

2024 Fraser Chinook Stock Assessment and Fishery Summary

Fraser and Approach Forum
January 28, 2025



2024 Fraser Chinook Management Objectives



Photo by: Shane Kalyn

- **Spring 4₂, Spring 5₂, and Summer 5₂ Chinook:** allow as many fish to pass through to the spawning grounds as possible.
- **Summer 4₁ Chinook:** Additional reductions in commercial and recreational fishery harvest opportunities implemented in recent years continued and were intended to support priority access for First Nations FSC fisheries in the Fraser River
 - Escapement objective of 12,300 for the Lower Shuswap River population
- **Fall 4₁ Chinook (Harrison):** The biologically-based escapement goal for Harrison Chinook is 75,100 Chinook.

In-season assessment: Albion Test Fishery

- Chinook-directed operation scheduled from Apr. 21 through Oct. 20, alternating between standard (8") and multi-panel (6-9") nets
- 3,161 Chinook were caught
- 2024 prediction for Spring and Summer 5₂ Chinook using standard gill net Albion data:
 - median = 47,290 (range 25,000 – 88,000)
- Anticipated modest return for 2024, similar to forecast/outlook

Post-season assessment: Overview

- Spawner abundance is estimated using several methods:
 - Mark-recapture studies – Nicola, Harrison, Lower Shuswap, and Chilko.
 - Electronic counters – Bonaparte and Deadman.
 - Fence counts at Salmon River (Salmon Arm).
 - Remaining assessments are through visual surveys (aerial, foot or float).
- Enumeration of 2024 Chinook escapement is still ongoing; estimates will be available in the Spring of 2025.

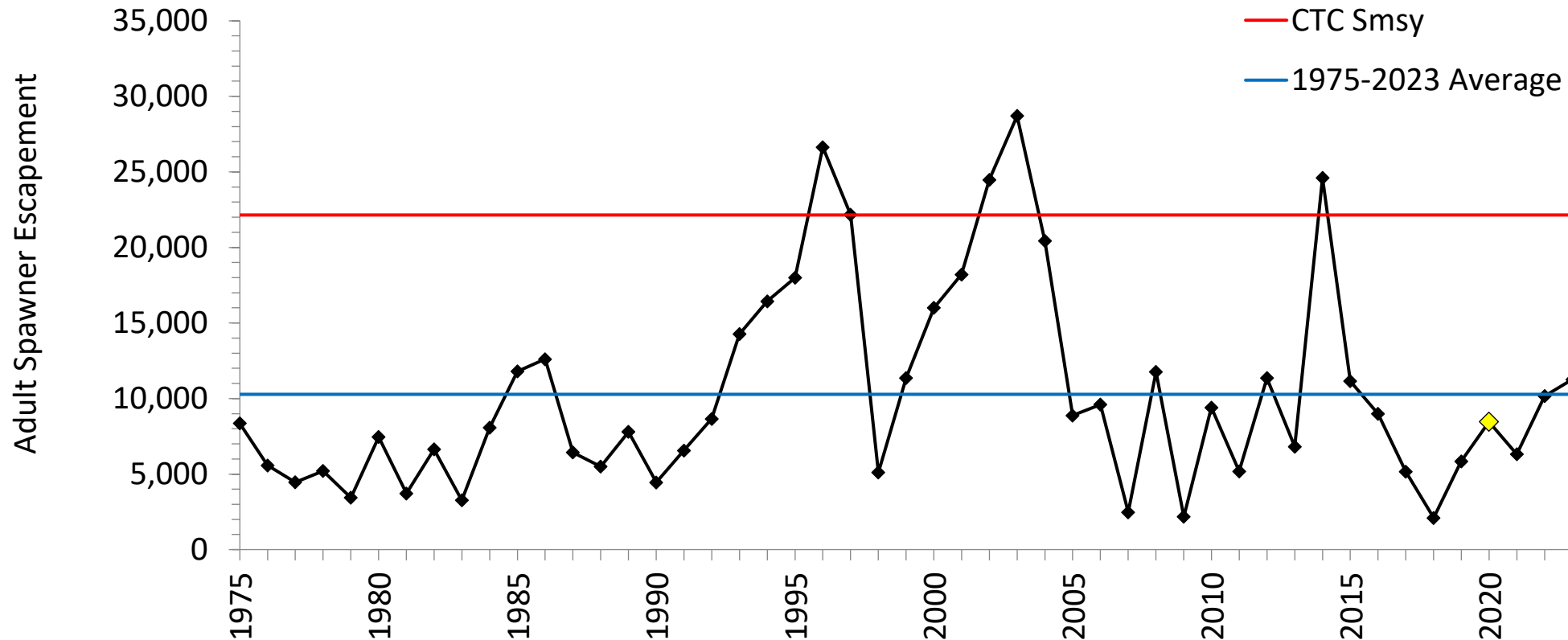
Post-season assessment: Escapement

Coming up:

- Time series of escapement for each Chinook MU
 - 2024 escapement estimates are not yet available.
 - Highlighting brood year escapement and pre-season forecasts.
- Comparison against S_{MSY} or escapement goal and long-term average.
- S_{MSY} = the number of spawners needed to maintain Maximum Sustainable Yield (MSY)
- MSY = highest possible annual catch that can be sustained over time
- For each MU with reference to S_{msy} , these values were developed using an approach relating productive capacity to freshwater habitat area (Parken et al. 2006)
 - Harrison (Fall 4₁) escapement goal is based on Ricker stock-recruit approach (CTC 2002)

