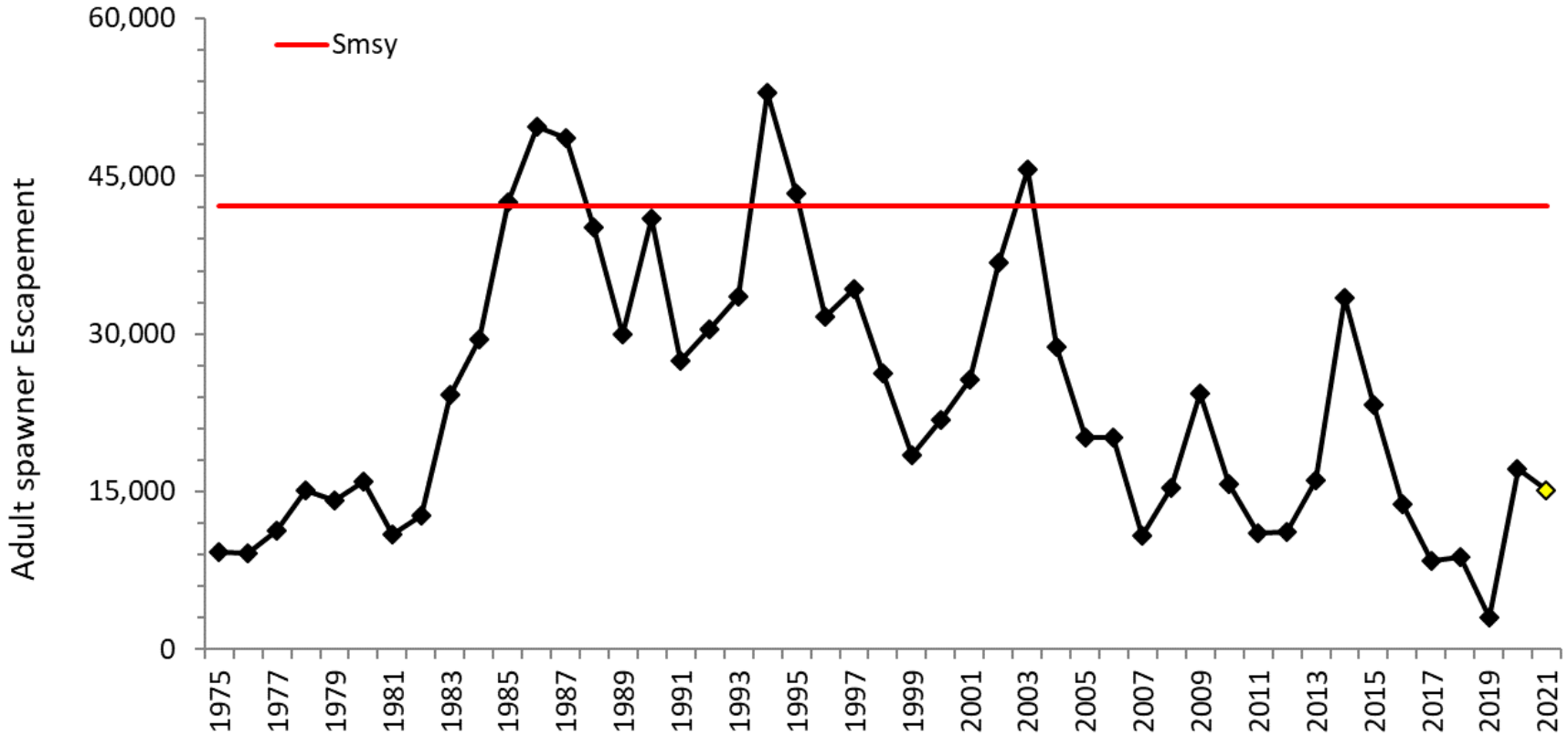
Escapement - Fraser Spring 4_2 Chinook

- Brood year escapement (2017) was well below Smsy
- The ***preliminary*** estimate for 2021 is ~6,000.



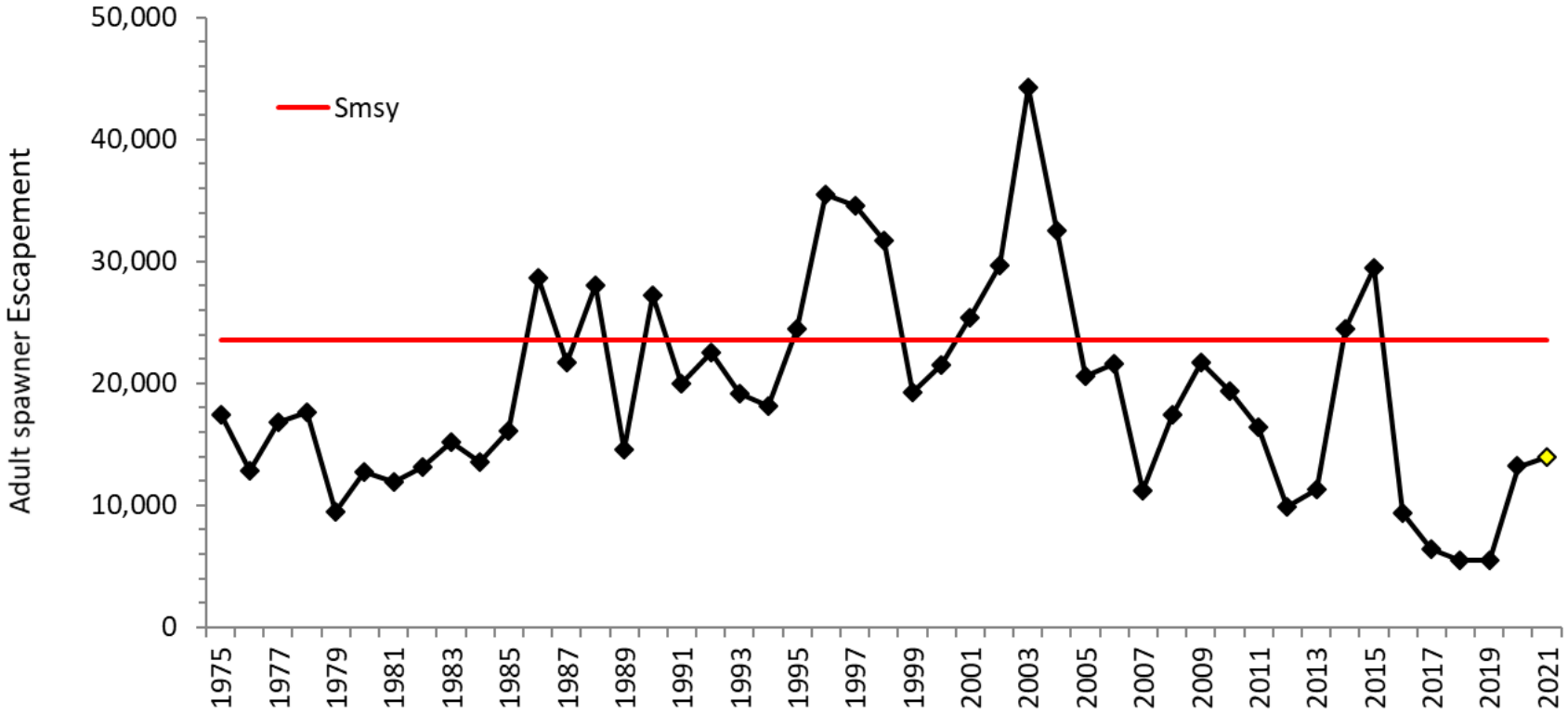
Escapement - Fraser Spring 5_2 Chinook

- Brood year escapement (2016) was below Smsy.
- The ***preliminary*** estimate for 2021 is ~15,100.



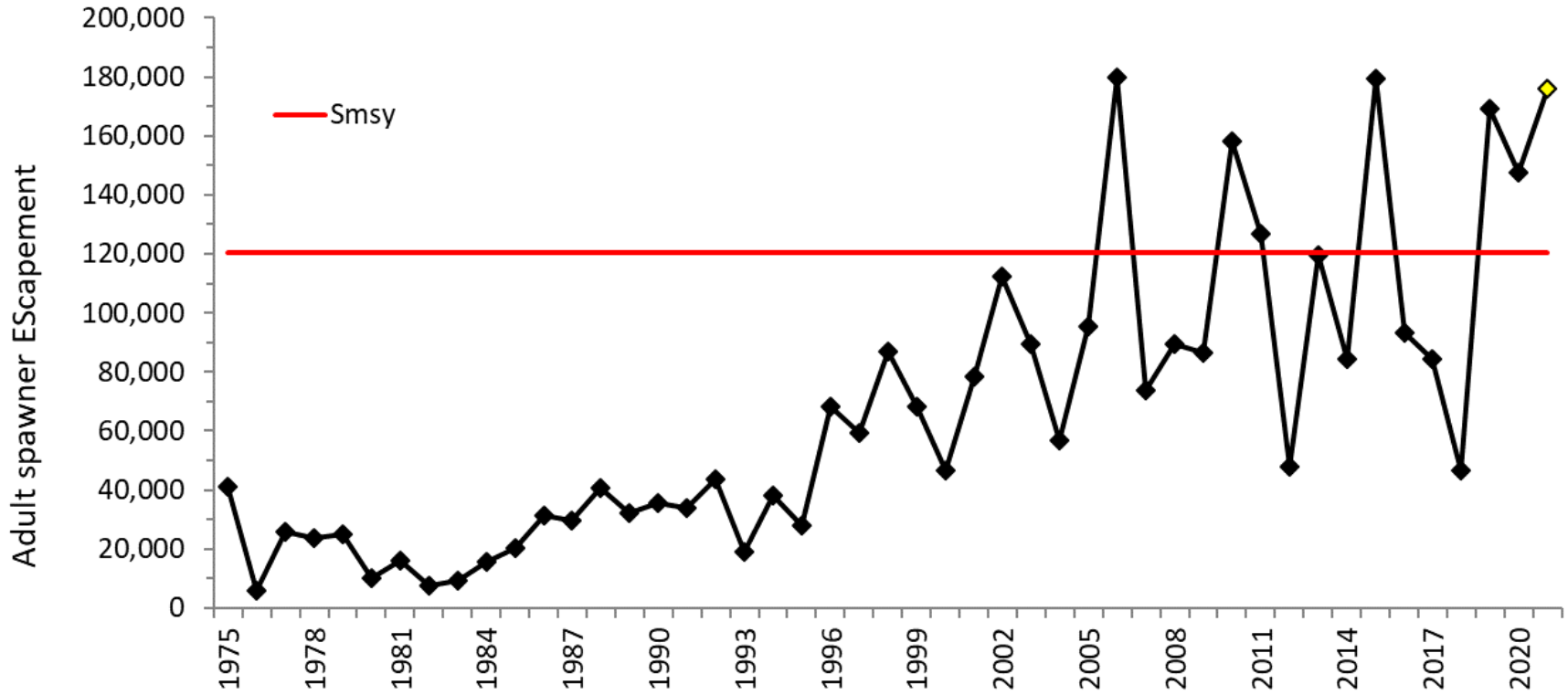
Escapement - Fraser Summer 5_2 Chinook

- Brood year escapement (2016) was below Smsy.
- The ***preliminary*** estimate for 2021 is ~13,900.



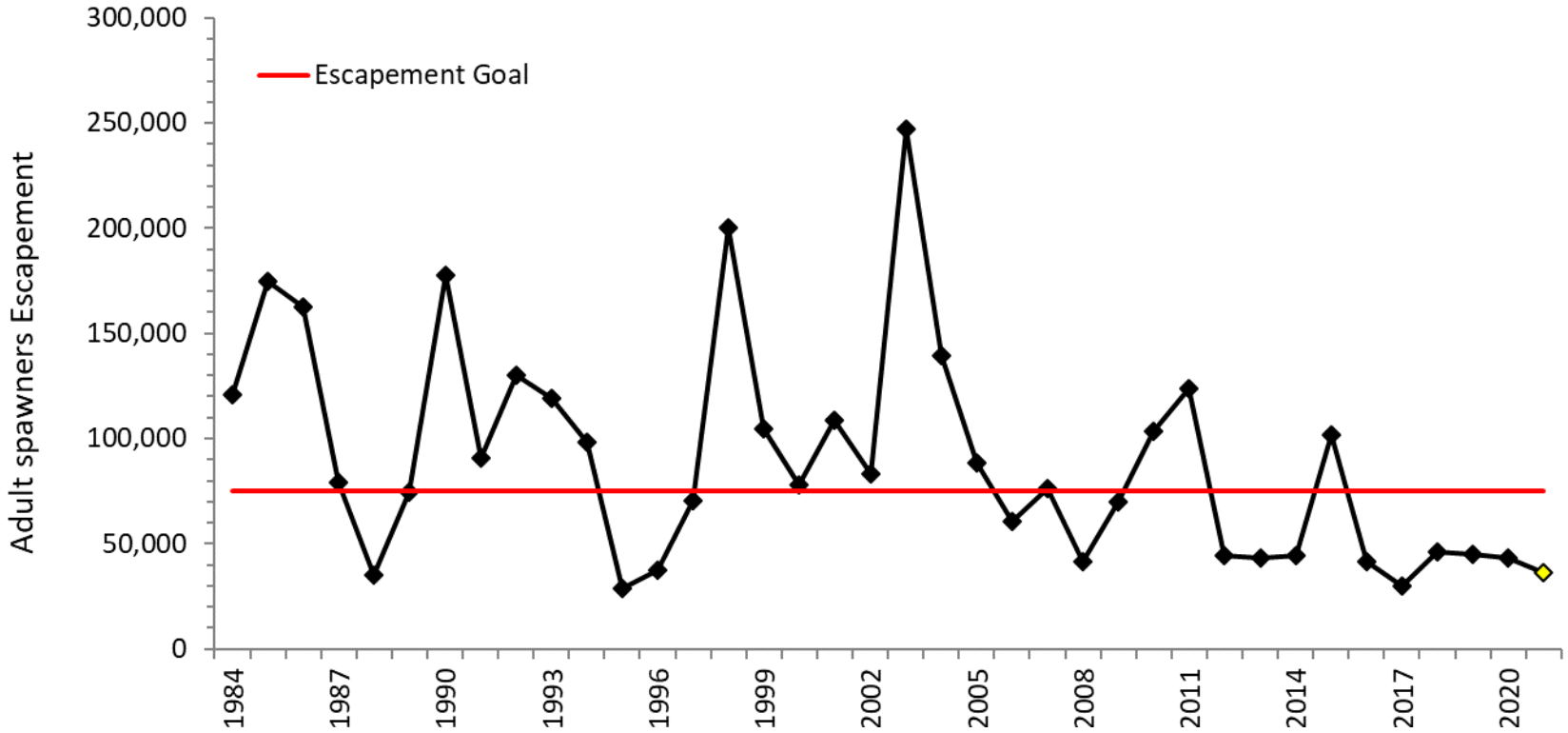
Escapement - Fraser Summer 4$_1$ Chinook

- Brood year escapement (2017) was above Smsy
- The ***preliminary*** estimate for 2021 is ~175,700.



