

# **Pre-Season Run Size Forecast for Fraser River Sockeye Salmon in 2024**



Fisheries and Oceans  
Canada

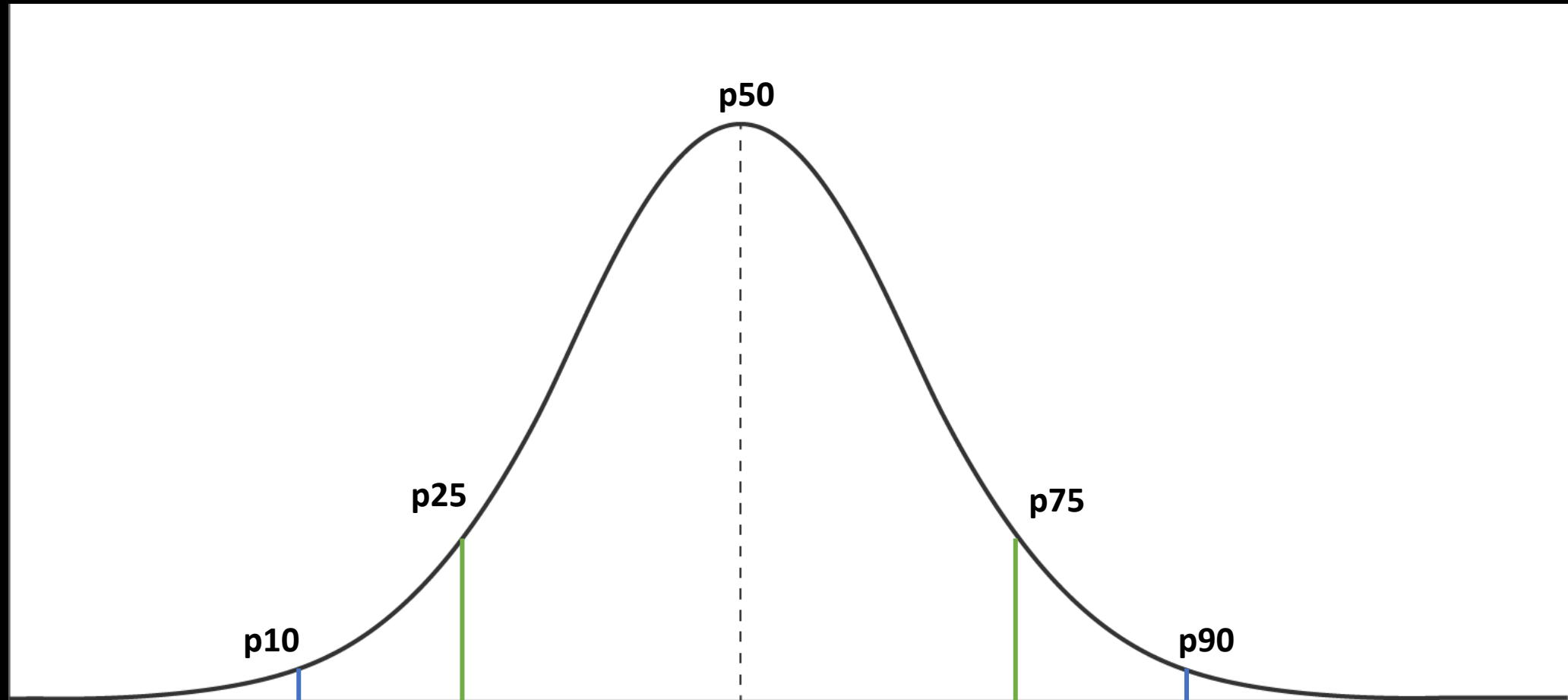
Pêches et Océans  
Canada

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**Presented to the FSMB Forum**