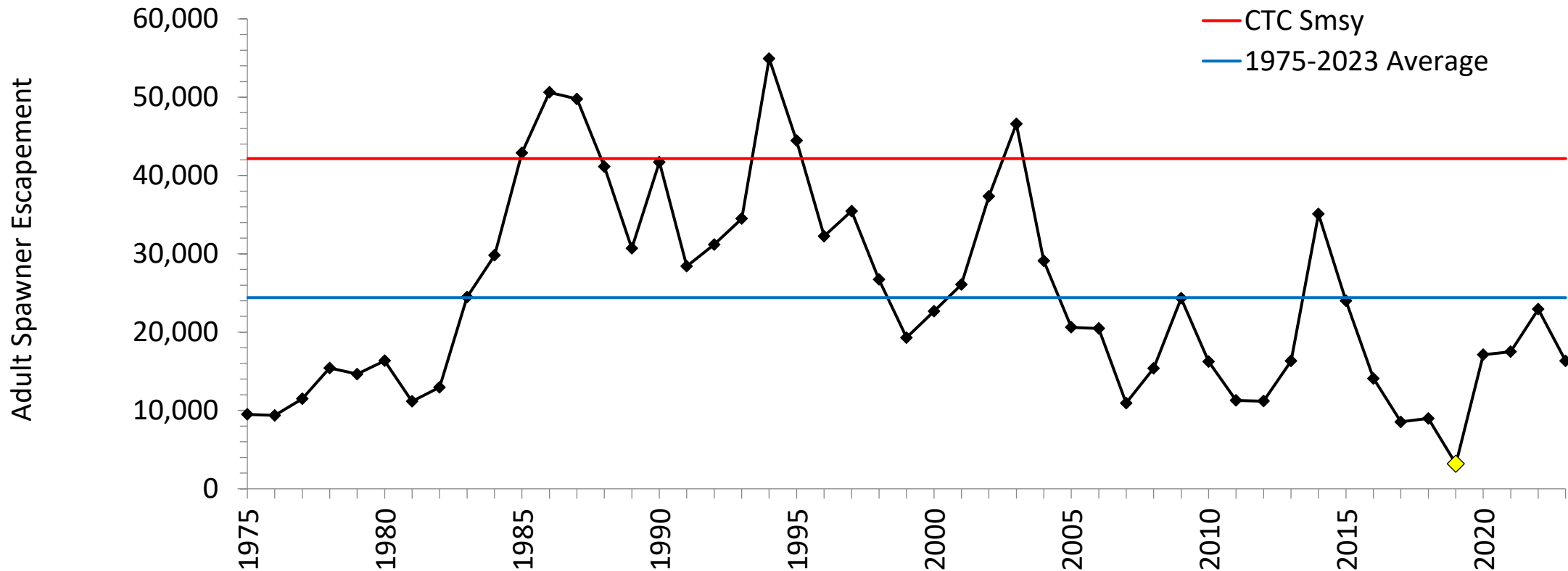
Escapement - Fraser Spring 4₂ Chinook

- 2024 brood year escapement (2020) was below the recent average.
- The final **2023** escapement estimate is 11,262.



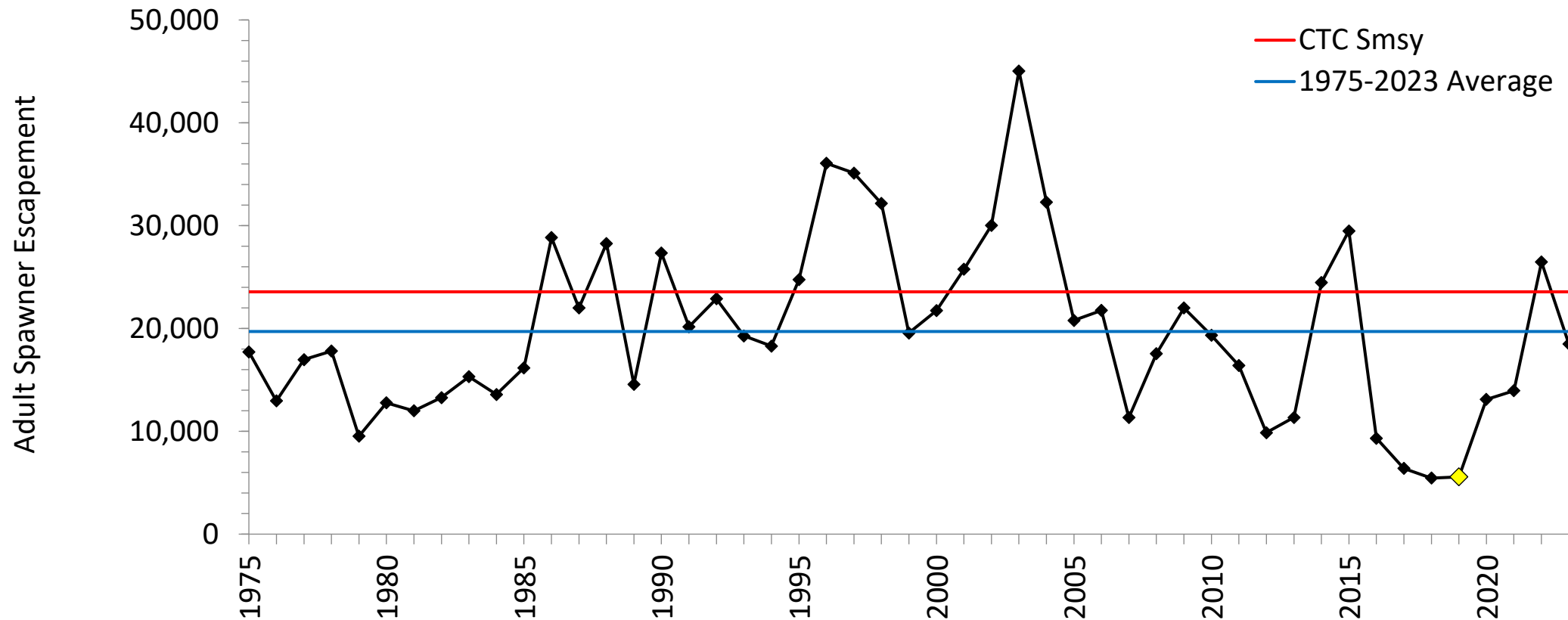
Escapement - Fraser Spring 5₂ Chinook

- 2024 brood year escapement (2019) was below the recent average.
- The final **2023** escapement estimate is 16,321.