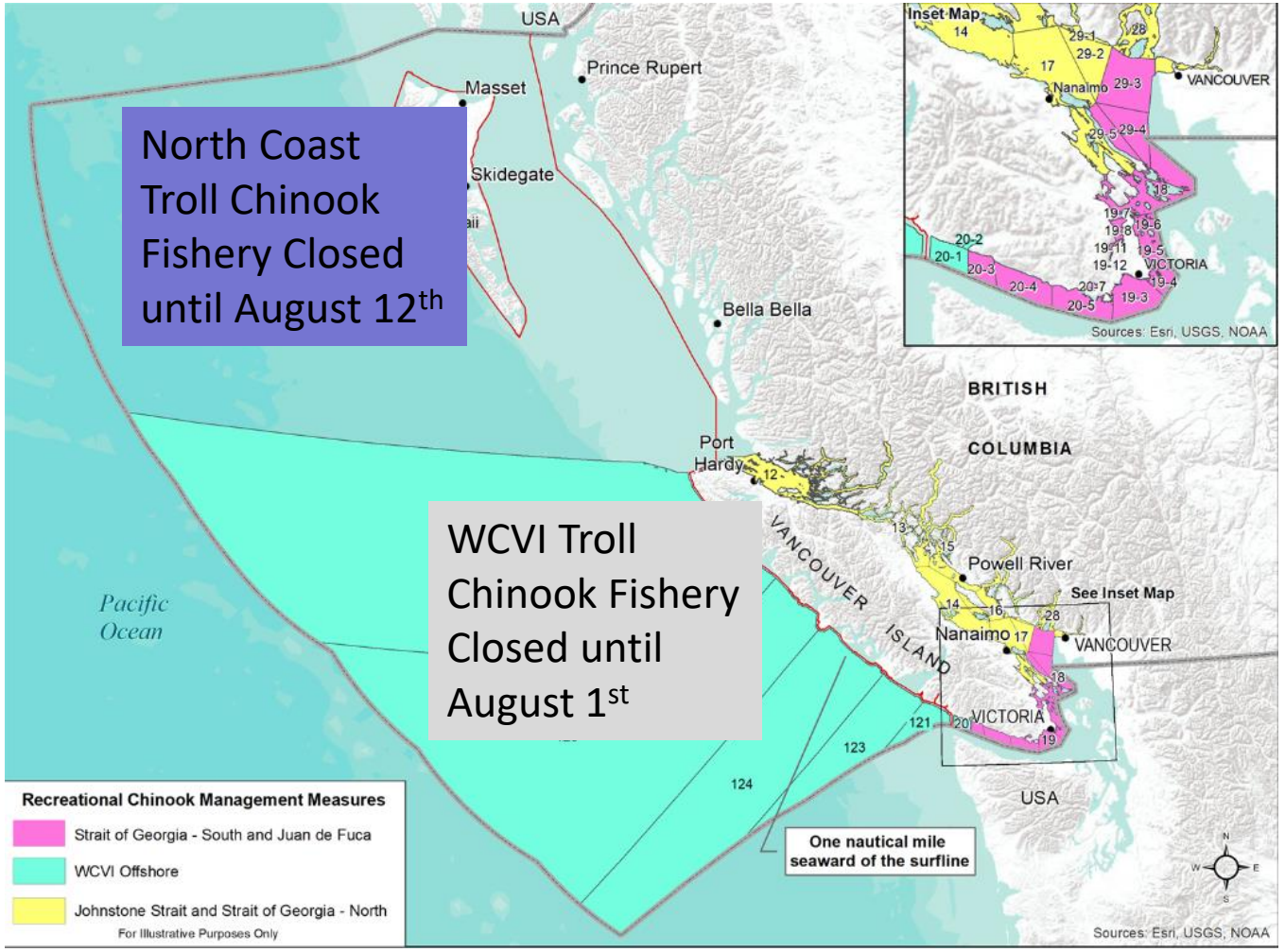
Escapement - Fraser Fall 4 1 Chinook

- Brood year escapement (2017) was below escapement goal
- The escapement goal (75,100) has only been met once in the last 10 years
- The ***preliminary*** escapement estimate for 2021 is ~36,000.



APPENDIX

2021 Commercial Chinook Management Measures

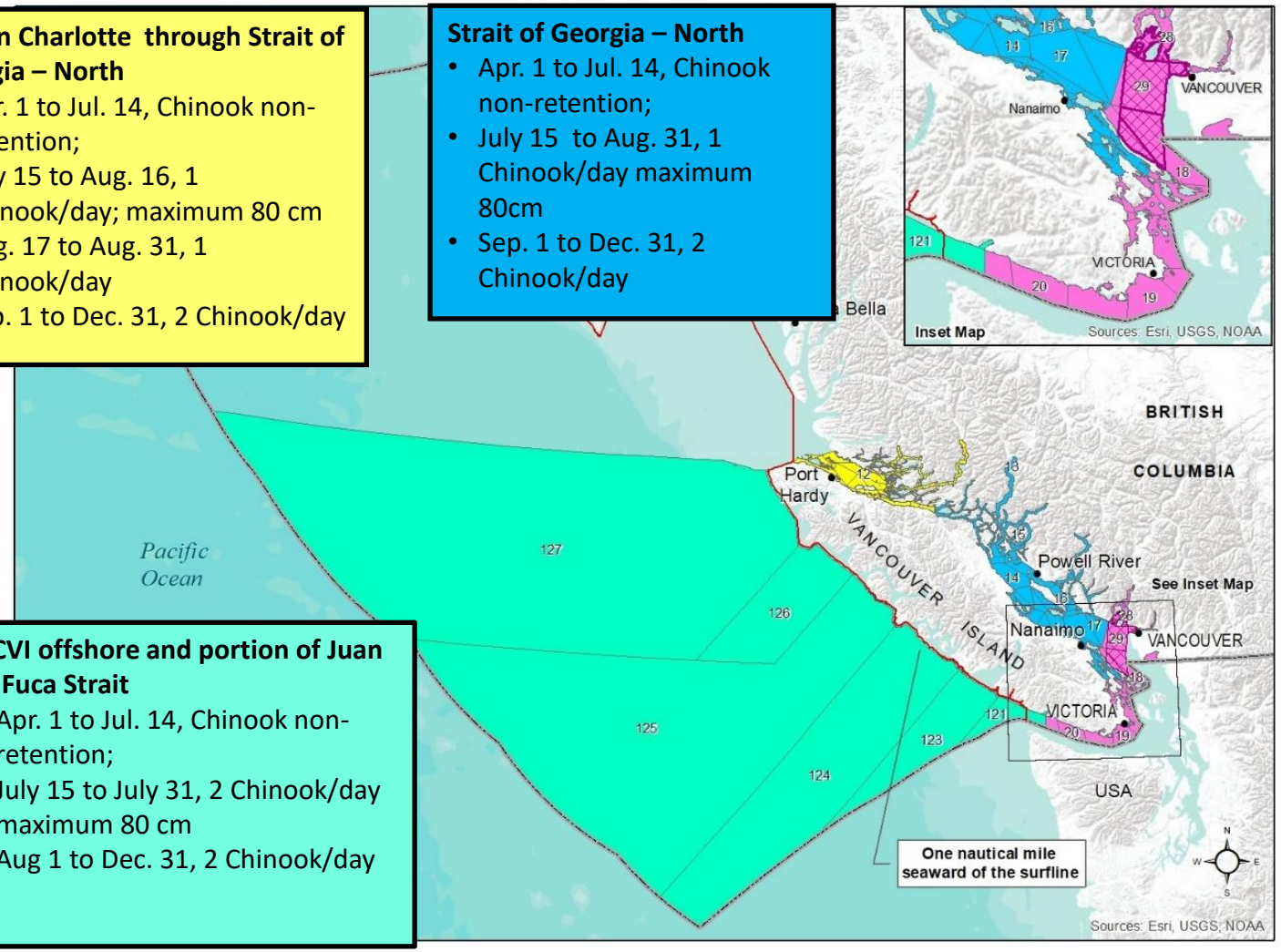


Canada

2021 Recreational Chinook Management Measures

Queen Charlotte through Strait of Georgia – North
- Apr. 1 to Jul. 14, Chinook non-retention;
- July 15 to Aug. 16, 1 Chinook/day; maximum 80 cm
- Aug. 17 to Aug. 31, 1 Chinook/day
- Sep. 1 to Dec. 31, 2 Chinook/day

Strait of Georgia – North
- Apr. 1 to Jul. 14, Chinook non-retention;
- July 15 to Aug. 31, 1 Chinook/day maximum 80cm
- Sep. 1 to Dec. 31, 2 Chinook/day



Portions of Southern Strait of Georgia, Howe Sound and Burrard Inlet (hatched area)
- April 1 to August 31: No fishing for Chinook
- September 1 to December 31: 2 Chinook per day.

Strait of Georgia – South and portion of Juan de Fuca Strait
- Apr. 1 to Jul. 31, Chinook non-retention;
- Aug. 1 to Aug. 31, 1 Chinook/day maximum 80cm
- Sep. 1 to Dec. 31, 2 Chinook/day.

WCVI offshore and portion of Juan de Fuca Strait
- Apr. 1 to Jul. 14, Chinook non-retention;
- July 15 to July 31, 2 Chinook/day maximum 80 cm
- Aug 1 to Dec. 31, 2 Chinook/day

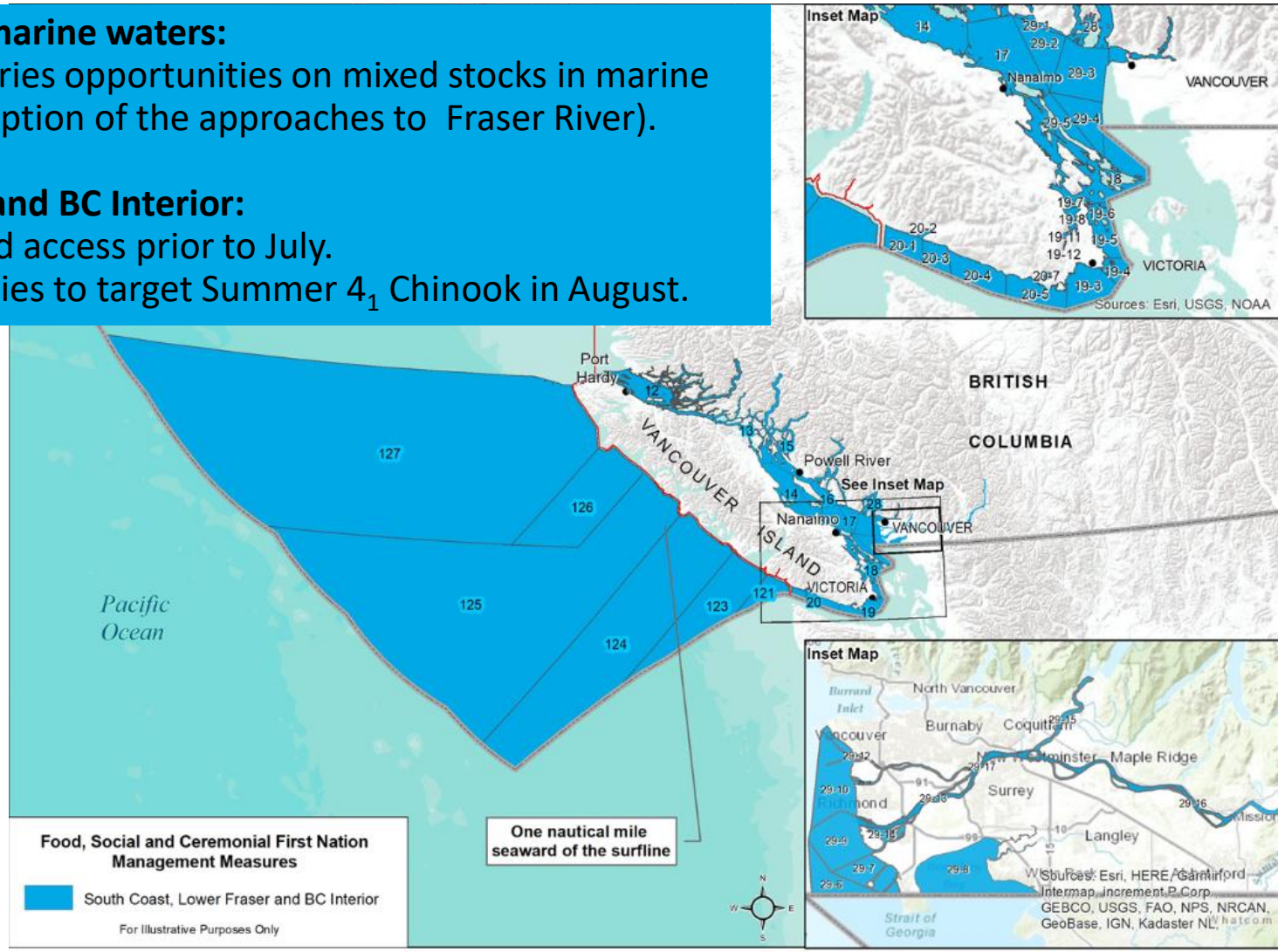
2021 First Nations Food, Social and Ceremonial

Southern BC marine waters:

- Some fisheries opportunities on mixed stocks in marine areas (exception of the approaches to Fraser River).

