



2020 Post-season Review

Fraser Sockeye Salmon

presented to: FSMC Forum
by: Jamie Scroggie
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Overview

- Pre-season
- In-season
- Post-season
- Next steps/Timelines

Fraser Sockeye Salmon

2020 PRE-SEASON

2020 Fraser Sockeye Forecast Summary

Run timing group	Probability that return will be at/or below specified run size				
	10%	25%	50%	75%	90%
Early Stuart	5,000	8,000	13,000	23,000	33,000
Early Summer	72,000	116,000	218,000	469,000	1,098,000
Summer	169,000	311,000	611,000	1,231,000	2,376,000
Late	28,000	53,000	99,000	190,000	374,000
TOTAL SOCKEYE	274,000	488,000	941,000	1,913,000	3,881,000

2020 Fishery Planning Considerations

- Forecasts for the 2020 run were lower than average
 - Concern of not achieving average escapements and escapement targets
 - No available TAC at any forecast level for Early Stuarts and Late groups
 - Early Stuart window closure was extended by one week to protect Early timed Early Summer groups
 - Unlikely to be any TAC until at least the p75 forecast (Early Summer and Summer groups)
- Abundance Based Escapement plan:
 - Total allowable mortality caps (50%)
 - 10% low abundance exploitation rate (LAER) limits for all run timing groups (Lates would increase to 20% only if the entire run p75 forecast level is reached)
- Potential constraints: Sakinaw, Late Run, IFR Coho, IFR Steelhead, Chinook.
- **Actual harvest opportunities would depend on in-season information**
- **Pre-season information to temper harvest expectations**
- **Overall, a slow, cautious start to fisheries was recommended.**

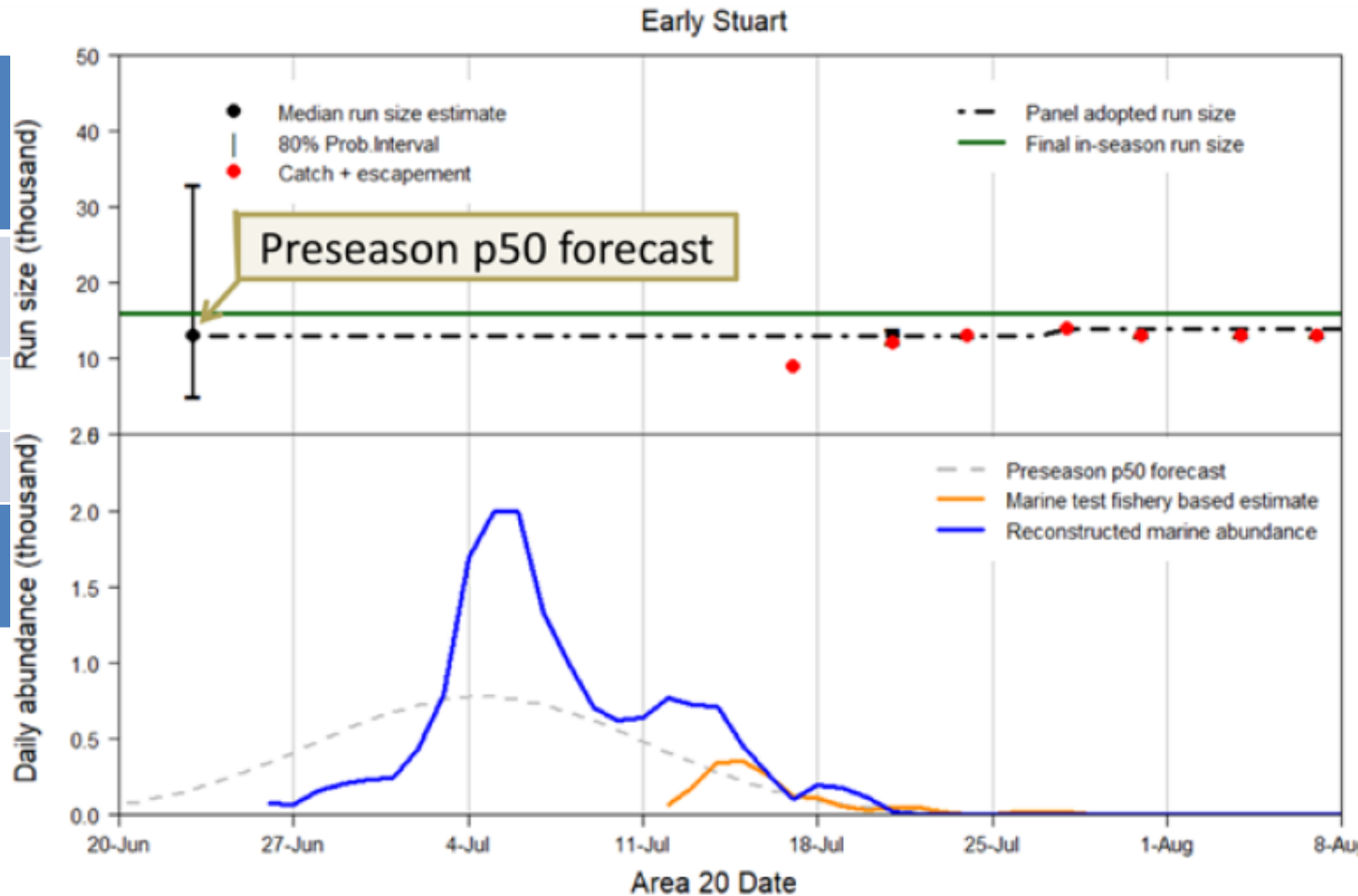
Fraser Sockeye Salmon

2020 IN-SEASON INFORMATION

2020 Preliminary Run size: Early Stuart

End-of-season estimate: 31% higher than p50 forecast

Date	Adopted Run Size
p50 Forecast	13,000
28-Jul	14,000
1-Sep	16,000
Accounted to Date	16,800