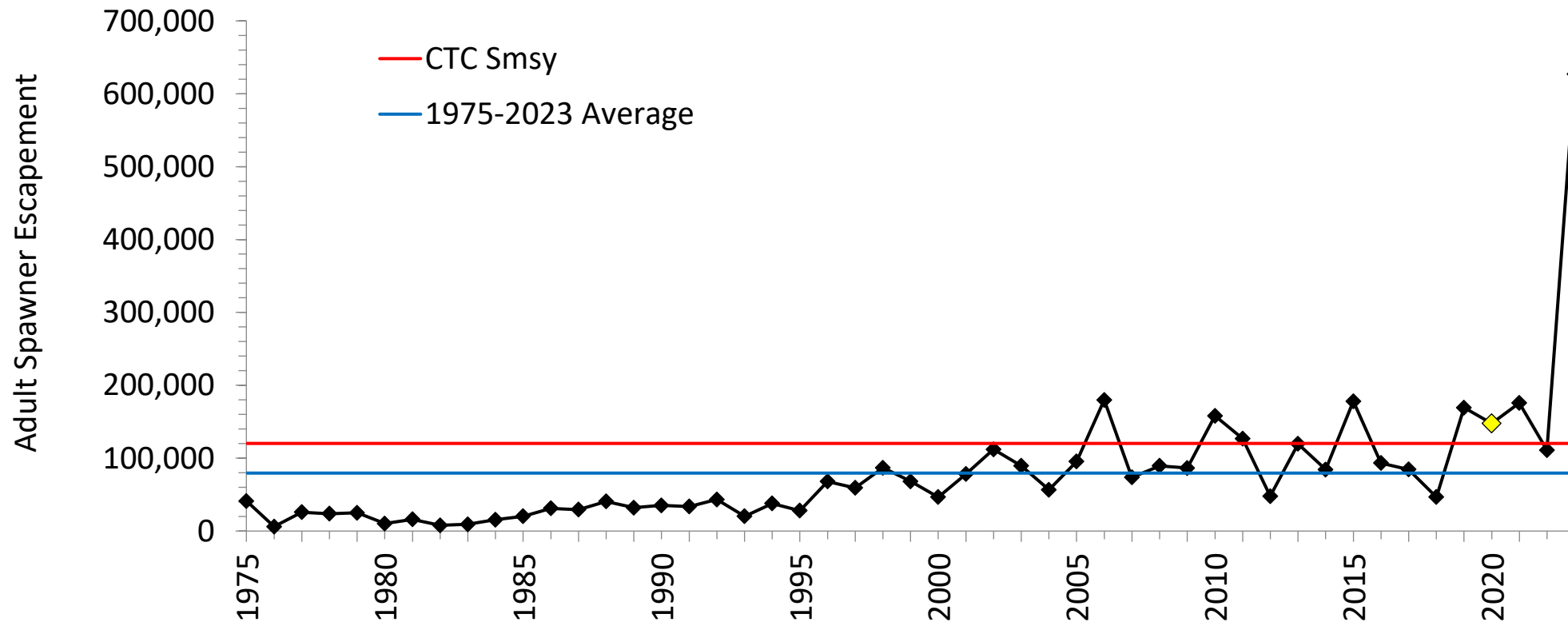
Escapement - Fraser Summer 5₂ Chinook

- 2024 brood year escapement (2019) was below the long-term average.
- The final **2023** escapement estimate is 18,482.



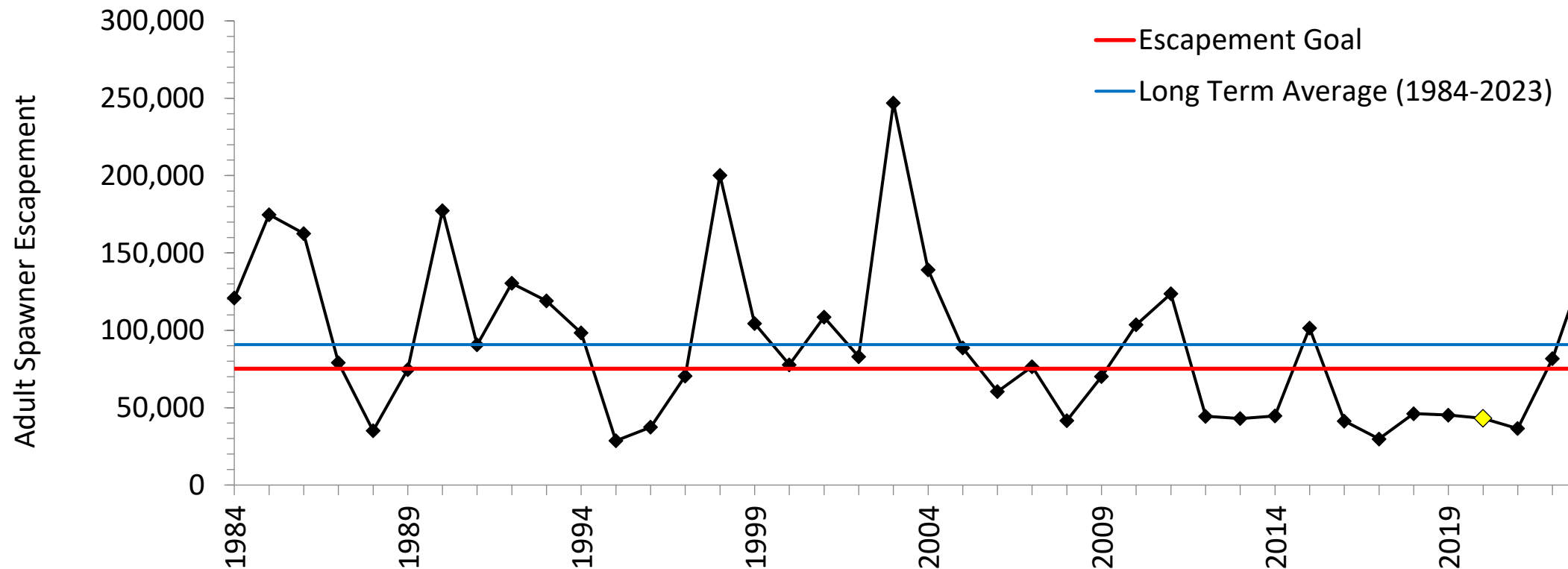
Escapement - Fraser Summer 4₁ Chinook

- 2024 brood year escapement (2020) was above S_{MSY} and recent average.
- The final **2023** escapement estimate is 626,919.



