

DRAFT AGENDA
PACIFIC SALMON COMMISSION
FRASER RIVER PANEL
Tuesday August 15, 2023 at 10:30 am.
In-person: Sheraton Airport Hotel and via Zoom Webinar
<https://psc-org.zoom.us/j/88416242194>

- 1) Roll Call (Panel and Tech members, others please email Julie, ehrmantraut@psc.org)
- 2) Webinar Etiquette:
 - a) Mute Phone: Please mute phone unless you are asking a question
 - b) Chat feature: Please use for questions regarding the distribution only
- 3) Agenda
- 4) Run status of Fraser River sockeye salmon relative to forecasts and adopted run sizes PSC Staff
- 5) In-season data flow for updating objectives PSC staff
 - a) Test fishing catches and acoustics
 - b) Mission projected sockeye vs. Qualark sockeye comparison
 - c) Stock proportions
 - d) Environmental conditions
 - e) Observations from the watershed DFO
- 6) Assessments and recommendations PSC Staff
 - a) Migration graphs, escapement projections, run size assessments
- 7) Review any decisions on staff recommendations Panel
- 8) Fisheries Recommendations Panel
 - a) Secretariat staff evaluation of fisheries recommendations
 - b) Panel decision on fisheries recommendations
- 9) Other Business Panel
 - a) Extend Matsqui fishwheel operations to August 23?
- 10) Next FRP Meeting, Friday August 18, 11:00 a.m. via Zoom Webinar Panel
 Next Technical Committee meeting, Thursday August 17, 1:00 p.m. via Zoom TC

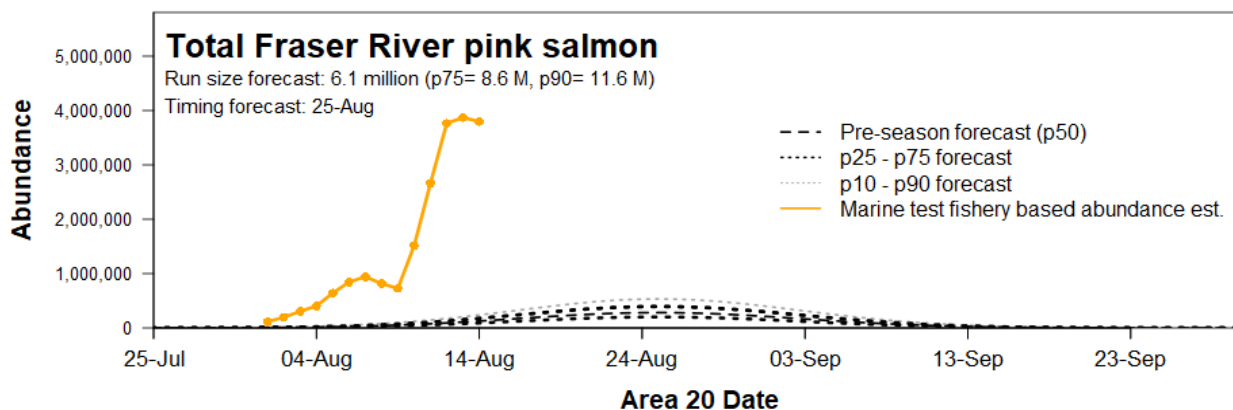
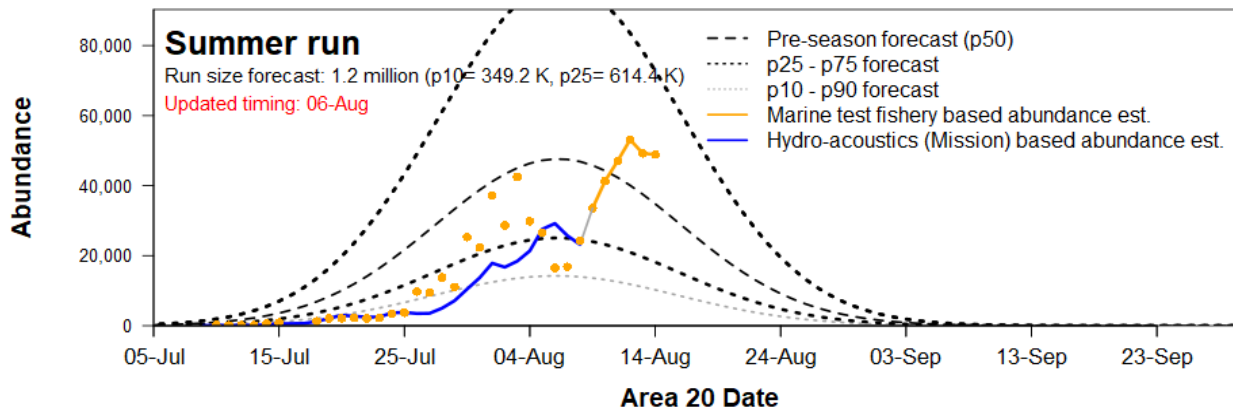
2023 Run status of Fraser sockeye and pink salmon

Date: Aug. 15, 2023

The information presented in this distribution has been prepared by PSC Secretariat staff and should be considered preliminary until reviewed by the Fraser River Panel

Week of: Aug. 13 - Aug. 19, 2023	Sockeye					Pink	
	Management Group				Total Fraser	Total Fraser	
	E.Stuart	E.Summer	Summer	Late			
Mission passage (inclds Pitt, Alouette, Coquitlam)	40,900	269,000	242,500	14,600	567,000	15,700	
Catch downstream of Mission	200	3,400	4,800	700	9,100	500	
Accounted Run To Date	41,100	272,400	247,300	15,300	576,100	16,200	
Run size adopted in-season ²	41,000	290,000	na	na	na	na	
Run size forecasted pre-season	23,000	186,000	1,167,000	188,000	1,564,000	6,135,000	
Area 20 timing adopted in-season	2/Jul	23/Jul	na	na	na	na	
Area 20 timing expected pre-season	7/Jul	6/Aug	17/Aug	24/Aug	16/Aug	25/Aug	
Johnstone Str. Diversion Rate					In-season 5-day average	60%	29%
					Preseason forecast of annual rate:	67%	62%

² Run sizes are usually not adopted until after the peak of the run has passed through marine test fishery areas in Juan de Fuca and Johnstone straits.



2023 Catch-to-date by fishery

Date: Aug. 15, 2023

Week of: Aug. 13 - Aug. 19, 2023		Sockeye	
		Total	Fraser
Canada		1,652	1,652
	Commercial	0	0
	B Purse Seine	0	0
	D Gillnet	0	0
	E Gillnet	0	0
	G Troll	0	0
	H Troll	0	0
	First Nations	0	0
	Food, Social & Ceremonial (FSC)	0	0
	Marine	0	0
	Fraser R.	0	0
	Economic Opportunity (EO) & Demonstration (Demo)	0	0
	Escapement Surplus to Spawning Requirements (ESSR)	126	126
	Recreational	0	0
	Charter (Albion & A12 Chum test fishery)	323	323
	Other****	1,203	1,203
United States		0	0
	Commercial	0	0
	Treaty Tribes (TRB)	0	0
	All Citizen (AC)	0	0
	Treaty Tribes Ceremonial & Subsistence (C&S)	0	0
	All Citizen Recreational	0	0
	Other****	0	0
	Alaska *	na	na
Panel-approved Test Fisheries		9,758	9,248
	Panel Waters	6,761	6,480
	Canada	6,761	6,480
	U.S.	0	0
	Non-Panel Waters**	2,997	2,769
Total		11,410	10,900
	Catch Seaward of Mission ***	9,631	9,121
	Catch Upstream of Mission	1,779	1,779

* Alaska data are processed post-season and so are unavailable in-season.

** Includes Qualark

*** All catches in marine areas and in the Fraser River downstream of Mission.

**** May include unauthorized directed retention or unauthorized bycatch retention in fisheries directed at other species

		Fraser Sockeye					Fraser Pinks	
		Early Stuart	Early Summer	Summer	Lates	Total	Total	
RUN STATUS, ESCAPEMENT NEEDS & AVAILABLE SURPLUS								
Pre-season or Adopted In-season Run Size		41,000	290,000	1,167,000	188,000	1,686,000	6,135,000	
Adult Spawning Escapement Target (SET)		41,000	145,000	1,046,600	188,000	1,420,600	5,335,200	
%SET from TAM rules		100%	50%	90%	100%		87%	
Management Adjustment (MA)*		69,700	156,600	240,720	188,000	655,020	0	
Proportional MA (pMA)*		1.70	1.08	0.23	1.00		0.00	
Adjusted Spawning Escapement Target (SET) **		41,000	290,000	1,167,000	188,000	1,686,000	5,335,200	
Test Fishing (TF)*****		250	3,700	11,860	2,030	17,840	25,270	
Surplus above Adjusted SET & Test fishing		0	0	0	0	0	774,530	
DEDUCTIONS & TAC FOR INTERNATIONAL SHARING								
Aboriginal Fishery Exemption (AFE)		0	0	0	0	0	0	
Total Deductions (Adj. SET + TF + Available AFE)		41,250	293,700	1,178,860	190,030	1,703,840	5,360,470	
Available TAC for International Sharing		0	0	0	0	0	774,530	
UNITED STATES (Washington) TAC								
Proportionally Distributed TAC ***		16.5%	0	0	0	0	25.7%	199,050
U.S. Payback ***		0.0%	0	0	0	0		0
Proportionally Distributed TAC + Payback		0	0	0	0	0	199,050	
Treaty Tribes Share ***		67.7%	0	0	0	0	50.0%	99,525
All Citizen Share		32.3%	0	0	0	0	50.0%	99,525
CANADA TAC								
Aboriginal Fishery Exemption (AFE)		0	0	0	0	0	0	
Canadian TAC + AFE		0	0	0	0	0	575,480	
CATCH-TO-DATE								
Test		250	3,480	4,800	730	9,250	510	
Treaty Tribes (Wash.) / Ceremonial (TRB)		0	0	0	0	0	0	
All Citizen (Wash.)		0	0	0	0	0	0	
Other (Wash.)****		0	0	0	0	0	0	
Washington		0	0	0	0	0	0	
First Nations Catch (including AFE)		0	0	0	0	0	0	
Planned Charter & Recreational Shares		20	140	150	8	323	0	20
Other****		150	780	270	0	1,200	0	0
Total Commercial (including FN EO/Demo*****)		0	0	0	0	0	0	0
Canada		170	920	420	8	1,530	20	
Total Catch in All Fisheries		420	4,400	5,220	738	10,770	530	
Exploitation Rate (catch-to-date / run size)		1.0%	1.5%	0.4%	0.4%	0.6%	0.0%	
Exploit. Rate with fishery-induced mortality included		1.1%	1.5%	0.5%	0.4%	0.7%		
CATCH REMAINING (BALANCE)								
Washington		0	0	0	0	0	199,050	
Canada		-170	-920	-420	-8	-1,518	575,460	
Balance Remaining [below share / -above share]		-170	-920	-420	-8	-1,518	774,510	

* Given the 2022 pre-season forecasts of abundances, fisheries decisions that could impact the Early Stuart sockeye management group will be based on Low Abundance Exploitation Rate (LAER) limit of 10%.

