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# 2017 Post-season Review

## Fraser Sockeye & Pink

presented to: Forum on Conservation and Harvest Planning

by: J. Nener

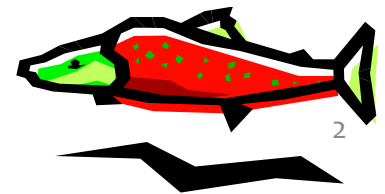
date: 23- January-2018

Canada 

# Overview

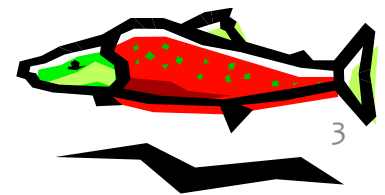
- Pre-season
- In-season
- Post-season
- Next steps/Timelines

Note: Please also refer to the hand-out provided for some background info on Fraser Sockeye and Pink salmon.



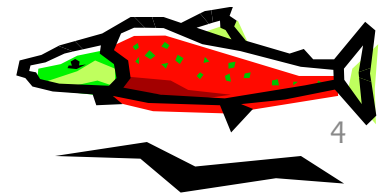
Fraser Sockeye & Pink

# 2017 PRE-SEASON



# Run size forecasts

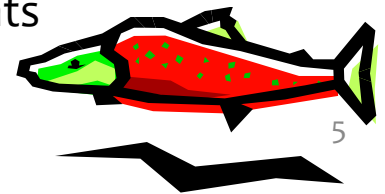
- The 2017 forecast document indicated that warmer coastal temperatures may have negatively impacted the survival of Fraser sockeye. For those stocks that were forecast based on models that did not include indices of environmental conditions, the forecast may overestimate potential returns.
- Chilko dominated the 2017 forecast of Fraser Sockeye (48% of the total median forecast); however, this forecast was highly uncertain, especially compared to previous years when smolt data were available.
- **Overarching message** – the 2017 forecast was highly uncertain.



# 2017 FR SK & PK run size forecast

Probability that Return will be at/below Specified Run Size					
	p10	p25	p50	p75	p90
Early Stuart	42,000	64,000	99,000	158,000	253,000
Early Summer	95,000	166,000	343,000	792,000	1,971,000
Summer	1,065,000	1,861,000	3,407,000	6,631,000	12,560,000
Late	113,000	247,000	583,000	1,292,000	2,849,000
Total	1,315,000	2,338,000	4,432,000	8,873,000	17,633,000
TOTAL PINK	4,447,000	6,177,000	8,693,000	12,353,000	16,682,000

- Pre-season planning considered the range of forecast values.
- The final pre-season plan adopted by the Fraser Panel started the season at p50 forecast for pink & all sockeye run timing.
- All harvest opportunities would be based on in-season assessments



# 2017 FR SK & PK Harvest Plan

- Option 1 Escapement Plan
- Considering pre-season assumptions Summer run sockeye harvest was expected to be limited by Early Summer and Late Run constraints
- Pink harvest would likely be limited by Late run sockeye constraints

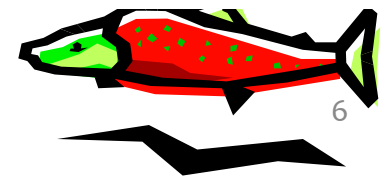
Management Group	Total Abundance	TAC*							Allowable Harvest **	50% Migration Date
		Spawning Escapement Target***	pMA	Management Adjust.	Test Fishing ***	Aboriginal Fishery Exemption **	Total Deductions	Total Allowable Catch		
										Area 20
Early Stuart	99,000	99,000	NA	NA	320	9,600	99,000	0	9,900	1-Jul
Early Summer	343,000	137,200	0.39	53,500	3,530	25,900	220,130	122,870	148,770	20-Jul
Summer	3,407,000	1,375,100	0.06	82,500	27,200	347,200	1,832,000	1,575,000	1,922,200	6-Aug
Late	583,000	314,000	0.92	288,900	3,950	17,300	583,000	0	116,600	14-Aug
<b>Sockeye</b>	<b>4,432,000</b>	<b>1,925,300</b>	<b>-</b>	<b>424,900</b>	<b>35,000</b>	<b>400,000</b>	<b>2,734,130</b>	<b>1,697,870</b>	<b>2,197,470</b>	<b>-</b>
Pink	8,693,000	6,000,000			112,000		6,112,000	2,581,000	2,693,000	28-Aug

\* The TAC is determined by the run sizes and TAC deductions (spawning escapement targets and projected test fishing catches) that were in effect when Panel control of the last U.S. fishery area was relinquished.

\*\* In a no TAC situation, the allowable harvest is the maximum harvest allowed under LAER management as identified in Canada's Escapement Plan.

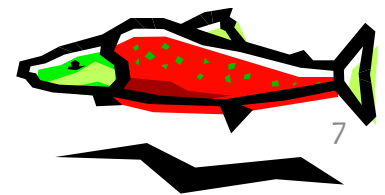
The allowable harvest (LAER) is not a target and is usually by-catch in fisheries directed at other stocks or species with some limited directed terminal harvest.

\*\*\* Spawning escapement target, test fishing deductions not in place until July 15 Panel meeting.