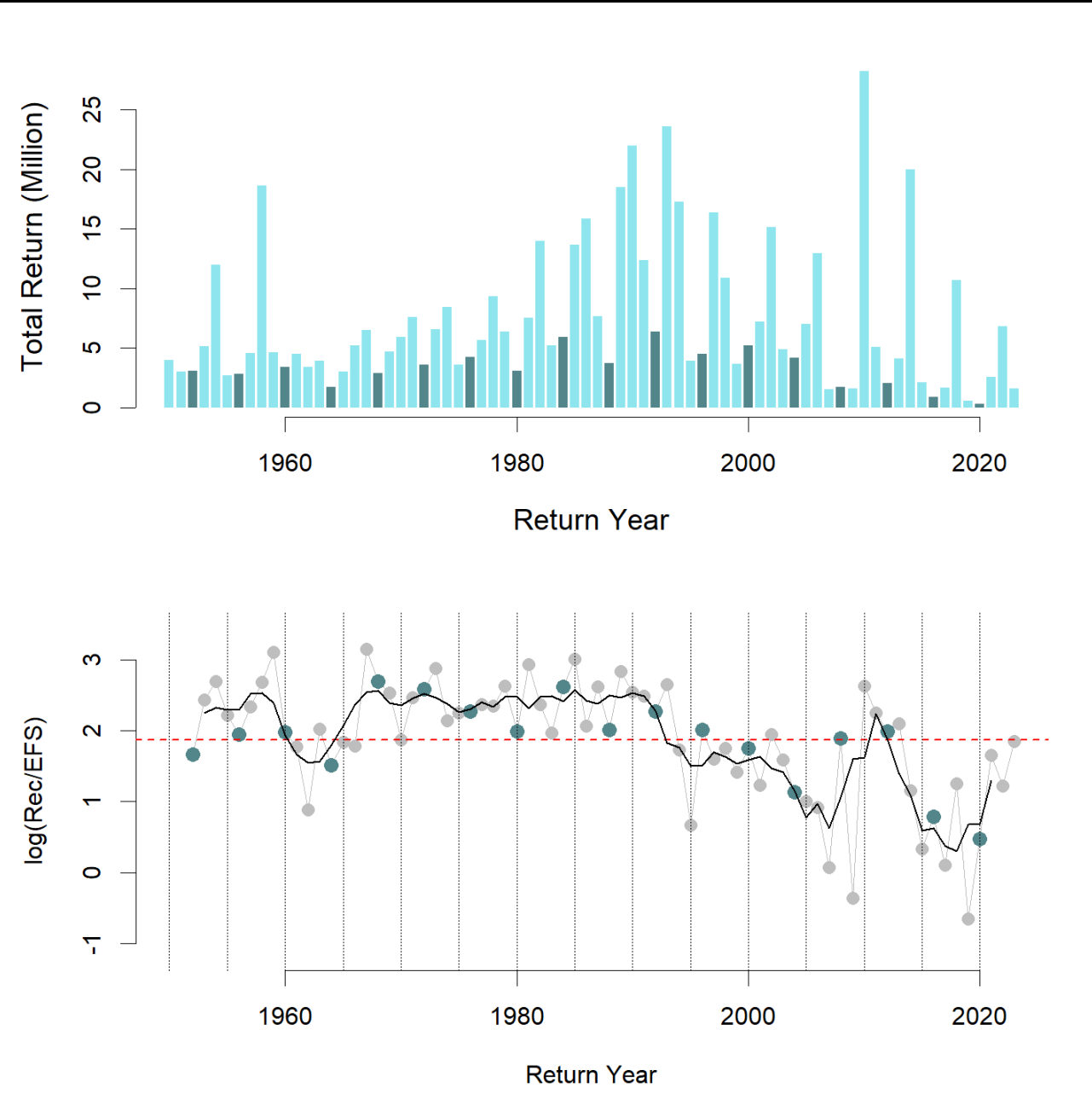
**March 5, 2024**

# How to Interpret Forecast Tables



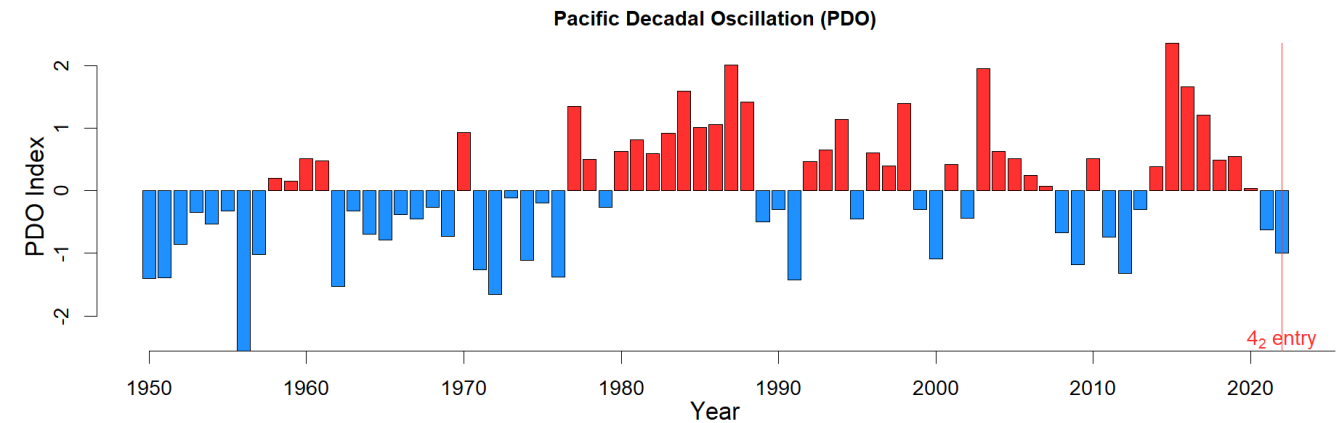