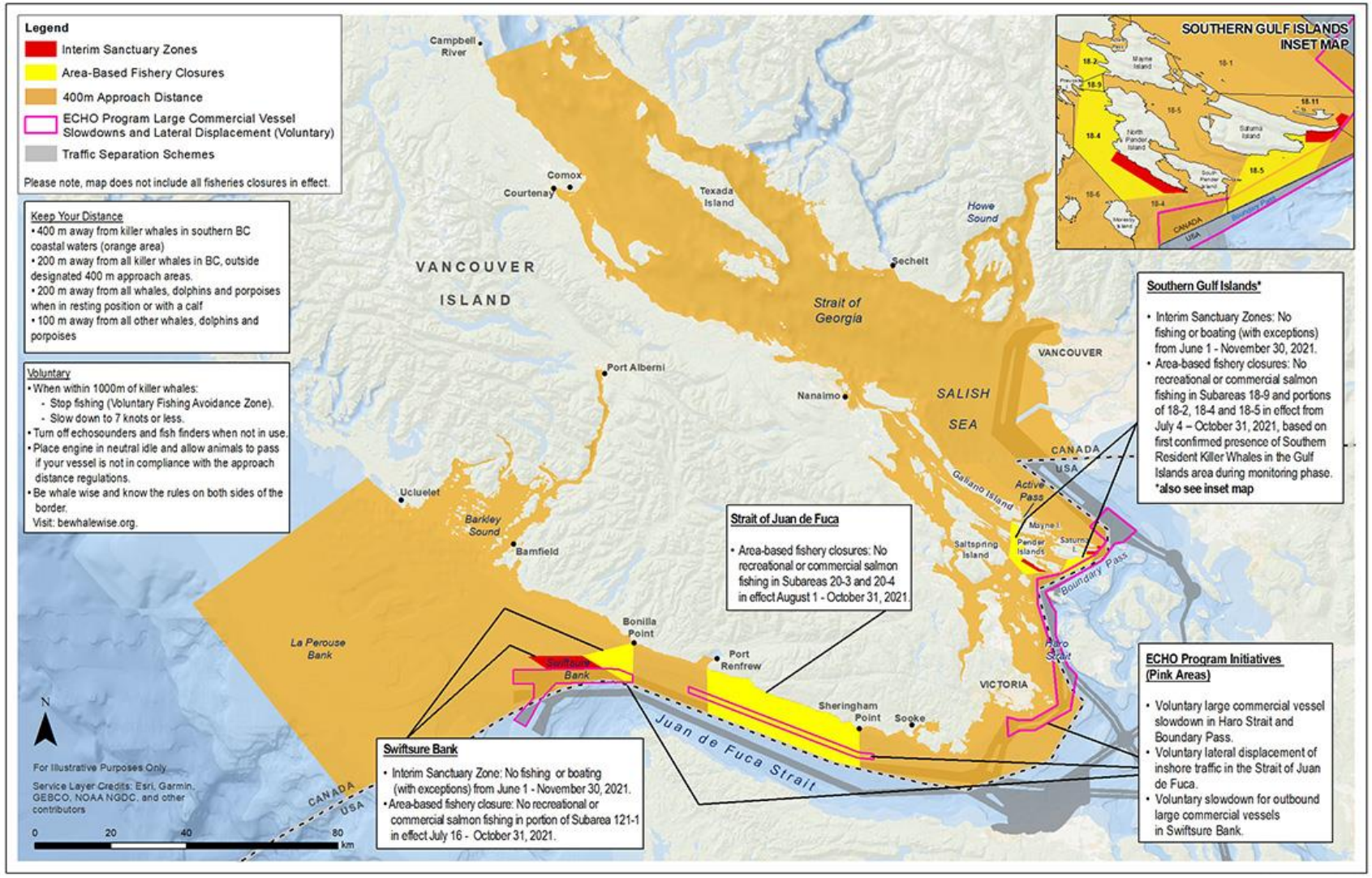
Lower Fraser and BC Interior:

- Very limited access prior to July.
- Opportunities to target Summer 4_1 Chinook in August.



Canada

2021 Southern Resident Killer Whale Management Measures



Canada

2021 Southeast Alaska Chinook Management

Pacific Salmon Commission Postseason Meeting
January 2022

SEAK AABM Fishery
Primary Treaty Obligations

1. Manage to preseason catch limit [6 (f)]
2. Manage to achieve escapement goals for 6 SEAK and TBR stocks [6 (b)(iv)]
3. Pay back any overages the following year [6 (h)(i)]
4. Manage incidental mortality to not exceed 59,400 [4 (a) and (f)]

2021 SEAK Winter CPUE

District 113 power troll harvest from statweeks 41–48
(Oct 11 – Nov 27)

- Catch = 1,772
- Effort = 460
- CPUE = 1,772/460 = 3.85

2021 Table 2 Catch Limits

CPUE-based Tier	AI-based Tier	Catch Limit
Less than 2.0	Less than 0.895	Commission Determination
2.0 to less than 2.6	Between 0.895 and 1.03	111,833
2.6 to less than 3.8	Between 1.035 and 1.24	140,323
3.8 to less than 6.0	Between 1.245 and 1.55	205,165
6.0 to less than 8.7	Between 1.555 and 1.87	266,585
8.7 to less than 20.5	Between 1.875 and 2.28	334,465
20.5 and greater	Greater than 2.2	372,921

Tier = 4 Catch Limit = 205,165

* 2020 catch limit not exceeded; no payback provision for 2021

2021 SEAK Postseason Performance

- Preseason allowable Treaty catch → 205,165
  - State fisheries catch → 201,068
  - Annette Island Reserve catch → +1,014
- All-gear Treaty catch → 202,082
- Hatchery addon → + 34,092
- Total catch → 236,175

2021 ADF&G Preseason Management Directives

1. Monitor closely inseason to avoid exceeding 2021 allowable catch & payback provision in 2022.
2. Manage fisheries based on production concerns for SEAK and TBR stocks.

Management Actions to Conserve SEAK & TBR Stocks

COMMERCIAL FISHERIES:

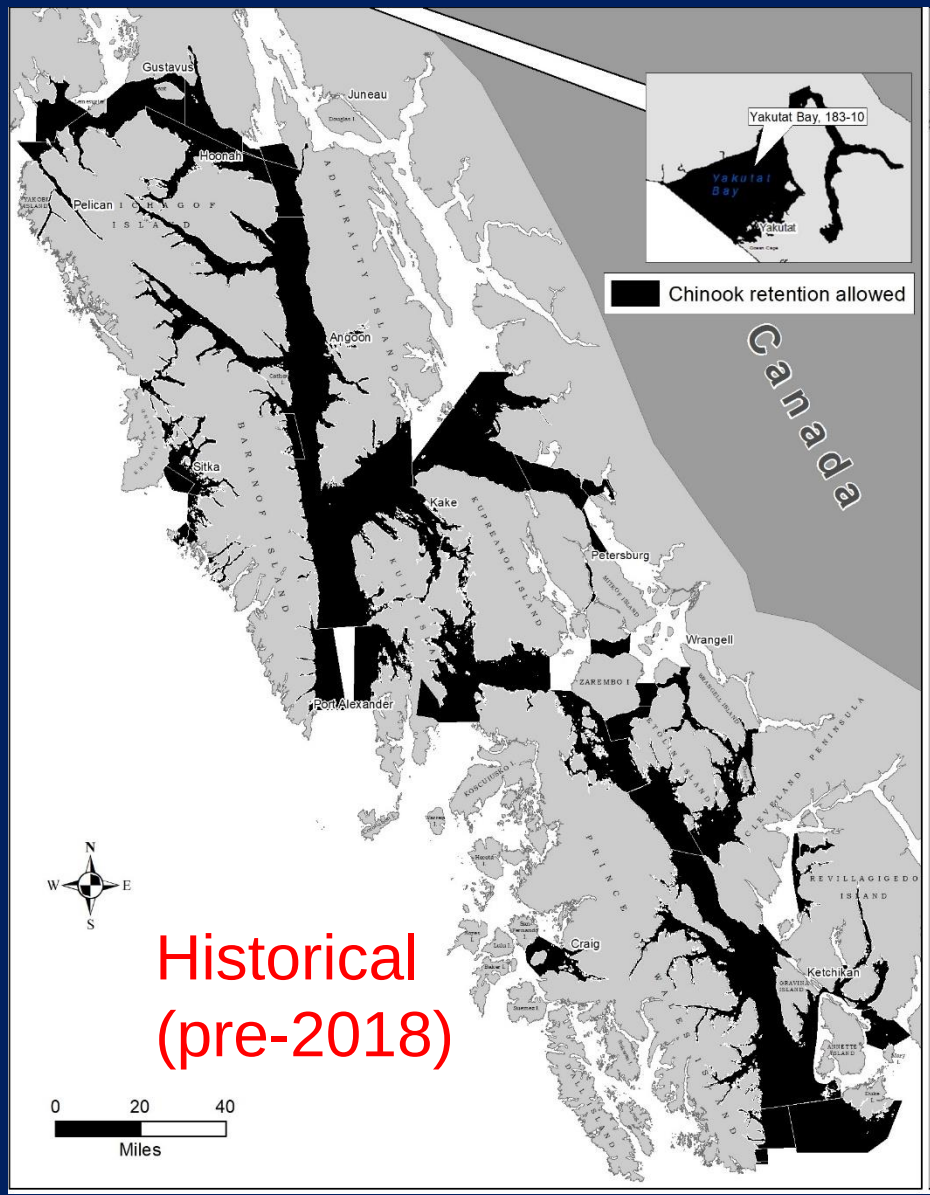
- ✓ TBR: No directed fisheries; additional actions in all traditional base level fisheries.
- ✓ Winter troll: Closed 6 weeks early; guideline harvest level of 45,000 not reached, Oct 11 - Mar 16.
- ✓ Spring troll: May & June restricted to outer coast and/or near hatchery release sites; all inside waters outside terminal harvest areas closed.
- ✓ Delayed initial openings of Chinook terminal harvest areas.
- ✓ Portions of Section 15-A (Chilkat River) closed to trolling July 1 - Dec 31.
- ✓ Summer troll: All waters of District 8 (Stikine River) and select areas of District 1 (Unuk River) closed to retention during 1st summer Chinook opening, July 1-6.
- ✓ Purse seine: delayed Chinook retention outside terminal harvest areas until August 2.
- ✓ Drift gillnet: delayed openings, reduced area, and mesh restrictions were implemented.

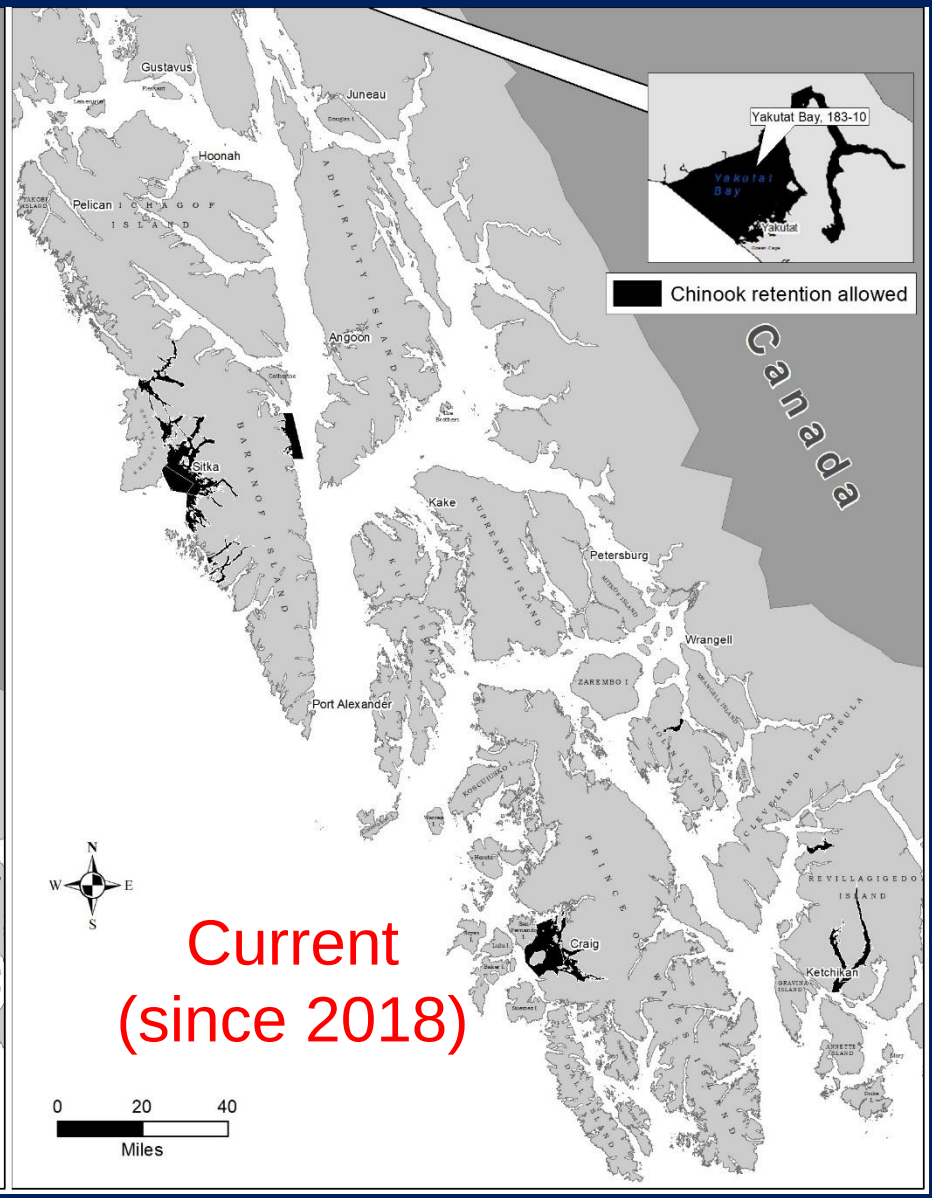
Management Actions to Conserve SEAK & TBR Stocks