Fraser Sockeye & Pink

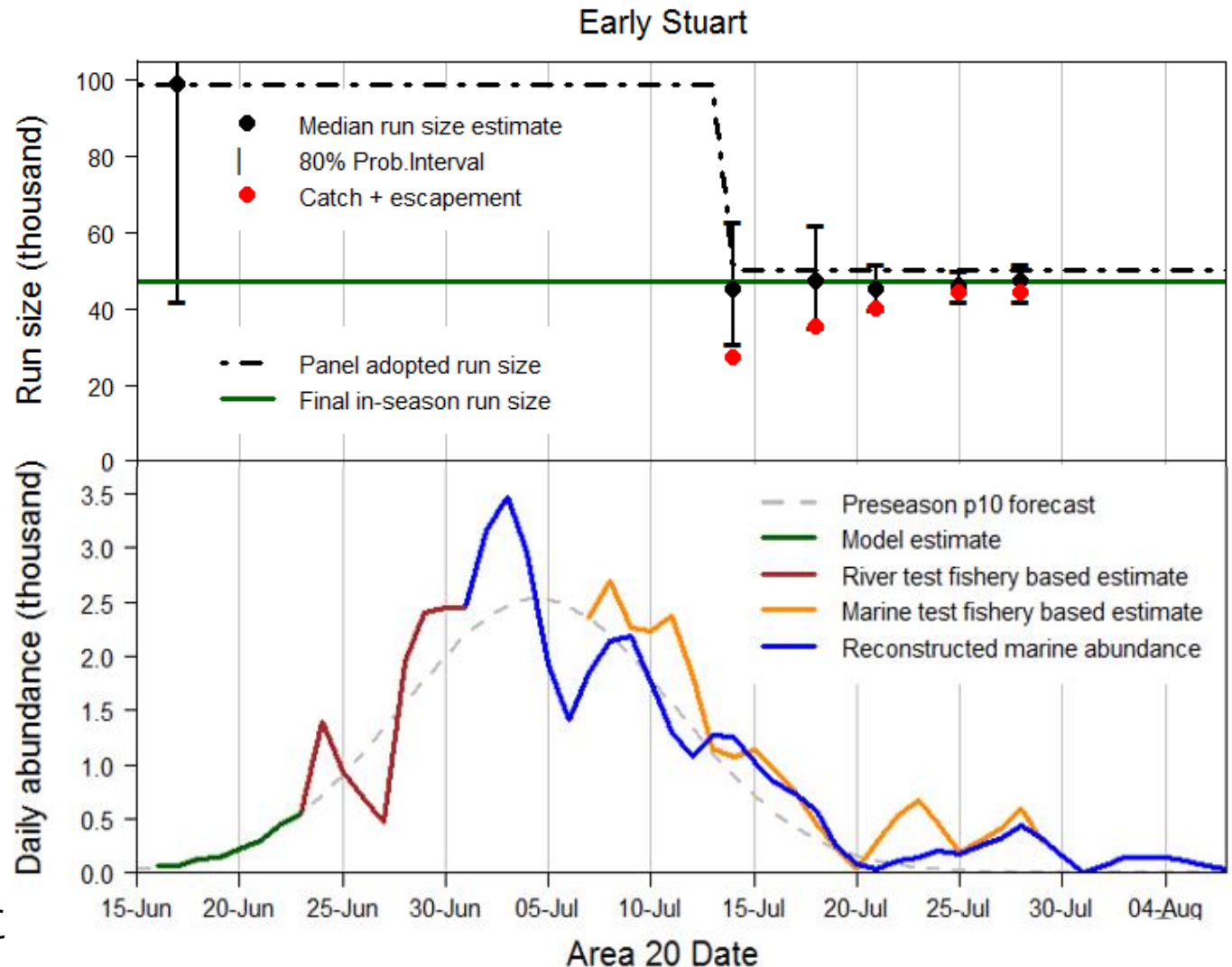
# 2017 IN-SEASON INFORMATION



# 2017 Run size: Early Stuart

End-of-season estimate: 52% lower than p50 forecast, 27% below the p25 forecast and similar to the p10 forecast

Date	Adopted Run Size
p50 Forecast	99,000
14-Jul	50,000
08-Aug	46,000
08-Sept	47,000
End of season	47,000