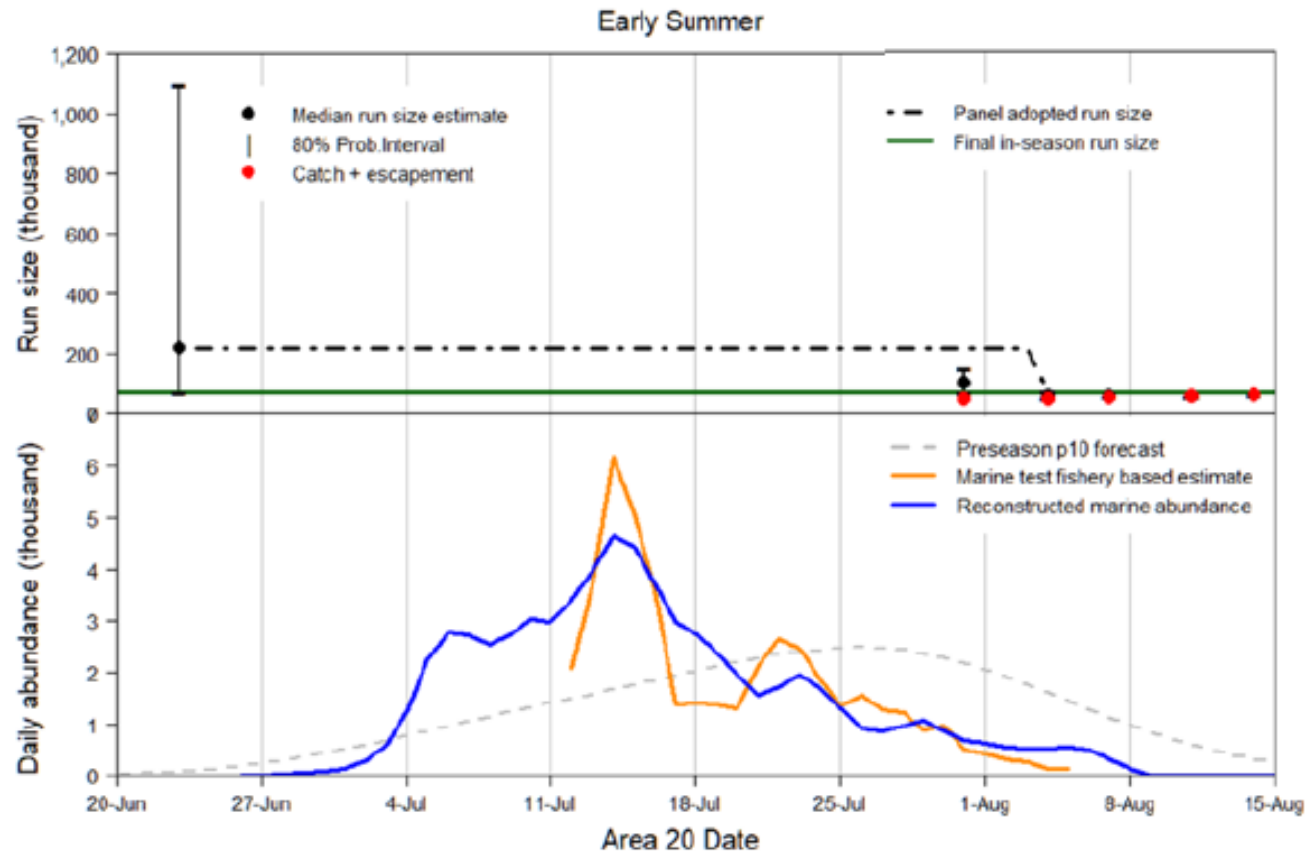


graph courtesy of PSC

2020 Preliminary Run size: Early Summer Run

End-of-season estimate: 67% lower than p50 forecast, close to the p10 forecast.