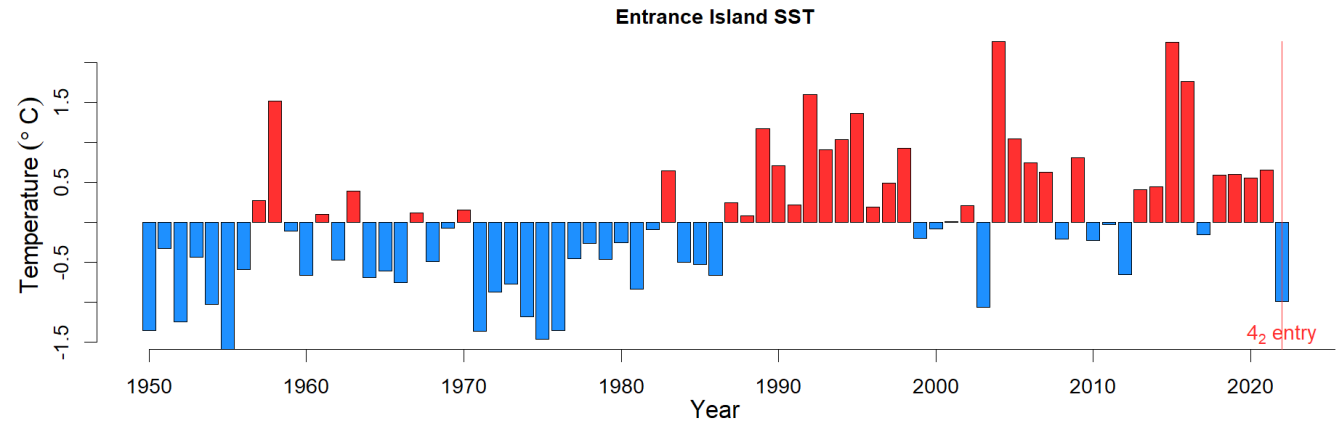
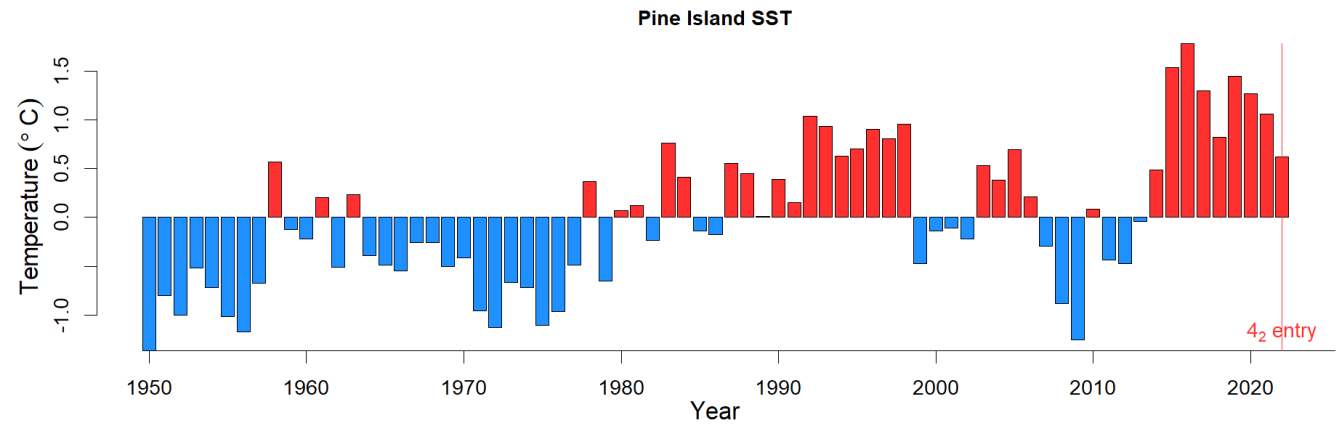
# Fraser Sockeye Returns and Productivity