Escapement - Fraser Fall 4₁ Chinook

- Harrison brood year escapement (2020) below escapement goal and recent average.
- The final **2023** escapement estimate is 146,498.



Initial field-season update - 2024 Fraser Chinook

The following 2024 estimates **will change** and should only be viewed as an initial update from the field season. They should not be used in any analyses or comparisons.

Caveats include missing estimates from some systems, verification, infilling and mark-recapture estimation are all incomplete.

SMU	2024 Field Escapement Estimate
Spring 4 ₂	5,600
Spring 5 ₂	11,000
Summer 5 ₂	13,000
Summer 4 ₁	166,000
Harrison	131,544

Fraser River Catch Summary

	Chinook	
	kept	released
FSC		
<i>Lower Fraser</i>	27,050	10
<i>BC Interior</i>	2,471	38
FSC Total	29,521	48
Economic Opportunity		
<i>Lower Fraser</i>	NA	NA
<i>BC Interior</i>	-	-
Ec Opp Total	0	0
ESSR.		
<i>Lower Fraser</i>	NA	-
<i>BC Interior</i>	-	-
ESSR Total	0	0

	Chinook	
	kept	released
Recreational		
<i>Lower Fraser</i>	NA	NA
<i>BC Interior</i>	4,107	754
Rec Total	4,107	754
Commercial		
<i>Lower Fraser*</i>	0	0
<i>BC Interior</i>	-	-
Comm Total	0	0
Other		
<i>Lower Fraser</i>	68	1
<i>BC Interior</i>	-	-
Other Total	68	1
All Catch		
<i>Lower Fraser</i>	27,118	11
<i>BC Interior</i>	6,578	792
All Catch Total	33,696	803

*Catch includes Area H and B Chum directed fisheries in PFMA 29.

Post-season assessment: Fishery Mortality Index

- Combines mortality data from the Fraser River Chinook run reconstruction model with genetic stock identification (GSI) applied to catch estimates from marine mixed-stock fisheries
- Alternative method for estimating impacts is the Chinook Technical Committee's Exploitation Rate analysis, but not available for Spring and Summer 5₂ Chinook

Known Issues/Uncertainties

- CTC reports – using landed catch only (no release/incidental mortality)
 - SBC rec is only place with fishery-related incidental mortality (release & drop-off) incorporated, except sub-legals
- Excluding some catch from analysis based on assumptions and/or missing information (i.e., groundfish trawl fishery, USA fisheries, JSt/GSt marine First Nations fisheries, central coast fisheries)
- Chilliwack and Chehalis Summer 5_2 are a hatchery stock – hard to remove from analysis
- At times, high amount of infilling done for escapement
- GSI data gaps; appropriateness of proxies chosen
- Concerns about representativeness of GSI baselines
- Outputs do not include quantification of uncertainty

Fishery Mortality Index Summary

Stock Management Unit	2014-2018 Avg. CDN Fishery Mortality	2019 CDN Fishery Mortality	2020 CDN Fishery Mortality	2021 CDN Fishery Mortality	2022 CDN Fishery Mortality	2023 CDN Fishery Mortality	2019-2023 Avg. CDN Fishery Mortality
Spring 4 ₂	24.0%	5.1%	4.4%	3.7%	2.9%	4.3%	4.0%
Spring 5 ₂	17.2%	10.2%	2.6%	5.6%	2.9%	3.2%	4.6%
Summer 5 ₂	25.0%	18.7%	13.0%	14.2%	10.9%	10.1%	12.7%
Summer 4 ₁	46.6%	32.2%	25.6%	25.3%	29.6%	12.8%	21.3%
Fall 4 ₁	18.3%	18.4%	19.7%	23.3%	31.8%	17.7%	22.5%