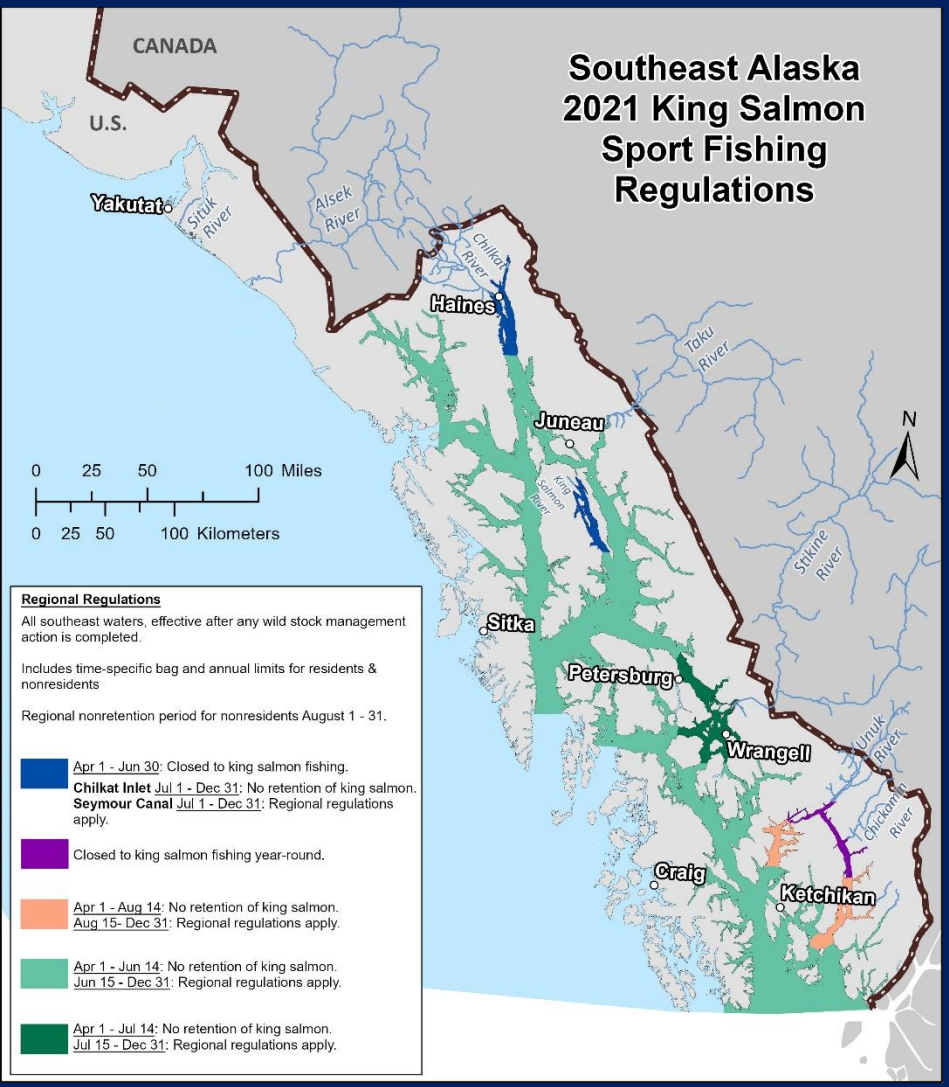
- **SPORT FISHERIES:**
  - ✓ Retention of Chinook was prohibited in inside waters, excluding designated hatchery areas, from April 1–June 14, extending through June 30 in the Juneau area, July 14 in the Petersburg/Wrangell area, August 14 in the Ketchikan area, and through Dec. 31 in the Upper Lynn Canal area.

- **SUBSISTENCE AND PERSONAL USE FISHERIES:**
  - ✓ Chilkat River: Delayed opening Chilkat Inlet Chinook fishery until July 17, reduced area when opened. Chilkat inriver fishery had reduced area June 15-July 31 and reduced to 4-days/week.
  - ✓ Taku River: personal use fishery delayed nearly 2 weeks, opened July 12–August 11.
  - ✓ Stikine River: directed Chinook subsistence fishery closed, general subsistence fishery delayed until June 21.

Spring Troll Fishing Areas

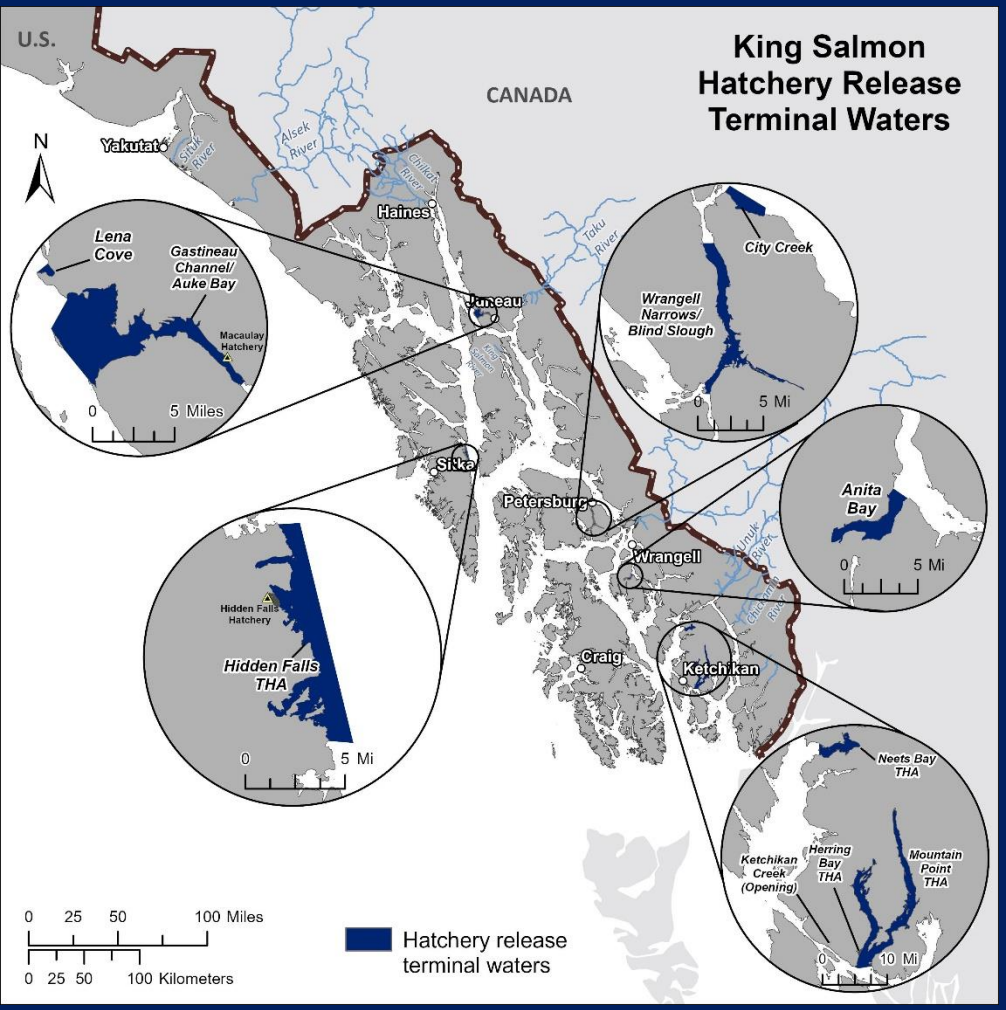






2021 Sport Fishery Management Actions:

- Regional regulations: applied during areas and times outside of wild stock conservation actions and designated hatchery areas.
- Inseason management: Bag, possession, and annual limits were progressively decreased as inseason projections indicated the sport fishery would exceed its allocation due to higher than anticipated HPUE.



2021 Designated Hatchery Sport Harvest Areas:

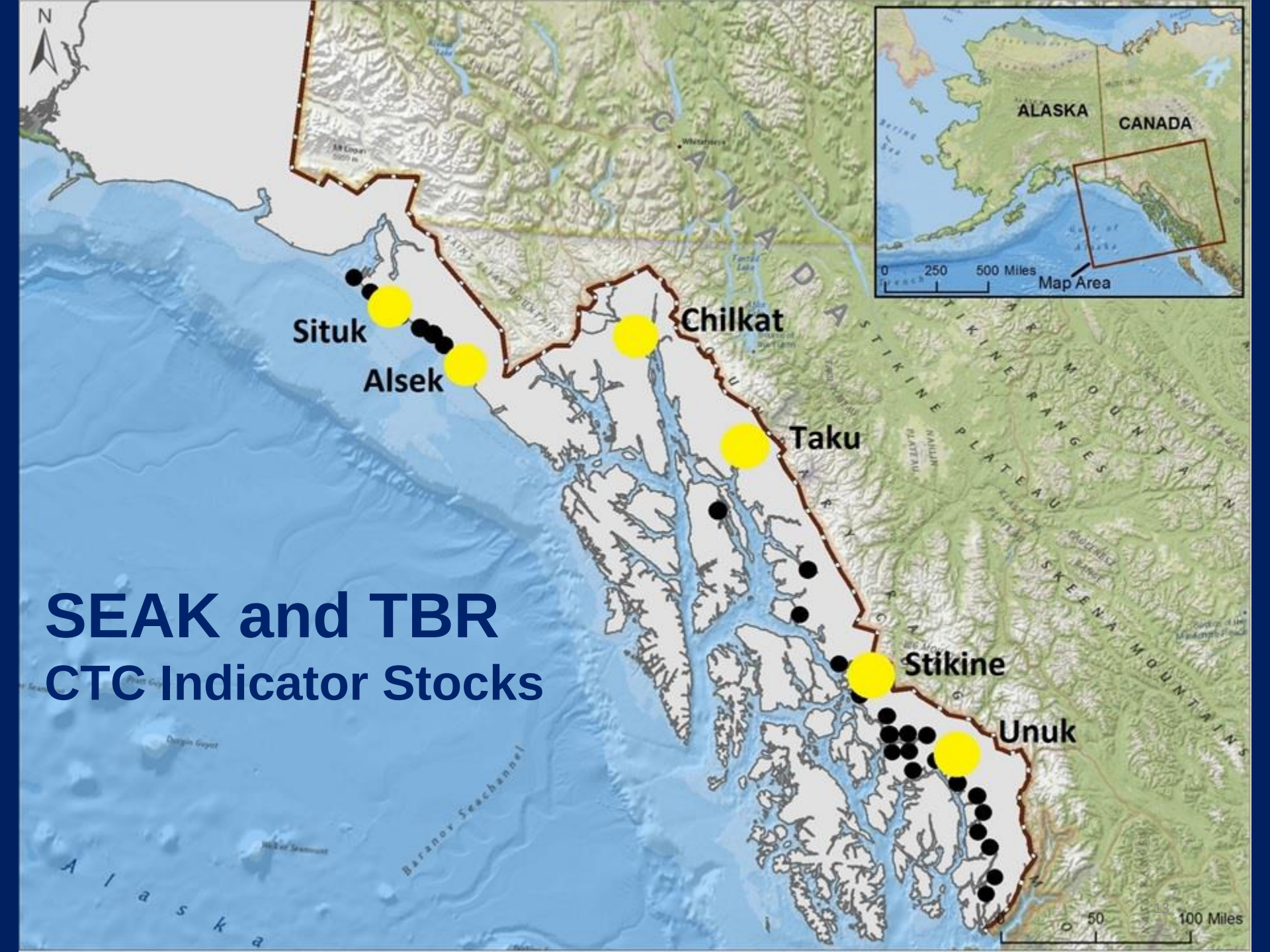
- Special regulations to allow harvest opportunity within areas and times when Alaska hatchery produced Chinook are available.
- Open periods were unique to each location and ranged between June 1 – August 31.

Summer Troll Management

- Traditionally summer Chinook fishery limited to two openings to provide opportunity to harvest remaining annual troll allocation.

- Prior to the completion of the 2nd summer Chinook retention period in late August, ADF&G estimated 6,500 Chinook remained on the all-gear treaty catch limit.
  - The remaining treaty allocation included unharvested fish from the commercial net fisheries.

- A portion of the remaining Treaty Chinook were reallocated to troll fishery, extending the 2nd summer retention period by 2 days.