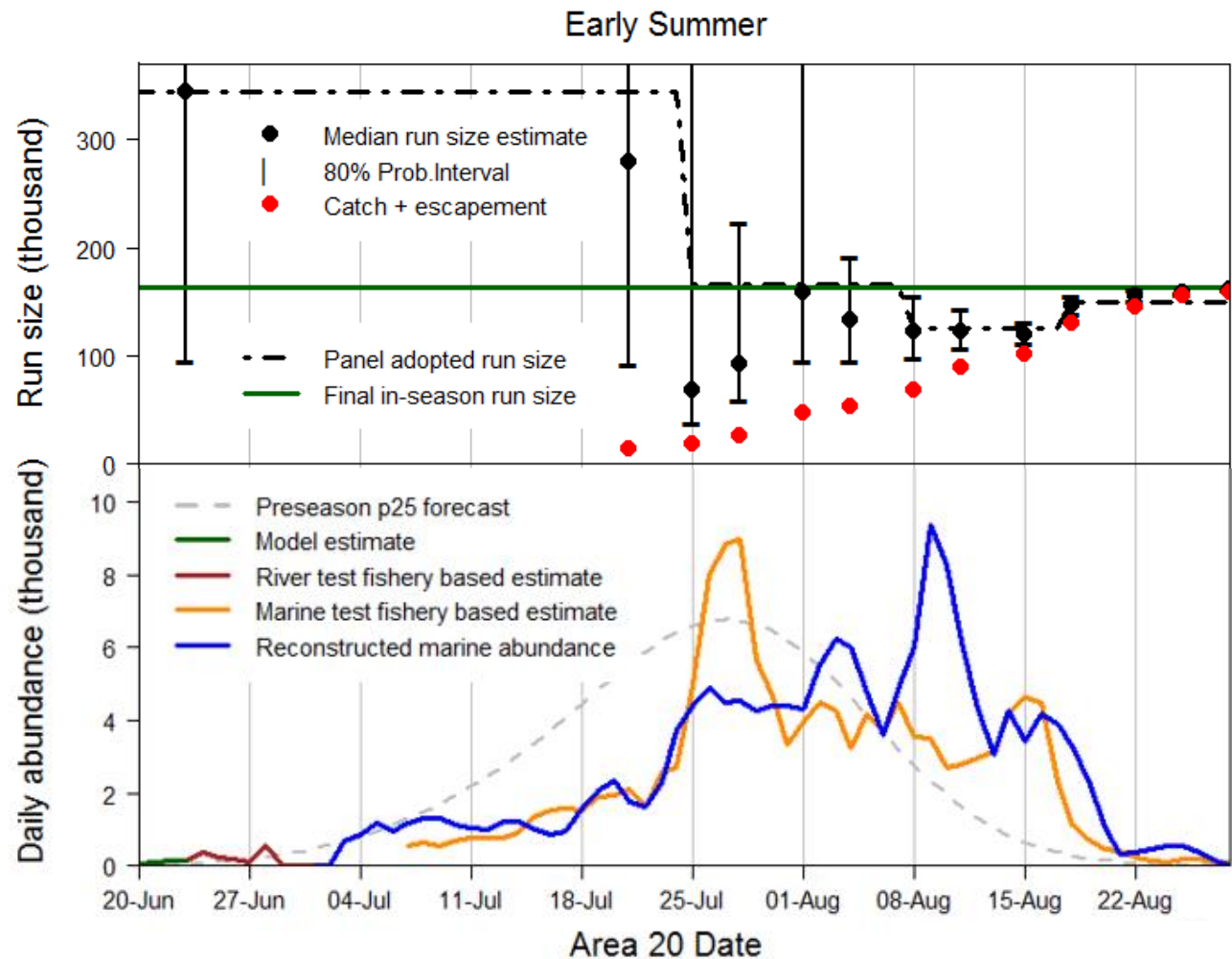
graphs courtesy of PSC



# 2017 Run size: Early Summer Run

End-of-season estimate: 52% lower than p50 forecast but similar to the p25 forecast

Date	Adopted Run Size
p50 Forecast	343,000
25-Jul	166,000
08-Aug	125,000
18-Aug	150,000
08-Sept	165,000
End of season	163,000

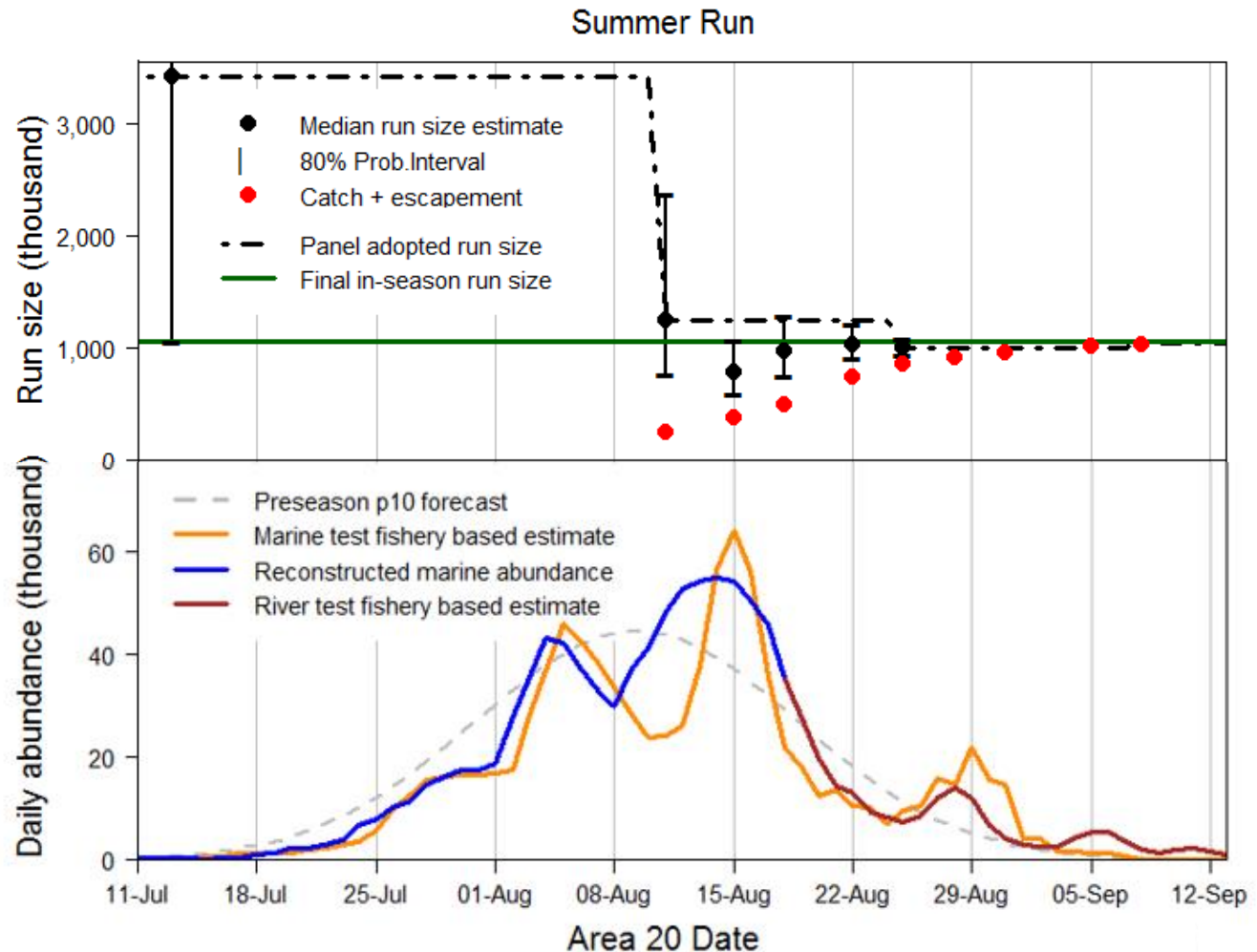


graphs courtesy of PSC

# 2017 Run size: Summer Run

End-of-season estimate: 69% lower than p50 forecast, 43% lower than the p25 forecast and similar to the p10 forecast

Date	Adopted Run Size
p50 Forecast	3,407,000
11-Aug	1,250,000
25-Aug	1,000,000
08-Sept	1,044,000
End of season	1,062,000

