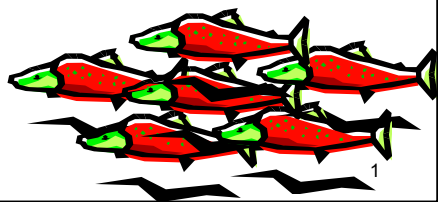
Fraser River Sockeye

2012 Review



updated: 18-Jan-2013

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Outline

- 2012 Sockeye Review
  - pre-season
  - in-season
  - post-season

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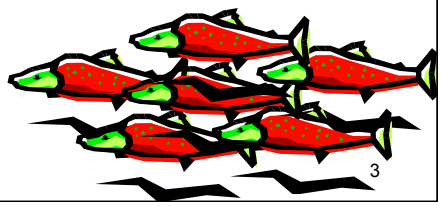
2012 Sockeye Pre-Season



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Re-alignment of Stocks within Management Groups

Early Summer Run

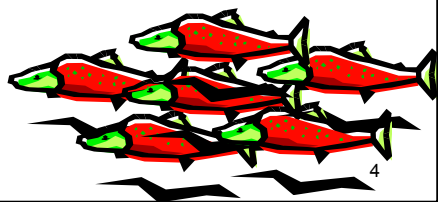
Raft, North Thompson (RNT)

Late Run

Harrison (Har)

Summer Run

Raft River and North Thompson stocks and Harrison River sockeye managed as part of the Summer Run aggregate to better align these stocks with other stocks of similar run timing.



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2012 Sockeye Forecast- 'Long-term Productivity'

	Probability that Return will be at or below specified Run Size				
Stock Management Group	p10	p25	p50	p75	p90
Early Stuart (-RNT)	39,000	61,000	99,000	161,000	270,000
Early Summer	78,000	145,000	277,000	522,000	967,000
Summer (+RNT & Har)	580,000	917,000	1,585,000	2,776,000	4,808,000
Late (-Har)	46,000	80,000	158,000	304,000	589,000
Total Sockeye Salmon	743,000	1,203,000	2,119,000	3,763,000	6,634,000

- Sockeye harvest would likely be directed on Summer run sockeye
- Likely to be harvest constraints based on low predicted returns of Early Summer and Late Run sockeye

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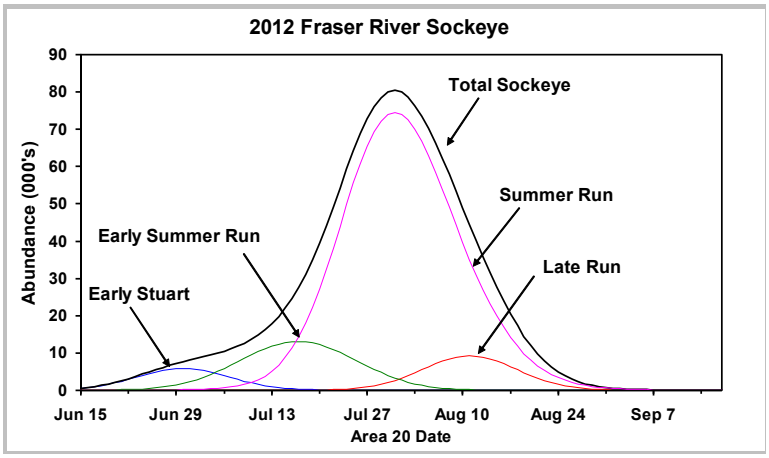
Pre-Season Run Size & Timing Expectations



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Pre-season Planning- Harvest Opportunities at mid-point forecast

	Pre-season Forecast	Escapement Target	Test Fisheries	Management Adjustment	Harvest Opportunities*
Early Stuart	99,000	52,000	2,500	101,400	**7,400**
Early Summer	277,000	166,000	5,300	53,100	**52,600**
Summer**	1,585,000	651,000	23,700	39,100	**871,200**
Late	158,000	158,000	2,600	153,300	**29,000**
Total	2,119,000	1,027,000	34,100	346,900	**960,200**

*** Includes AFE and ER ceilings**
**** Raft, North Thompson, and Harrison sockeye included in Summer-run management group**

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Pre-season Management Considerations

- Early Stuart moving window closure with no extension for early-timed Early Summer Run
- Late Run Management:
  - Assumption of 16 day delay prior to entering the river (equal to average delay of last 3 years)
  - 20% exploitation at p50 forecast abundance but potential to increase to 30% at or above p75 level of abundance
  - Cultus exploitation managed within the constraints of the Late Run aggregate

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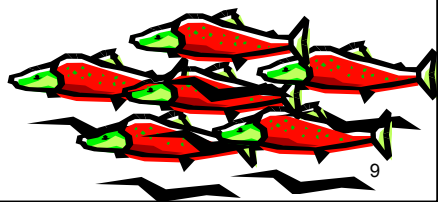
2012 Sockeye In-Season