N
ALASKA
CANADA
0 250 500 Miles
Map Area
Situk
Alsek
Chilkat
Taku
Stikine
Unuk
SEAK and TBR
CTC Indicator Stocks
0 50 100 Miles

SEAK & TBR Chinook Escapements 2016-2021

Stock	2016	2017	2018	2019	2020	2021
Situk	329	1,187	420	623	1,197	1,064
Alsek	2,514	1,762	4,312	6,400	5,308	5,616
Chilkat	1,380	1,173	873	2,028	3,180	2,038
Taku	9,177	8,214	7,271	11,558	15,593	10,806
Stikine	10,554	7,206	8,344	13,817	10,671	9,034
Unuk	1,463	1,203	1,971	3,115	1,135	2,667

- Poor production since 2012
- Most escapement goals not achieved 2016-2018
- More escapement goals achieved in 2019-2021 owing to restrictive management measures

SEAK AABM Fishery
Primary Treaty Obligations

1. Manage to preseason catch limit

   Actual Treaty catch was below the limit

2. Manage to achieve escapement goals for 6 SEAK and TBR stocks

   With restrictive management actions 4 of 6 escapement goals met

3. Payback any overages the following year

   No overage in 2021 = no payback in 2022

4. Manage incidental mortality to not exceed 59,400

   Below limit in 2020; do not anticipate exceeding in 2021 (TBD = March)


Questions?

2021 Oregon South of Cape Falcon Ocean Salmon Season Summary

Overview: Although improved over the 2020 season, Chinook Salmon landings in the commercial troll fishery continued near record lows. Much of the limited catches in the troll fishery in 2021 were due to very short open periods for much of the season coupled with poor marine weather conditions during multiple open periods. The shortened season dates were in response to an overfished designation for Klamath River fall-run Chinook Salmon and a revised forecast model that considered higher impact rates on Klamath River Chinook Salmon for most commercial troll time and area cells.

The hatchery origin coho salmon forecast was one of the best since the 1970s. Oregon Production Index area hatchery coho salmon were forecasted at 1,607,900 fish. Combined with a reasonably robust natural production forecast, this allowed for substantial marked coho salmon quotas and a successful recreational season.

Cape Falcon to Humbug Mountain:

Commercial Troll: The season opened on March 20th, but the sub-area from Heceta Bank to Humbug Mountain remained closed until May 1st. Vessels in this area are limited to no more than 4 spreads per wire. The season from May 1st through the end of August was broken into 14 open periods of varying lengths that totaled 57 open days of fishing. The season continued through September and October with no breaks, but vessels were limited to no more than 75 Chinook Salmon per week during the fall period. Preliminary estimated Chinook Salmon landings for the year total 16,988 fish. A total of 13,023 (77%) of these Chinook Salmon were landed into the port of Newport.

For the first time since 2014, there was an allowance for coho salmon retention in this area. This was structured as an incidental allowance of marked hatchery origin coho salmon during the July and August open periods. Trollers were allowed to land up to 20 coho salmon per week but were required to land at least as many Chinook Salmon at the same time. There was a quota of 10,000 marked coho salmon during this season and the landings totaled 2,092 coho salmon.

Recreational: The Chinook Salmon season in this area was open from March 15th through October 31st without a quota. From March 15th through the end of May, there were a total of 316 Chinook Salmon landed. From June through August, there were an additional 4,322 Chinook Salmon landed in this area. For September and October, there were 872 Chinook Salmon landed. These totaled 5,510 Chinook Salmon for the year. This was more Chinook Salmon landed than any other year since 2014, but still below the recent 10-year average of 6,064 Chinook Salmon.

The coho salmon seasons for the area included a hatchery mark-selective season from June 12th through August 28th with a quota of 120,000 marked coho salmon (open from Cape Falcon to the OR/CA border), and a non-selective coho salmon season starting September 10th and scheduled to be open each Friday through Sunday period through the end of September with a

quota of 14,000 coho salmon. The total coho salmon catch in the mark selective season was 68,278 fish, including 766 coho salmon landed in the Humbug Mountain to the OR/CA Border area, which left a remainder of 51,722 coho salmon on the quota. Much of the summer season was affected by strong northerly winds that kept boats off the water for a good part of the season. An impact neutral rollover of the remaining mark selective quota to the non-selective quota was made on September 14th to add 6,230 coho salmon to the original quota resulting in a revised quota of 20,230 coho salmon. In addition, the open days were extended to all days of the week beginning on September 17th. Recreational coho salmon landings in the expanded area from Cape Falcon to the OR/CA Border were the third highest since mark selective seasons were first introduced in 1999.

Humbug Mountain to the OR/CA Border:

Commercial Troll: the season opened on March 20th and continued through May 5th without interruption. It then re-opened from May 10th – May 21st and again from May 26th – May 31st. The open periods prior to June were not limited by a quota, but as is typical, catches were minimal at this time of year in this area. For the March through May period, a total of 17 Chinook Salmon were landed. As mentioned before, vessels in this area are limited to no more than 4 spreads per wire.

There were two quota openings in this area: one quota of 300 Chinook Salmon for June and one quota of 200 Chinook Salmon for July. Vessels were limited to no more than 20 Chinook Salmon per week during June. Total landings in June were 276 Chinook Salmon with the season closing early on June 16th to ensure that the quota was not exceeded. The remainder of the quota was rolled to the July season on an impact neutral basis, resulting in a modified July quota of 216 Chinook Salmon. Vessels were limited to no more than 10 Chinook Salmon per week in July and landings totaled 133 Chinook Salmon for the second quota period.

Recreational: The Chinook Salmon season in the area from Humbug Mountain to the OR/CA Border was open without quota from June 19th through August 15th. Chinook Salmon landings totaled 895 fish.

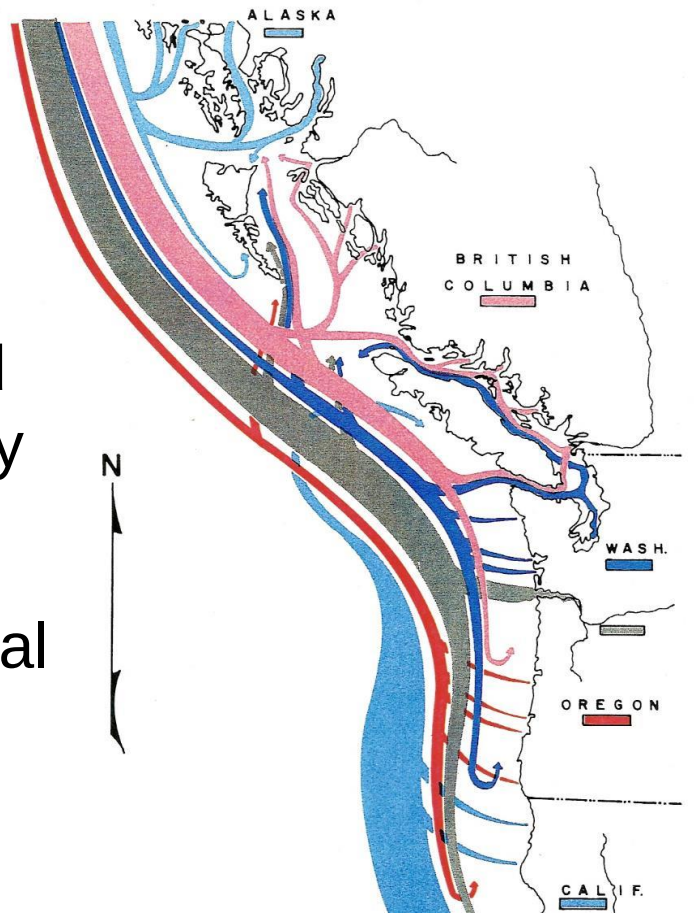
As noted earlier, this area was open for the mark selective coho salmon season from June 12th through August 28th. The catches from this area totaled 766 coho salmon out of the 68,278 total coho salmon landed. This season structure resulted in several weeks when the fishery was open for coho salmon but closed for Chinook Salmon.

Fishing opportunity was significantly limited by inclement weather during the season.

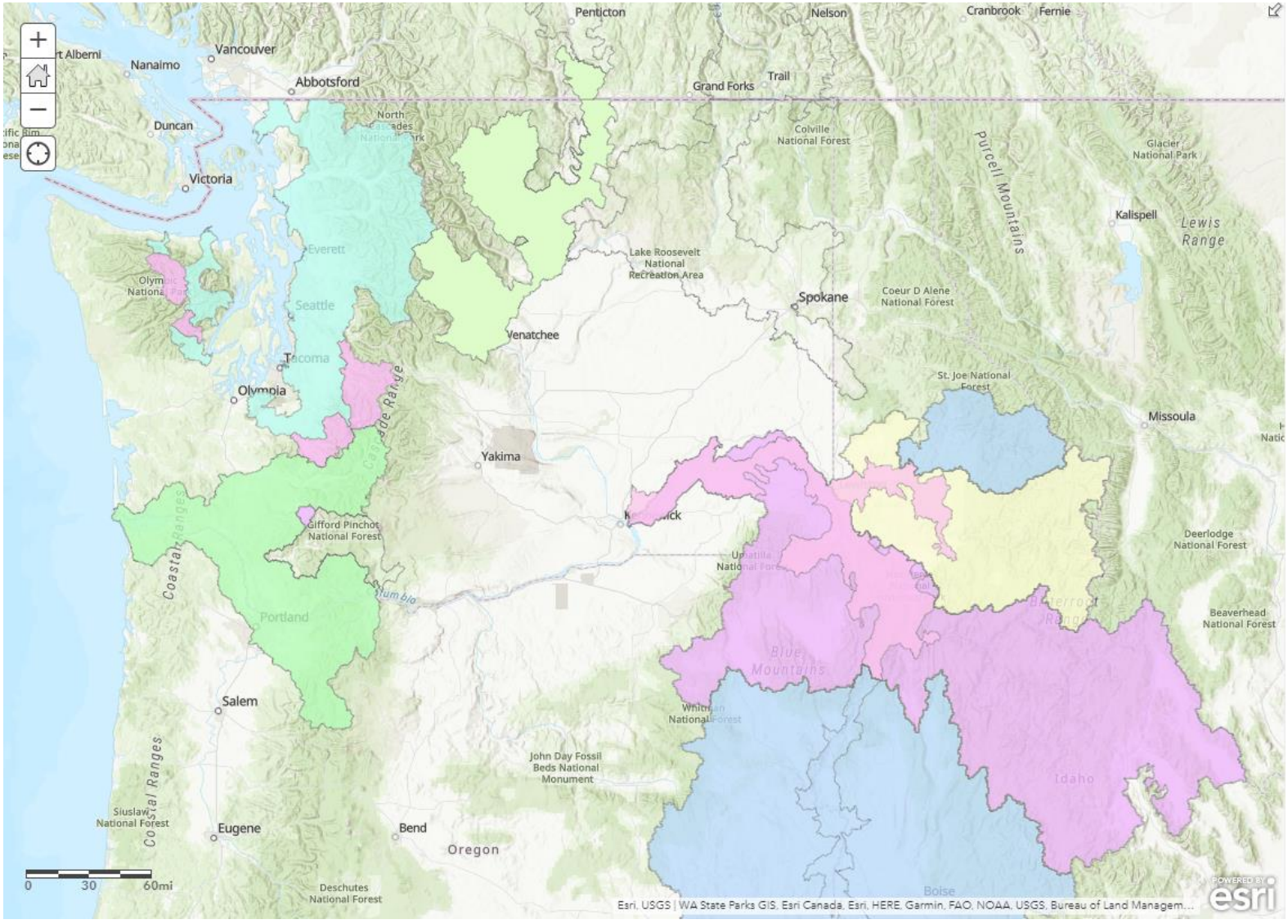
Southern U.S. CHINOOK MANAGEMENT IN 2021

Management Along the Migration

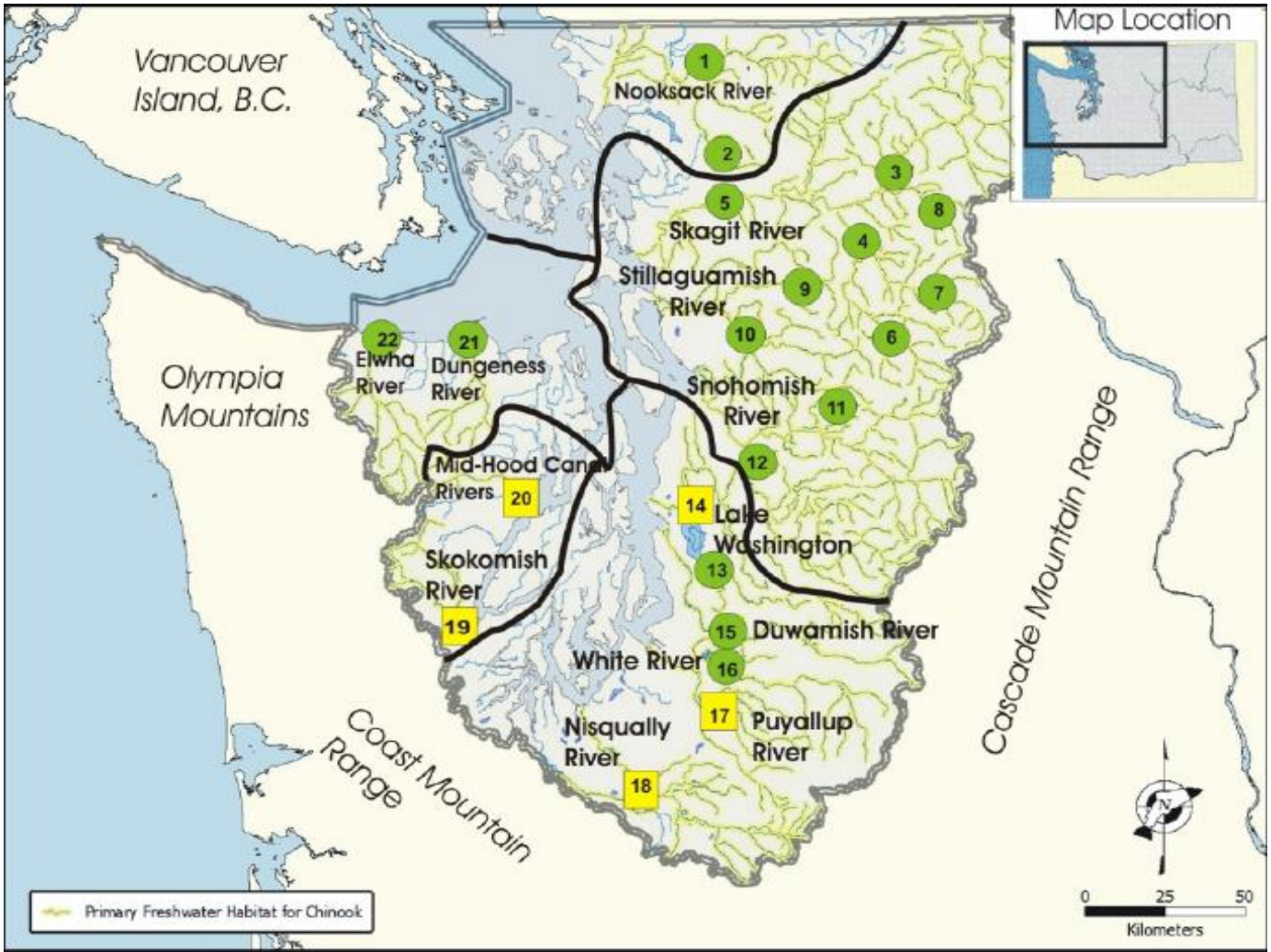
- ESA-Impact Limits on Puget Sound and Columbia River Chinook stocks severely constrain Southern U.S. fisheries
- Mixed stock fisheries limited by incidental impacts on constraining stocks
- Intensive Management - Preseason & Inseason