The intent of LAER is to allow for limited fisheries directed on co-migrating stocks or species, but also may permit limited harvest in some cases. The application of the LAER obviates the need for management adjustments for this group.

** The adjusted SET is the lesser of the run size or the sum of the MA + TAM - defined SET.

*** Washington sockeye and pink shares according to Annex IV of the Pacific Salmon Treaty.

Sockeye: 16.5% of the TAC - payback (maximum of 5% of share).

Pink: 25.7% of the TAC - payback (maximum of 5% of share)

**** May include unauthorized directed retention or unauthorized bycatch retention in fisheries directed at other species.

***** EO = FN Economic Opportunity fisheries; Demo = FN Demonstration fisheries.

***** The test fishing deduction was updated in-season to 42,579 on September 2, 2022.

2023 Fraser Sockeye Test Fishing & Escapement Summary

Area/Gear Location From A20	Johnstone Strait	Juan de Fuca Strait		Fraser River									
	A12 PS Blinkhorn (-1 day)	A20 PS Port Renfrew (0 days)	A7 RN ¹ San Juan Is (+3 days)	A29-13 GN Cottonwood (+5 days)	A29-17 GN Brownsville Bar ² (+5 days)	A29-16 GN Whonnock (+6 days)	Whon CPUE Estimate (+6 days)	Qualark			Mission Hydroacoustics		Hells Gate
								GN Catch (+8 days)	Estimate ³	Method ⁴	Estimate ⁵ (+6 days)	Method ⁶	Estimates ⁷ (+10 days)
25-Jul	134	50			43	2	0.19	15	9,079	RB + LB	9,000	S1+M2+A2	1,970
26-Jul	1,390	70		16	42	4	0.37	16	9,408	RB + LB	10,700	S1+M2+A2	1,880
27-Jul	107	127		9	40	2	0.17	9	8,444	RB + LB	8,500	S1+M2+A2	5,000
28-Jul	522	81		20	36	9	0.83	10	6,521	RB + LB	7,000	S1+M2+A2	3,010
29-Jul	13	265		1	17	3	0.27	11	6,965	RB + LB	9,200	S1+M2+A2	2,660
30-Jul	239	384		3	44	5	0.47	11	5,396	RB + LB	6,600	S1+M2+A2	930
31-Jul	99	1,021		8	66	19	1.64	8	6,890	RB + LB	11,000	S1+M2+A2	890
1-Aug	4,592	230		3	36	11	0.93	16	8,067	RB + LB	9,000	S1+M2+A2	930
2-Aug	1,400	143		3	24	20	1.72	10	8,834	RB + LB	7,900	S1+M2+A2	1,080
3-Aug	6,197	147		10	44	21	1.74	14	9,597	RB + LB	17,800	S1+M2+A2	1,960
4-Aug	2,824	184		17	57	15	1.25	23	9,209	RB + LB	13,900	A1+S1+M2+A2	2,720
5-Aug	203	162		17	136	58	4.33	10	12,073	RB + LB	19,600	A1+S1+M2+A2	2,630
6-Aug	683	387		21	143	31	2.48	7	14,372	RB + LB	23,900	A1+S1+M2+A2	4,220
7-Aug	663	492		28	51	11	0.97	20	16,577	RB + LB	25,700	A1+S1+M2+A2	4,500
8-Aug	93 (2 sets)	188		9	107	12	1.06	17	21,431	RB + LB	30,600	A1+S1+M2+A2	6,870
9-Aug	5,923	85 (3 sets)		19	116	9	0.82	15	21,271	RB + LB	18,000	A1+S1+M2+A2	6,860
10-Aug	1,645	72 (3 sets)		44	155	24	1.89	17	20,706	RB + LB	32,000	A1+S1+M2+A2	11,100
11-Aug	4,017	1,294		15	83	44	3.42	19	11,411	RB + LB	37,100	A1+S1+M2+A2	11,620
12-Aug	9,032	2,000		24	80	72	5.63	12	18,569	RB + LB	37,800	A1+S1+M2+A2	7,060
13-Aug	991	865		15	71	60	4.82	20	29,195	RB + LB	35,200	A1+S1+M2+A2	2,580
14-Aug	763	1006 (5 sets)	290	45	106	84	6.16	47			26,100	A1+S1+M2+A2	No Count
15-Aug													
16-Aug													

¹ Area 7 Reefnet test fishery is for observation of fish presence and species composition. Vessels are operating at two observation sites.

² Alternative Lower River Test Fishery - Southern Endowment Fund Project

³ Qualark escapement estimate - does not include Chilliwack, Pitt, Harrison, Birkenhead, Big Silver, Weaver, and Cultus

⁴ Qualark source:

RB + LB = Right-bank (RB) + Left-bank (LB)

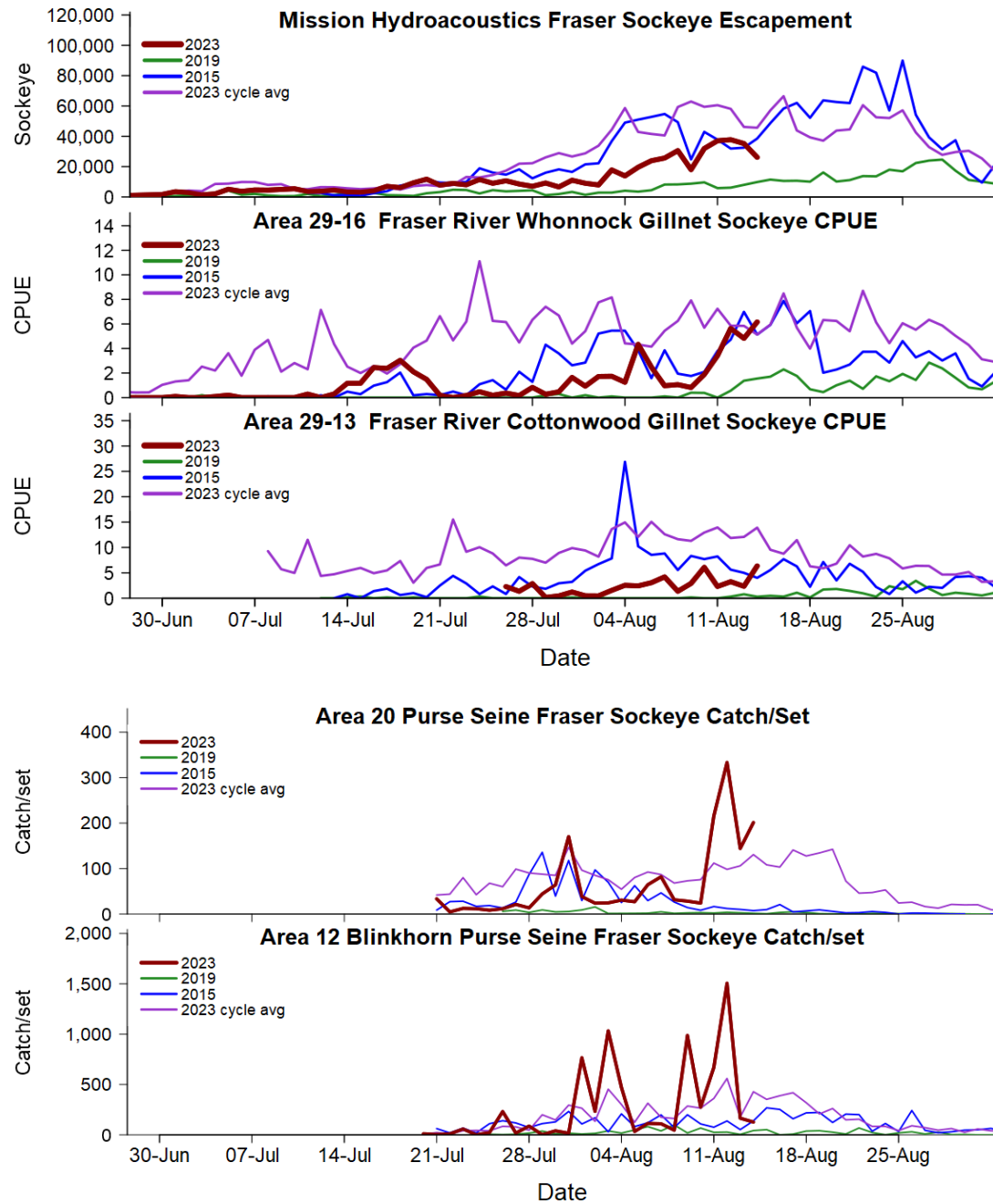
⁵ Mission escapement estimate - does not include Pitt

⁶ Mission source:

S1+M2+A2 = Left bank split-beam (S1) + Mobile ARIS (M2) + Right bank ARIS (A2)

A1+S1+M2+A2 = Left bank ARIS (A1) + Left bank split-beam (S1) + Mobile ARIS (M2) + Right bank ARIS (A2)

⁷ Daily Hells Gate abundance estimate; actual daily count has been expanded.



2023 Fraser Pink Test Fishing & Escapement Summary

Area/Geor Location From A20	Johnstone Strait	Juan de Fuca Strait		Fraser River									
	A12 PS Blinkhorn (- 2 days)	A20 PS Port Renfrew (0 days)	A7 RN ¹ San Juan Is	A29-13 GN Cottonwood	A29-17 GN Brownsville Bar ²	A29-16 GN Whonnock	Whon CPUE Estimate	GN Catch	Qualark Estimate ³	Method ⁴	Mission Hydroacoustics		Hell's Gate Estimates ⁷
											Estimate ⁵	Method ⁶	
25-Jul	927	1,150			0	0	0.00	0	0	RB+LB	0	S1+M2+A2	0
26-Jul	9,305	3,364		0	0	0	0.00	0	0	RB+LB	0	S1+M2+A2	0
27-Jul	3,334	10,148		0	0	0	0.00	0	0	RB+LB	0	S1+M2+A2	0
28-Jul	11,055	6,285		0	0	0	0.00	0	0	RB+LB	0	S1+M2+A2	0
29-Jul	574	7,964		0	0	0	0.00	0	0	RB+LB	0	S1+M2+A2	0
30-Jul	1,800	6,100		0	0	0	0.00	0	0	RB+LB	0	S1+M2+A2	0
31-Jul	2,199	4,152		0	0	0	0.00	0	0	RB+LB	0	S1+M2+A2	0
1-Aug	10,849	6,072		0	0	0	0.00	0	0	RB+LB	0	S1+M2+A2	0
2-Aug	11,745	4,101		0	0	0	0.00	0	0	RB+LB	0	S1+M2+A2	0
3-Aug	15,892	5,102		0	0	0	0.00	0	0	RB+LB	0	S1+M2+A2	0
4-Aug	5,826	10,886		0	1	0	0.00	0	0	RB+LB	0	A1+S1+M2+A2	0
5-Aug	4,442	7,835		0	2	0	0.00	0	0	RB+LB	730	A1+S1+M2+A2	0
6-Aug	12,365	20,036		0	0	1	0.08	0	0	RB+LB	1,470	A1+S1+M2+A2	0
7-Aug	25,449	22,255		0	1	0	0.00	0	0	RB+LB	1,470	A1+S1+M2+A2	0
8-Aug	4322 (2 sets)	12,043		0	3	0	0.00	0	0	RB+LB	1,470	A1+S1+M2+A2	0
9-Aug	88,365	2709 (3 sets)		1	0	0	0.00	0	0	RB+LB	2,010	A1+S1+M2+A2	0
10-Aug	51,493	6080 (3 sets)		0	1	0	0.00	0	0	RB+LB	2,010	A1+S1+M2+A2	0
11-Aug	61,846	32,260		0	1	0	0.00	0	0	RB+LB	2,020	A1+S1+M2+A2	0
12-Aug	92,413	52,160		0	1	1	0.08	0	0	RB+LB	1,010	A1+S1+M2+A2	0
13-Aug	12,244	49,024		0	2	0	0.00	0	0	RB+LB	1,520	A1+S1+M2+A2	0
14-Aug	9,283	23431 (5 sets)	398	0	2	0	0.00	0	0	RB+LB	2,020	A1+S1+M2+A2	No Count
15-Aug													
16-Aug													

¹ Area 7 Reefnet test fishery is for observation of fish presence and species composition. Vessels are operating at two observation sites.

