Fisheries and Oceans Pêches et Océans

MEMORANDUM NOTE DE SERVICE

To
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First Nations Chiefs, Councillors and Fisheries Representatives;
Sport Fishing Advisory Board;
Commercial Salmon Advisory Board;
Marine Conservation Caucus

From
De

Pacific Region
Fisheries and Oceans Canada

Security Classification - Classification de sécurité
UNCLASSIFIED
Our file - Notre référence
Your File - Votre référence
Date
2024-01-26

Subject
Object

2023 Area G Springtime Inshore Demonstration Chinook Fishery Review

1. Introduction

The 2023–2024 Southern Salmon Integrated Fishery Management Plan (IFMP) indicated that the results of the 2023 Area G Springtime Inshore Demonstration Fishery would be considered in planning for the 2024 fishery. This memo provides some background and summarizes the key results from the 2023 demonstration fishery.

2. Background

Canada manages the Area G troll West Coast of Vancouver Island (WCVI) Aggregate Abundance-Based Management (AABM) Chinook fishery in compliance with Chapter 3 of the Pacific Salmon Treaty. Canada also manages the Area G Chinook troll fishery to minimize impacts on domestic Chinook stocks of concern. From 2009 to 2018, the Area G Chinook fishery management regime included three different seasons (Springtime, Summer, and Winter) each with their own management measures and a predetermined proportion of the annual total allowable catch (TAC). The springtime fishery season was limited to 20% of the annual TAC and included time, area, and effort restrictions to limit impacts on Fraser Chinook stocks of concern (Table 1).

Table 1. Springtime Area G troll management measures from 2009–2018.

MARCH 16 TO APRIL 19	**CLOSED**			
APRIL 20 TO JUNE 15	**Full fleet**			40%
April		max 250 boat days	Starting Apr 20	NWVI open only (23 to 27, 125 to 127)
May		max 1000 boat days	Starting May 2 - 124 open Starting May 7 - partial 123 Starting May 15 - full 123	NWVI open partial openings SWVI until May 15
June		max 650 boat days		All areas open
JUNE 16 TO JULY 31	**CLOSED**			

In the springtime fishery, catch and effort were predominately concentrated in areas offshore from northwest Vancouver Island (NWVI); much lower efforts and harvest occurred in areas of southwest Vancouver Island (SWVI) and in inshore areas along the West Coast of Vancouver Island (WCVI). The compositions of Chinook stocks in the springtime fishery catches were monitored each year by collecting coded-wire tag samples, which were accompanied in some years by tissue samples for genetic analysis.

In 2019, Canada introduced new restrictions to commercial, recreational, and First Nation fisheries throughout Southern BC to further reduce catches of Fraser Chinook stocks of concern. One of these measures was the closure of Area G's springtime fishery, which remained closed until 2023.

3. 2023 Springtime Demonstration Fishery Plan

In 2022, the Area G Harvest Committee proposed a springtime demonstration Chinook fishery in the inshore Pacific Fishery Management Areas (PFMAs) 23–27 (Figure 1) with the intention to demonstrate that Fraser Chinook stocks of concern could be largely avoided during April and May. The demonstration fishery, which included a limited TAC of 3000 Chinook and a thorough stock composition sampling program, was approved in the 2022/2023 Southern Salmon IFPM.