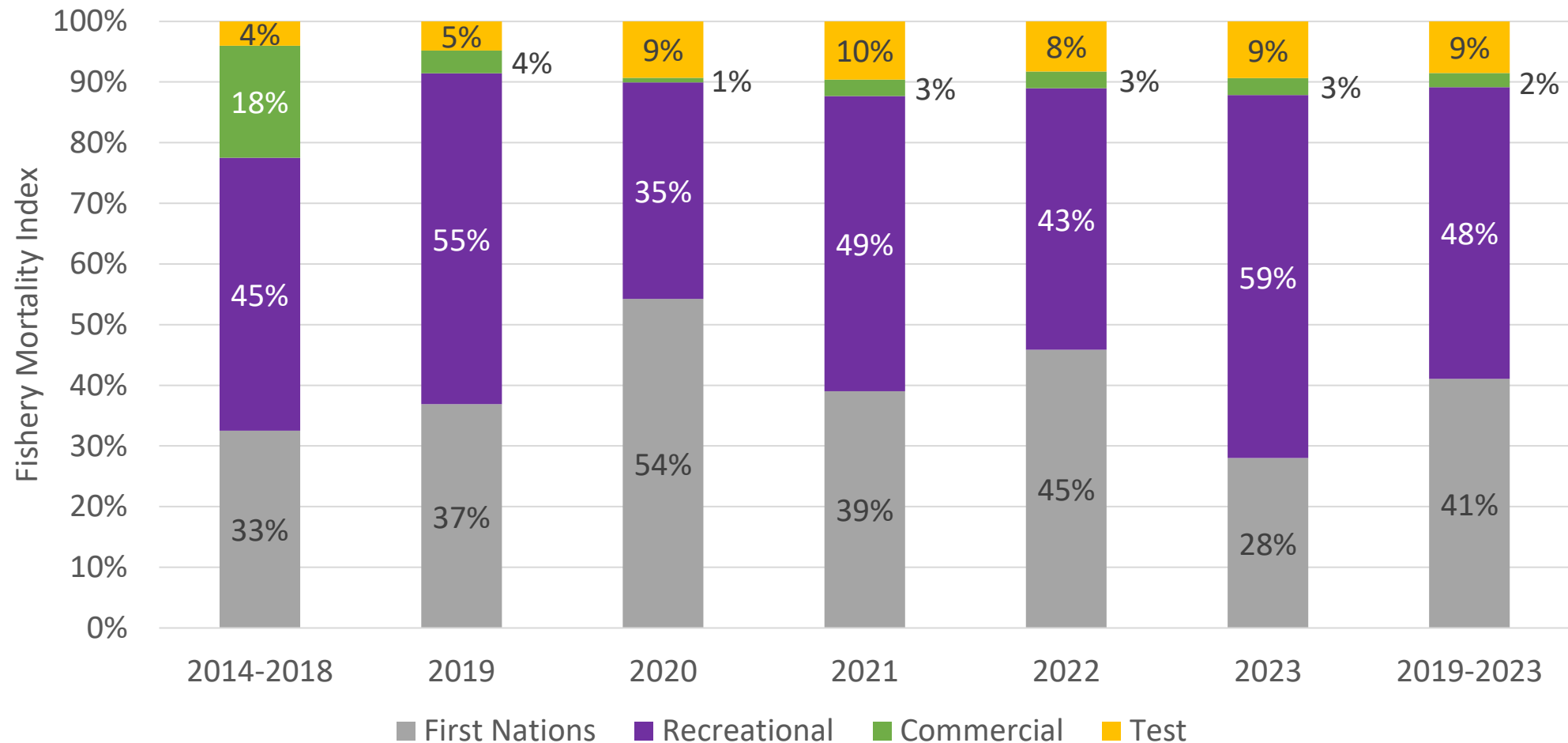
Total Chinook Catch (All SMUs)

	AVERAGE 2014-2018	2019	2020	2021	2022	2023	AVERAGE 2019-2023
RECREATIONAL							
In-river	12,471	11,752	9,682	15,684	35,451	31,782	20,870
Marine	52,185	62,180	31,529	42,093	60,502	69,766	53,214
Total	64,657	73,932	41,211	57,777	95,953	101,548	74,084
COMMERCIAL/EO							
In-river	3,791	2	0	0	25	134	32
Marine	31,446	5,914	3,758	10,772	8,348	9,531	7,665
Total	35,238	5,916	3,758	10,772	8,373	9,665	7,697
TEST							
In-river	2,374	3,668	2,978	3,483	3,373	5,075	3,715
Marine	20	116	69	160	161	324	166
Total	2,394	3,784	3,047	3,643	3,534	5,399	3,881
FIRST NATIONS							
In-river	18,132	28,996	32,680	26,813	23,350	30,125	28,393
Marine	5,601	3,350	1,807	3,788	3,776	8,056	4,155
Total	23,733	32,346	34,487	30,601	27,126	38,181	32,548
Total CDN Fishing Mortality Index	126,022	115,979	82,502	102,793	134,986	154,793	118,211
Run Size Index	409,941	447,244	387,802	446,766	498,358	1,104,490	576,932

Summer 5₂ Fishery Mortality Index

	AVERAGE 2014-2018	2019	2020	2021	2022	2023	AVERAGE 2019-2023
RECREATIONAL							
In-river	2.5%	1.7%	2.3%	1.7%	1.3%	1.6%	1.7%
Marine	8.7%	8.5%	2.3%	5.4%	3.4%	4.8%	4.5%
Total	11.2%	10.1%	4.7%	7.1%	4.8%	6.5%	6.2%
COMMERCIAL/EO							
In-river	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Marine	4.2%	0.7%	0.1%	0.4%	0.3%	0.3%	0.3%
Total	4.6%	0.7%	0.1%	0.4%	0.3%	0.3%	0.3%
TEST							
In-river	1.0%	0.9%	1.2%	1.4%	0.9%	1.0%	1.1%
Marine	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	1.0%	0.9%	1.2%	1.4%	0.9%	1.0%	1.1%
FIRST NATIONS							
In-river	7.1%	6.2%	7.0%	5.0%	4.7%	2.3%	4.8%
Marine	1.0%	0.7%	0.0%	0.7%	0.3%	0.7%	0.5%
Total	8.1%	6.9%	7.0%	5.6%	5.1%	3.0%	5.3%
Total CDN Fishing Mortality Index	24.9%	18.6%	13.0%	14.6%	11.0%	10.9%	12.9%
Run Size Index	28,667	18,255	25,312	25,370	43,740	31,426	28,821

% distribution of Fishery Mortality Index (Summer 5₂)



What does this all mean?

- Conservation status is poor for the early-timed Chinook, so management actions in recent years have mainly focused on reducing impacts to stream-type Chinook while providing opportunity to fish on more abundant populations (e.g., Summer 4₁ Chinook)
- While the FMI appears to have decreased in 2019-2023 compared to the base period and the index of escapement for many populations has increased, escapements for stocks of concern have not yet reached recovery targets.
- Domestic fishery management changes in 2019-2023 may be a contributing factor to the observed changes in escapement. Natural variability, measurement error (catch and escapement inputs) and uncertainties present in the assessment tools could be confounding both the inputs and the outputs related to the FMI.
- Recommend continuing precautionary management and low mortalities in 2025



Questions?

A scenic sunset over a beach. The sun is low on the horizon, partially obscured by clouds, creating a golden glow. The sun's reflection is visible on the water. The foreground shows a sandy beach with gentle waves lapping at the shore. In the background, a dark silhouette of a forested coastline is visible against the bright sky. The sky is filled with scattered, light-colored clouds that catch the light of the setting sun.