- Returns have been generally decreasing on this cycle line
- Historically low return to the Fraser in 2020 (288K)
- Productivity has been trending back toward average after a historic low in 2019



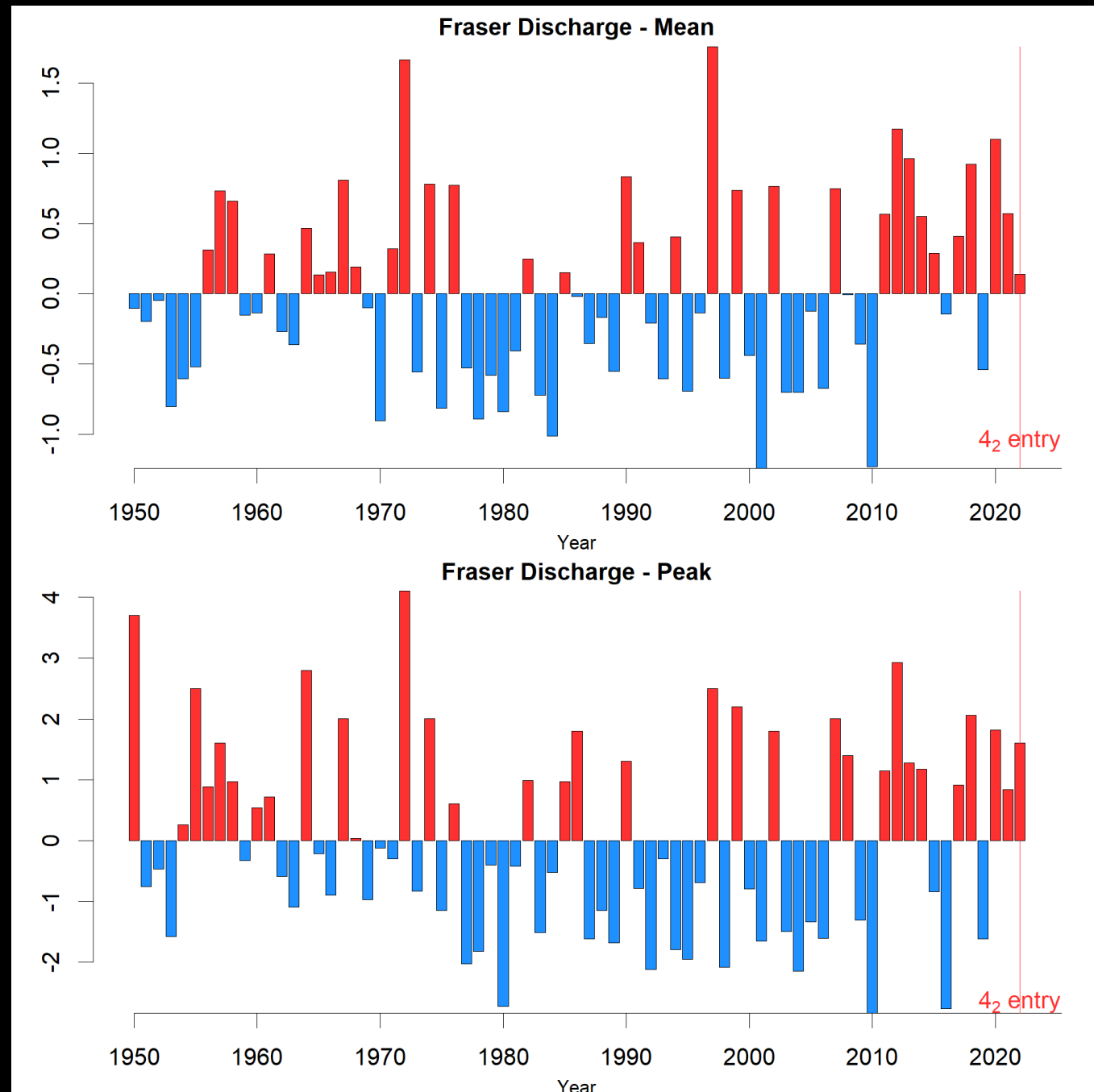
# Environmental Conditions: Marine

- Pine Island and Entrance Island Sea Surface Temperature (Nearshore)
- Pacific Decadal Oscillation (Offshore)
- Mixed signals for our nearshore temperature stations at early marine entry