² Alternative Lower River Test Fishery - Southern Endowment Fund Project

³ Qualark escapement estimate - does not include Chilliwack, Pitt, Harrison, Birkenhead, Big Silver, Weaver, and Cultus

⁴ Qualark source:

$RB+LB = \text{Right Bank (RB)} + \text{Left Bank (LB)}$

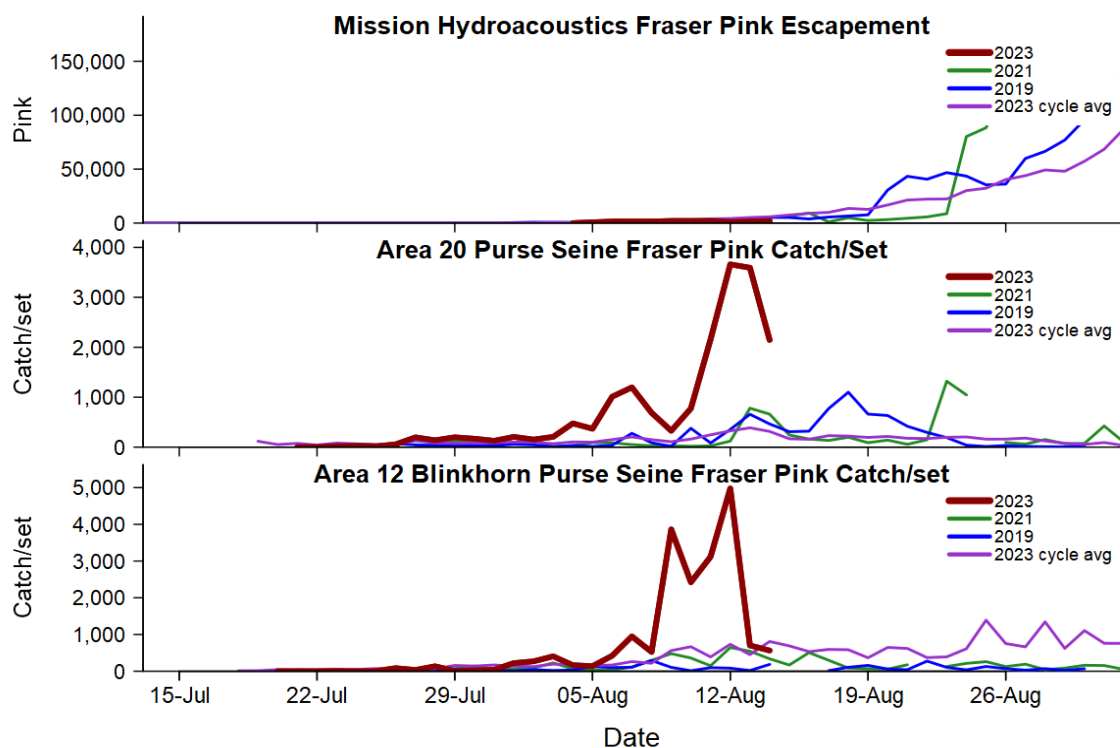
⁵ Mission escapement estimate - does not include Pitt

⁶ Mission source:

$S1+M2+A2 = \text{Left bank split-beam (S1)} + \text{Mobile ARIS (M2)} + \text{Right bank ARIS (A2)}$

$A1+S1+M2+A2 = \text{Left bank ARIS (A1)} + \text{Left bank split-beam (S1)} + \text{Mobile ARIS (M2)} + \text{Right bank ARIS (A2)}$

⁷ Daily Hells Gate abundance estimate; actual daily count has been expanded.



Fraser Sockeye: Qualark Passage Estimate and Mission-based Projection

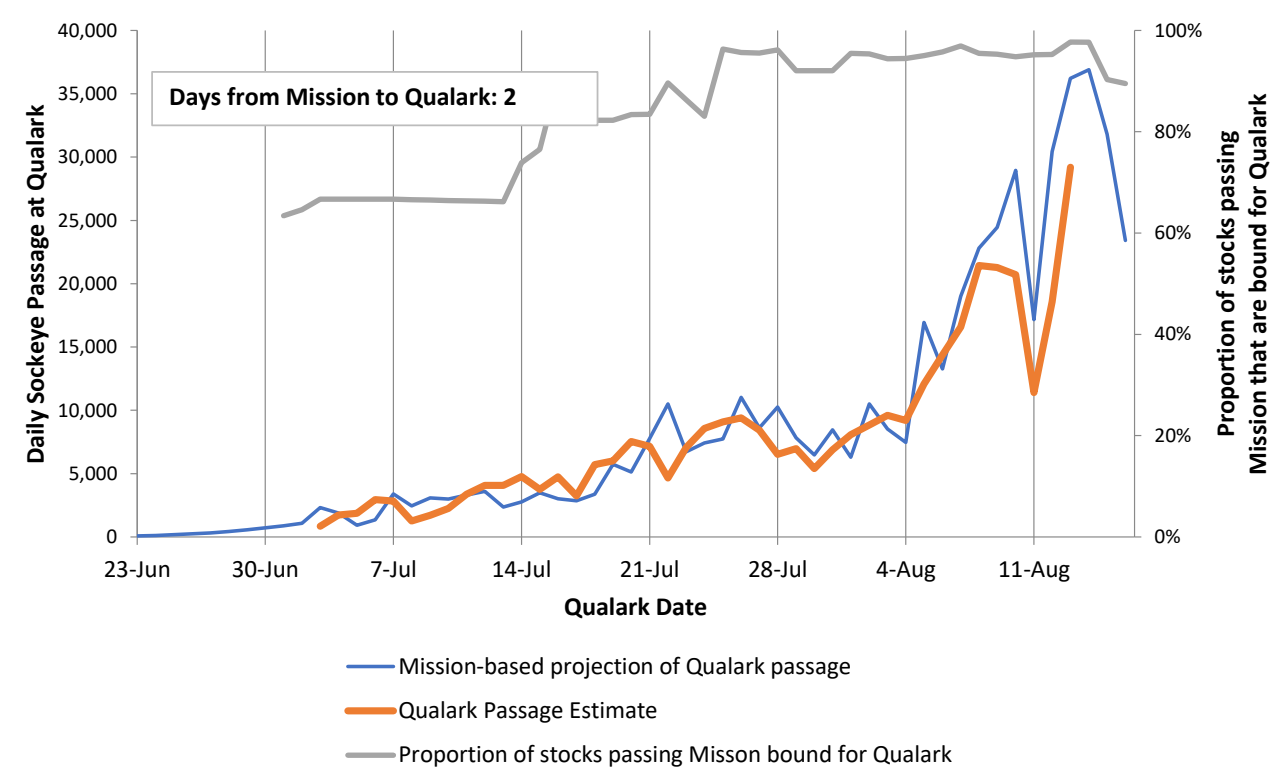
Year: 2023

Date: 15/Aug/23

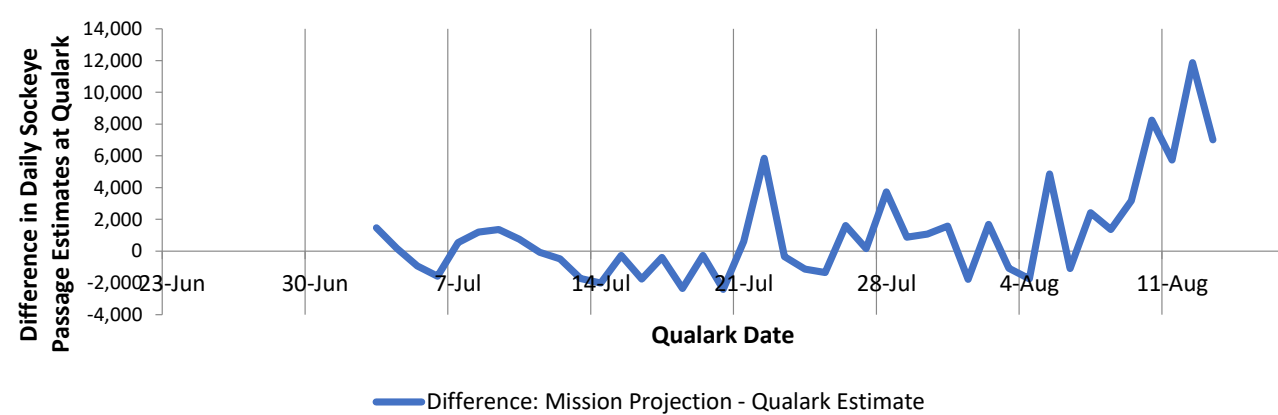
Time: 9:27 AM

	All Days	Common Days
Mission projection	485,596	388,891
Qualark estimate	344,224	344,224
	Difference	44,667
	%Difference	11%

Compare Qualark Passage Estimate and Mission-based Projection



Difference between Qualark Passage Estimate and Mission-based Projection



2023 Fraser River Sockeye Salmon Stock identification Review

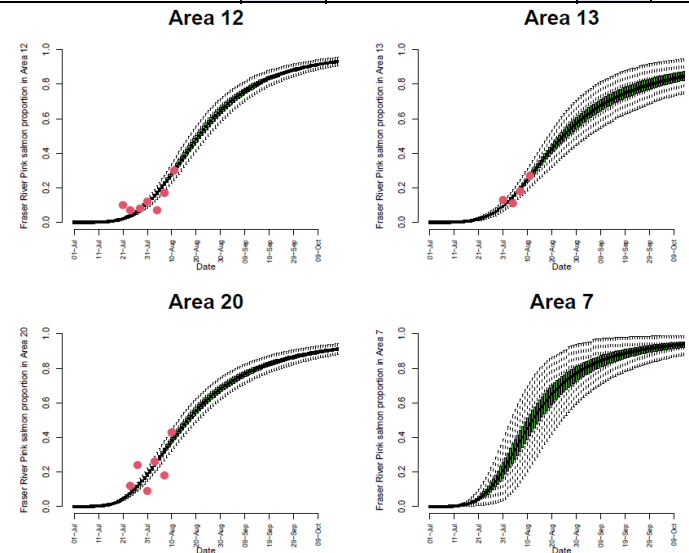
Recent stock composition estimates for sockeye salmon