West Coast of Vancouver Island

2024 Southern Salmon Post-Season

Jan 28, 2025

AABM Chinook

Pre-Season Total Allowable Catch and Preliminary Catch Estimates for October 2023-September 2024 WCVI AABM Chinook

	Pre-Season TAC	In-Season TAC	Preliminary Catch
First Nations (FSC)	10,000 ^a	10,000 ^a	10,000 ^b
Maa-nulth Treaty	3,744	3,744	4,137 ^b
Five Nations	15,431	19,645 ^c	17,278
AABM Recreational	35,000 ^a	35,000 ^a	38,683
Science	n/a	n/a	n/a
Area G Troll	40,825	36,611	24,154
Total AABM Chinook	105,000	105,000	94,200

a. Expected catch

b. FSC catch is being compiled

c. Maa-nulth Treaty catch is preliminary

d. Includes 4,214 transfer of Area G uncaught TAC to Five Nations

Commercial – AABM Chinook Fisheries

- Area G Troll:
 - Delayed opening until Aug. 16 for Fraser Chinook
- Five Nations "Offshore Integrated Hook and Line" Fishery:
 - Restricted to inshore AABM areas before July 15 for Fraser Chinook
 - Maximum 80cm size limit July 15-31

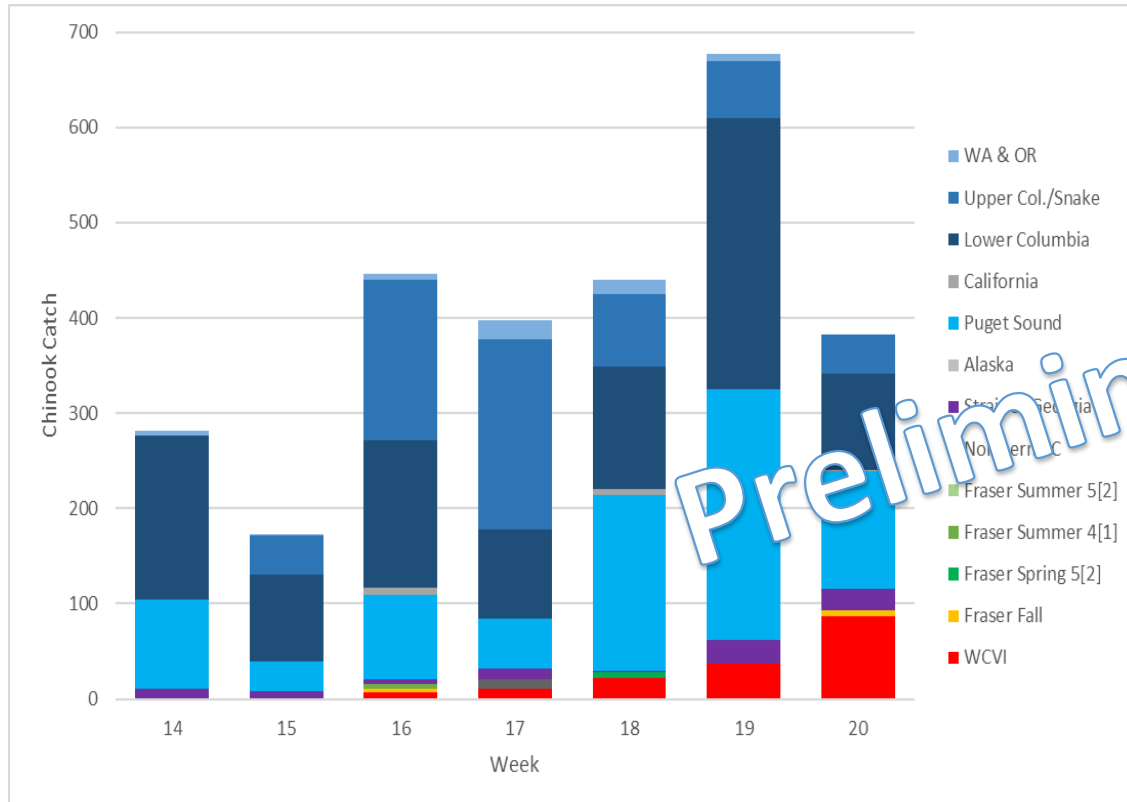
MTH-YR	CHINOOK	
	AREA G	FIVE NATIONS
Jan-Mar 24	1,281	208
Apr-May 24	2,859	865
Jun-24		2,195
Jul-24		11,302
Aug-24	19,022	2,666*
Sep-24	992	42**
Total	24,154	17,278