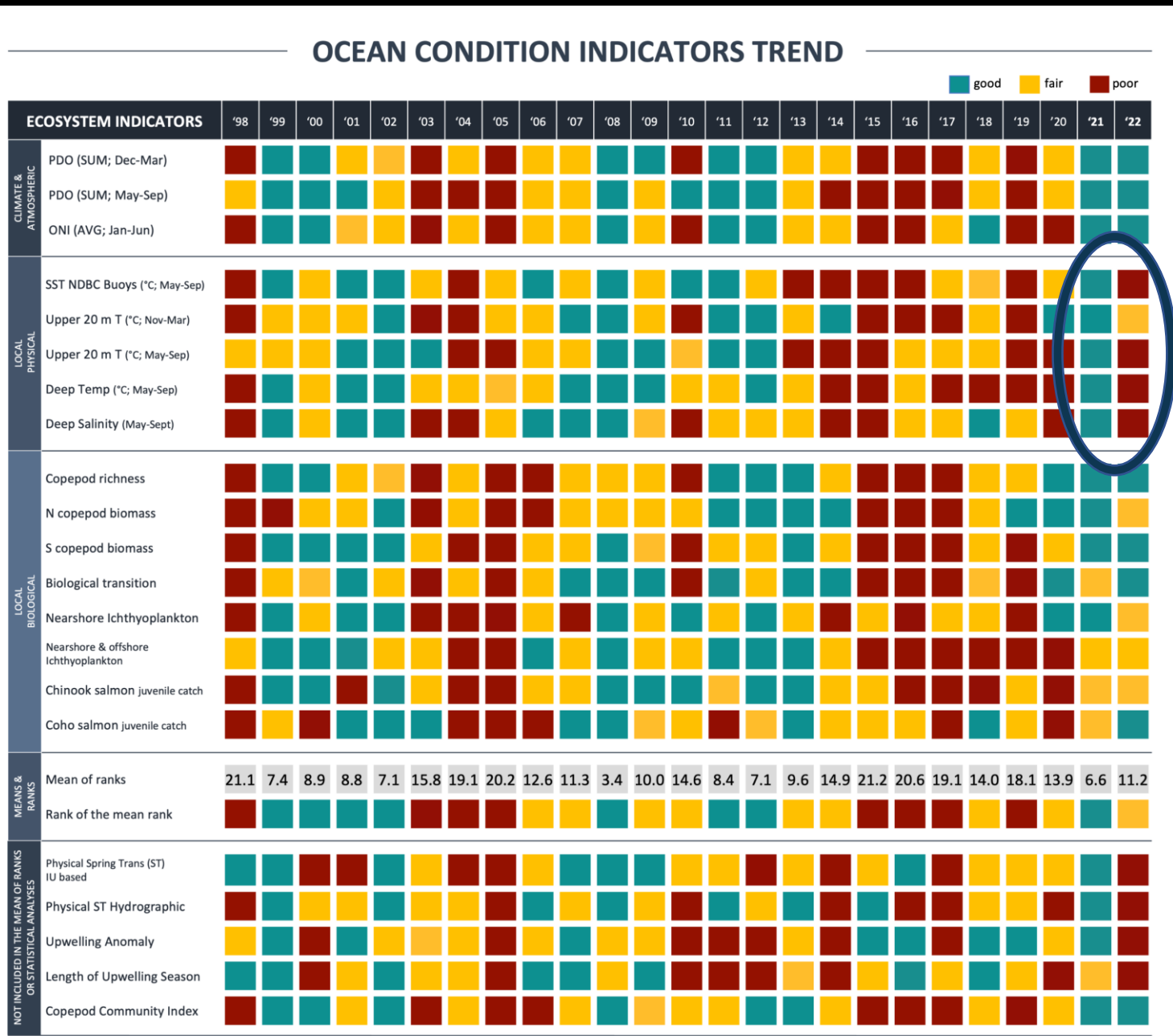
# Environmental Conditions: In-River

- Fraser Discharge Mean and Peak
- Mean was slightly above average but the peak was well above the average.