Fishing						Fraser-only Stock Proportions by Reporting Group ⁴ (%)														Age (%)	
						Early Stuart	Early Summer					Summer					Late				Overall Stocks
						Early Stuart	Nadina Bowron Pitt Gates Alouette Nahat-latch Early Thompson				Early Summer sub-total	Harri-son Late Stuart Chilko Ques-nel Raft North Thompson				Summer sub-total	Birken-head Late Shuswap Weaver Cultus			Late sub-total	Age-4 ₂
Area/Gear ¹	Sector ²	Date	Type ³	Size (n)	%Fraser		Chilli-wack	Coquit-lam	Taseko	Widg-eon		Stellako	Ques-nel	Thomp-son	Big Silver		Portage	Cultus			
Johnstone Strait & Queen Charlotte Strait																					
A12 ps	tf	Aug 6	DNA	94	93%	0%	1%		7%	1%	7%		27%	47%	3%	77%	5%	2%	9%	15%	56%
A12 ps	tf	Aug 8	DNA	68	99%	0%			7%	5%	12%		14%	49%	7%	70%	4%	1%	13%	18%	64%
A12 ps	tf	Aug 9	DNA	89	98%	0%			5%	1%	7%		23%	52%	2%	77%	5%	3%	8%	16%	66%
A12 ps	tf	Aug 12	DNA	90	99%	0%			3%		3%		16%	59%	1%	75%	7%	4%	10%	21%	64%
A12 ps		Aug 17	Prediction	1	99%	0%			1%	0%	1%		6%	52%	4%	62%	12%	5%	20%	36%	NA
Juan de Fuca Strait & Washington & Other																					
A20 ps	tf	Aug 5	DNA	99	98%	0%		4%	3%	5%	12%	10%	14%	42%	1%	66%	7%	1%	15%	22%	61%
A20 ps	tf	Aug 8	DNA	100	96%	0%		4%	7%	2%	14%	2%	12%	39%	4%	57%	10%	4%	15%	29%	62%
A20 ps	tf	Aug 11	DNA	98	100%	0%			4%	1%	6%	2%	22%	49%		73%	12%	2%	7%	21%	NA
A20 ps	tf	Aug 12	DNA	97	98%	0%			8%	3%	11%		9%	60%		69%	6%	9%	5%	20%	70%
A20 ps		Aug 17	Prediction	1	100%	0%			5%	1%	6%	1%	7%	52%		60%	11%	11%	12%	34%	NA
In-river																					
BB gn Bro	tf	Aug10-11	DNA	99	100%	0%			1%	6%	20%	1%	14%	64%		79%		0%	0%	1%	NA
BB gn Bro	tf	Aug12-13	DNA	100	100%	0%	1%		5%	8%	14%	2%	21%	56%		80%	3%	4%		7%	NA
BB gn Cot	tf	Aug12-13	DNA	39	100%	0%	1%	3%	22%		26%		13%	45%		59%	16%			16%	NA
AB gn	tf	Aug11-12	DNA	98	100%	0%			12%	5%	17%	1%	7%	73%		81%	2%			2%	66%

2023 Fraser River Pink Salmon Stock identification Review

Recent stock composition estimates for pink salmon

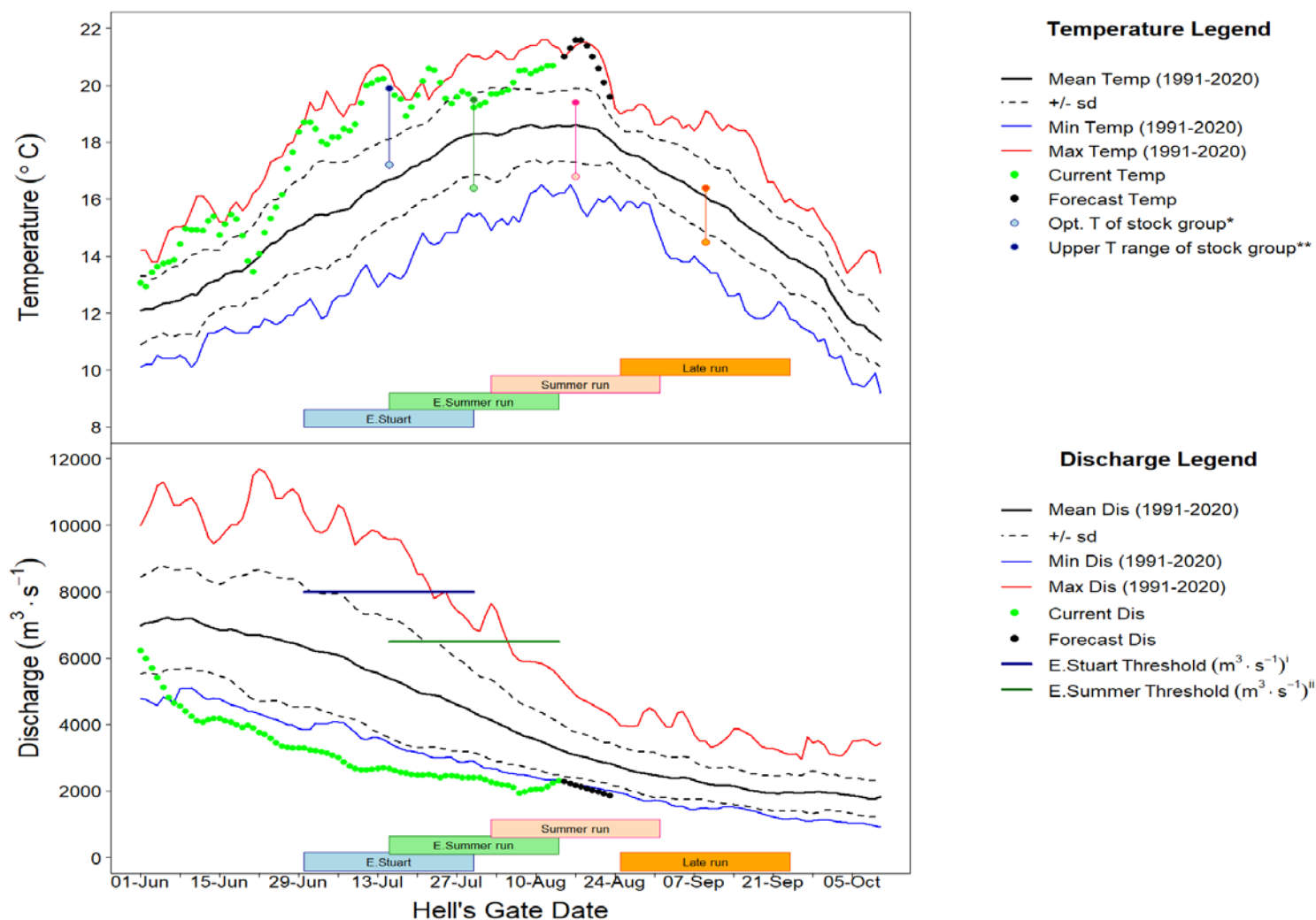
Fishing					DNA % Estimates by Group		
Area/Gear ¹	Sector ²	Date	Type ³	Size (n)	Fraser River	Washington	Canada South Coast
Johnstone Strait							
A12 PS	TF	Aug7	DNA	96	17%	31%	53%
A12 PS	TF	Aug11	DNA	95	30%	28%	42%
A12		Aug17	Prediction	1	43%	25%	32%
Juan de Fuca Strait							
A20 PS	TF	Aug7	DNA	95	18%	49%	33%
A20 PS	TF	Aug10	DNA	96	43%	38%	19%
A20		Aug17	Prediction	1	51%	34%	15%
Washington							



Fraser River Environmental Report for August 14, 2023

Observed Fraser River Temperature at Qualark for 14-Aug	20.7°C
Average (1991-2020) Historical Temperature on this day	18.6°C
Deviation from Average	2.1°C
Forecast Temperature for 20-Aug-23	21°C
The forecast in Kamloops and Prince George is for above average air temperature until Aug 17 and 18, respectively. Air temperature is then forecast to drop to below average and then return to above average air temperature for the rest of the forecast period.	

Observed Fraser River Discharge at Hope for 14-Aug	2304 m ³ ·s ⁻¹
Average (1991-2020) Historical Discharge on this day	3265 m ³ ·s ⁻¹
% above or below Historical Discharge	-29%
Forecast Discharge for 20-Aug-23	2025 m ³ ·s ⁻¹
The forecast in Kamloops is for 37 mm of precipitation. The forecast in Prince George is for 24 mm of precipitation.	



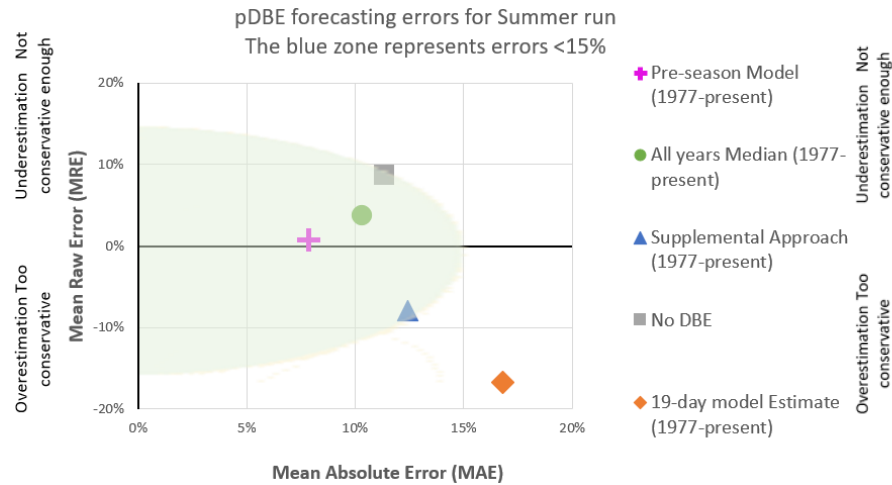
Run timing bars represent a 31 day spread of the run centered around the Hell's Gate date. Hell's gate timing is 5 days from Mission for Early Stuart and Late run; and 4 days from Mission for Early Summer and Summer run. ⁱpMA is the proportional increase to spawning escapement targets to help ensure targets are achieved. ⁱⁱ%DBE is %difference between estimates of potential spawning escapement and spawning escapement. *This is the optimum temp for aerobic swimming - T_{opt} (Eliason et al. (2011). Science 332: 109-112)**This is the upper range of the optimum temp for aerobic swimming - T_{pejus}. ⁱDischarge threshold of 8000cms for Early Stuart from Macdonald (2000). Can. Tech. Rep. Fish. Aquat. Sci. 2315: 120p. ⁱⁱDischarge threshold of 6500cms for Early Summer run from Macdonald et al. (2010). Trans. Am. Fish. Soc. 139: 768-782. 19 days of T & Q data are required to calculate a pMA - 15 days before the Hell's Gate Date and 3 days after. MA estimates can be calculated 4 days after the Area 20 date.