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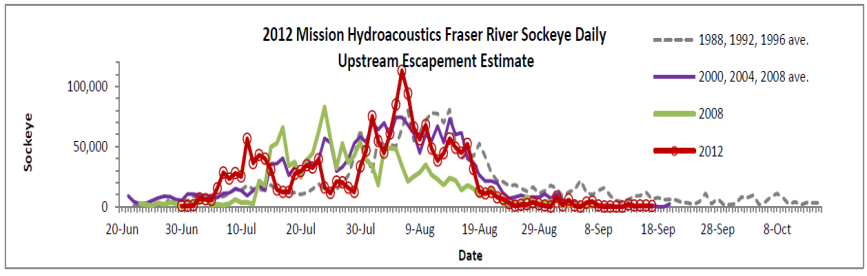
Mission Escapement



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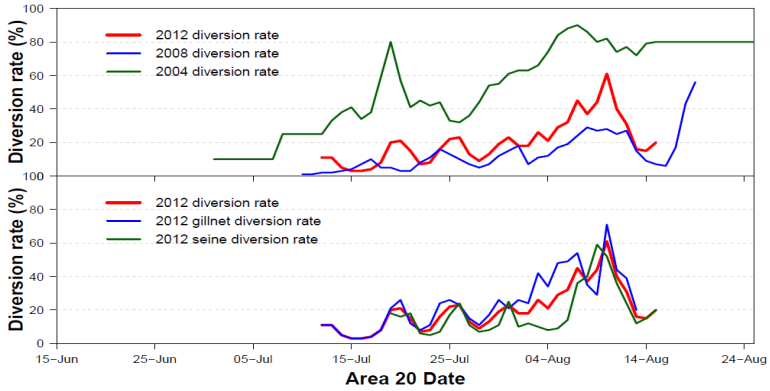
Diversion Rate

2012 Fraser River sockeye diversion rate (3 day averages)

Percentage of Fraser River sockeye migration through Johnstone Strait



Diversion rate: pre-season 43%; in-season 23%

Strong Southern diversion compared to recent years

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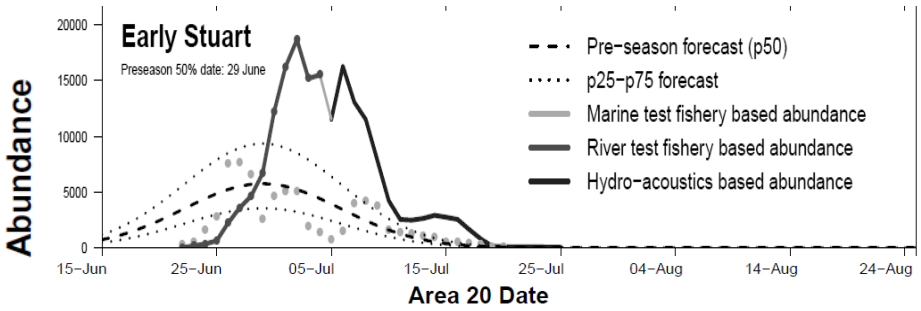
Early Stuart Migration Profile



A20 50% migration dates: pre-season 29-Jun; in-season 4-Jul

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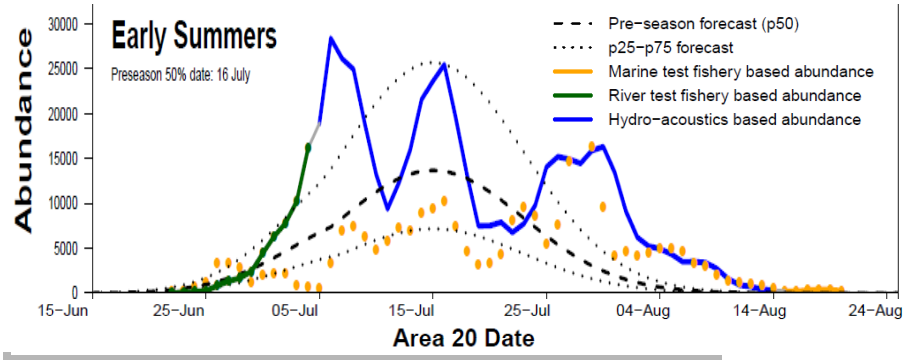
Early Summer Migration Profile



A20 50% migration dates: pre-season 16-Jul; in-season 16-Jul

- The multi-modal return profile of the Early Summer-run sockeye made it difficult to determine the peak of the run in-season.