Endangered Species Act-listed Chinook



Puget Sound Chinook Management Units & Populations



Puget Sound Wild Chinook Forecasts: 2020 vs. 2021

Basin	2020	2021	Comparison
Nooskack spring	411	517	1.26
Skagit spring	1,605	1,556	0.97
Skagit S/F	12,877	10,461	0.81
Stillaguamish	359	325	0.91
Snohomish	2,978	2,922	0.98
Lake Washington	807	746	0.92
Green	2,396	3,949	1.65
White spring	493	856	1.74
Puyallup	1,674	1,398	0.84
Nisqually	901	911	1.01
Skokomish	503	278	0.55
Mid Hood Canal	39	18	0.46
Dungeness spring	288	358	1.24
Elwha	187	216	1.16
Hoko	1,411	676	0.48
Total	26,929	25,187	0.94

2021 Limiting Stocks

LAT = Low Abundance Threshold

Below LAT

- Nooksack Spring
- Skagit Spring (Cascade)
- Skagit Summer/Fall
- Stillaguamish
- Snohomish
- Mid Hood Canal

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		32.5%	**10.5%**	4.4%
North/Middle Fork	< LAT			154			
South Fork	> LAT			310			
Skagit - Total	> LAT	10.3%	SUS	1,442	22.5%	**10.3%**	4.1%
Upper Sauk	> LAT			871			
Upper Cascade	< LAT			141			
Suiattle	> LAT			431			
White	> UMT	22.0%	SUS	2,281	21.3%	**16.6%**	4.5%
Dungeness	> LAT	10.0%	SUS	699	14.4%	**3.6%**	3.6%
Summer/Fall:							
Skagit - Total	< LAT	17.0%	SUS	8,837	38.9%	**17.0%**	4.0%
Upper Skagit	> LAT			6,587			
Sauk	> LAT			400			
Lower Skagit	> LAT			1,420			
Stillaguamish - Total	900-1200	22.0%	Total	990			
Unmarked ER		8.0%	UM SUS		**18.1%**	**7.4%**	4.3%
Marked ER		12.0%	M SUS		23.1%	**11.0%**	8.0%
Snohomish - Total		19.0%	Total	2,936	**16.7%**	**6.3%**	4.9%
Skykomish	< LAT	8.0%	SUS	1,876			
Snoqualmie				1,060			
Lake WA (Cedar R.)	> UMT	13.0%	PT-SUS	778	34.1%	23.6%	**11.5%**
Green	**> UB**	13.0%	PT-SUS	3,741	54.7%	44.1%	**11.5%**
				6,347			
Puyallup	> UMT	13.0%	PT-SUS	2,536	47.3%	36.8%	**11.5%**
				4,136			
Nisqually	> LAT	47%	Total	8,047	**47.7%**	41.4%	16.0%
Western Strait-Hoko	> UMT	10%	SUS	1,054	21.6%	**2.0%**	2.0%
Elwha	> LAT	10%	SUS	4,089	14.3%	**3.8%**	3.8%
Mid-Hood Canal	< LAT	TBD	PT-SUS	18	22.6%	14.4%	**12.1%**
Skokomish	> UMT	50%	Total	3,787	**49.2%**	41.0%	12.7%
				17,956			

Model Run: SLC-Chin3721_Final	**SRFI =**	**50.3%**	**(70% Ceiling)**
Run Date & Time: 04/16/21 12:03	**Lower Col Nat Tule ER =**	**38.0%**	**(38% Ceiling)**

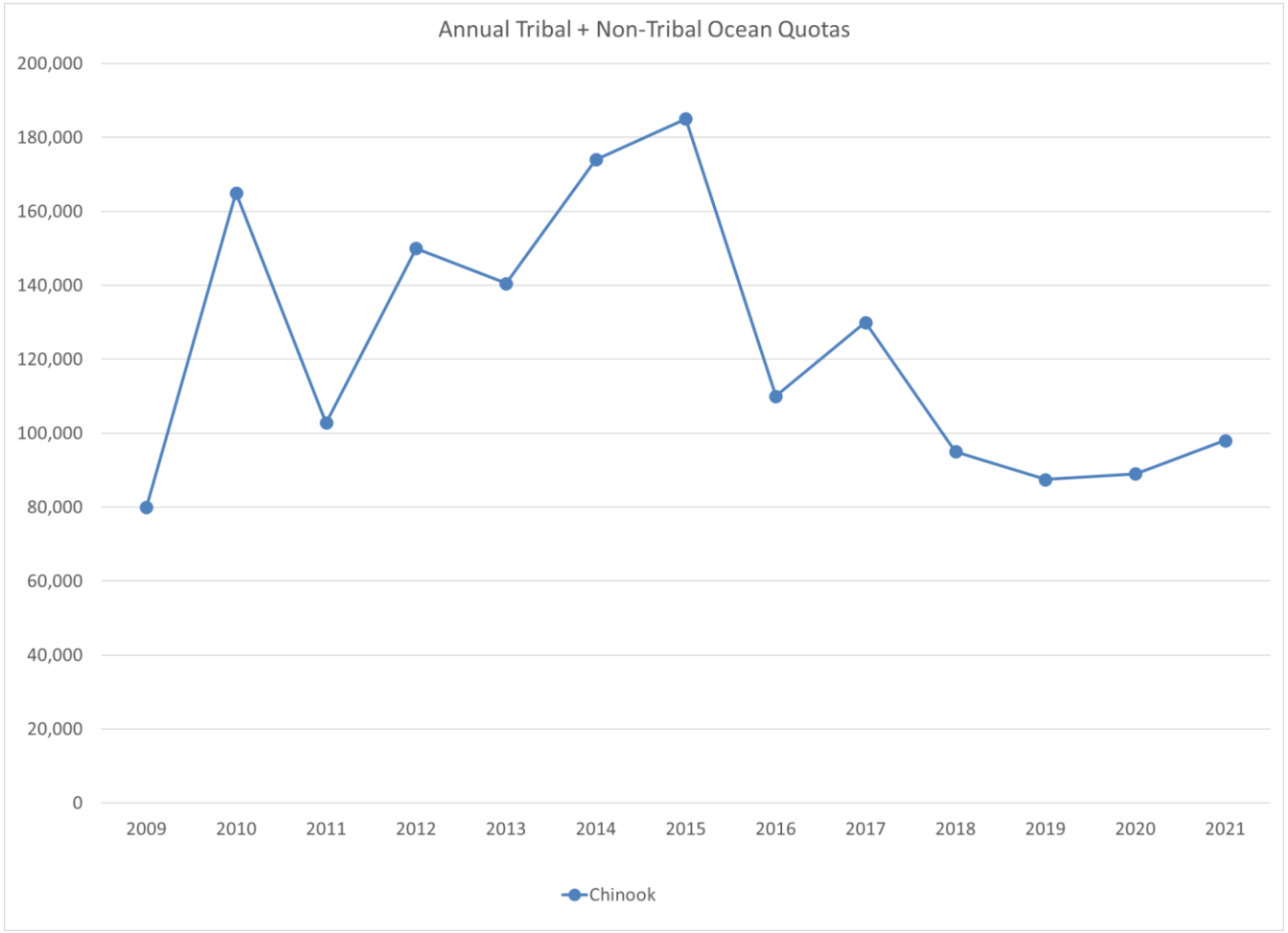
Chapter 3 ISBM Obligations for SUS stocks

Stock Region	Escapement Indicator Stock	Canadian ISBM CYER Limit	US ISBM CYER Limit	Management Objective
WA/OR/ID	Nooksack Spring (NSF)	87.5% avg 09-15	100% avg 09-15	TBD
	Skagit Spring (SKF)	87.5% avg 09-15	95% avg 09-15	690
	Skagit Summer/Fall (SSF)	87.5% avg 09-15	95% avg 09-15	9,202
	Stillaguamish (STL)	87.5% avg 09-16	100% avg 09-15	TBD
	Snohomish (SKY)	87.5% avg 09-17	100% avg 09-15	TBD
	Hoko (HOK)	NA	10% CYER	TBD
	Grays Harbor Fall (QUE adj)	NA	85% avg 09-15	13,326
	Queets Fall (QUE)	NA	85% avg 09-15	2,500
	Quillayute Fall (QUE adj)	NA	85% avg 09-15	3,000
	Hoh Fall (QUE adj)	NA	85% avg 09-15	1,200
	Upriver Brights (HAN, URB)	NA	85% avg 09-15	40,000
	Lewis (LRW)	NA	85% avg 09-15	5,700
	Coweeman (CWF)	NA	100% avg 09-15	TBD
	Mid-Columbia Summers (SUM)	NA	85% avg 09-15	12,143
	Nehalem (SRH adj)	NA	85% avg 09-15	6,989
	Siletz (SRH adj)	NA	85% avg 09-15	2,944
	Siuslaw (SRH adj)	NA	85% avg 09-15	12,925
	South Umpqua (ELK adj)	NA	85% avg 09-15	TBD
	Coquille (ELK adj)	NA	85% avg 09-15	TBD

2021 – PRESEASON OVERVIEW

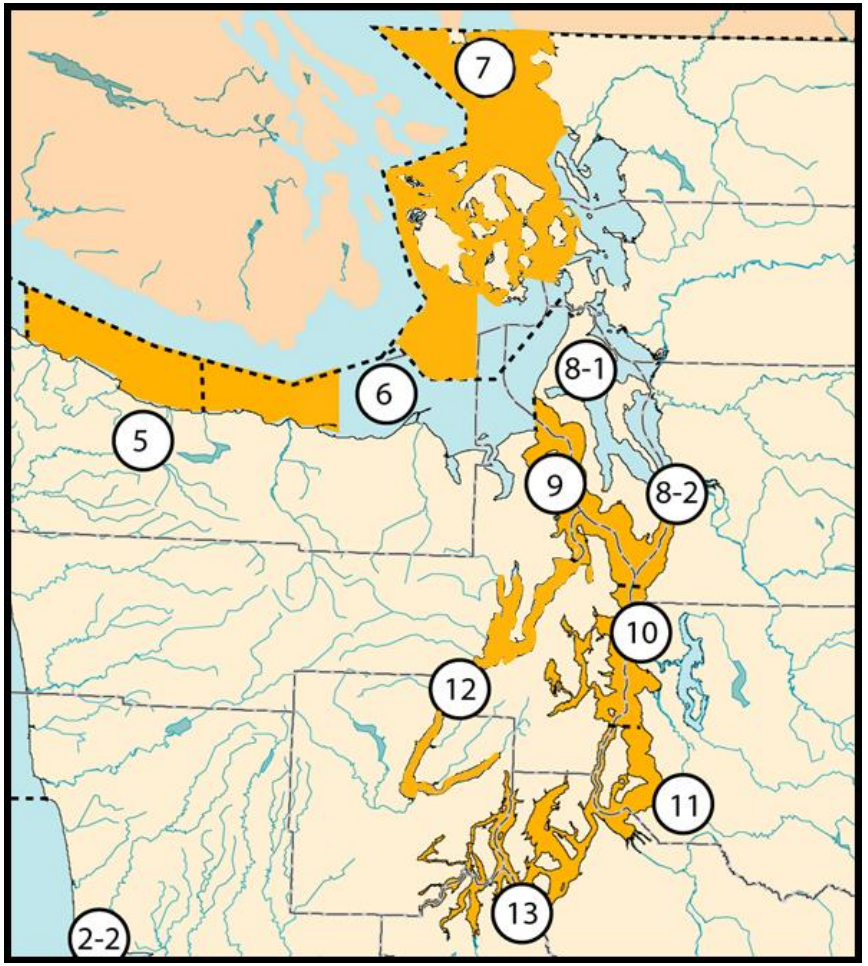
- Restrictive fishery measures in place due to Puget Sound stocks below their Low Abundance Thresholds
- Puget Sound Recreational Fishery
  - San Juan Sport
    - Planned to limit to one month MSF Chinook fishery in July, pink and coho fishery in August-September
  - Winter MSF recreational fisheries closed in most areas in PS
- Total (Tribal/Non-Tribal) Ocean Chinook quotas
  - Slightly higher in 2021 compared to 2020
  - 2020 = 89,000 and 2021 = 98,000