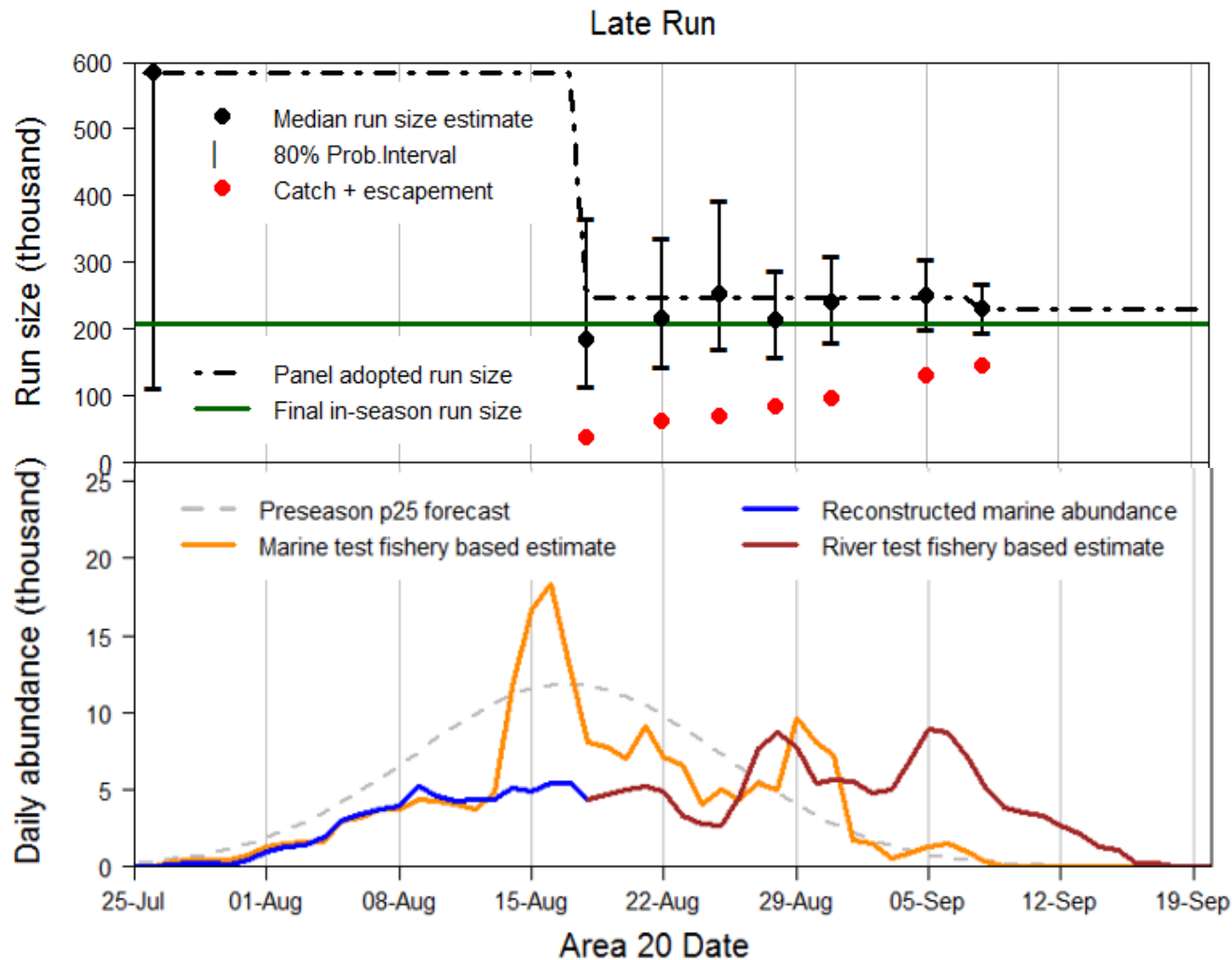


graphs courtesy of PSC

# 2017 Run size: Late Run

End-of-season estimate: 64% lower than p50 forecast and 15% below the p25 forecast

Date	Adopted Run Size
p50 Forecast	583,000
18-Aug	247,000
08-Sept	231,000
End of season	210,000