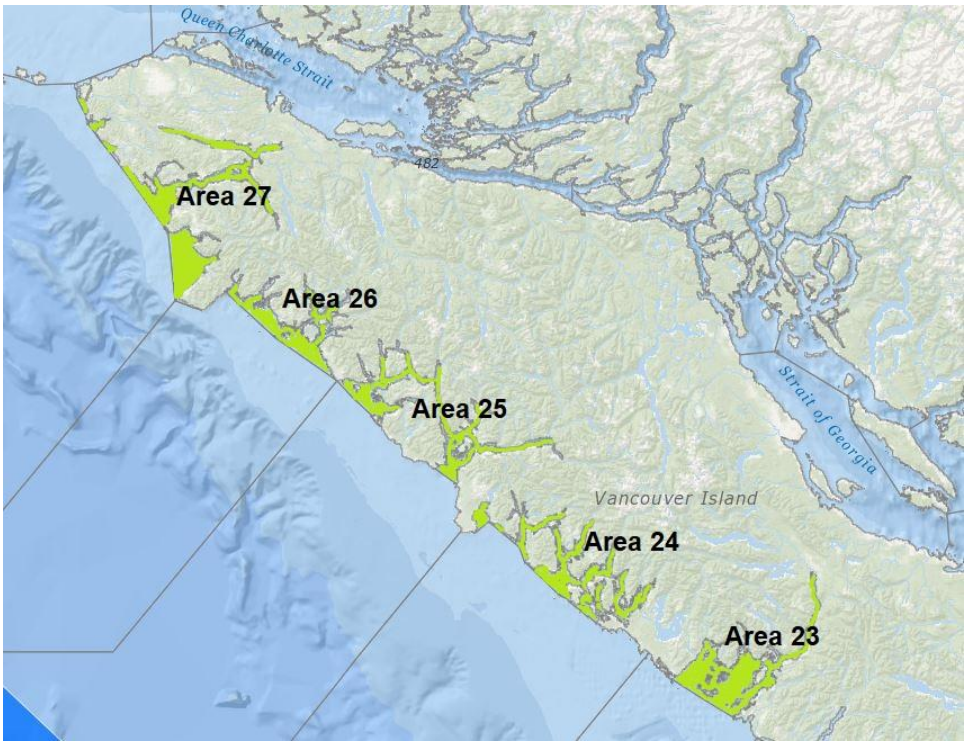

Figure 1. Inshore fishing areas for the 2023 Area G springtime demonstration fishery.

4. 2023 Demonstration Fishery Results

The 2023 springtime demonstration fishery was open from April 5 to May 31. Total fishing effort was 112 vessel-days. Effort occurred only in PFMAs 23 and 27 (Table 2, Figure 2). Most (86%) of the effort occurred in PFMA 23 and the effort in PFMA 27 only occurred in May. Ten different vessels participated in the demonstration fishery. Tissue and coded-wire tag (CWT) samples were collected from catches landed at designed landing sites. Only results from genetic analysis of the tissue samples are presented in this memo.

Table 2. Effort counts (number of vessel-days) by week and PFMA in the 2023 Area G springtime demonstration fishery.

Statistical week	Fishing start date	Fishing end date	PFMA 23	PFMA 24	PFMA 25	PFMA 26	PFMA 27	Total
04/1	5-Apr	8-Apr	4	0	0	0	0	**4**
04/2	9-Apr	15-Apr	4	0	0	0	0	**4**
04/3	16-Apr	22-Apr	3	0	0	0	0	**3**
04/4	23-Apr	29-Apr	19	0	0	0	0	**19**
04/5	30-Apr	6-May	19	0	0	0	0	**19**
05/1	7-May	13-May	18	0	0	0	6	**24**
05/2	14-May	20-May	11	0	0	0	5	**16**
05/3	21-May	27-May	9	0	0	0	3	**12**
05/4	28-May	31-May	9	0	0	0	2	**11**
Total	**5-Apr**	**31-May**	**96**	**0**	**0**	**0**	**16**	**112**

The total Chinook kept catch for the springtime demonstration fishery was 1363 pieces, with the majority (67%) coming from PFMA 23; however, catches-per-unit-effort (CPUEs) in PFMA 27 were higher (Table 3, Figure 2).

Table 3. Total Chinook kept catch by week and PFMA in the 2023 Area G springtime demonstration fishery.

Statistical week	Fishing start date	Fishing end date	PFMA 23	PFMA 24	PFMA 25	PFMA 26	PFMA 27	Total
04/1	5-Apr	8-Apr	5	0	0	0	0	**5**
04/2	9-Apr	15-Apr	42	0	0	0	0	**42**
04/3	16-Apr	22-Apr	7	0	0	0	0	**7**
04/4	23-Apr	29-Apr	223	0	0	0	0	**223**
04/5	30-Apr	6-May	272	0	0	0	0	**272**
05/1	7-May	13-May	165	0	0	0	130	**295**
05/2	14-May	20-May	33	0	0	0	157	**190**
05/3	21-May	27-May	83	0	0	0	77	**160**
05/4	28-May	31-May	88	0	0	0	81	**169**
Total	**5-Apr**	**31-May**	**918**	**0**	**0**	**0**	**445**	**1363**