*1,347 from Area G transfer

**42 from Area G Transfer

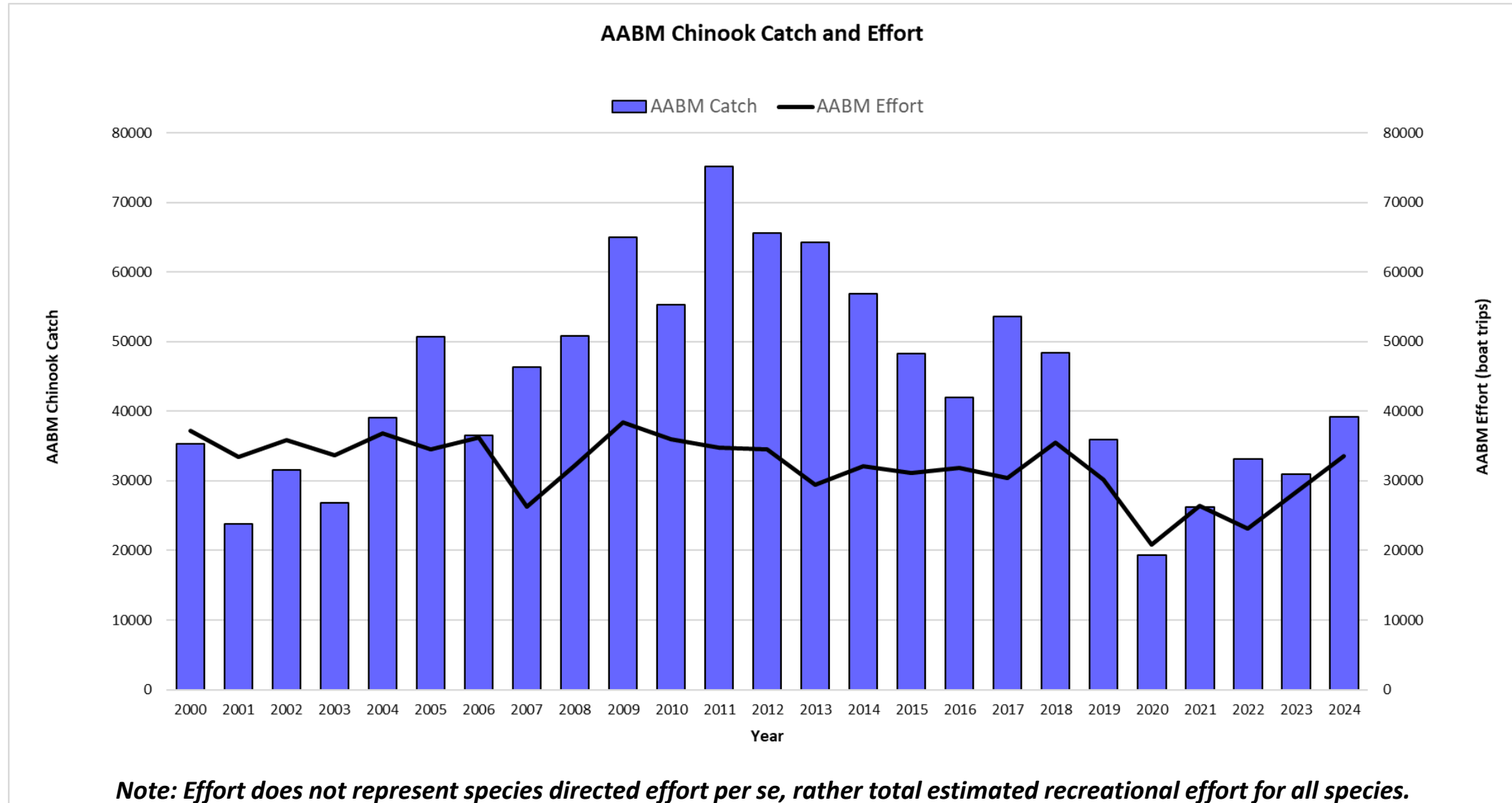
Area G Troll – Springtime Chinook Demo

- 3,000 limit (2,859 catch)
- Open April 1 to May 16
- Inshore areas only
- Included in 2024/25 IFMP
- Memo with detailed 2024 results available soon



Alaska	-	0.0%
California	15	0.5%
Fraser Fall	10	0.3%
Fraser Spring 5[2]	7	0.2%
Fraser Summer 4[1]	6	0.2%
Fraser Summer 5[2]	0	0.0%
Lower Columbia	1,027	35.9%
Northern BC	10	0.4%
Puget Sound	837	29.3%
Strait of Georgia	82	2.9%
Upper Col./Snake	585	20.5%
WA & OR	55	1.9%
WCVI	163	5.7%
Unassigned	62	2.2%
Total	2,859	100%

WCVI Chinook - Recreational AABM Catch/Effort





Questions?

Fraser Chinook Appendix Slides

Conservation Status – Summer 5₂ Chinook

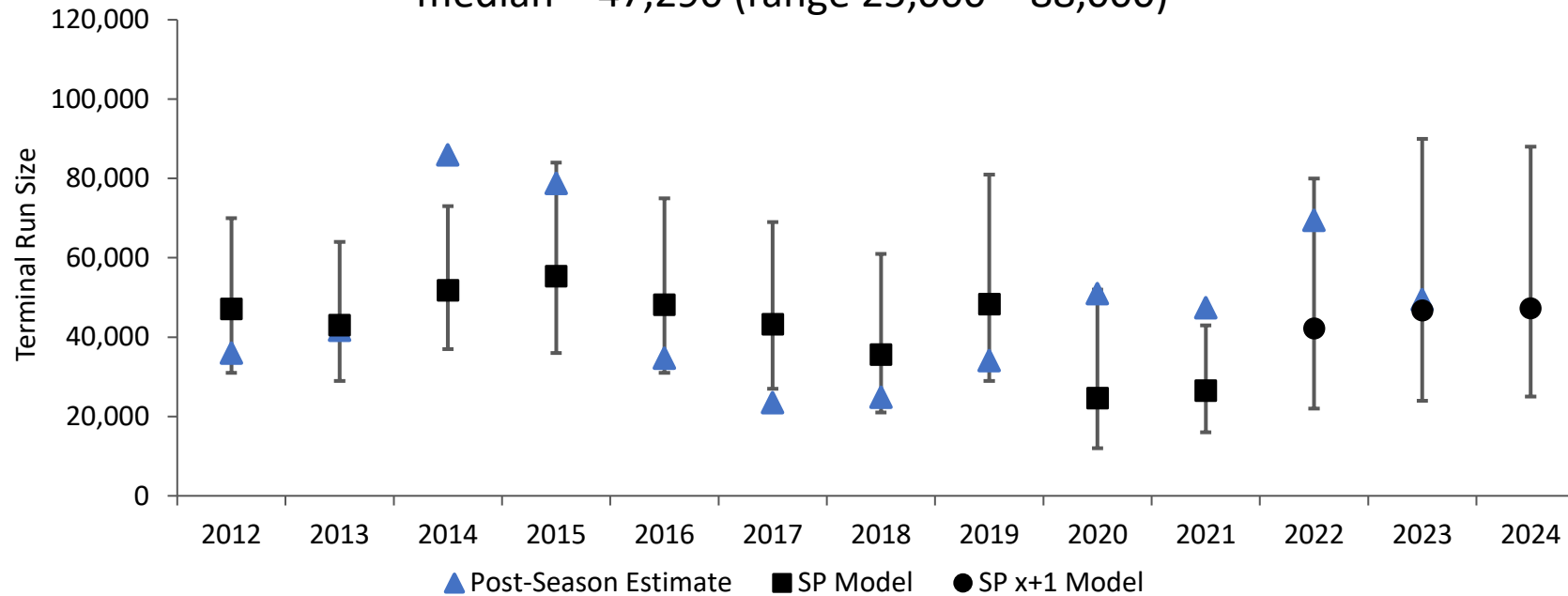
Designatable Unit	COSEWIC Assessment	Survival Target (COSEWIC)	Recovery Target (COSEWIC/WSP)	2019-2023 Average	2023
DU4 (LFR-Upper Pitt)	Endangered	1,000	1,000	46	69
DU5 (LFR-Summer)	Threatened	1,000	1,285	50	82
DU8 (MFR-Portage)	Endangered	1,000	1,358	78	118
DU10 (MFR-Summer)	Threatened	5,878	25,260	11,138	13,268
DU13 (STh-Stream-Summer)	Endangered	1,326	5,257	1,494	1,180
DU17 (NTh-Summer)	Endangered	1,824	7,773	3,929	4,593