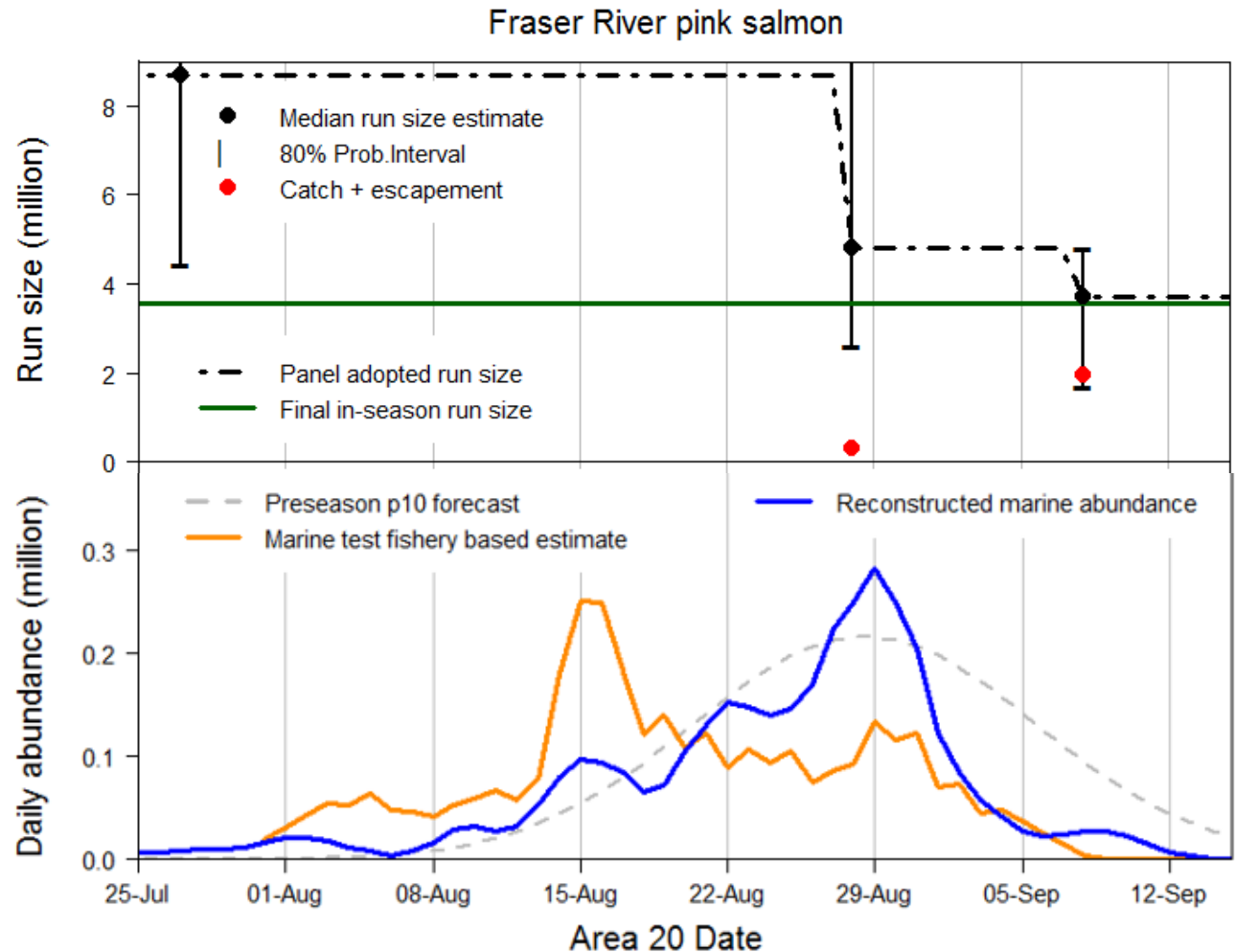


graphs courtesy of PSC

# 2017 Run size: Pink salmon

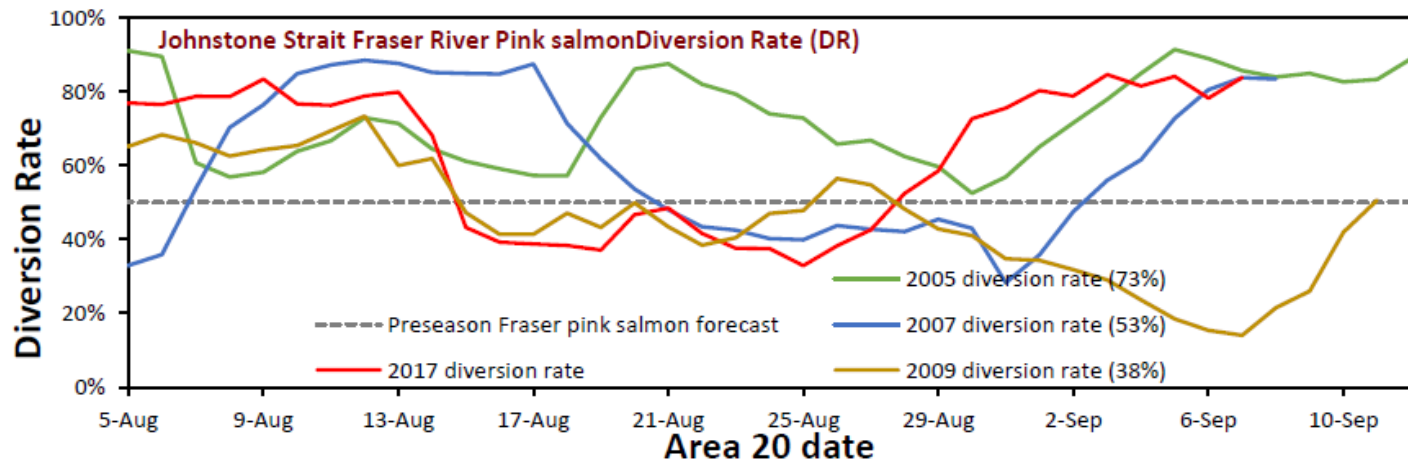
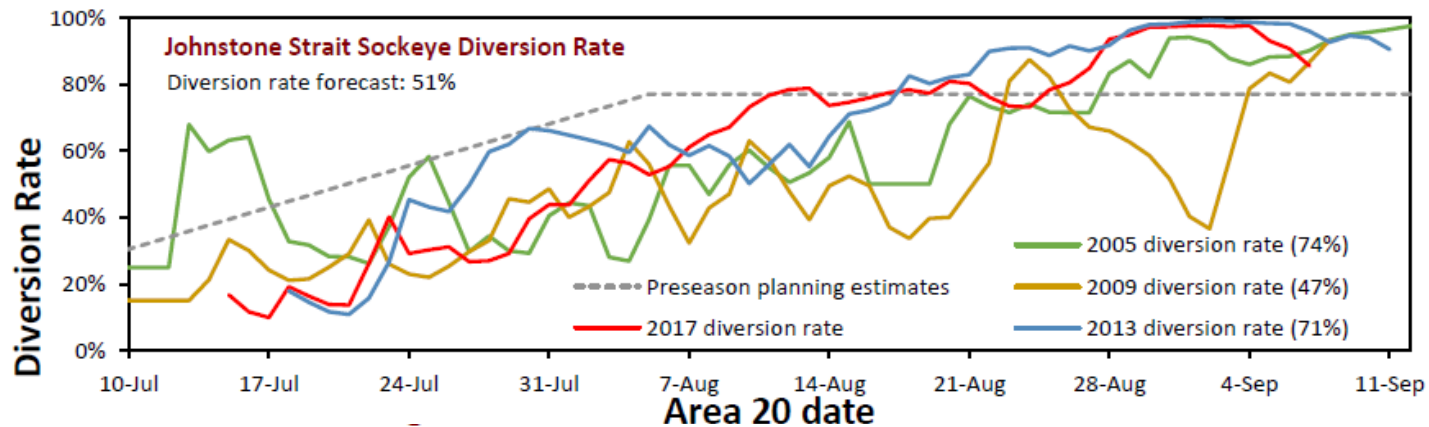
End-of-season estimate: 58% lower than p50 forecast, 41% below the p25 forecast and 19% below the p10 forecast

Date	Adopted Run Size
p50 Forecast	8,693,000
28-Aug	4,800,000
05-Sept	4,500,000
08-Sept	3,700,000
End of season	3,616,000