Current Temperatures						
Upriver of Slide	Map #	13-Aug	Daily Mean	Historic Mean	Deviation from Historical Mean	Historic Year Range
<u>Fraser River Mainstem</u>						
	1	Fraser River @ Qualark	20.7	18.6	2.1	1991-2020
	2	Fraser River @ Texas Creek	19.7	18.3	1.4	2006-2022
	3	Fraser River @ Big Bar Creek	NA	NA	NA	2019-2022
►	4	Fraser River @ Marguerite	18.5	18.4	0.1	2015-2022
►	5	Upper Fraser @ Shelley	15.9	15.3	0.6	1994-2022
<u>Fraser River Tributaries</u>						
	6	Thompson R. @ Ashcroft	20.5	18.5	2.0	1995-2022
	7	South Thompson @ Chase	21.2	19.7	1.5	1994-2022
	8	North Thompson @ McLure	17.3	15.6	1.7	2006-2022
►	9	Quesnel R. @ Quesnel	18.7	17.1	1.6	2000-2022
►	10	Nechako R. @ Isle Pierre	19.0	18.7	0.3	2006-2022
►	11	Stuart R. @ Ft. St. James	19.5	18.7	0.8	2000-2022

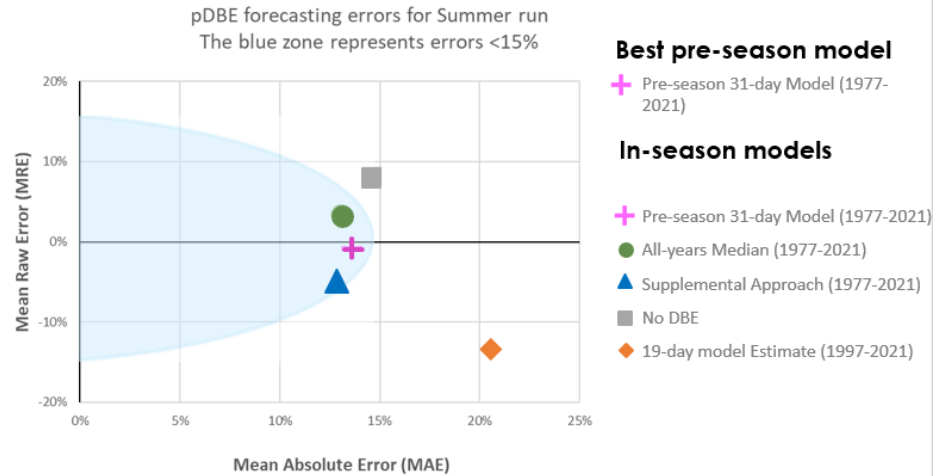


Retrospective Analysis of methods to predict Summer-run pDBEs based on Low Discharge years

Performance using Low Discharge years



Performance using All-years



Model Performance in Low Discharge years

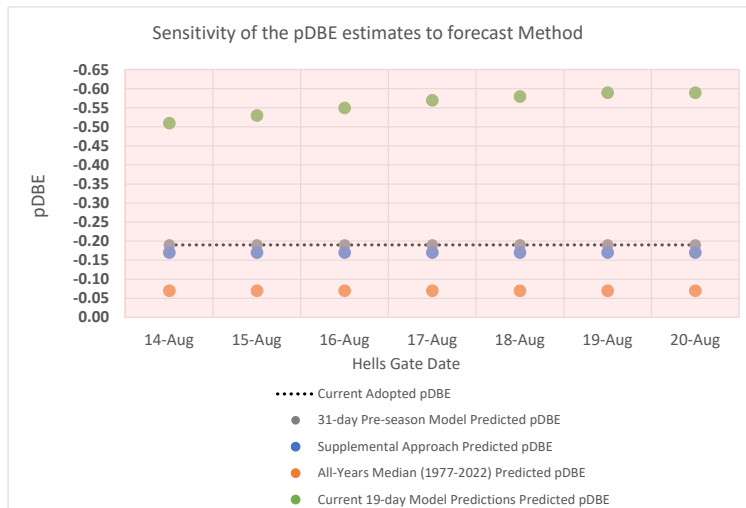
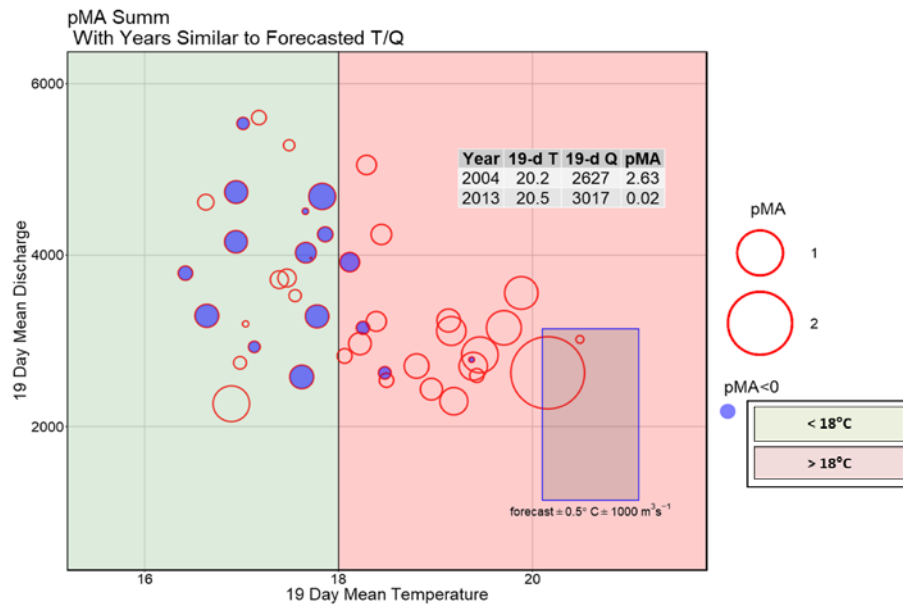
	MAE	MRE
Pre-season Model (1977-present)	8%	1%
All years Median (1977-present)	10%	4%
Supplemental Approach (1977-present)	12%	-8%
No DBE	11%	9%
19-day model Estimate (1977-present)	17%	-17%

Conclusions for low discharge years

- During low discharge years (< 2,500 cms), the mean absolute error and the mean raw error is smallest for the Pre-season model compared to the All-years Median and the Supplemental Approach.
- The pre-season model is still the best performing model, even in low discharge years.

Summer run pDBE Forecast and Sensitivity Analysis for August 15, 2023

Based on the retrospective analysis evaluation of 2010-2021 for Summer run the best performing in-season model is the 31-day pre-season model

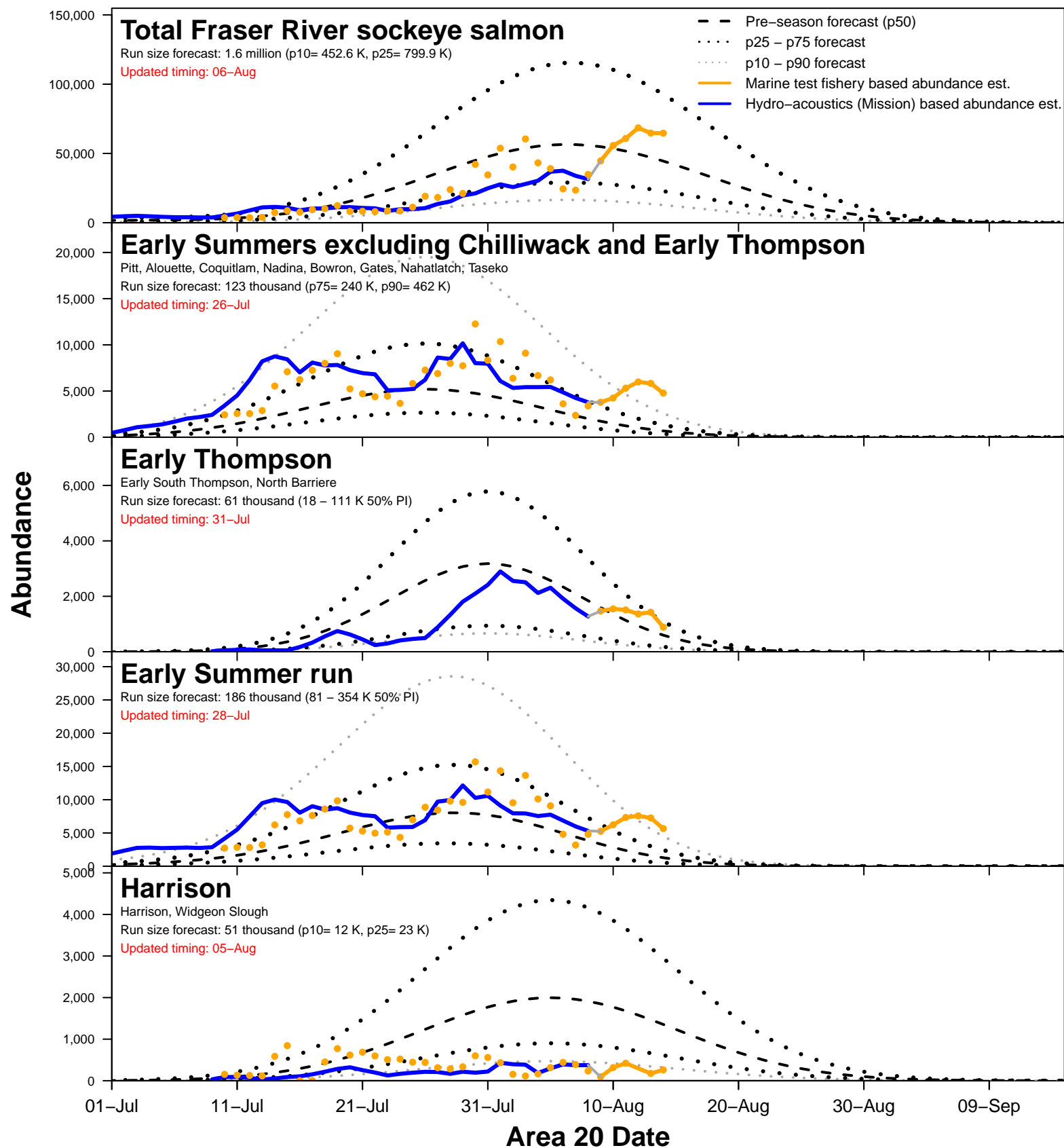


Model Performance Based on "In-season pDBE Approach"					Best		Tied Second Best (too conservative)	Tied Second Best (not conservative enough)	Least
Retrospective					Current Adopted	31-day Pre-season Model	Supplemental Approach	All-Years Median (1977-2022)	Current 19-day Model Predictions
Area	Hells Gate Date	Average Temperature °C	Average Discharge m³/s		Predicted pDBE	Predicted pDBE	Predicted pDBE	Predicted pDBE	Predicted pDBE
03-Aug	14-Aug	20.3	2192		-0.19	-0.19	-0.17	-0.07	-0.51
04-Aug	15-Aug	20.4	2177		-0.19	-0.19	-0.17	-0.07	-0.53
05-Aug	16-Aug	20.5	2159		-0.19	-0.19	-0.17	-0.07	-0.55
06-Aug	17-Aug	20.6	2142		-0.19	-0.19	-0.17	-0.07	-0.57
07-Aug	18-Aug	20.7	2126		-0.19	-0.19	-0.17	-0.07	-0.58
08-Aug	19-Aug	20.7	2110		-0.19	-0.19	-0.17	-0.07	-0.59
* Implied pMA									
09-Aug	20-Aug	20.7	2093		0.23	0.23	0.20	0.08	1.44

*Currently last day with 19 days of observed (10 days) and forecasted (9 days) Temp & Disch data.