# Environmental Conditions : Additional Context

- Ocean Conditions in 2022:
- Return to more average conditions
- Higher SST at early marine entry



# 2024 Fraser Sockeye Forecast Table

- Total Sockeye: 567,000 [167K, 2.2M]
- Early Stuart: 200 [80, 400]
- Early Summer: 159,000 [58K, 465K]
- Summer: 379,000 [51K, 1.6M]
- Late: 29,000 [8K, 796K]

Run timing group Stocks	Forecast Model	Probability that Return will be at/or Below Specified Run Size				
		10%	25%	50%	75%	90%
Early Stuart	Ricker (Ei)	80	100	200*	300	400
Early Summer Total		58,000	93,000	159,000	281,000	465,000
Total excluding misc. stocks		37,000	66,000	121,000	226,000	379,000
Bowron	RickerCyc	400	700	1,000*	2,000	4,000
Upper Barriere (Fennell)	PowerBasic4Sibling5	1,000	3,000	5,000	12,000	23,000
Gates	Ricker (Pi)	9,000	15,000	27,000	47,000	76,000
Nadina	Ricker(ErDneak)4					
	Sibling5	18,000	33,000	65,000	127,000	216,000
Pitt	LarkinBasicCyc	7,000	10,000	16,000	24,000	36,000
Scotch	Larkin	1,000	3,000	5,000	10,000	18,000
Seymour	Ricker (Pi)	700	1,000	2,000	4,000	7,000
Misc (EShu)	R/S	100	100	700*	1,000	2,000
Misc (Taseko)	R/S	10	20	70*	90	100
Misc (Chilliwack)	Ricker4Sibling5	20,000	26,000	34,000	48,000	71,000
Misc (Nahatlatch)	R/S	500	900	3,000	6,000	12,000
Summer Total		101,000	192,000	379,000	774,000	1,554,000
Total excluding misc. stocks		101,000	192,000	379,000	772,000	1,551,000
Chilko	RickerCyc4Sibling5	51,000	96,000	176,000	317,000	564,000
Late Stuart	R1C	2,000	5,000	12,000	33,000	80,000
Quesnel	R2C	300	900	3,000	9,000	26,000
Stellako	R2C4Sibling5	25,000	39,000	65,000	107,000	169,000
Harrison	TSA3Sibling4	17,000	41,000	106,000	277,000	663,000
Raft	PowerBasicCyc	6,000	10,000	17,000	29,000	51,000
Misc (N. Thomp. Tribs)	R/S	50	80	200*	500	700
Misc (N. Thomp. River)	R/S	50	80	200*	500	700
Misc (Widgeon)	R/S	20	60	80*	1,100	1,600
Late Total		8,000	15,000	29,000	66,000	154,000
Total excluding misc. stocks		8,000	15,000	29,000	63,000	150,000
Cultus	PowerLux(Pi)	40	70	100*	300	600
Late Shuswap	Ricker(Pi)4Sibling5	100	500	2,000	10,000	42,000
Portage	Ricker (Pi)	30	80	200*	600	1,000
Weaver	RickerCyc	400	700	2,000	5,000	19,000
Birkenhead	Ricker (Ei)	7,000	13,000	24,000	46,000	87,000
Misc Harrison/Lillooet	R/S	50	100	200*	3,000	4,000
TOTAL SOCKEYE SALMON		167,000	299,000	567,000	1,121,000	2,173,000
Total Sockeye excluding misc. stocks		147,000	272,000	529,000	1,061,000	2,081,000