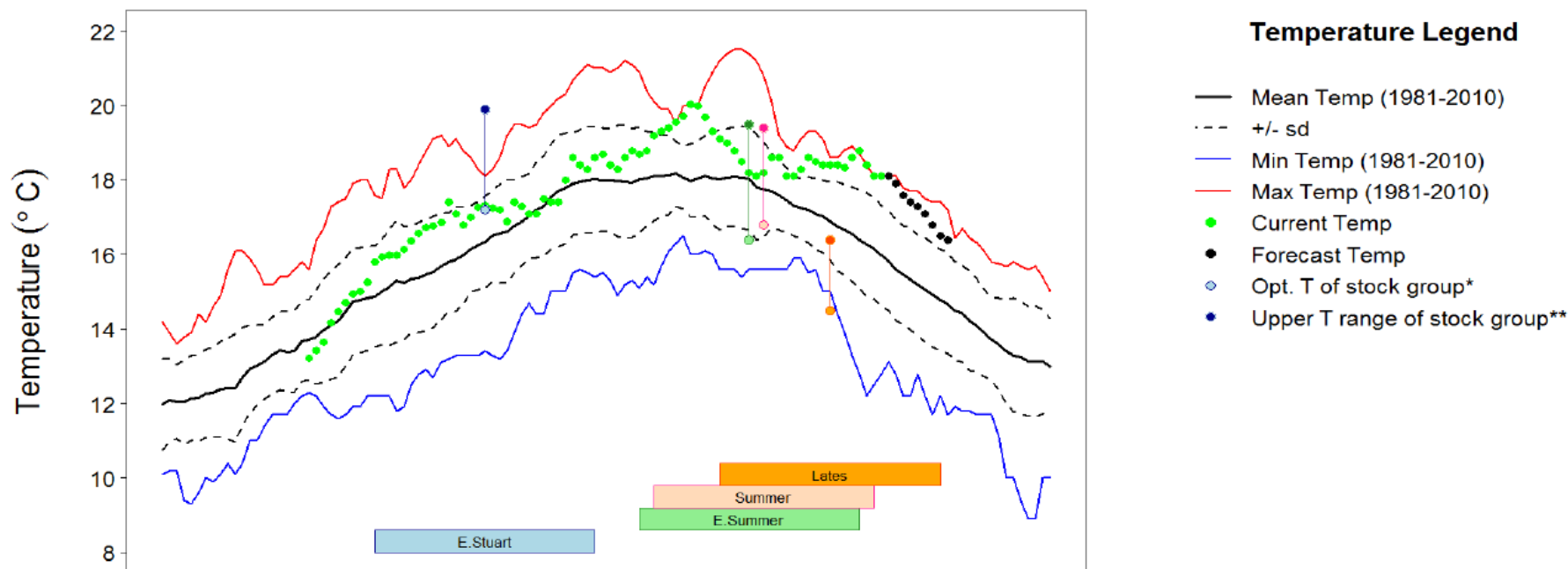


# diversion rate

	Pre-season	End of season
Sockeye	51%	71%
Pink salmon	50%	57%



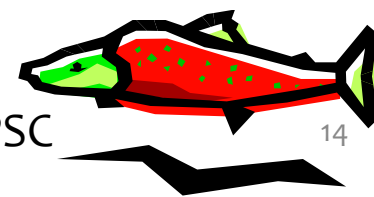
# environmental conditions & pMA



	adopted pMAs	
	pre-season	in-season*
Early Stuart	NA	NA
Early Summer	0.39	0.39
Summer	0.06	0.06
Lates	0.92	0.92

\* *final in-season adopted pMA*

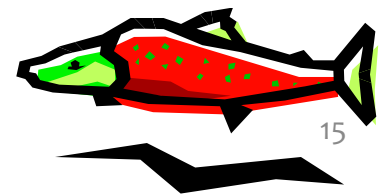
graph courtesy of PSC



Fraser Sockeye & Pink

# 2017 POST-SEASON\*

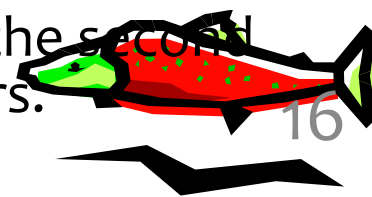
\* relative to fisheries management season  
... it's still in-season for Stock Assessment!



# Post-season: 2017 Run-size Summary

Management Group	Pre-season Run Size	End-of-season Run Size	Post season Run Size <sup>1</sup>	Difference
Early Stuart	99,000	47,000	46,000	-54%
Early Summer Run	343,000	163,000	157,000	-54%
Summer Run	3,407,000	1,062,000	1,035,000	-70%
Late Run	583,000	210,000	208,000	-64%
<b>Total Sockeye</b>	<b>4,432,000</b>	<b>1,482,000</b>	<b>1,446,000</b>	<b>-67%</b>
<b>Total Pink salmon</b>	<b>8,693,000</b>	<b>3,616,000</b>	<b>3,603,000</b>	<b>-59%</b>

- **Total Sockeye Run Size:** The run size was 66% below the run size of the brood year (4.2 million) and 87% below the cycle line average (11 million). 2017 was the second smallest (after 2016) run size over the last 70 years.
- **Total Pink salmon Run Size:** The run size was 38% below the run size of the brood year (5.8 million). 2017 was the second smallest (after 1999) run size over the last 50 years.



<sup>1</sup>Estimates as of January 3, 2018



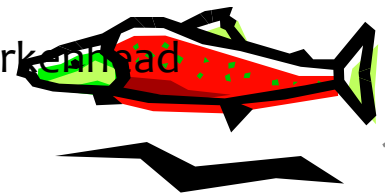
# 2017 Migration Timing

	Area 20 Timing			Mission Timing <sup>2</sup>	
Management Group	Pre-season forecast <sup>1</sup>	Post season	Differ.	Pre-season	End of season
Early Stuart	1-July	4-July	+3 days		
Early Summer	20-July	4-Aug	+15 days		
Summer	6-Aug	12-Aug	+6 days		
Late	14-Aug	17-Aug	+3 days	30-Aug	4-Sept
Pink salmon	28-Aug	18-Aug	-10 days		

<sup>1</sup>Based on Panel agreed timing estimates following the June meeting. DFO's pre-season timing estimates were: June 29 for Early Stuart, August 4 for Chilko and August 29 for Fraser River pink salmon.

<sup>2</sup>50% migration date at Mission for Late-run excluding Birkenhead.