Date	Adopted Run Size
p50	218,000
04-Aug	72,000
Accounted to Date	70,700

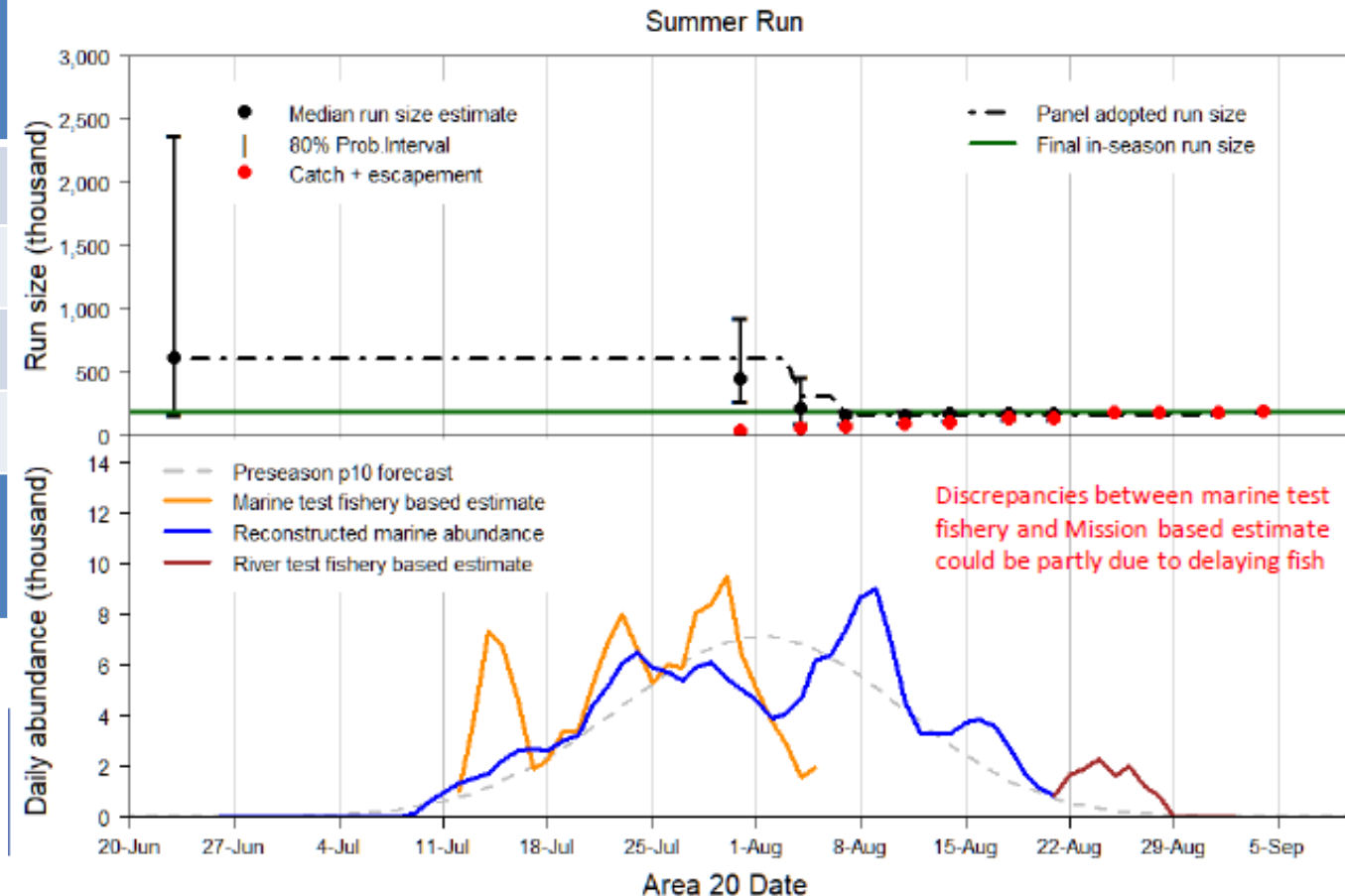


graph courtesy of PSC

2020 Preliminary Run size: Summer Run

End-of-season estimate: 69% lower than p50 forecast, close to the p10 forecast.

Date	Adopted Run Size
p50	611,000
04-Aug	311,000
07-Aug	169,000
01-Sep	191,000
Accounted to Date	188,000