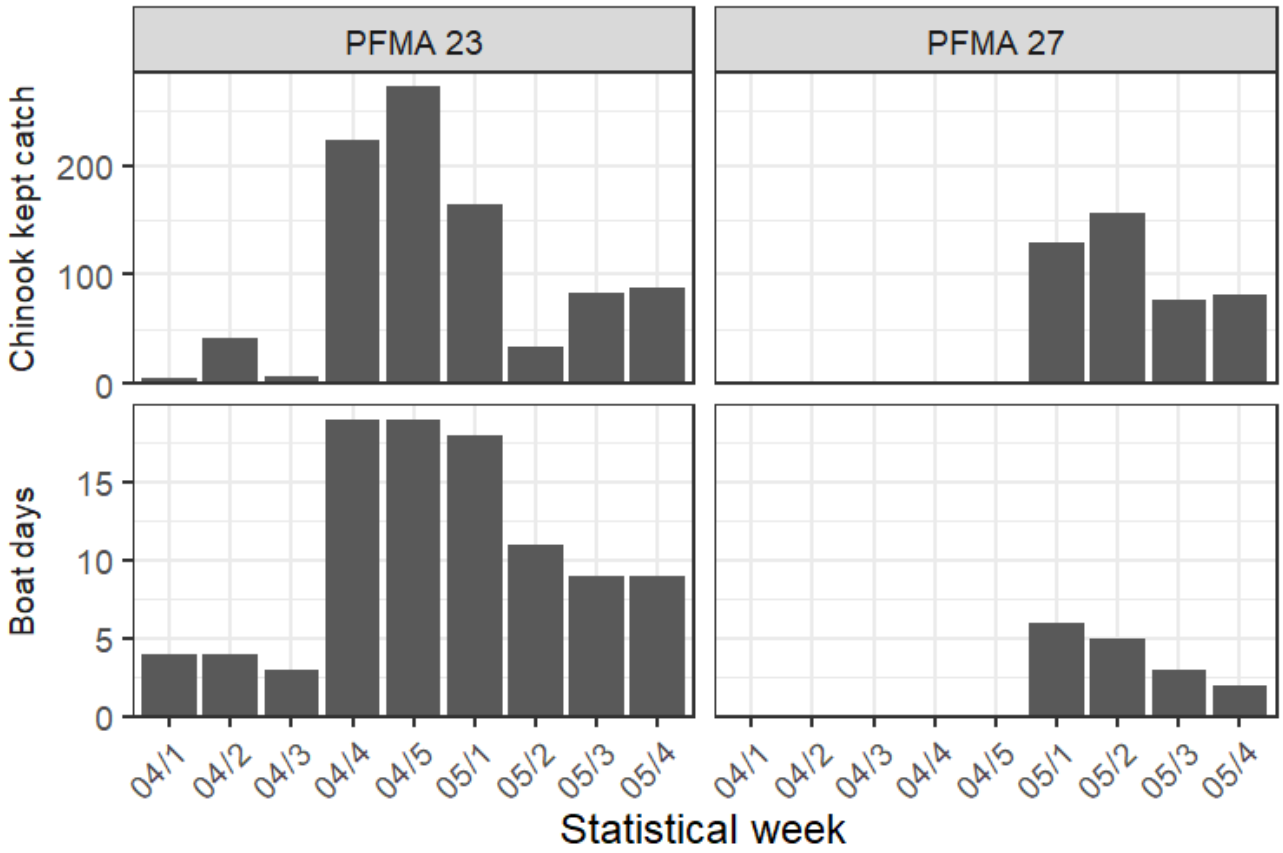

Figure 2. Summary of kept Chinook catch and effort in the 2023 Area G springtime demonstration fishery. Grey bars show counts by statistical week—statistical week 04/1 spans from April 2 to April 8, with the following weeks corresponding to each 7-day period thereafter.

A total of 600 tissue samples were collected from the demonstration fishery, with a 42% sample rate for Chinook landed in NWVI (caught in PFMA 27) and a 45% sample rate for Chinook landed in SWVI (caught in PFMA 23). Total Chinook catches by Stock Management Unit (SMU) were estimated from genetic analysis of these samples. The majority (79%) of the Chinook landed were American stocks (Table 4). The largest Canadian stock component was WCVI (16%), followed by the Fraser Summer 4_1 SMU (3.1%). Among the Fraser Chinook stocks of concern, a total catch of two (0.1%) Fraser Spring 4_2 Chinook was estimated and only traces of Fraser Summer 5_2 Chinook were detected (estimated catch < 1 individual).

Table 4. Estimated Chinook catches (with percentages of column totals in parentheses) based on genetic results stratified by landing site (NWVI or SWVI) and SMU. All values other than 0 have been rounded to the nearest integer; trace detections with estimated catches in (0,1) are listed as "< 1."

SMU	NWVI	SWVI	Total
Fraser Summer 4_1	36 (8%)	0 (0%)	36 (3%)
Lower Columbia	98 (22%)	412 (45%)	510 (37%)
WCVI	171 (38%)	45 (5%)	216 (16%)
Puget Sound	23 (5%)	361 (39%)	384 (28%)
Washington & Oregon	7 (2%)	5 (1%)	12 (1%)
Upper Columbia/Snake	108 (24%)	65 (7%)	173 (13%)
Strait of Georgia	<1 (0%)	10 (1%)	10 (1%)
Fraser Fall	<1 (0%)	14 (1%)	14 (1%)
Northern BC	3 (1%)	2 (0%)	5 (0%)
Fraser Spring 4_2	<1 (0%)	2 (0%)	2 (0%)
Alaska	<1 (0%)	0 (0%)	<1 (0%)
Fraser Summer 5_2	<1 (0%)	0 (0%)	<1 (0%)
California	<1 (0%)	0 (0%)	<1 (0%)

Stock compositions differed between fish landed in NWVI versus SWVI. A higher proportion of American Chinook stocks (92% vs 53%) and a lower proportion of WCVI stocks (5% vs 38%) were observed in SWVI-landed catches. Fraser Summer 4_1 Chinook were less prevalent in SWVI (0% vs 8%). These stock composition differences could be partly attributed to the temporal differences between SWVI and NWVI—all the NWVI catches occurred in May while only 70% of the SWVI catches occurred in May. Figure 3 shows the estimated bi-weekly Chinook catches by stock and area.