Below Survival Target
Above Survival Target, Below Recovery Target

In-season assessment: Spring 5₂ and Summer 5₂ Chinook

2024 prediction using standard (8") gill net Albion data:

median = 47,290 (range 25,000 – 88,000)

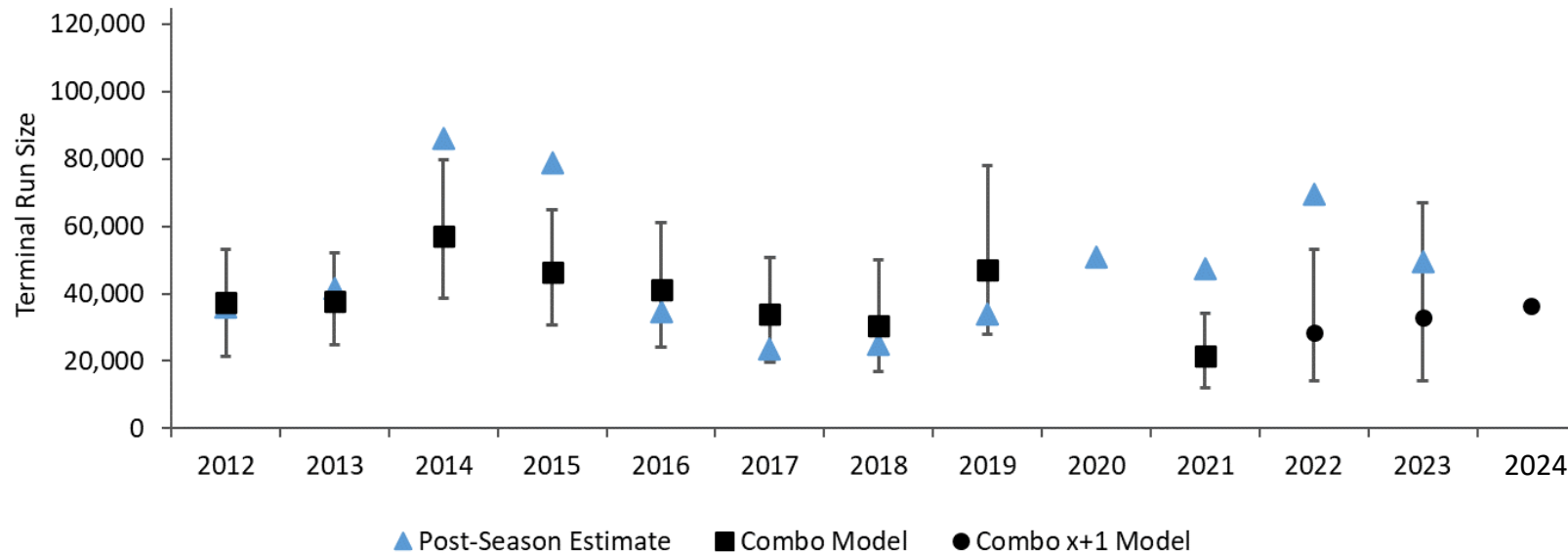


- This graph represents the difference in the model prediction (black symbols with error bars) and the post-season estimate (blue triangles) for 2012-2023.
- The post-season estimate of the 2024 run size will be available in spring of 2025.

In-season assessment: Spring 5_2 and Summer 5_2 Chinook Alternative Albion Model Outputs

Prediction using both multi-panel and standard net Albion data:

17,000 – 71,000 (median = 36,560)



- For 2020, there was no catch in the multipanel net up to week 06/2, so the model could not be run unless a placeholder CPUE input of 0.01 was used. This was considered an unreliable estimate so is not included in comparisons with other years.
- In 2022-2024, due to below average cumulative catch per unit effort (CPUE) values at the Albion test fishery, an alternative approach was explored using transformed CPUE inputs by adding one (1) to each value. These model outputs are included in the plot above and denoted with a circle.
- The post-season estimate for 2024 will be available in spring of 2025

2024 Albion Test Fishery Summary

Dates

Chinook-directed
single panel (8"):
Apr. 21 – Oct. 20

Chinook-directed
multi-panel (6-9"):
Apr. 22 – Aug. 30

Chum-directed
single panel (6.75"):
Sep. 1 – Nov. 23

Catch

Chinook: **3,161**

Chum: **8,085**

Coho: **856**

Sockeye: **241**

Pink: **0**

Steelhead: **18**

References

- CTC. 2002. Catch and escapement of Chinook salmon under Pacific Salmon Commission jurisdiction 2001. Pacific Salmon Commission, Report TCCHINOOK (02)–1. Vancouver, BC.
- Parken, C. K., R. E. McNicol, and J. R. Irvine. 2006. Habitat-based methods to estimate escapement goals for data limited Chinook salmon stocks in British Columbia, 2004. Department of Fisheries and Oceans Canada, Canadian Science Advisory Secretariat Research Document 2006/083.