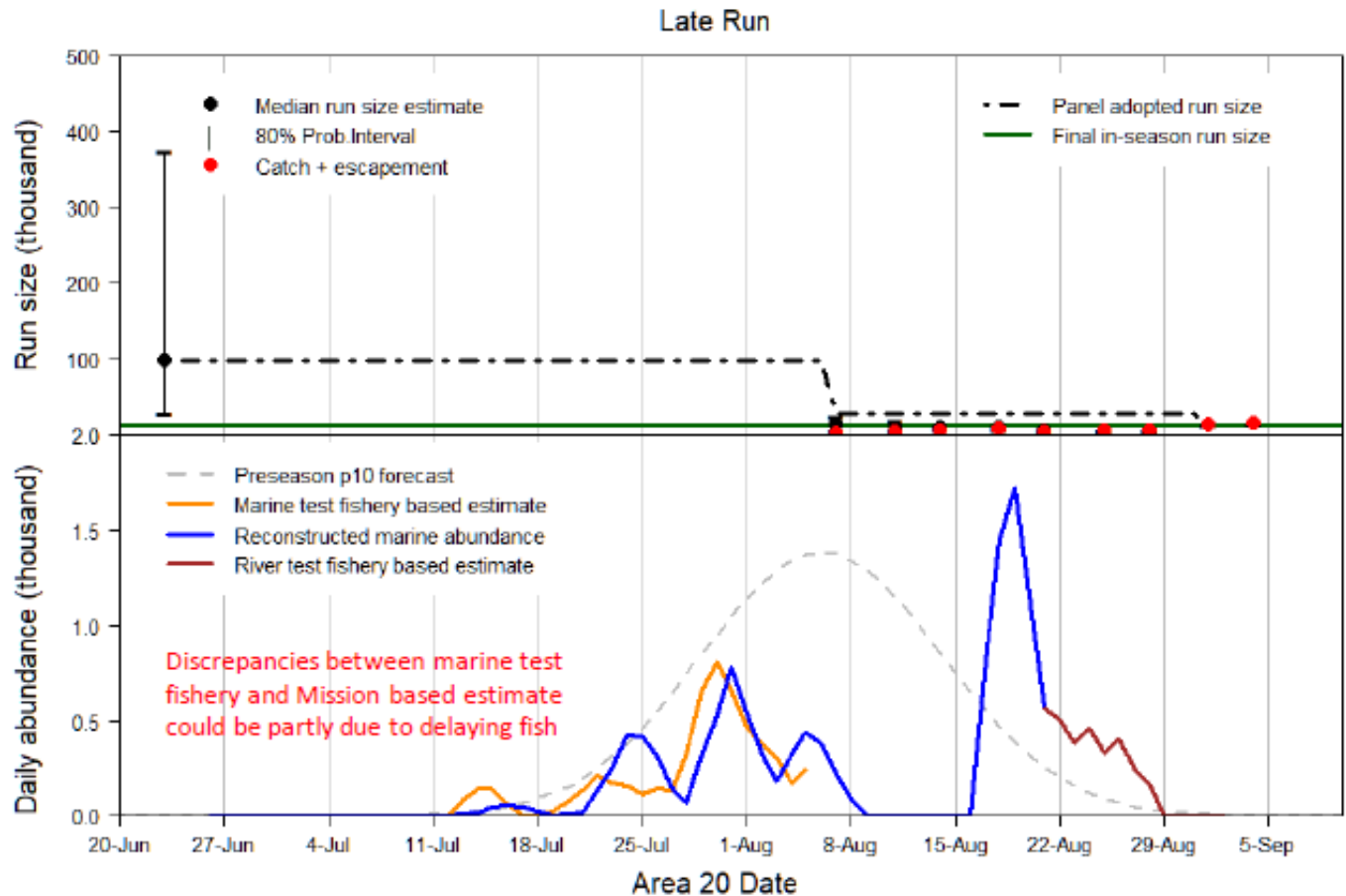


graph courtesy of PSC

2020 Preliminary Run size: Late Run

End-of-season estimate: 84% lower than p50 forecast, less than the p10 forecast.

Date	Adopted Run Size
p50 Forecast	99,000
7-Aug	28,000
1-Sep	14,000
Accounted to Date	16,000



graph courtesy of PSC

Note: Late run salmon may be delayed migrating into the river causing the daily abundance at Mission to deviate from the daily marine abundance