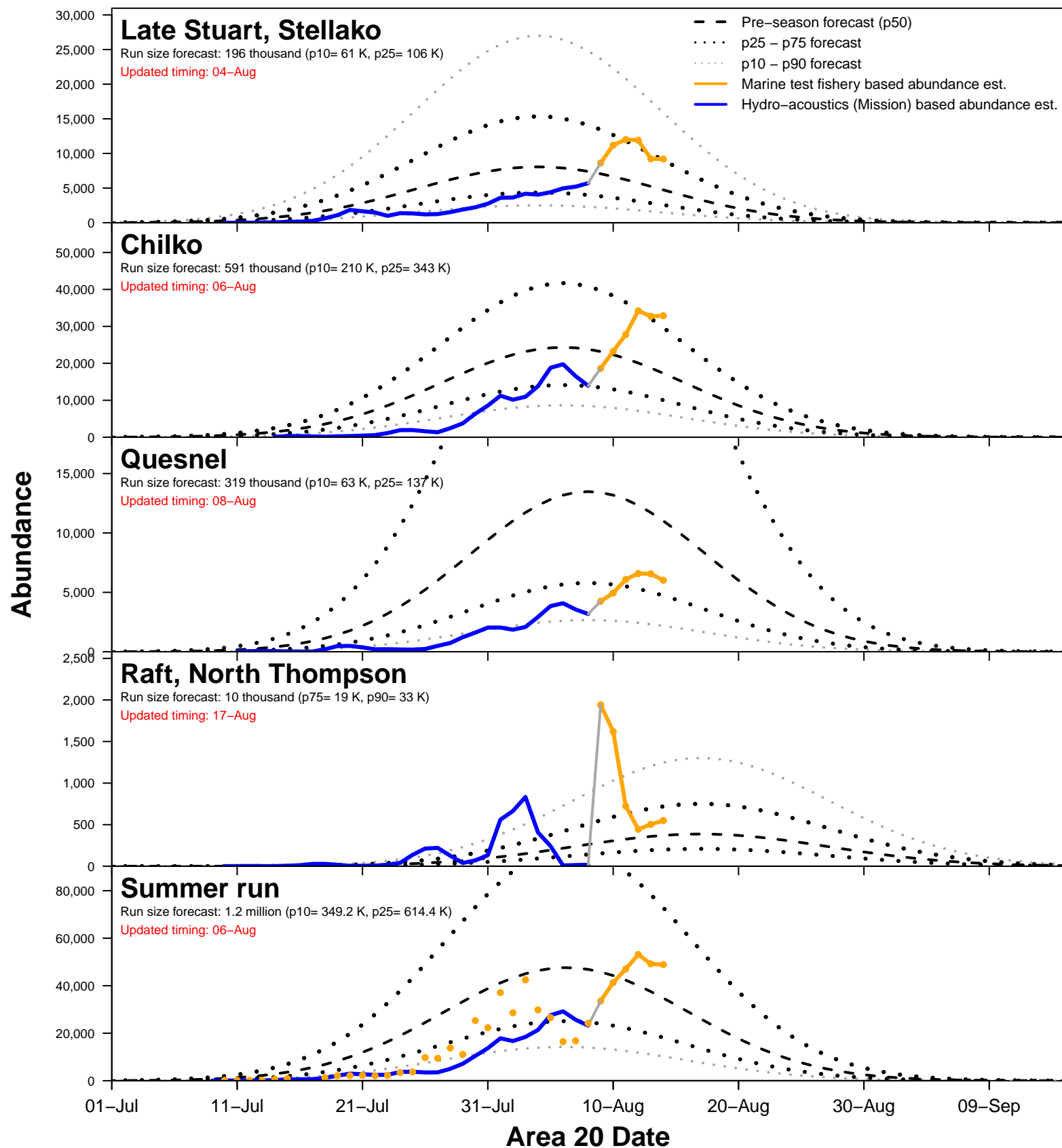
2023 Fraser River sockeye salmon daily migration

Timing updated based on Timing Correlations



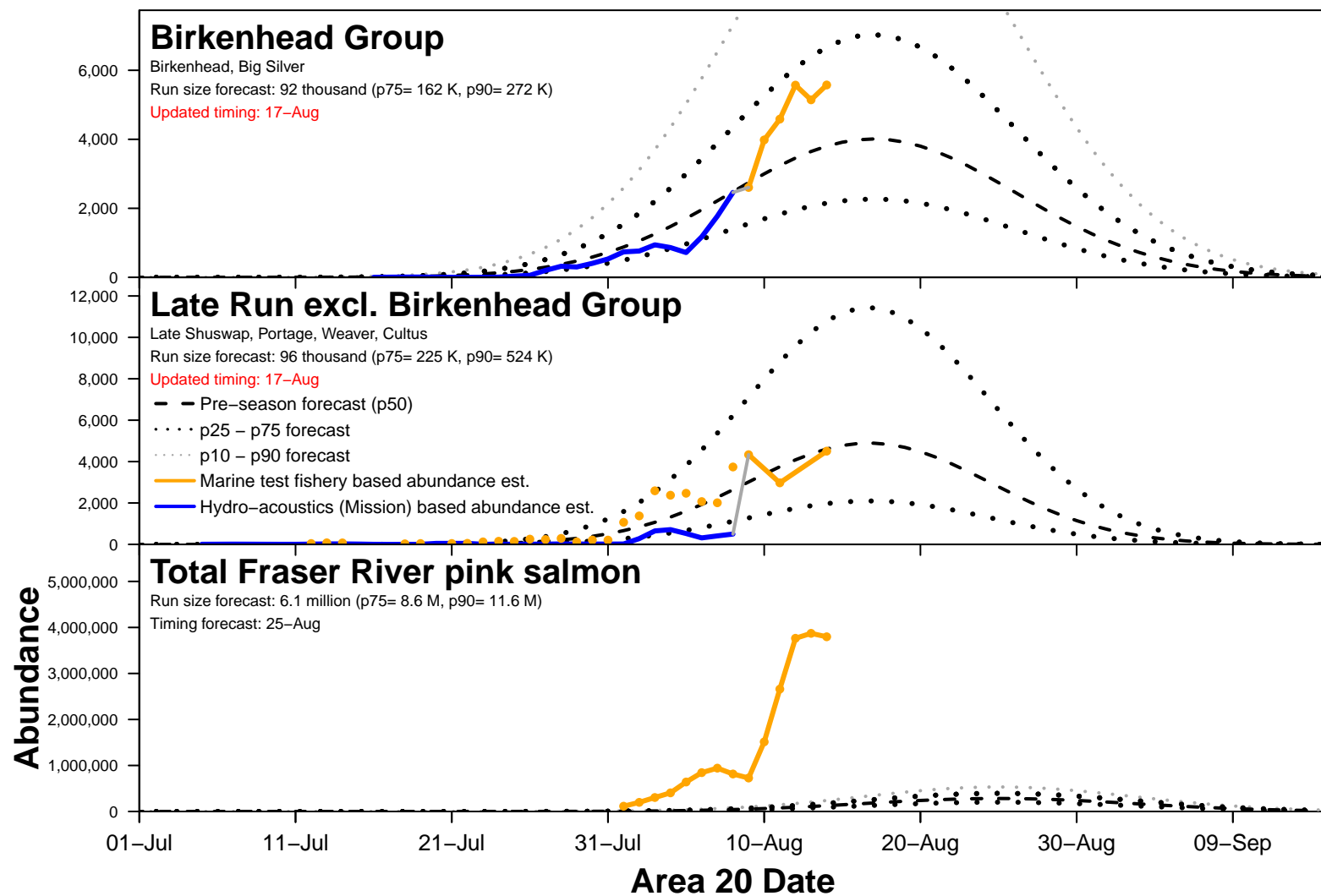
2023 Fraser River sockeye salmon daily migration

Timing updated based on Timing Correlations



2023 Fraser River sockeye salmon daily migration

Timing updated based on Timing Correlations



2023 Fraser River sockeye abundance en-route to Mission

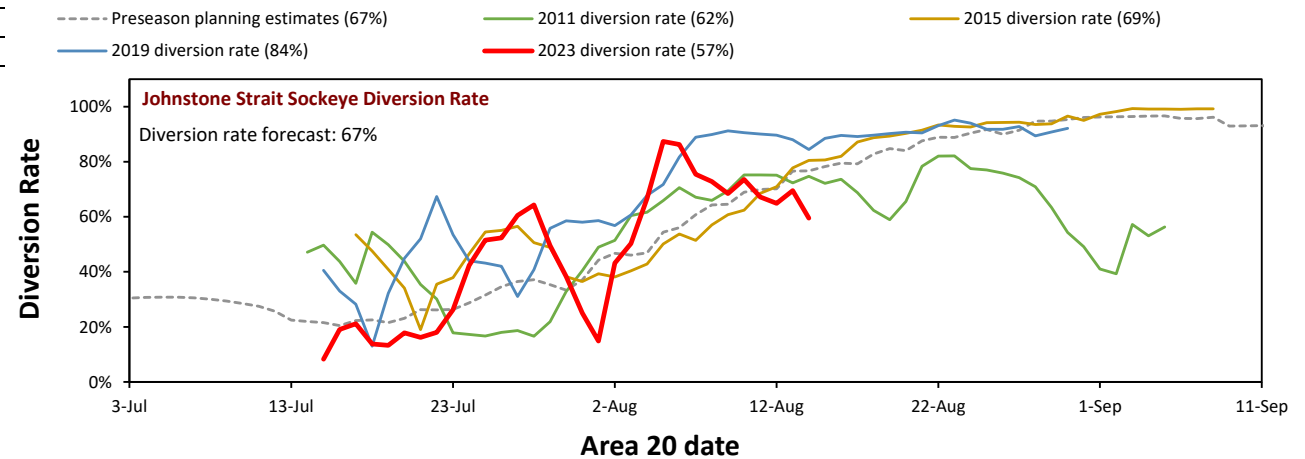
Current date: 15-Aug

	Escapement past Mission through 14-Aug	Projected abundance en route to Mission based on marine test fishery data ^{1,2}								Escapement + projections through 20-Aug	
Area 20 date		09-Aug	10-Aug	11-Aug	12-Aug	13-Aug	14-Aug	Total	80% PI ³		
Mission date		15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug		10p	90p	
Total Fraser	567,100	49,400	57,300	60,100	64,500	80,100	48,600	360,000	214,700	543,900	927,100
Early Summer Run	269,000	7,200	7,200	4,200	10,600	7,600	3,700	40,500	19,800	83,800	309,500
Chilliwack	31,200	0	1,100	200	200	0	0	1,500	700	3,100	32,700
Pitt/Alouette/Coquitlam	32,000	200	100	0	0	0	0	300	100	600	32,300
Nadina group ⁴	175,400	4,400	4,800	3,200	7,900	6,800	2,700	29,800	14,600	61,700	205,200
Early Thompson ⁵	30,400	2,600	1,200	800	2,500	800	1,000	8,900	4,400	18,400	39,300
Summer Run	242,600	32,900	46,600	44,100	49,600	66,100	31,300	270,600	165,100	389,700	513,200
Harrison / Widgeon ²	6,400	100	100	800	0	200	400	1,600	1,000	2,300	8,000
Late Stuart / Stellako	56,200	6,800	13,800	12,800	9,300	13,500	4,800	61,000	37,200	87,800	117,200
Chilko	144,300	18,700	25,200	25,600	32,300	44,400	21,100	167,300	102,100	240,900	311,600
Quesnel	31,900	4,200	6,100	4,500	7,600	7,500	4,400	34,300	20,900	49,400	66,200
Raft / North Thompson	3,800	3,100	1,400	400	400	500	600	6,400	3,900	9,200	10,200
Late Run	14,600	9,300	3,500	11,800	4,300	6,400	13,600	48,900	29,800	70,400	63,500
Birkenhead / Big Silver	11,000	2,500	3,500	5,900	4,300	6,400	4,700	27,300	16,700	39,300	38,300
Late run excl Birkenhead	3,600	6,800	0	5,900	0	0	8,900	21,600	13,200	31,100	25,200