- **Sockeye timing:** Despite pre-season forecasts indicating early timing, the timing matched historic median timing estimates on this cycle, except for Early Summer run (timed 9 days later than the cycle median).
- **Sockeye delay:** A delay of 9 days is detected for Late run excluding Birkenhead
- **Pink salmon timing:** earliest on record



# 2017 Spawning Escapement Summary

- **Early Stuart:** Less than target and smaller than brood year escapement of 86,262
- **Early Summer:** Less than target and smaller than brood year escapement of 205,355
- **Summer:** Less than target and smaller than brood year escapement of 1,900,847
- **Late:** Data not yet available, but likely smaller than brood year escapement of 286,803

Management Group	Spawning Escapement Target	Potential Spawning Escapement	31-d Model Predicted Spawning Escapement	Preliminary Spawning Escapement	% Deviation from SET
Early Stuart	99,000	43,000	29,300	15,451	-84%
Early Summer	137,000	154,000	106,700	65,697	-52%
Summer Run	1,375,100	961,000	690,700	784,440	-43%
Late Run	314,000	202,000	83,700 <sup>1</sup>	NA	
<b>Total Sockeye</b>	<b>1,925,100</b>	<b>1,360,000</b>	<b>910,400</b>		

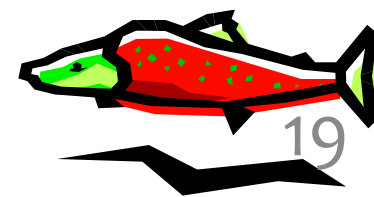
<sup>1</sup>Predicted %DBE based on RT model and 04-Sep Mission Upstream timing

## Preliminary Catch and Exploitation Rate Summary

Fishery Type	Fraser Sockeye						Fraser Pinks	
	Early Stuart	Early Summer	Summer	Late	Total	% of Run	Total	% of Run
<b>CANADIAN CATCH</b>								
Commercial Catch	0	0	0	0	0	0%	0	0%
First Nations Catch	2,600	1,900	62,700	4,200	71,400	5%	32,300	1%
Non-commercial Catch *	0	10	100	40	140	0%	3,500	0%
<b>Canadian Total</b>	<b>2,600</b>	<b>1,900</b>	<b>62,800</b>	<b>4,200</b>	<b>71,600</b>	<b>5%</b>	<b>35,800</b>	<b>1%</b>
<b>UNITED STATES CATCH</b>								
Commercial catch	0	0	0	0	0	0%	102,200	3%
Non-commercial Catch *	0	30	850	600	1,500	0%	30	0%
Washington Total	0	30	850	600	1,500	0%	102,200	3%
Alaska (preliminary)	0	0	0	0	0	0%	0	0%
<b>United States Total</b>	<b>0</b>	<b>30</b>	<b>850</b>	<b>600</b>	<b>1,500</b>	<b>0%</b>	<b>102,200</b>	<b>3%</b>
<b>TEST FISHING CATCH</b>								
<b>Test Fishing Total</b>	<b>320</b>	<b>1,400</b>	<b>10,200</b>	<b>1,900</b>	<b>13,800</b>	<b>1%</b>	<b>17,700</b>	<b>0%</b>
<b>TOTAL CATCH</b>								
<b>Total Catch in All Fisheries</b>	<b>2,900</b>	<b>3,400</b>	<b>73,800</b>	<b>6,800</b>	<b>86,900</b>	<b>6%</b>	<b>155,800</b>	<b>4%</b>
<b>PRELIMINARY EXPLOITATION RATE</b>								
<b>Preliminary Run Size</b>	<b>47,000</b>	<b>165,000</b>	<b>1,044,000</b>	<b>231,000</b>	<b>1,487,000</b>	<b>100%</b>	<b>3,700,000</b>	<b>100%</b>
<b>Preliminary Exploitation Rate</b>	<b>6%</b>	<b>2%</b>	<b>7%</b>	<b>3%</b>	<b>6%</b>		<b>4%</b>	

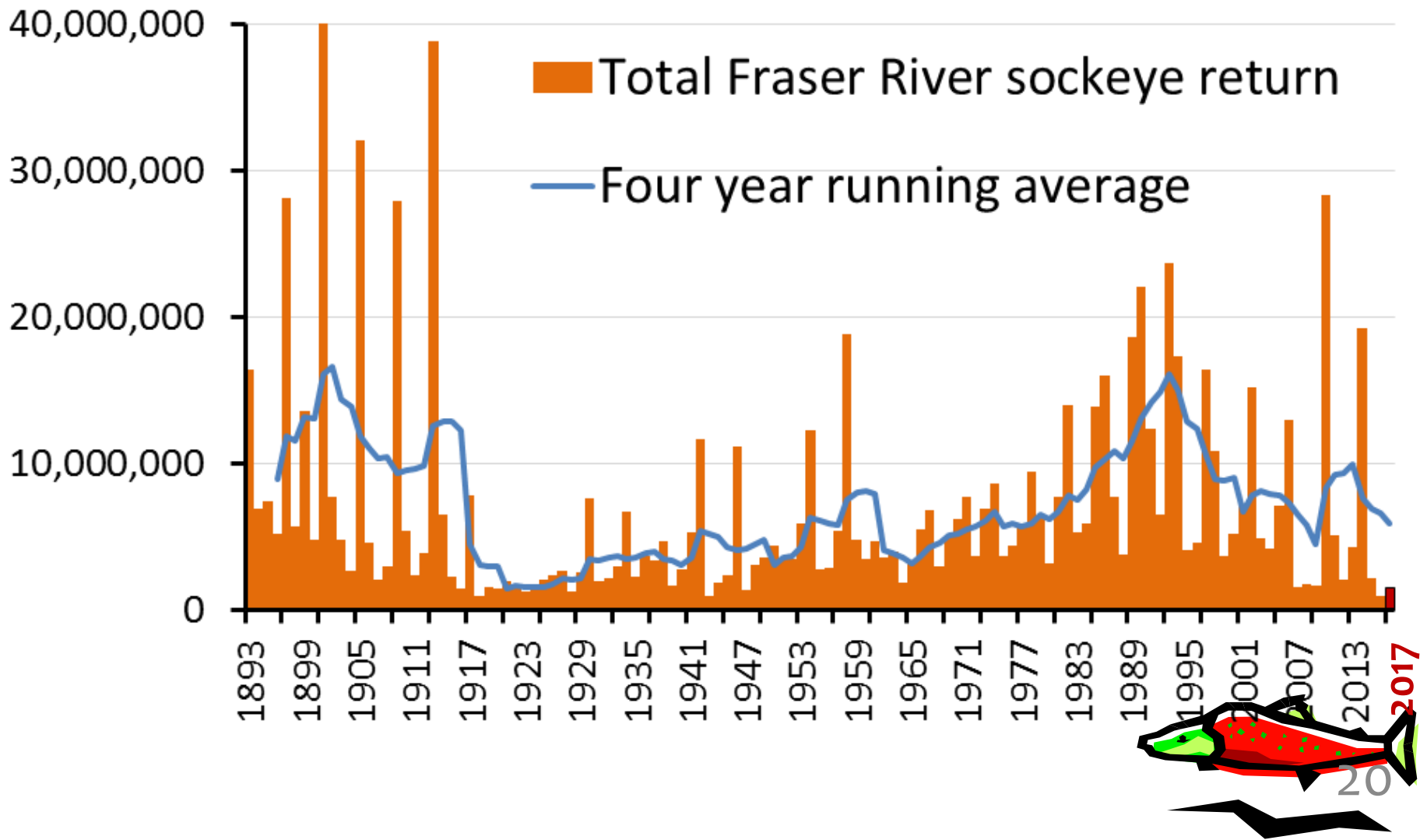
\* Non-Commercial catch includes recreational, charter and ESSR catches in Canada, and sport and C&S catches in the U.S. Rounding may cause discrepancies among totals.