Washington Ocean Chinook Quotas



Examples of 2021 In-season Actions

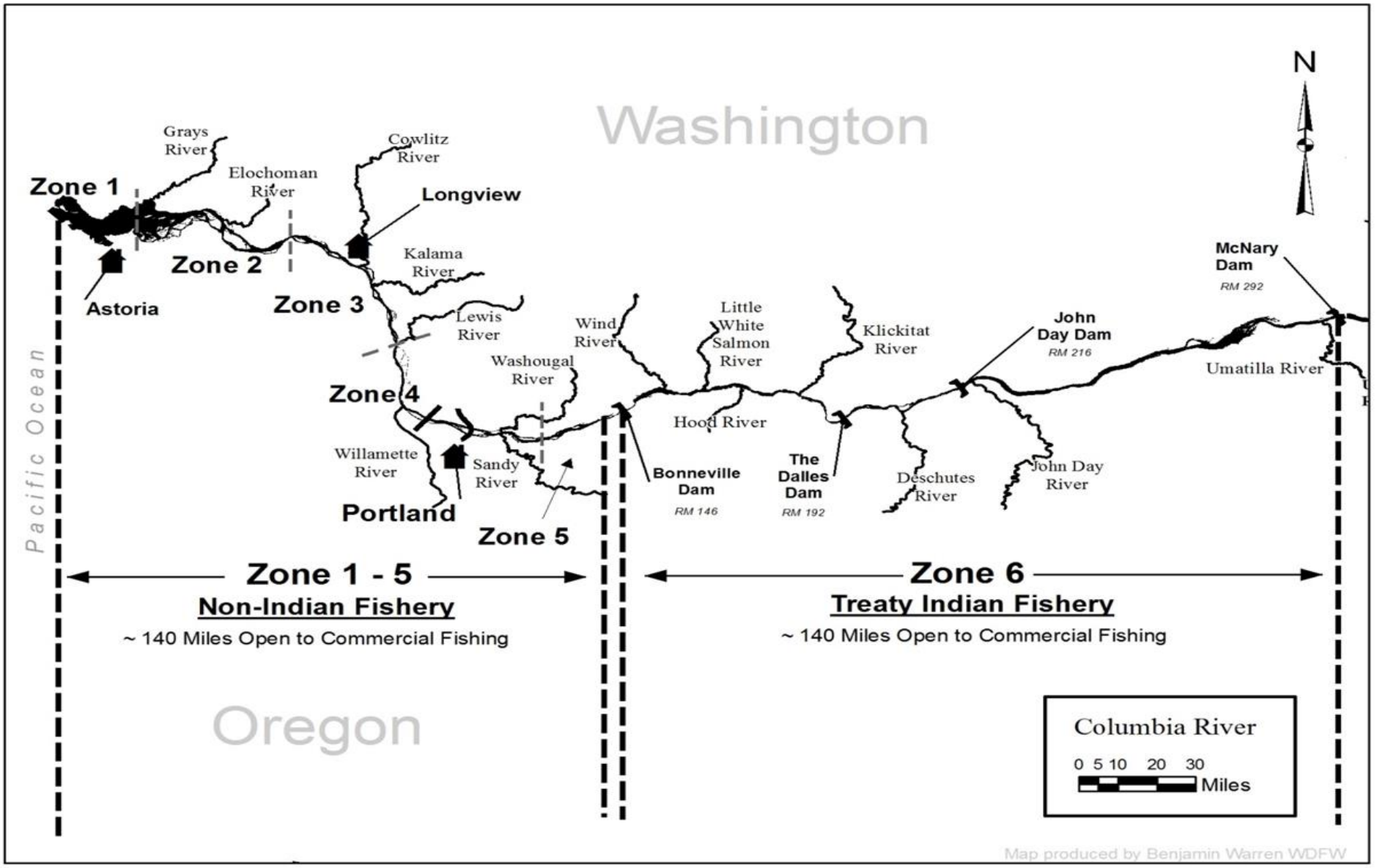
- Puget Sound Recreational:
  - Area 7 Summer MSF
    - Chinook retention planned July 1-31, Chinook release August 1-Sept 30
    - Based on in-season monitoring, area was closed to all salmon fishing beginning July 8.
  - Area 5 Summer MSF
    - Chinook retention planned July 1 through August 15, Chinook release August 16-September 30
    - Based on in-season monitoring, area was closed to Chinook retention beginning July 19



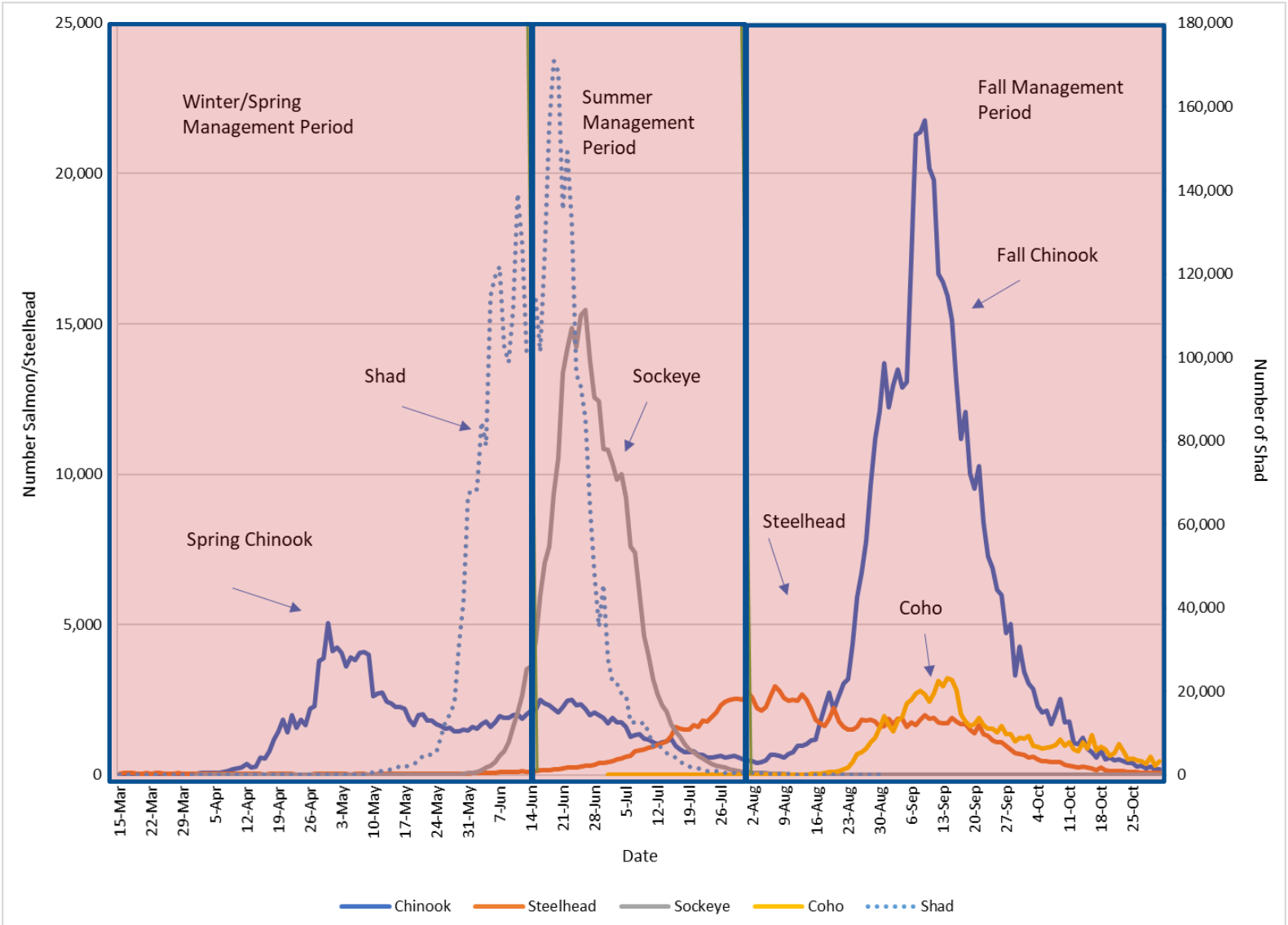
Examples of 2021 In-season Actions

- 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.