¹ En route catches are incomplete: catches from present and future fisheries must be deducted from projections and added to the catches removed² Projected abundances en route to Mission include Harrison and Late runs, an uncertain number of which are expected to delay³ 80% Probability Interval: there exists an 80% chance that the true abundance lies within this interval⁴ Nadina / Bowron / Gates / Nahatlatch / Taseko⁵ Early South Thompson / North Barriere

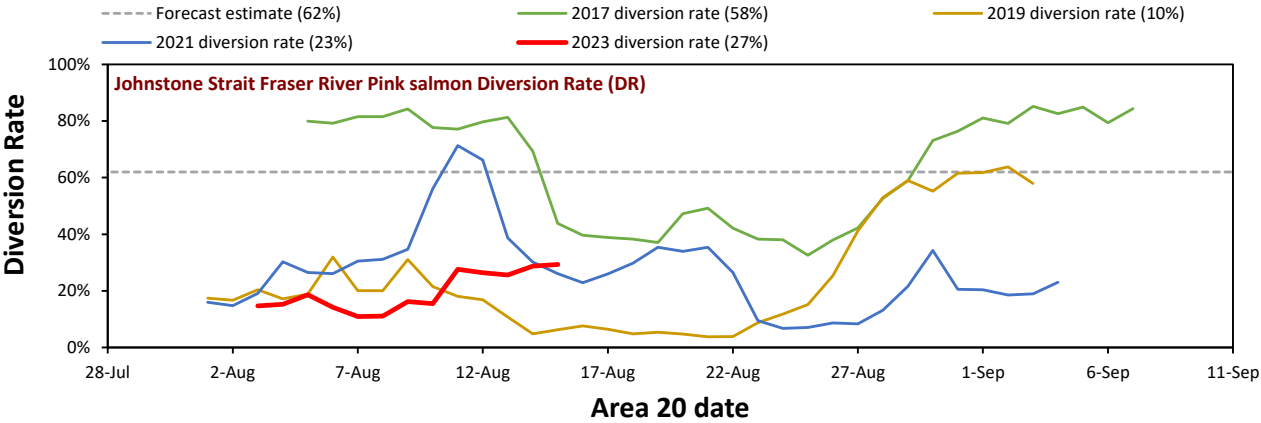
2023 Fraser River sockeye diversion rates through Johnstone Strait

	5-day-average
Diversion rate	60%



2023 Fraser River Pink salmon diversion rates through Johnstone Strait

	5-day-average
Fraser pink salmon	29%



* Pink forecast diversion rate updated from 53% to 62% based upon the DFO forecast received in August

Pink In-season Update

August 15, 2023

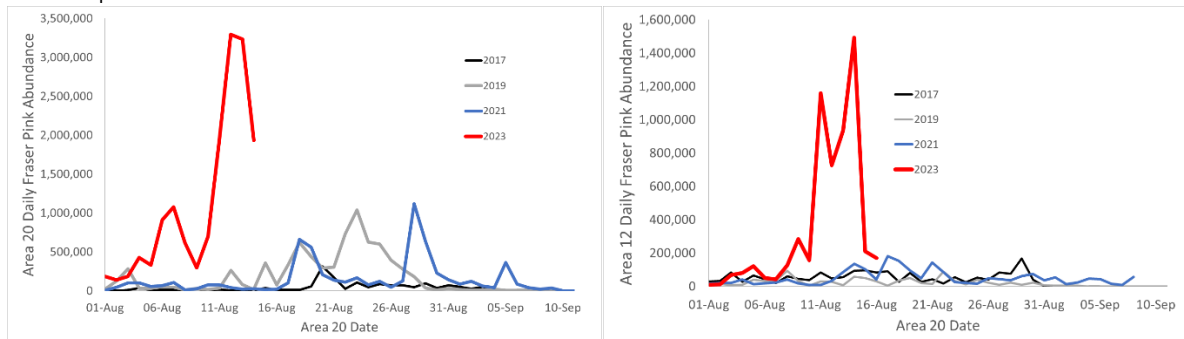
Current Trends

- Continue to see unprecedented high catches in marine test fisheries
- Low abundances of pinks observed in the river to-date
- Added cumulative CPUE as another piece of evidence that the run is exceeding the pre-season p75 (8.6M)

Daily abundances by Area

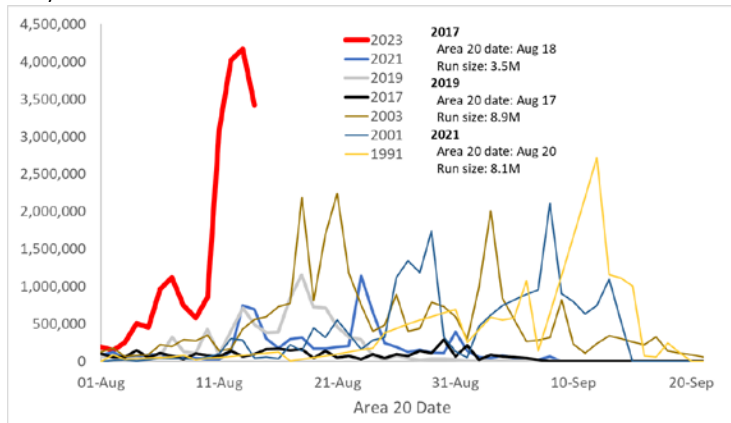
Area 20 expansion line: 900

Area 12 expansion line: 300



Overall run size (for overlapping days only)

2-day assumed offset between Area 12 and Area 20



Pink Salmon Run Size Weight of Evidence

Default Run Size Method: PreSeason Forecast 6.1M (4.4-8.6M 50% PI)

2023-08-15

<4.4M (p25)	4.4-8.6M (p25-p75)	>8.6M (p75)
	<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

☒ Default run size estimate = PreSeason Forecast

☐ Alternative run size estimate

Models	Description
PreSeason Forecast	<input checked="" type="checkbox"/> Recruits per spawner (mean)
Time Density Model	<input type="checkbox"/> Bayesian fit to CPUE*EL data (prior to peak of the run)
SST Regression	<input type="checkbox"/> June SST at Pine Island vs. run size
Cumulative CPUE	<input type="checkbox"/> Cumulative CPUE to date vs. run size
Power(fry) forecast	<input type="checkbox"/> Recruits per spawner

2023 Fraser River run size and timing estimates

The information presented on this page has been prepared by PSC Secretariat Staff. All in-season estimates of run size and timing should be considered draft preliminary estimates unless adopted by the Fraser River Panel.

Preseason forecasts, inseason estimates, and official estimates of run size and associated timing

	Run Size						Run size components				Run Timing ¹					
	Inseason Adopted	Preseason Forecast	Inseason estimate	Inseason 80% Pls ²		Method	Catch + Escapement	6-day Projection ³	Seaward Abundance	Migration Delay	Inseason Adopted	Preseason Forecast	Inseason estimate	Inseason 80% Pls ²		Method
				10% PI	90% PI									10% PI	90% PI	
Early Stuart Run	41,000	23,000	✓ 41,000	41,000	41,000	Recon	41,000	0	0	0	02-Jul	07-Jul	02-Jul	02-Jul	02-Jul	Recon
Early Summer Run	290,000	186,000	● 295,000	277,000	313,000	Sum	273,000	17,000	5,000	0	23-Jul	06-Aug	23-Jul	22-Jul	24-Jul	Weight
Chilliwack		2,000	● 33,000	32,000	33,000	Recon	31,000	2,000	0	0		20-Jul	05-Jul	05-Jul	05-Jul	Recon
Pitt/Nadina Group ⁴		123,000	● 223,000	213,000	235,000	Recon(2)	210,000	9,000	4,000	0		05-Aug	24-Jul	23-Jul	25-Jul	Recon(2)
Early Thompson ⁵		61,000	● 39,000	32,000	45,000	Model	32,000	6,000	1,000	0		09-Aug	03-Aug	02-Aug	05-Aug	Model
Summer Run	NA	1,167,000	◇ 695,000	537,000	908,000	Sum	247,000	237,000	207,000	4,000	NA	17-Aug	11-Aug	09-Aug	14-Aug	Weight
Harrison / Widgeon		51,000	◇ 15,000	10,000	25,000	Model	7,000	2,000	2,000	4,000		12-Aug	31-Jul	28-Jul	03-Aug	Model
Late Stuart / Stellako		196,000	◇ 124,000	101,000	150,000	Model	57,000	29,000	38,000	0		13-Aug	09-Aug	07-Aug	11-Aug	Model
Chilko		591,000	◇ 443,000	338,000	585,000	Model	147,000	167,000	129,000	0		17-Aug	12-Aug	09-Aug	15-Aug	Model
Quesnel		319,000	◇ 98,000	78,000	125,000	Model	32,000	34,000	32,000	0		19-Aug	13-Aug	10-Aug	15-Aug	Model
Raft / North Thompson		10,000	◇ 15,000	10,000	23,000	Model	4,000	5,000	6,000	0		23-Aug	12-Aug	09-Aug	16-Aug	Model

¹ Run timing refers to the date when 50% of the run migrated past the Area 20 reference point.

² 80% Probability Interval: there exists an 80% chance that the true abundance lies within this interval

³ Normally based on test fishery data. Based on Model if Method = Recon(2).

⁴ Pitt / Alouette / Coquitlam / Nadina / Bowron / Gates / Nahatlatch / Taseko

⁵ Early South Thompson / North Barriere.

Run Size Uncertainty Legend[†]

- ✓ ≥ 95% of the run size has been accounted for in catch + escapement. Clear indication of run size; minor run size updates still expected
- ≥ 70% of the run size has been accounted for in catch + escapement. Good indication of run size; peak fo the run has been observed at Mission, uncertainty relates to seaward abundance
- ▲ ≥ 50% of the run size has been accounted for in catch + escapement. Decent indciation of run size; ≥ 50% confirmed at Mission
- ◇ < 50% of the run size has been accounted for in catch + escapement. Uncertain or early indciation of run size based on marine data

[†] The **Run Size Uncertainty Indicator** is a categorical indication of the degree of uncertainty present in the run size estimate. Estimates are categorized quantitatively based on the proportion of the run that has been accounted for with high certainty in catch + escapement.