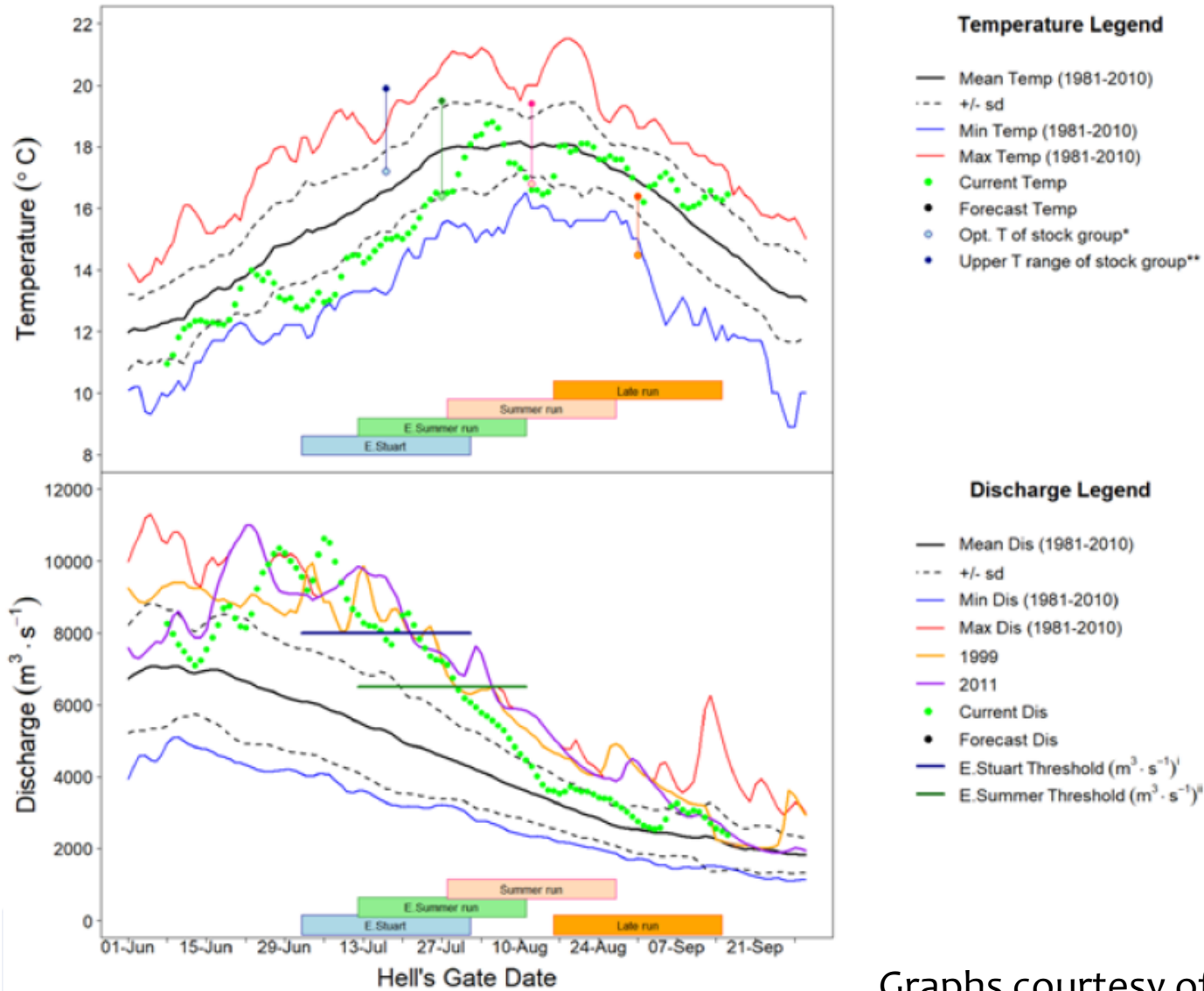
2020 Migration Timing

	Area 20 Timing		
Management Group	Pre-season forecast ¹	End of season	Difference
Early Stuart	04-July	06-July	+2
Early Summer	24-July	15-July	-9
Summer	31-July	28-July	-3
Late	6-Aug	4-Aug	-4

¹Based on Panel agreed timing estimates following the June meeting. DFO's pre-season timing estimates were: July 3 for Early Stuart, August 10 for Chilko. DFO estimates were not adopted this year

- **Sockeye timing:** Early Stuart returned later than forecast; all other groups returned earlier. The 9 day early return of Early Summer is due to a greater contribution of the Chilliwack system to the overall run size.
- **Sockeye delay:** there is evidence (slowed migration time between Mission and Qualark) of fish being delayed in-river during high water events earlier in the season. Late run sockeye delayed upstream migration by 18 days, while Harrison delayed 16 days.

High Discharge



Big Bar Rock Slide

- Occurred between Oct - Nov 2018
- Reported June 2019
- 2019 mitigation relied heavily on helicopter transport upstream of the slide



Courtesy of PSC, September 2019

Big Bar Rock Slide

- In winter 2019/20 mitigation work focused on the construction of a nature-like fishway, the installation of the Whooshh passage portal, the construction of a road for truck and transport options, and the development of emergency hatchery enhancement for stocks deemed to be most at risk