\*As of January 3<sup>rd</sup>, 2018



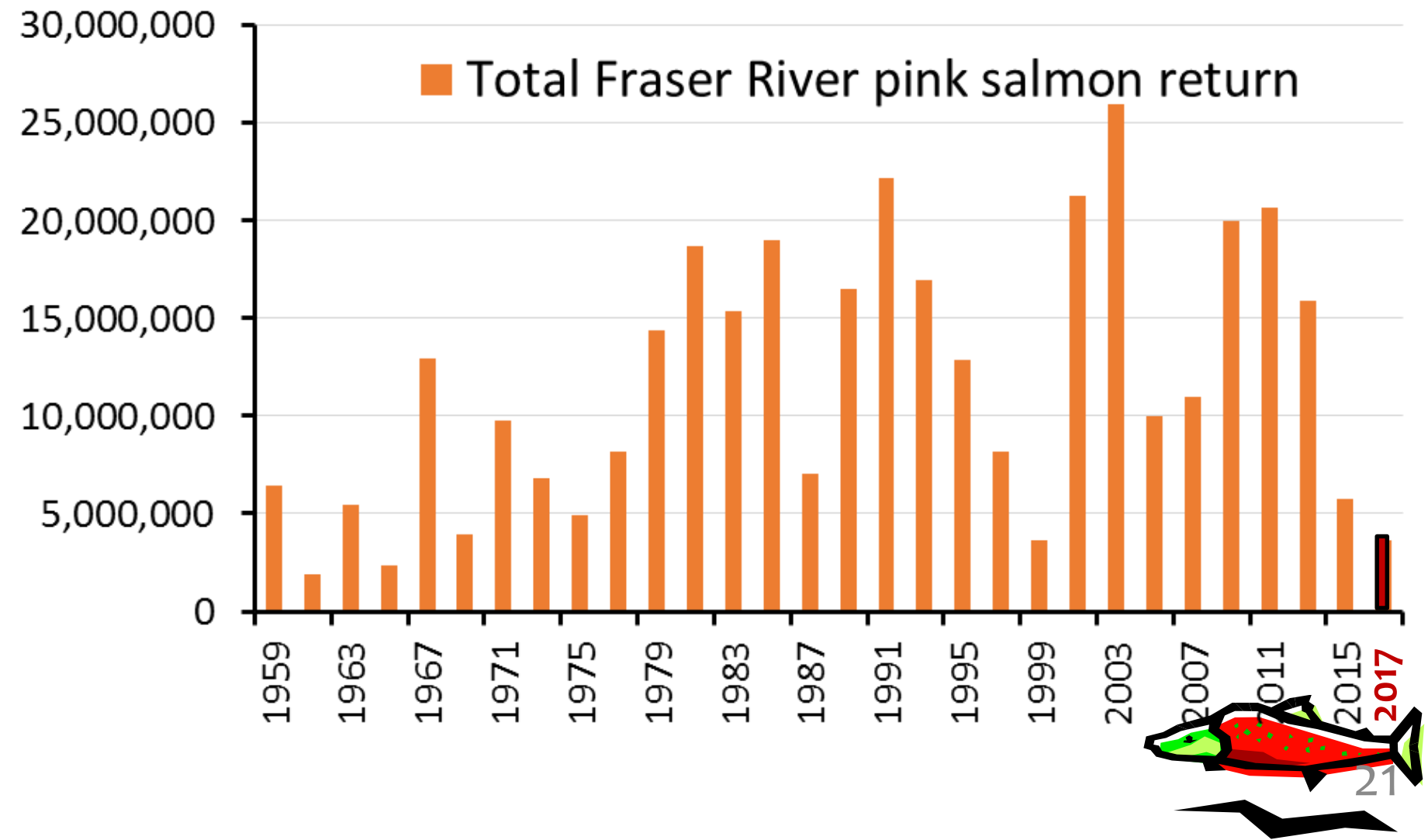
# 2017 Sockeye Run-size Summary

2017 was the second smallest sockeye run over the last 70 years



# 2017 Pink salmon Run-size Summary

2017 was the second lowest pink salmon run since 1965



# Next Steps & Timelines

- Late Run escapement preliminary (Jan)
- near finals escapement for all mu: Feb
- 2018 FR SK forecasts
  - January
- FR SK escapement plan
  - options in draft IFMP
- Draft IFMP