Summer run size based on timing

Catch+Escapement To Date: 247,000

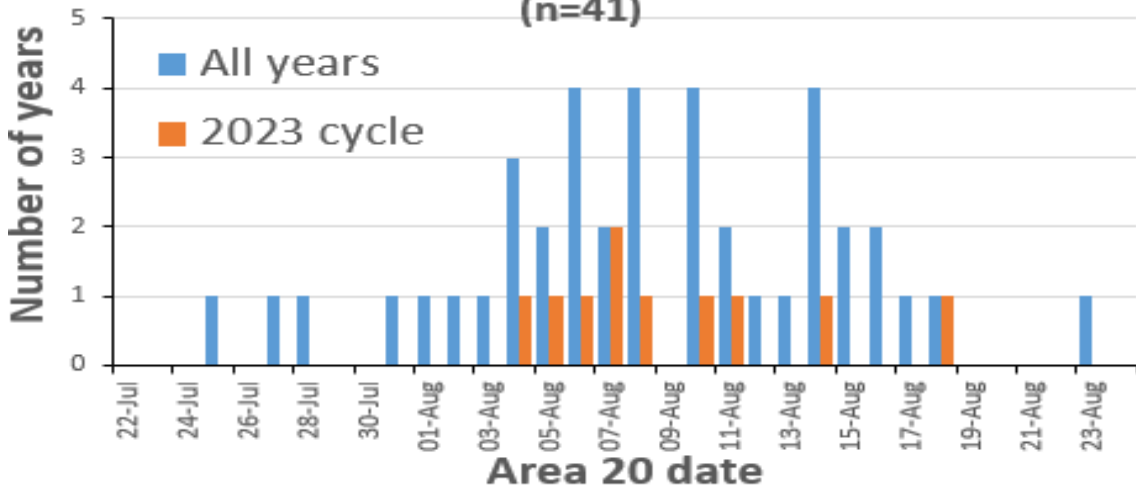
6-day Projection: 237,000

	Method	Run Size*	% Seaward
Based on timing of 11-Aug	50% Date	740,000	67%
Based on timing of 13-Aug	50% Date	973,000	75%
Based on timing of 15-Aug	% Seaward	1,055,000	77%
Based on timing of 17-Aug	% Seaward	1,254,000	80%
Based on timing of 19-Aug	% Seaward	1,430,000	83%

*Based on % seaward in 2011, 2015 and 2019 if timing is later than 14-Aug

*Equal to double the reconstructed abundance if timing is earlier than 15-Aug

Historical 50% migration date for Summer run (n=41)



2023 Predicted Fraser River Sockeye Mortality in Area 7/7A Pink Directed Purse Seine Fisheries

*The actual pink salmon catch of proposed fisheries should not exceed the available total allowable catch for pink salmon
Pink salmon catches below the expected daily abundances would cause predicted sockeye mortality to be reduced proportionally*

Date: 15/08/2023

Area 7 date	Fraser River pink salmon ¹			% Sockeye Abundance	Fraser River Sockeye Salmon ^{2,7}				TRT harvest rate ³	AC harvest rate ³	Sockeye Release Mortality rate ⁴	Sockeye Retention Policy		Predicted mortality of Sockeye ⁵	
	Daily predicted catch ⁶				Total	E. Summers	Summer	Lates				Treaty Tribes	All Citizen	Total Treaty Tribes	Total All Citizen
	Predicted abundance ⁸	Treaty Tribes	All Citizen												
14-Aug	328,600	77,653	66,870	10.5%	38,488	2,652	27,781	8,056	12%	10%	25%	Retention	Non-Retention	4,541	977
15-Aug	374,300	88,359	76,089	8.5%	34,693	7,695	24,795	2,203	12%	10%	25%	Retention	Non-Retention	4,093	881
16-Aug	420,800	99,230	85,450	3.3%	14,262	2,566	10,261	1,435	12%	10%	25%	Retention	Non-Retention	1,682	362
17-Aug	466,400	107,352	92,445	7.1%	35,762	3,315	22,523	9,925	12%	10%	25%	Retention	Non-Retention	4,219	908
18-Aug	509,600	120,030	103,363	5.3%	28,239	4,525	19,193	4,521	12%	10%	25%	Retention	Non-Retention	3,331	717
19-Aug	549,350	129,347	111,385	4.9%	28,239	4,525	19,193	4,521	12%	10%	25%	Retention	Non-Retention	3,331	717
20-Aug	584,600	137,549	118,448	4.6%	28,239	4,525	19,193	4,521	12%	10%	25%	Retention	Non-Retention	3,331	717
21-Aug	613,400	144,294	124,257	4.4%	28,239	4,525	19,193	4,521	12%	10%	25%	Retention	Non-Retention	3,331	717
22-Aug	634,900	148,529	127,904	4.3%	28,239	4,525	19,193	4,521	12%	10%	25%	Retention	Non-Retention	3,331	717

¹ Assumed travel time for pink salmon from Area 20 to Area 7 is 6 days

² Assumed travel time for sockeye salmon from Area 20 to Area 7 is 3 days

³ Assumes fixed daily sockeye harvest rate combined over 7/7A. TRT effort = 8 PS equivalents; AC effort = 5 PS equivalents

⁴ Sockeye release mortality of 25% applied to purse seine catches based on past studies

⁵ Assumes Treaty Tribes and All Citizen fisheries will take place on different days

⁶ Assumes fishing on 3 days (or blocks) of pink salmon. Does not account for any depletion effects.

⁷ Sockeye abundance for last 5 days are based on a 3-day average of preceding values

⁸ Pink salmon daily abundances are based on a time-density run-size model

2023 Predicted Fraser River Sockeye Mortality in Area 7/7A Pink Directed Gillnet Fisheries

The actual pink salmon catch of proposed fisheries should not exceed the available total allowable catch for pink salmon

Pink salmon catches below the expected daily abundances would cause predicted sockeye mortality to be reduced proportionally

Date: 15/08/2023

Area 7 date	Fraser River pink salmon ¹			% Sockeye Abundance	Fraser River Sockeye Salmon ^{2,9}				TRT harvest rates ³		AC harvest rates ³		Sockeye Release Mortality rate ⁴	Sockeye Retention Policy		Predicted mortality of Sockeye ⁵	
	Predicted abundance ¹¹	Treaty Tribes	All Citizen		Total	E. Summers	Summer	Lates	Sockeye	Pink ¹⁰	Sockeye	Pink ¹⁰		Treaty Tribes	All Citizen	Total Treaty Tribes	Total All Citizen
14-Aug	328,600	617	576	10.5%	38,488	2,652	27,781	8,056	9%	0.1%	9%	0.1%	60%	Retention	Non-Retention	3,606	2,020
15-Aug	374,300	702	655	8.5%	34,693	7,695	24,795	2,203	9%	0.1%	9%	0.1%	60%	Retention	Non-Retention	3,250	1,821
16-Aug	420,800	788	736	3.3%	14,262	2,566	10,261	1,435	9%	0.1%	9%	0.1%	60%	Retention	Non-Retention	1,336	748
17-Aug	466,400	852	796	7.1%	35,762	3,315	22,523	9,925	9%	0.1%	9%	0.1%	60%	Retention	Non-Retention	3,350	1,877
18-Aug	509,600	953	890	5.3%	28,239	4,525	19,193	4,521	9%	0.1%	9%	0.1%	60%	Retention	Non-Retention	2,645	1,482
19-Aug	549,350	1,027	959	4.9%	28,239	4,525	19,193	4,521	9%	0.1%	9%	0.1%	60%	Retention	Non-Retention	2,645	1,482
20-Aug	584,600	1,092	1,020	4.6%	28,239	4,525	19,193	4,521	9%	0.1%	9%	0.1%	60%	Retention	Non-Retention	2,645	1,482
21-Aug	613,400	1,146	1,070	4.4%	28,239	4,525	19,193	4,521	9%	0.1%	9%	0.1%	60%	Retention	Non-Retention	2,645	1,482
22-Aug	634,900	1,179	1,101	4.3%	28,239	4,525	19,193	4,521	9%	0.1%	9%	0.1%	60%	Retention	Non-Retention	2,645	1,482

¹ Assumed travel time for pink salmon from Area 20 to Area 7 is 6 days

² Assumed travel time for sockeye salmon from Area 20 to Area 7 is 3 days

³ TRT effort = 24 gillnet vessels; AC effort = 10 gillnet vessels

⁴ Sockeye release mortality of 60% applied to gillnet catches based on past studies

⁵ Assumes Treaty Tribes and All Citizen fisheries will take place on different days

⁶ Assumes fishing on 3 days (or blocks) of pink salmon. Does not account for any depletion effects.

⁹ Sockeye abundance for last 5 days and pink abundance for last 2 days is based on a 3-day average of preceding values

¹⁰ Harvest rate of pink salmon is estimated to be 1% of the sockeye harvest rate

¹¹ Pink salmon daily abundances are based on a time-density run-size model

2023 Predicted Fraser River Sockeye Mortality in Area 4B/5 Pink Directed Fisheries

*The actual pink salmon catch of proposed fisheries should not exceed the available total allowable catch for pink salmon
Pink salmon catches below the expected daily abundances would cause predicted sockeye mortality to be reduced proportionally*

Date: 15/08/2023

Area 4B/5 date	Fraser River pink salmon ¹ Daily predicted catch ⁶		% Sockeye Abundance S/(S+P)	Fraser River Sockeye Salmon ^{2,6}				TRT harvest rate ³		Sockeye Release Mortality rate ⁴	Sockeye Retention Policy Treaty Tribes	Predicted mortality of Sockeye	
	Predicted abundance ⁸	Treaty Tribes		Total	E. Summers	Summer	Lates	Sockeye	Pink ⁷			Total Treaty Tribes	
10-Aug	420,800	38	0.7%	2,924	436	2,120	368	0.5%	0.005%	60%	Retention		13
11-Aug	466,400	42	7.6%	38,488	2,652	27,781	8,056	0.5%	0.005%	60%	Retention		173
12-Aug	509,600	46	6.4%	34,693	7,695	24,795	2,203	0.5%	0.005%	60%	Retention		156
13-Aug	549,350	49	4.4%	25,368	3,594	18,232	3,542	0.5%	0.005%	60%	Retention		114
14-Aug	584,600	52	5.3%	32,850	4,647	23,603	4,600	0.5%	0.005%	60%	Retention		148
15-Aug	613,400	55	4.8%	30,970	5,312	22,210	3,449	0.5%	0.005%	60%	Retention		139
16-Aug	634,900	57	4.7%	30,970	5,312	22,210	3,449	0.5%	0.005%	60%	Retention		139
17-Aug	647,500	58	4.6%	30,970	5,312	22,210	3,449	0.5%	0.005%	60%	Retention		139

¹ Assumed travel time for pink salmon from Area 20 to Area 4B/5 is 0 days

² Assumed travel time for sockeye salmon from Area 20 to Area 4B/5 is 0 days

³ Assumes fixed daily sockeye harvest rate combined over Area 4B/5. TRT effort = 3 vessels

⁴ Sockeye release mortality of 60% applied to gillnet releases based on past studies

⁵ Assumes fishing on 1 day (or block) of fish.

⁶ Sockeye and pink salmon abundance for last 3 days is based on a 3-day average of preceding values

⁷ Harvest rate of pink salmon is estimated to be 1% of the sockeye harvest rate

⁸ Pink salmon daily abundances are based on a time-density run-size model