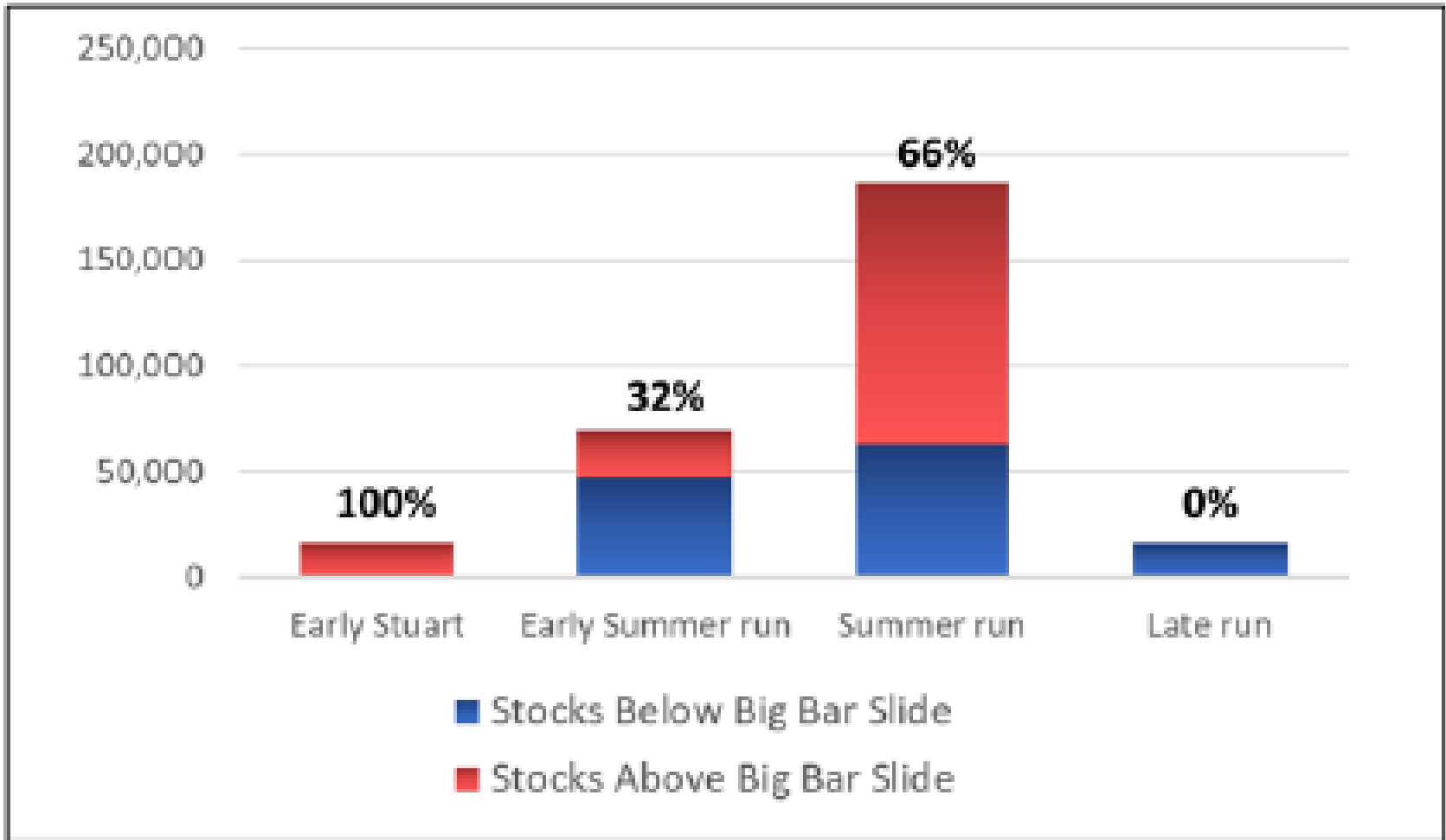


Big Bar Rock Slide

- Discharge thresholds for Sockeye increased in 2020 compared to 2019
- Earlier timed stocks (Early Stuarts) still faced substantial passage barriers
- Work at the site is ongoing; construction of a permanent fishway will begin in winter 2020/21 and likely continue in winter 2021/22 (completion target is prior to 2022 salmon run)



In-season estimates of stocks expected to migrate past the Big Bar rock slide



Total estimate of successful passage of sockeye past Big Bar rock slide in 2020

% survival (natural + assisted)	July migrants	Late July – early Sept.	Mid-Aug. – Sept.
2019	<1%	~50%	~80%
2020	NA	NA	NA

- Estimates are not yet available for the 2020 season; we expect preliminary estimates at the Feb. PST meeting
- A detailed review of passage estimates by species and stock is currently being undertaken by DFO Stock Assessment and Science

2020 Sockeye Fisheries

- There were no licenced fisheries directed on FR Sockeye in Canadian or United States waters in 2020
- Retention of FR Sockeye was not authorized by DFO in any circumstances
- The main fisheries that impacted FR Sockeye in 2020 were some (a couple of) isolated unlicenced FSC fisheries and to a much lesser extent Chinook-directed fisheries (bycatch)

Fraser Sockeye and Pink Salmon

2020 POST-SEASON*

* relative to fisheries management season
... it's still in-season for Stock Assessment!

Preliminary Post-season: Run-size Summary

Management Group	Pre-season Run Size	End-of-season Run Size ¹	Difference
Early Stuart	13,000	16,000	+23%
Early Summer Run	218,000	69,000	-68%
Summer Run	611,000	187,000	-69%
Late Run	99,000	16,000	-84%
Total Sockeye	941,000	288,000	-69%

- **Total Sockeye Run Size:** The run size was 66% below the run size of the brood year (853,000).

¹Estimates as of September 23, 2020

Preliminary Post Season Kept Catch

Fishery Type	Fraser Sockeye				Total	% of Run
	Early Stuart	Early Summer	Summer	Late		
CANADIAN CATCH						
Commercial Catch	0	0	0	0	0	0%
First Nations Catch	0	0	0	0	0	0%
Non-commercial Catch *	0	10	50	10	70	0%
† Unauthorized First Nations Catch**	30	350	10,900	0	11,300	4%
Canadian Total	30	360	10,950	10	11,370	4%
UNITED STATES CATCH						
Commercial catch	0	0	0	0	0	0%
Non-commercial Catch *	0	0	0	0	0	0%
Washington Total	0	0	0	0	0	0%
Alaska (preliminary)***	0	0	0	0	0	0%
United States Total	0	0	0	0	0	0%
TEST FISHING CATCH						
Test Fishing Total	110	1,260	3,120	120	4,610	2%
TOTAL CATCH						
Total Catch in All Fisheries	140	1,630	14,100	140	16,000	5%
PRELIMINARY EXPLOITATION RATE						
Preliminary Run Size	16,800	70,700	188,000	16,000	291,500	100%
Preliminary Exploitation Rate	1%	2%	8%	1%	5%	

* Non-Commercial catch includes recreational, charter and ESSR catches in Canada, and C&S catch in the U.S.