# Stock Highlight: Early Stuart Hatchery Forecast

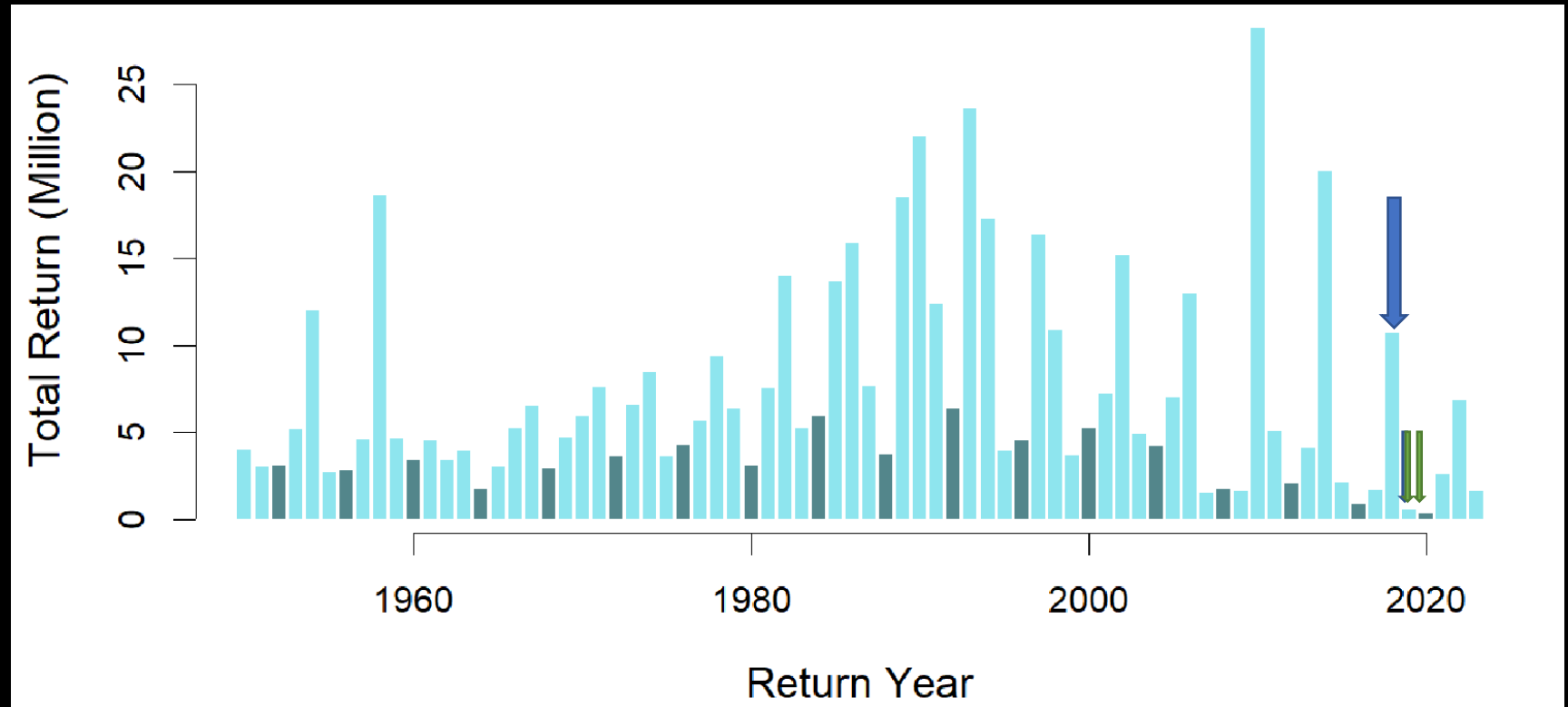
Run timing group Stocks	Forecast Model	Probability that Return will be at/or Below Specified Run Size				
		10%	25%	50%	75%	90%
Early Stuart	<i>Ricker (E)</i>	80	100	200*	300	400
<i>Early Stuart Hatchery*</i>		500	800	1,000	2,000	2,000

- Based on estimates of marine survival for Chilko (high, average, low) over the last 3 generations.
- Assuming somewhere between 10-30% mortality in FW as smolts
- **Not comparable to forecasts of other populations (based on assumptions due to lack of data).**



# Age Composition of Fraser Sockeye

- Many stocks in 2023 were predominantly 5-year-old Sockeye.
- With the exception of Harrison, Fraser Sockeye return to spawn at age 4 and age 5.



# Key Messages

- Lowest forecasted total return on record (previously 968,000 in 2020; return was 288,000).
- Brood for the 2024 return come from the two lowest consecutive returns on record (2019 and 2020).
- Marine conditions are still in a more favourable state than in the previous decade.