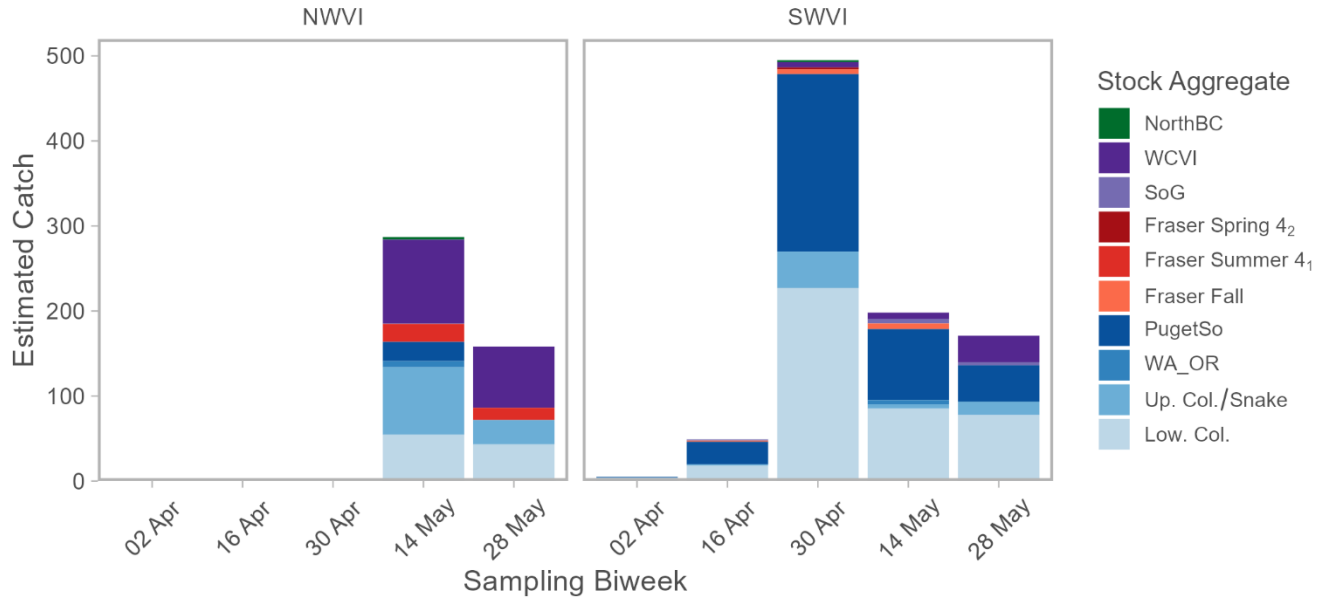

Figure 3. Estimated bi-weekly catch compositions for NWVI and SWVI. Dates along the x-axis show midpoints of the bi-weekly bins. *Note.*—traces of Fraser Summer 5_2 and Alaskan stock aggregates were detected in the genetic analysis but are not plotted because the estimated catches were < 1 individual.

Catches from the WCVI SMU were further partitioned to river-based assignments using Parental-Based Tagging (PBT) or Genetic Stock Identification (GSI). Over 90% of WCVI hatchery-origin Chinook have the necessary baseline data for identification via PBT and stock identifications based on PBT are considered to be 100% accurate for analytical purposes. A total of 29 samples were identified as originating from WCVI hatcheries using PBT. In the genetic analysis, all samples were first screened for PBT; if no parental match was detected, samples were run against the GSI baseline, which has high accuracy when assigning samples to Conservation Units but has moderate-to-poor accuracy when assigning samples to individual rivers. The vast majority of WCVI Chinook estimated in the springtime demonstration fishery catch were assigned to production hatchery stocks—Conuma and Robertson Creek (Figure 4). However, approximately20 Chinook (not including trace detections) from the WCVI Wild Chinook stock of concern were estimated in the Area G catch (Appendix 2).