** Retention of sockeye salmon not authorized during 2020

***Alaskan catch not yet reported for 2020

†Note that this is not final wording; will be updated at the Feb. PST meeting

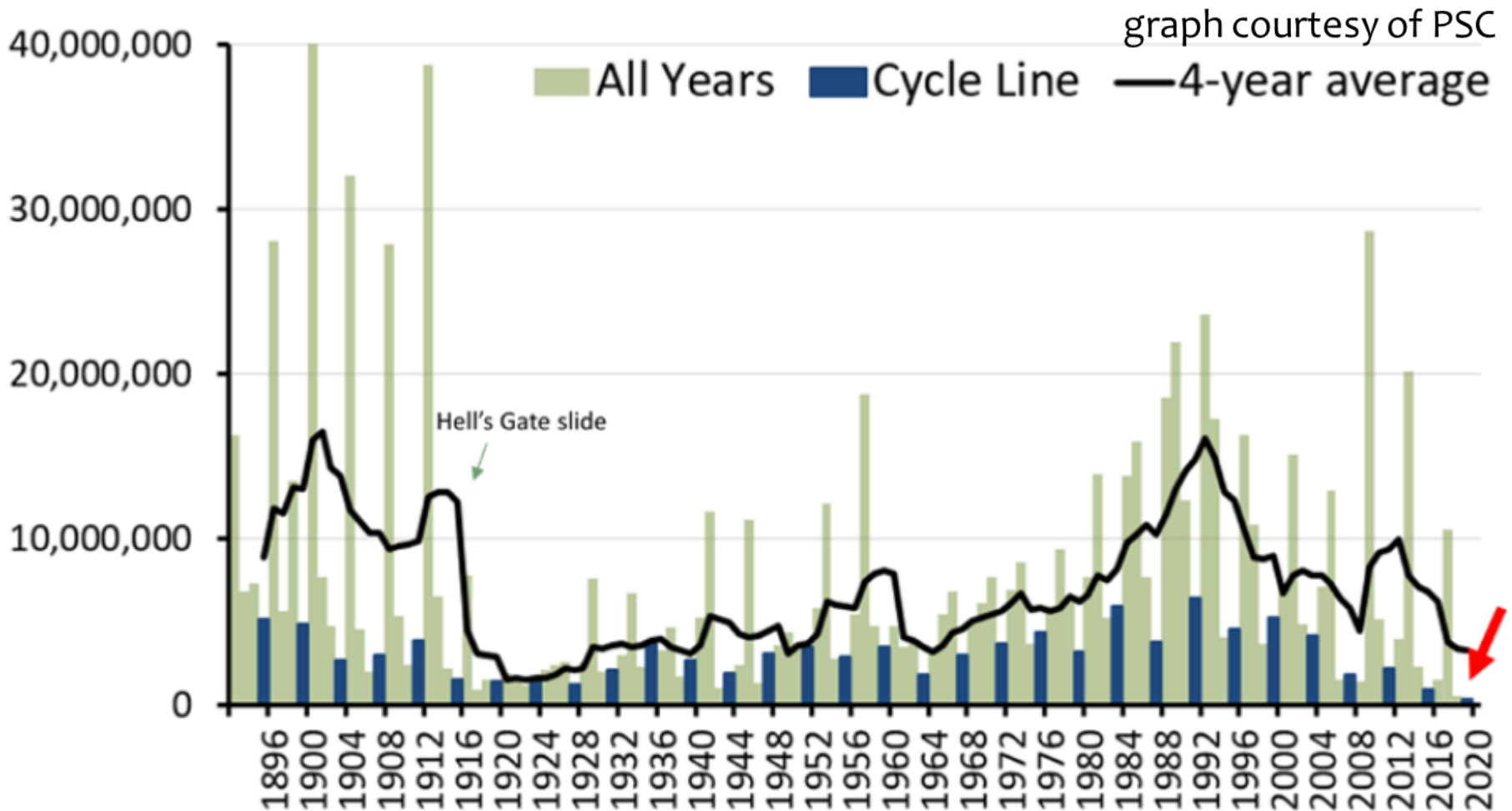
As of Jan. 8, 2020

Preliminary Post Season Exploitation Rates

	Fraser Sockeye				
	Early Stuart	Early Summer	Summer	Late	Total
Preliminary Post Season Run Size	16,800	70,700	188,000	16,000	291,500
Preliminary Total Kept	144	1,626	14,075	136	15,981
Preliminary Total FIM	7	173	1,461	22	1,663
Allowable Exploitation Rate (LAER)	10%	10%	10%	10%	10%
Preliminary Exploitation Rate	0.9%	2.5%	8.3%	1.0%	6.1%

- Above estimates current as of January 20th, 2021. Final estimates will likely be available in May 2021
- Given the very low return as well as passage concerns at the Big Bar Slide due to high discharge early in season, potential impacts on sockeye were kept to a minimum to allow as many sockeye to pass to the spawning grounds as possible
- Fishery induced mortalities are included in the catch estimates above.
- There was no sockeye TAC identified in-season (LAER).

2020 Sockeye Run-size Summary



The red arrow indicates the preliminary estimate of the 2020 run size
This is the smallest run size for Sockeye since 1893.

Preliminary Escapement

Note that the following values are **preliminary** and will almost certainly be modified when the near-final escapement estimates for 2020 are released by May 2021.

At this time, estimates are only available for Early Stuart and Early Summer.