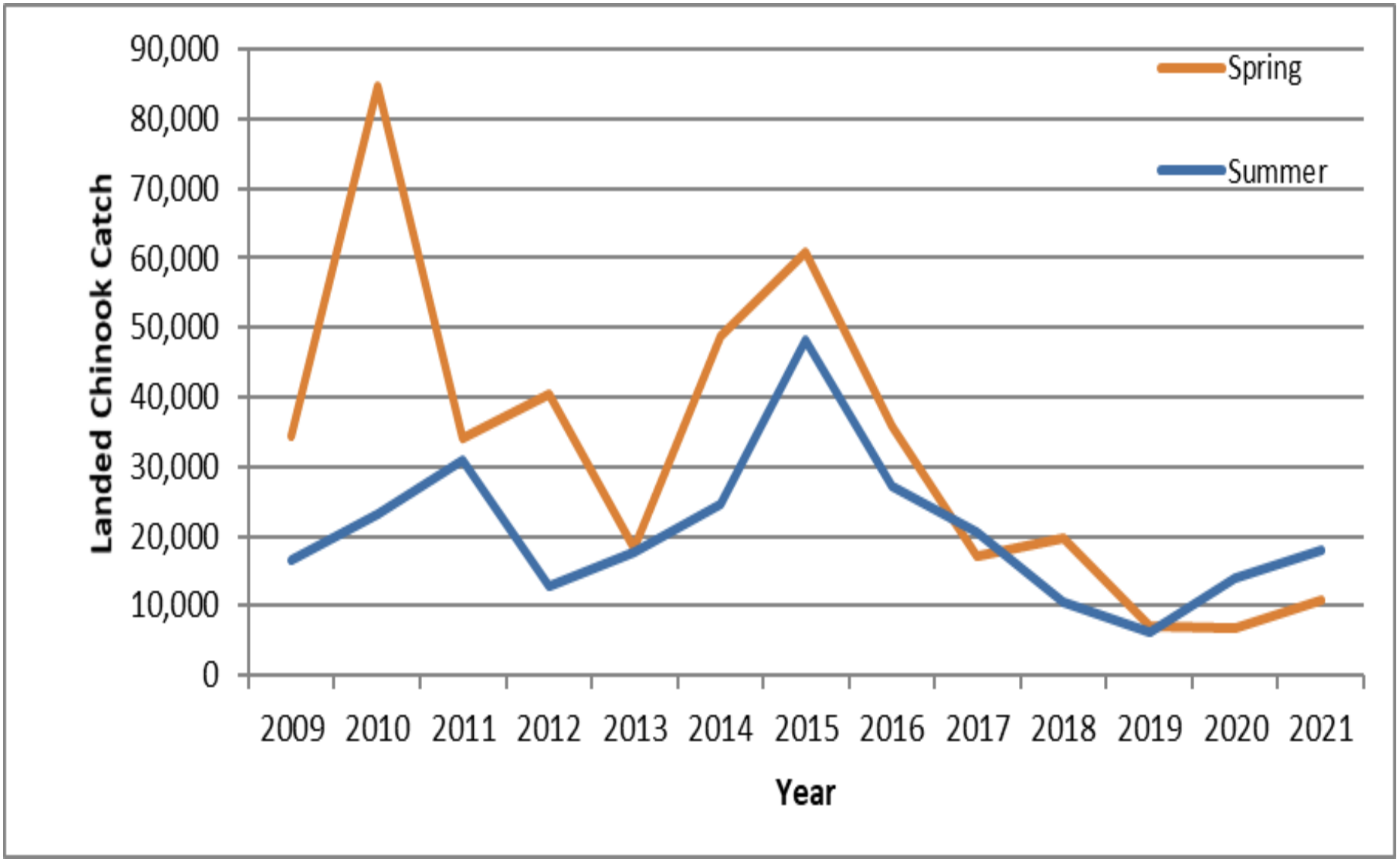
Columbia River Fisheries



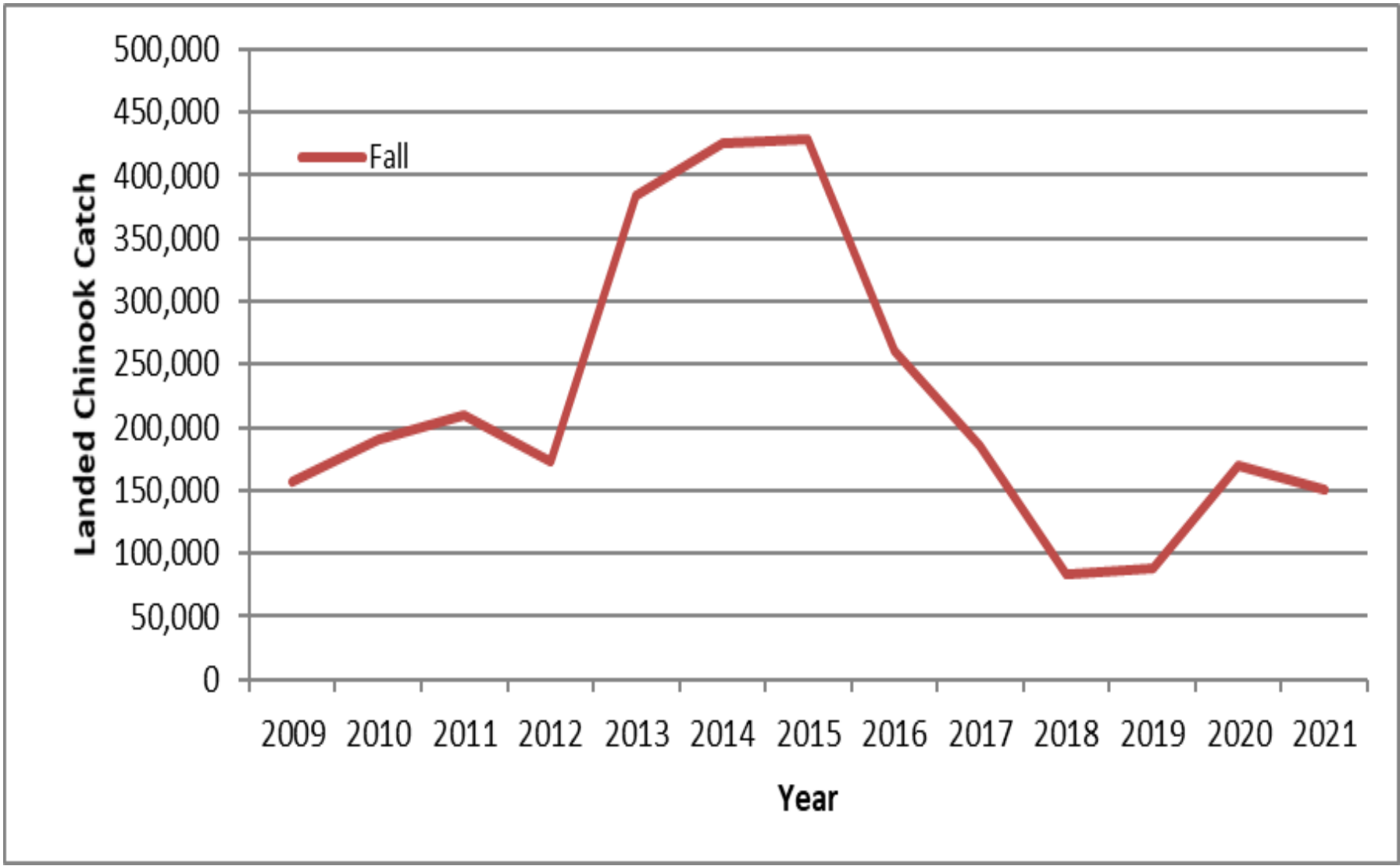
2012-2021 Ave Daily BON Counts



2009-21 Harvest: Spring & Summer Fisheries



2009-21 Harvest: Fall Fisheries



Conclusions

- SUS fisheries limited by conservation of weak stocks
- SUS fishery harvest has been relatively low across Ocean, Columbia River and Puget Sound since 2015
- 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

Chinook Interface Group Report to the Pacific Salmon Commission

2022 PSC Post-Season Meeting

The CIG met once during this week with a focus on seven agenda items. The following reports our work and recommendations for the Commission's consideration.

Commissioners in attendance: Phil Anderson, Andrew Thomson, Russ Jones, McCoy Oatman, John McCulloch, Doug Vincent-Lang

1) **Adoption of the Agenda:** No changes were made to the agenda.

2) **Phillips River Indicator Stock:** Commissioner Thomson reviewed the information provided on the Phillips River Chinook salmon stock. The hatchery producing the Phillips River Chinook achieved recovery goals and discontinued production with brood year 2019. The stock will no longer be available as a coded-wire tag (CWT) indicator stock but will continue to be monitored as an escapement indictor. There will be no impact to the PSC Chinook Model, as the Quinsam Chinook indicator stock can adequately replace the Phillips Chinook. Canada will continue to investigate alternative stocks to replace Phillips and that better represent the large rivers of the mainland inlets. . Dr. Antonio Velez-Espino (DFO) clarified that Phillips will still be included as part of the Upper Georgia Strait model stocks as an escapement indicator. He also noted that there is no management objective for Phillips. Any new stock identified would need to be fully developed before recommending as an addition in Attachment I. Commissioner Riddell added that when Phillips was selected as a CWT indicator, it was anticipated as a good indicator for mainland inlet populations but subsequent information demonstrated that it was very similar to Quinsam, and not representative of the larger mainland inlet rivers. He noted that Quinsam has long term data available for assessing CYER, it would take several years to develop any new indicator stock. Dropping Phillips as a CWT indicator will not impact the PSC Model Calibration, additionally, dropping Phillips from Attachment I will not impact CYER analyses for other stocks. The timeline for providing an alternative indicator is unknown, however work continues on this.

    - CIG recommends discontinuing the Phillips CWT indicator stock currently identified in Attachment I to Chapter 3. Canada is exploring options for an alternate indicator for mainland inlet stocks and will communicate back with CIG when a stock is proposed for consideration by the Parties. The CIG will discuss how to report this change in Chapter 3 at the February Annual meeting.

3) **Incidental Mortality Data Standards Assignment Update:** Mr. John Carlile (ADF&G) provided an update on the Incidental Mortality Work Group's (IMWG) progress. The IMWG intends to publish a report by January 31, 2022 reviewing fishery specific catch (kept and released) estimates and associated uncertainty (coefficient of variation). The fisheries were ranked on relative size and uncertainty. The Treaty called for the

development of precision and accuracy standards which is not included in the report, but it does outline data and methods that currently exists. More extensive work would be required to develop data standards and could require changes to sampling and monitoring programs. Dr. Velez-Espino noted that developing and applying data standards across all fisheries requires information and resources that the IMWG has not considered. He noted that the PSC Chinook Model includes deterministic IM rates, and therefore cannot accommodate uncertainty. Commissioner Riddell suggested focusing effort on a subset of fisheries where the most mortality is occurring. He noted that during the 2018 Treaty negotiations, limiting IM was incorporated into the Chapter and requires annual accounting. Commissioner Vincent-Lang stated that IM standards would require a lot of additional work and the CIG would need to evaluate the cost/benefit of doing further work in this area. Commissioner Vincent-Lang inquired about the sensitivity of the Model to changes in IM rates and Mr. Carlile noted that it's fishery dependent.

- CIG recommends reviewing the CTC's Incidental Mortality Work Group's Catch Estimates report when published at the end of January.

4) **COVID-19 Impacts on Chapter 3 Implementation:** Mr. Jon Carey (NOAA Fisheries) reviewed the impacts of COVID-19 on Chinook monitoring, sampling, and tagging efforts in 2020 and 2021. There were no changes to 2020 reported activities as reported in October 2020. In 2021, similar issues occurred but were much more limited. The CTC is focused on addressing missing brood years from 2020 tagging gaps, which will show up in this year's analyses as age-2 fish. Dr. Velez-Espino noted that all of the issues identified for 2021 were handled by agencies, will not require significant analytical work done by the CTC, and that the CTC is proceeding forward with the exploitation rate analysis and model calibration. Mr. Carey further noted that staffing challenges at field projects were noted by many agencies as a problem and put additional work load on existing staff. Commissioner Vincent-Lang asked about the determination for each category (no issues, some issues, significant issues). Dr. Velez-Espino noted that information was provided by agencies and Mr. Carey added that the categorical determination was left up to the CTC members from that region. Mr. Carey also noted that the CTC is working to address items labeled as significant issues (all in 2020) and how the issues will manifest in the ERA.

5) **Calendar Year Exploitation Rate Working Group Recommendation Action Plan:** Dr. Rob Houtman (DFO) provided a status update on the Technical Report 46 recommendation to improve or replace proxy methods in 7 Canadian sport fisheries and 3 net fisheries in chapter 3 of the report. Canada plans to expand creel surveys for marine sport fisheries and transition iREC (Internet Recreational Effort and Catch Reporting Program) when creel surveys are unavailable. Canada is working on improvements to monitoring in the identified Food, Social, and Ceremonial net fisheries. Commissioner Vincent-Lang inquired about how Canada collects heads for CWTs. Dr. Houtman explained that head submission in the recreational fishery is through a voluntary program with head "depots" at landing sites throughout the province. Recoveries are expanded

based on submission rate of heads, which occurs through direct sampling or proxy methods. Recoveries are stratified by creel areas which are a finer scale than larger management areas (i.e. North Coast). Commissioner Vincent-Lang asked about the commercial fisheries buy-backs associated with PSSI and whether future commercial fisheries data will affect data sets in the CTC model. Commissioner Thomson noted that the license retirement aspect of the PSSI is still in development, and that the PSSI is not solely focused on Chinook but on all salmon species and any PST implications will be part of Canada's considerations. Mr. Jim Scott (WDFW) reviewed recommendations on terminal area adjustments as presented in Technical Report 46 chapter 4. The CTC has implemented or is planning to implement recommendations for analysis and documentation. Mr. Scott also touched on chapter 5 of the report regarding fisheries where CWT stocks are not recovered but are caught. Recommendation 5.1.2 encourages management entities to provide estimates of CWT recovery, either directly or through proxy methods. Both Parties are evaluating the recommendations in Technical Report 46 and evaluating options for implementation. The U.S. has distributed a request for proposals to address the recommendations. Commissioner Anderson asked about communication between the CYER WG and management entities. Mr. Scott suggested that the Commission may wish to consider sending a letter to management entities summarizing the recommendations, inquiring about implementation plans and if funding is needed to implement the recommendations. Commissioner Vincent-Lang inquired about the timeline for functional CYERs. Mr. Scott noted that with the interplay of the CYER WG and CTC's schedules, CYERs are expected to be included in a full ISBM evaluation for the 2023 ERA which would account for the MSF algorithms to be included. Mr. Carlile confirmed Mr. Scott's timeline.

6) **Chinook Interface Group Forward Agenda:** Commissioner Anderson noted that the U.S. section sees value in developing a forward-looking agenda. Commissioner Thomson agreed it is useful for planning.

    - CIG recommends sending forward-looking agenda items to Jessica Gill for development of a forward-looking agenda and finalizing during a discussion at the February Annual meeting.

7) **CWTR/CEII Work Group Update:** Mr. Tommy Garrison (CRIFTC) provided an update on the Coded-Wire Tag and Recovery/Catch and Escapement Indicator Improvement (CWTR/CEII) Work Group. The group met for the first time bilaterally on January 11, 2022 to discuss a work plan. The WG intends to send a work plan to the CIG for approval at the February 2022 Annual meeting. The US provided initial funding for the 2021-2022 funding cycle and three U.S. projects were funded. The 2022-2023 request for proposals is focused on recommendations from the CYER WG's Technical Report 46. Mr. Aaron Foos noted that no funds have directly been assigned to the Canadian portion of the work group yet. However projects that will be discussed within the WG will be funded using existing Canadian funding. As a first step Canada intends to prepare an

initial domestic “state of knowledge” document to identify data gaps and develop a plan to address the commitments and bring projects forward for bilateral discussion.

8) **CTC Canadian Alternate Position:** Commissioner Thomson introduced Ms. Laura Tessier (DFO) as an alternate Canadian CTC co-chair to provide additional support to the CTC.

SUMMARY OF RECOMMENDATIONS:

1) CIG recommends discontinuing the Phillips CWT indicator stock currently identified in Attachment I to Chapter 3. Canada is exploring options for an alternate indicator for mainland inlet stocks and will communicate back with CIG when a stock is proposed for consideration by the Parties. The CIG will discuss how to report this change in Chapter 3 at the February Annual meeting.
2) CIG recommends reviewing the CTC’s Incidental Mortality Work Group’s Catch Estimates report when published at the end of January.
3) CIG recommends sending forward-looking agenda items to Jessica Gill for development of a forward-looking agenda and finalizing during a discussion at the February Annual meeting.

Update from the Management Entities Work Group

Prepared for the PSC Post-Season Meeting

January 2022

Background

The Commission formed the Management Entities Work Group (MEWG) in January 2021 to build on the successes of the February 2019 meeting with domestic agency officials and other key representatives. In February 2021, the Commission directed the group to explore options for engaging management entities and make recommendations to the Commission in October 2021.

At the October 2021 Fall Meeting the MEWG reported:

- It needed more time to assess COVID implications for future management entities meetings, and to assess the best format for those meetings.
- It could be useful to host a series of "focus groups" or workshops on particular topics that affect the PSC and management entities.
- The MEWG would revisit these issues and report more fully in January 2022.

The Commission directed the MEWG to pursue its work and report in January 2022. This report responds to that directive.

Considerations

The MEWG[1] met on December 10, 2021 and discussed mutually agreeable goals. It was noted that uncertainty over the COVID pandemic complicates plans for future meetings with management entities, where in-person events are preferable. In addition, there are several emerging issues of interest to the PSC and management entities and it will take considerable time to plan agendas. These issues include:

- Predation on juvenile and adult salmon
- Mark-Selective Fisheries
- Tracking salmon migrations
- Invasive species
- Declines in productivity/changing population dynamics
- Orientation and succession planning for PSC delegates

The MEWG continues to believe that hosting focus groups or roundtable discussions on these topics is appropriate, likely once or twice a year in the long term. However, planning for events should be paused while public health orders evolve and while the MEWG assesses priorities for the Commission to consider. There may also be synergies to consider with the seminar series currently underway by the Southern Panel for 2022.

Next steps

[1] Canada: Dean Allan and Neil Davis; USA: Phil Anderson, Bill Templin, Jim Scott. Assisted by the Executive Secretary.

- The MEWG perceives the Commission will be better placed in 2023 to predict and execute in-person meetings with management entities on topics of mutual concern.
- The MEWG proposes pausing planning efforts for the next 8-10 months, during which time the group can prioritize topics, monitor public health orders, and recommend a course of action to the Commission.
- The MEWG will be prepared to report back to the Commission no later than January 2023 with a status update.