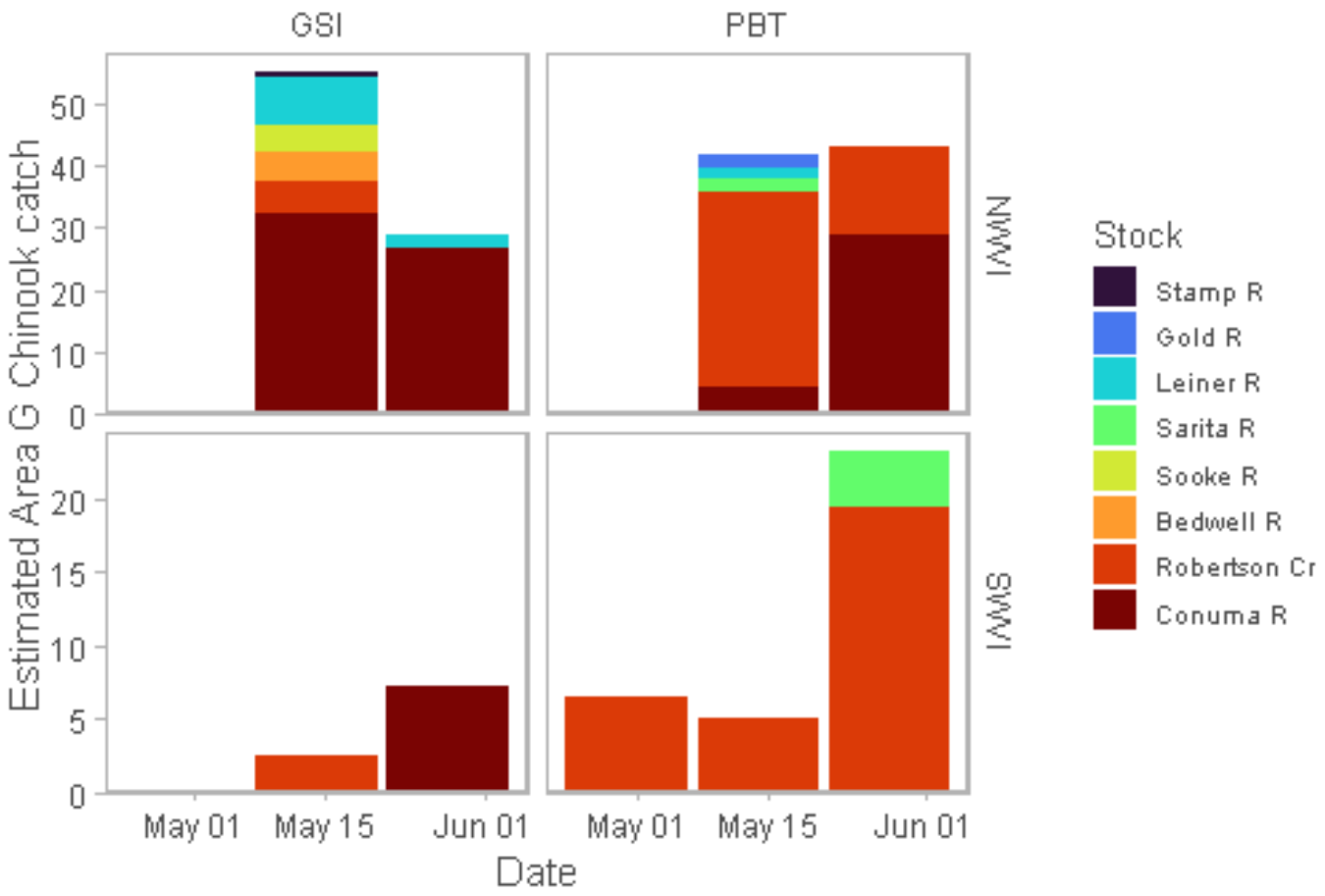

Figure 4. Estimated catches of WCVI stocks in Area G springtime fisheries. Assignments were made using either parentage-based tagging ("PBT"), which can be considered accurate to individual rivers, or genetic stock identification ("GSI"), which is considerably less accurate for assignment to individual rivers. Trace detections have been removed.

5. Comparison to previous years' Area G springtime fisheries with offshore areas open

Stock composition data are also available from Area G springtime fisheries that occurred from 2007–2015. During these years, offshore areas of the WCVI were open for fishing and most catch and effort occurred in offshore areas. There are no inshore NWVI samples from 2007–2015 to compare to the 2023 results (Figure 5); however, there are inshore SWVI samples from 2007–2015 that have been compared directly to the 2023 results (Figure 6). The high proportion of WCVI stocks in the 2023 NWVI catches is notable (Figure 5). Returns of hatchery WCVI Chinook in 2023, particularly from Robertson Creek, were among the highest in recent decades, which likely contributed to this higher than expected prevalence of WCVI Chinook in the NWVI catch. Other Canadian stock proportions in 2023 inshore waters were similar to those in offshore waters in previous years, with Fraser stocks of concern remaining quite low. For American stocks, the Upper Columbia River/Snake River stock was somewhat less prevalent and the Lower Columbia River stock was somewhat more prevalent in 2023 in inshore waters compared to offshore waters in previous years (Figure 5).