Preliminary Escapement

Early Stuart

- Preliminary Escapement is 30 adults
- Significantly impacted by high discharge during in-river migration
- Hydroacoustic data suggested the majority of Early Stuarts failed to arrive at Big Bar
- 365 Early Stuarts were captured by fishwheel at Big Bar and retained for broodstock
 - 254 survived to maturity (150 males, 104 females)
 - As of Jan. 13 2021; 116,079 juveniles on hand, average size of 0.27 grams, feeding well

Preliminary Escapement

Early Summer

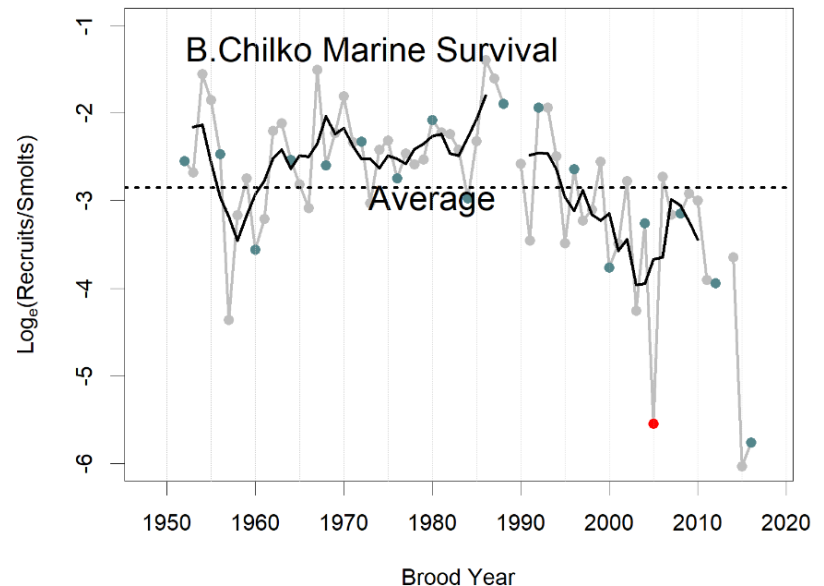
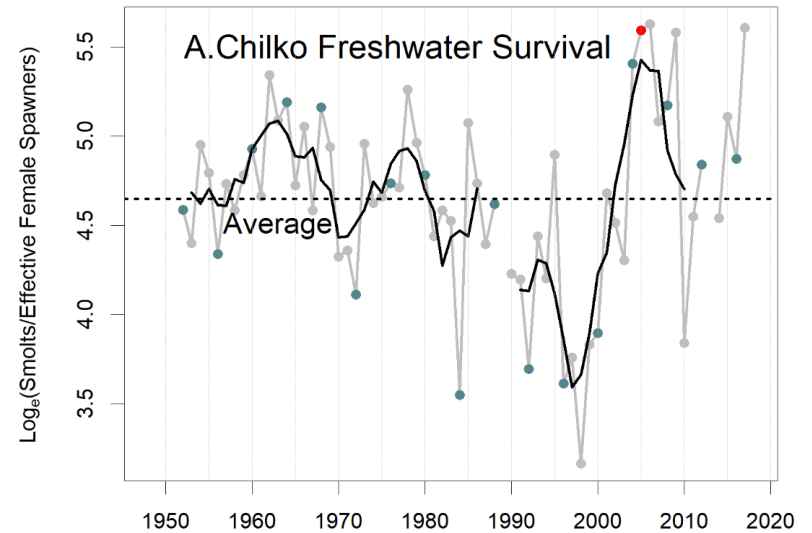
- Preliminary Escapement is 80,340 adults
- This is higher than the PSC estimated in-season run size (71,000)
- CUs above Big Bar experienced delayed migration
 - Despite this, overall timing of peak spawning activity was within normal ranges throughout the watershed
- 44 Upper Bowron River Sockeye collected at Big Bar for enhancement
 - 29 survived to maturity (20 male, 9 female)
 - 12,444 viable alevin as of late Nov. 2020
 - These fish will be ponded mid Jan. 2021

Preliminary Escapement Comparisons

MU	Brood Year Esc. (2016)	2020 PSC projected Esc.	2020 Preliminary Esc.
Early Stuart	18,000	3,700	30
Early Summer	240,500	36,700	80,340
Summer	529,200	173,800	NA
Late	70,600	8,300	NA
Total Sockeye	858,300	222,500	NA

Climate Conditions and Productivity

- Chilko freshwater productivity has been good. This may not be the case for the whole watershed
- Chilko marine productivity has been poor. Climatic conditions have likely not been favourable for Sockeye survival



Next Steps & Timelines

- Preliminary escapements: Early Stuart (released), Early Summer (released), Summer and Lates (Jan-Feb)
 - near finals: May 2021
- Final Run Size and Exploitation Rate Summary:
 - May 2021
- 2021 FR SK and PK forecasts
 - Feb 2021
- FR SK and PK escapement plan
 - Options in draft IFMP

Questions?

Detailed Preliminary Early Summer Escapement

CU	Preliminary Esc.	Relative to brood	Relative to cycle line	Spawning Success
Chilliwack	31,770	55%	43%	100%
Nahatlach	2,096	47%	63%	97%
Pitt	6,783	18%	14%	100%
Seton-Anderson	6,361	72%	19%	96%
Shuswap	2,592	165%	15%	90%
North Barriere	981	85%	12%	97%
*Taseko	60	37%	3%	**100%
Nadina-Francois	29,353	110%	78%	100%
Bowron	344	250%	5%	**100%

* note that carcass enumeration and escapement estimates were impacted by covid-19 restrictions

** based on assumptions