# Key Uncertainties

- Low escapements in 2019 and 2020 could result in very high productivity or productivity could remain very low.
- Forecasts for 10 stocks ( 4 major, 6 miscellaneous) are equal to or less than 1000.
- Some of the largest expected returns are forecasted to come from stocks that have a shorter stock-recruit time series (Chilliwack) or huge variability in the data (Harrison)



Photo credit A Bruno

# Extra Slide

Run Timing Group Stocks	2020 EFS	2019 EFS	Mean EFS		2024 FC Return	Mean Run Size	
			All Years	Cyc. Years		Stocks	Cyc. Years
<b>Early Stuart</b>	20	50	39,000	17,000	200	<b>Early Stuart</b>	111,000
<b>Early Summer (excl. Bowron)</b>	24,300	17,500	9,000	6,000	121,000	<b>Early Summer</b>	-
<u>Bowron</u>	200	10	4,000	3,000	1,000	<u>Bowron</u>	22,400
<u>Upper Barriere</u>	600	300	3,000	3,000	5,000	<u>Upper Barriere</u>	27,200
<u>Gates</u>	3,300	5,000	4,000	7,000	27,000	<u>Gates</u>	108,000
<u>Nadina</u>	15,900	8,400	9,000	9,000	65,000	<u>Nadina</u>	115,000
<u>Pitt</u>	3,300	2,100	14,000	15,000	16,000	<u>Pitt</u>	77,200
<u>Scotch</u>	600	1,000	9,000	500	5,000	<u>Scotch</u>	10,200
<u>Seymour</u>	400	700	19,000	3,000	2,000	<u>Seymour</u>	28,400
<u>Misc(EShu)</u>	100	1,300	9,000	5,000	700	<u>Misc(EShu)</u>	-
<u>Misc(Taseko)</u>	30	0	1,000	1,000	100	<u>Misc(Taseko)</u>	-
<u>Misc(Chilliwack)</u>	19,300	600	3,000	14,000	34,000	<u>Misc(Chilliwack)</u>	-
<u>Misc(Nahatlatch)</u>	1,400	600	1,000	3,000	3,000	<u>Misc(Nahatlatch)</u>	-
<b>Summer (excl. misc.)</b>	95,500	170,100	58,200	366,000	379,000	<b>Summer (excl. misc.)</b>	
<u>Chilko</u>	27,100	74,600	221,000	231,000	176,000	<u>Chilko</u>	1,523,000
<u>Late Stuart</u>	2,500	3,000	66,300	22,500	12,000	<u>Late Stuart</u>	166,000
<u>Quesnel</u>	500	14,300	148,400	4,100	3,000	<u>Quesnel</u>	38,300
<u>Stellako</u>	22,100	26,700	54,300	57,000	65,000	<u>Stellako</u>	408,000
<u>Harrison</u>	40,600	51,100	29,700	9,800	106,000	<u>Harrison</u>	9,800
<u>Raft</u>	2,700	400	4,200	6,200	17,000	<u>Raft</u>	49,800
<u>Misc(N. Thomp. Tribs)</u>	100	70	300	300	200	<u>Misc(N. Thomp. Tribs)</u>	-
<u>Misc(N. Thomp. River)</u>	100	100	2,000	500	200	<u>Misc(N. Thomp. River)</u>	-
<u>Misc (Widgeon)</u>	90	90	300	300	80	<u>Misc (Widgeon)</u>	-
<b>Late (excl. misc.)</b>	9,600	7,100	78,400	9,200	29,000	<b>Late (excl. misc.)</b>	
<u>Cultus</u>	30	10	800	100	100	<u>Cultus</u>	17,000
<u>Late Shuswap</u>	10	3,400	330,800	2,500	2,000	<u>Late Shuswap</u>	23,200
<u>Portage</u>	10	300	3,400	440	200	<u>Portage</u>	12,000
<u>Weaver</u>	40	1,000	17,400	13,500	2,000	<u>Weaver</u>	266,000
<u>Birkenhead</u>	1,600	2,000	39,300	29,700	24,000	<u>Birkenhead</u>	225,000
<u>Misc(Non-Shuswap)</u>	300	40	2,000	2,000	192	<u>Misc(Non-Shuswap)</u>	-
<b>Total Sockeye</b>	129,400	194,700	NA	NA	528,879	<b>Total Sockeye</b>	<b>3,237,000</b>