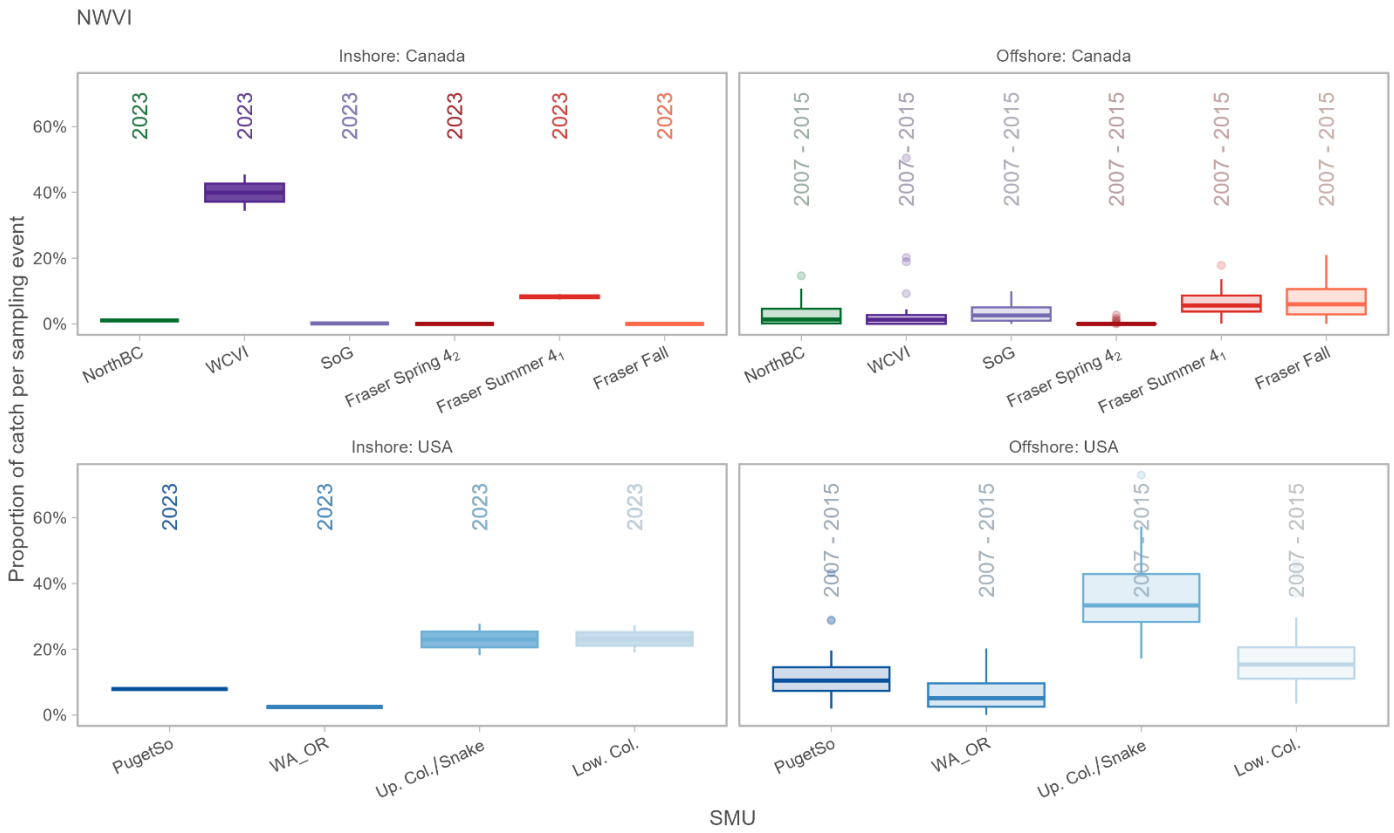

Figure 5. SMU compositions in historical (2007–2015) and 2023 Area G springtime Chinook catches from inshore and offshore areas of NWVI. Each datum corresponds to the SMU composition in one bi-weekly period in one year. Text annotations on each panel indicate the dataset (historical versus 2023) summarized by each boxplot. Boxplots show the median (solid horizontal line), 75% quantiles (box area), 95% quantiles (whiskers), and outliers (points) of the data for each SMU.

In the SWVI springtime fishery, low proportions of Canadian stocks estimated in the 2023 catch were consistent with results from samples collected during 2007–2015 (Figure 6). Similar to what was observed in the NWVI, the Lower Columbia stock was more prevalent in 2023 SWVI catches compared to historical SWVI catches.

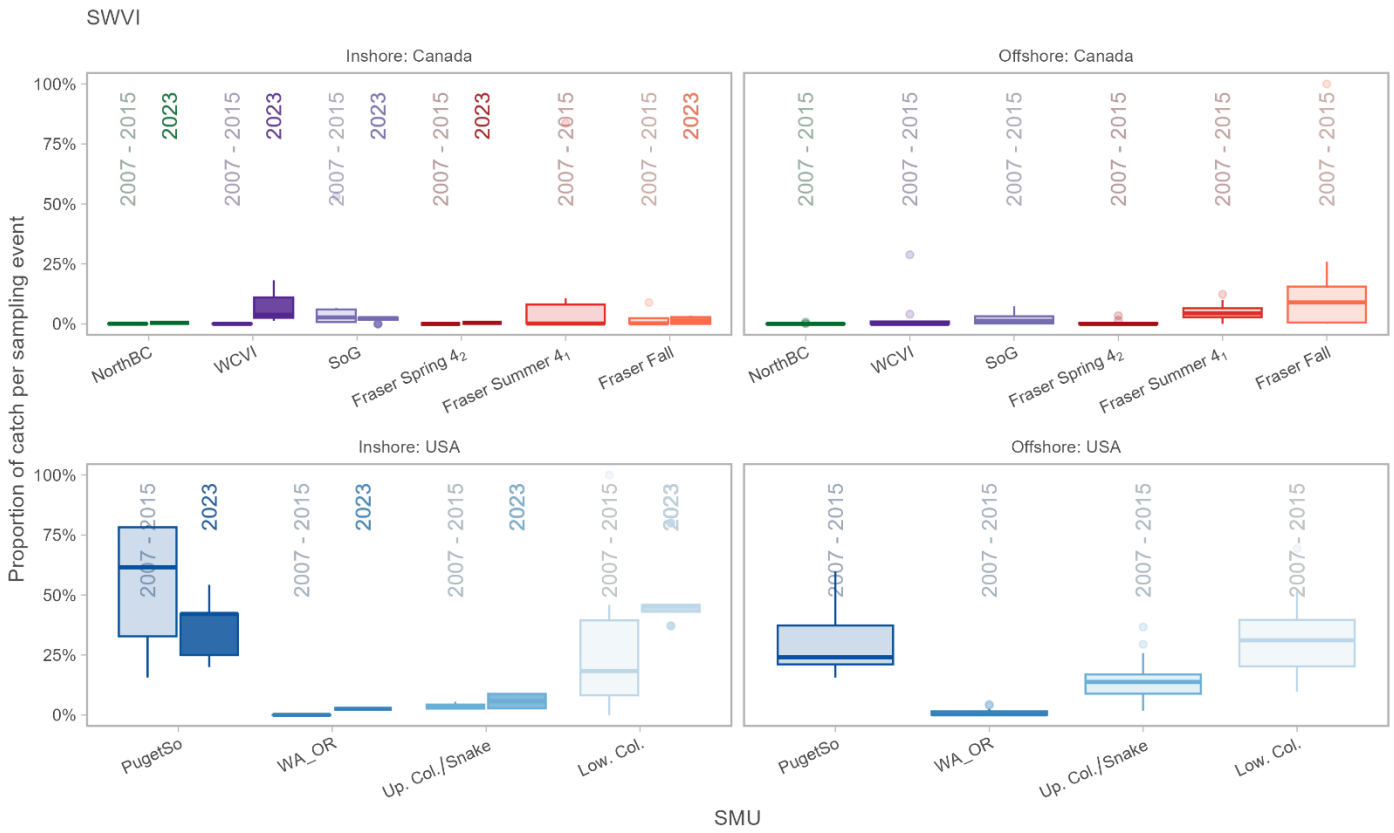

Figure 6. SMU compositions in historical (2007–2015) and 2023 Area G springtime Chinook catches from inshore and offshore areas of SWVI. Each datum corresponds to the SMU composition in one bi-weekly period in one year. Text annotations on each panel indicate the dataset (historical versus 2023) summarized by each boxplot. Boxplots show the median (solid horizontal line), 75% quantiles (box area), 95% quantiles (whiskers), and outliers (points) of the data for each SMU.

Overall, the presence of stocks of concern in the 2023 Area G springtime demonstration fishery was low—possibly lower than in previous years, but the lack of inshore NWVI samples in historical data confounded our ability to distinguish inter-annual from area-related differences. It is possible that fishing inshore rather than offshore NWVI areas reduced interceptions of Fraser Chinook stocks of concern, but it is also possible that these stocks were less abundant or migrated more predominately through Johnstone Strait in 2023 compared to previous years.

Appendix 1. Estimated Chinook catches based on genetic analysis of samples stratified by fishing area (NWVI vs SWVI), SMU, and 2-week period in the 2023 springtime Area G demo fishery. All values other than 0 have been rounded to the nearest integer; trace detections with estimated catches in (0, 1) are listed as "< 1."

Landing site	SMU	25 Mar–8 Apr	8–22 Apr	22 Apr–6 May	6–20 May	20 May–3 Jun	Total
NWVI	Fraser Summer 4_1	0	0	0	21	14	**36**
NWVI	Low. Col.	0	0	0	54	43	**98**
NWVI	WCVI	0	0	0	99	72	**171**
NWVI	PugetSo	0	0	0	23	0	**23**
NWVI	WA_OR	0	0	0	7	0	**7**
NWVI	Up. Col./Snake	0	0	0	80	29	**108**
NWVI	SoG	0	0	0	<1	0	**<1**
NWVI	Fraser Fall	0	0	0	<1	0	**<1**
NWVI	NorthBC	0	0	0	3	0	**3**
NWVI	Fraser Spring 4_2	0	0	0	<1	0	**<1**
NWVI	Alaska	0	0	0	<1	0	**<1**
NWVI	Fraser Summer 5_2	0	0	0	<1	0	**<1**
NWVI	Cali	0	0	0	<1	0	**<1**
SWVI	Fraser Summer 4_1	0	0	0	0	0	**0**
SWVI	Low. Col.	4	18	227	85	78	**412**
SWVI	WCVI	0	0	6	8	31	**45**
SWVI	PugetSo	<1	27	209	83	43	**361**
SWVI	WA_OR	0	0	0	5	0	**5**
SWVI	Up. Col./Snake	0	1	43	5	16	**65**
SWVI	SoG	0	1	<1	5	4	**10**
SWVI	Fraser Fall	<1	1	6	7	<1	**14**
SWVI	NorthBC	0	0	2	0	0	**2**
SWVI	Fraser	0	0	0	0	0	**0**
SWVI	Fraser Spring 4_2	0	0	2	0	0	**2**
SWVI	Fraser Summer 5_2	0	0	0	0	0	**0**
Total		**4**	**49**	**495**	**485**	**330**	**1,363**

Appendix 2. Estimated catches of WCVI Chinook in the 2023 springtime Area G troll fishery based on PBT and GSI stock identification methods. All values other than 0 have been rounded to the nearest integer; trace detections with estimated catches in (0,1) are listed as "< 1."

Landing Site	Stock	23 Apr-6 May	7-20 May	21 May-3 Jun
NWVI	NITINAT RIVER	0	<1	0
NWVI	ROBERTSON CREEK	0	36	14
NWVI	MARBLE RIVER	0	<1	0
NWVI	CONUMA RIVER	0	37	55
NWVI	SARITA RIVER	0	2	0
NWVI	GOLD RIVER	0	3	0
NWVI	COLONIAL CREEK	0	<1	0
NWVI	SOOKE RIVER	0	5	0
NWVI	STAMP RIVER	0	1	0
NWVI	NAHMINT RIVER	0	<1	0
NWVI	LEINER RIVER	0	10	2
NWVI	BEDWELL RIVER	0	5	0
NWVI	TLUPANA RIVER	0	<1	<1
NWVI	TRANQUIL CREEK	0	<1	0
NWVI	ZEBALLOS RIVER	0	<1	<1
NWVI	TAHSIS RIVER	0	<1	<1
NWVI	BURMAN RIVER	0	<1	<1
NWVI	SAN JUAN RIVER	0	<1	0
NWVI	CYPRE RIVER	0	<1	0
NWVI	MEGIN RIVER	0	<1	<1
NWVI	MOYEHA RIVER	0	<1	<1
NWVI	KAOUK RIVER	0	<1	<1
NWVI	TOQUART RIVER	0	<1	0
NWVI	TAHSISH RIVER	0	<1	<1
NWVI	THORNTON CREEK	0	<1	0
NWVI	KENNEDY RIVER-LOWER	0	<1	0
SWVI	NITINAT RIVER	0	<1	0
SWVI	ROBERTSON CREEK	6	7	19
SWVI	CONUMA RIVER	0	<1	7
SWVI	SARITA RIVER	0	<1	4
SWVI	GOLD RIVER	0	<1	0
SWVI	SOOKE RIVER	0	<1	0
SWVI	STAMP RIVER	0	<1	0
SWVI	NAHMINT RIVER	0	<1	<1
SWVI	LEINER RIVER	0	<1	<1
SWVI	BEDWELL RIVER	0	<1	<1
SWVI	TLUPANA RIVER	0	<1	<1
SWVI	TRANQUIL CREEK	0	<1	<1
SWVI	ZEBALLOS RIVER	0	<1	<1
SWVI	TAHSIS RIVER	0	<1	<1
SWVI	BURMAN RIVER	0	<1	<1
SWVI	SAN JUAN RIVER	0	<1	0
SWVI	CYPRE RIVER	0	<1	<1
SWVI	MEGIN RIVER	0	<1	<1
SWVI	MOYEHA RIVER	0	<1	<1
SWVI	KAOUK RIVER	0	<1	<1
SWVI	TOQUART RIVER	0	<1	0
SWVI	TAHSISH RIVER	0	<1	<1
SWVI	THORNTON CREEK	0	<1	0
SWVI	KENNEDY RIVER-LOWER	0	<1	<1
SWVI	GORDON RIVER	0	<1	0
SWVI	ARTLISH RIVER	0	<1	0