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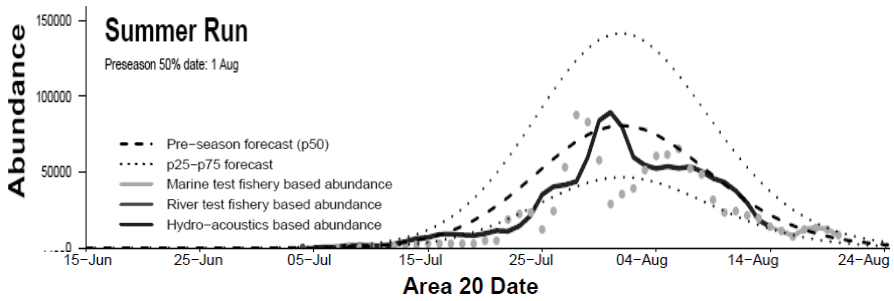
Summer Run Migration Profile



A20 50% migration dates: pre-season 01-Aug; in-season 2-Aug
Note: timing RNT (3-Aug) and Harrison (31-Jul)

- Low composition of Summer-run sockeye in test fishery catch relative to other stock aggregates increased the uncertainty in the timing and abundance for this group.

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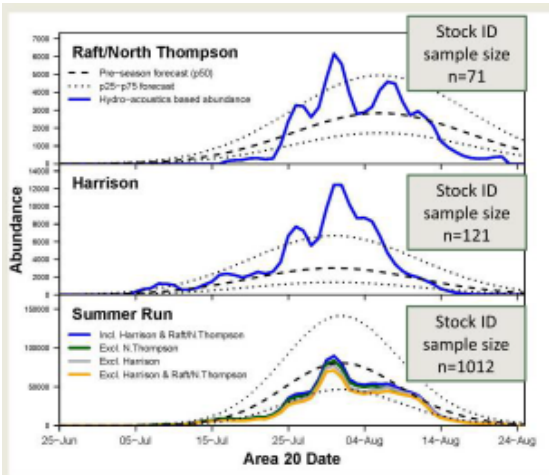
Summer Run Migration Profile



* Stock ID sample size relates to in-river samples

A20 50% migration dates: pre-season 01-Aug; in-season 2-Aug

Note: timing RNT (3-Aug) and Harrison (31-Jul)

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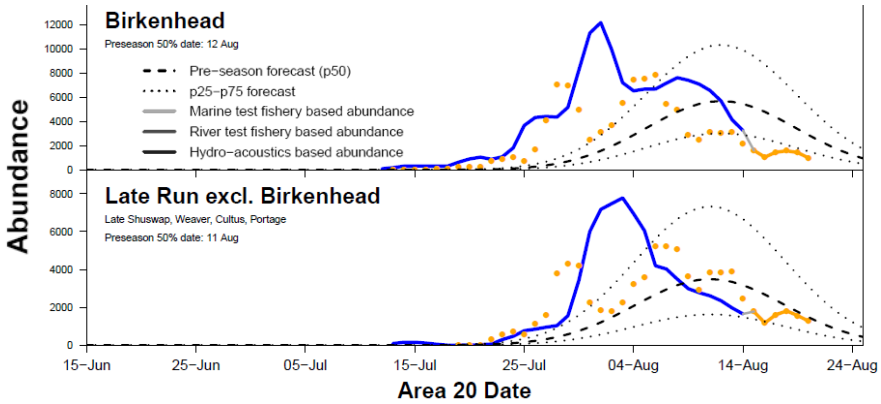
Late Run Migration Profiles



A20 50% migration dates Late run aggregate: pre-season 11-Aug; in-season 5-Aug

Although Late-run delay has been observed for the previous three years there was no evidence of Late-run holding pattern in 2012.

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2012 Fraser Sockeye Forecasts & In-season Run Size Estimates

Run	Pre-Season Forecast			Final In-Season Estimate (Sep 26)
	25% Probability	50% Probability	75% Probability	
Early Stuart	61,000	99,000	161,000	185,000
Early Summer	145,000	277,000	522,000	530,000
Summer	917,000	1,585,000	2,776,000	1,300,000
Late	80,000	158,000	304,000	260,000
Total	**1,203,000**	**2,119,000**	**3,763,000**	**2,275,000**

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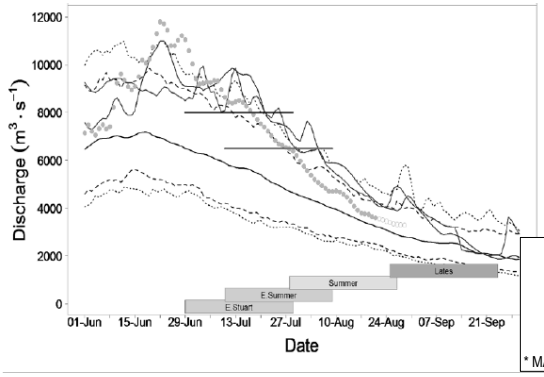
Fraser Discharge Profile



Discharge Legend

- Mean Discharge (1971-2000)
- 10 Year Return Intervals
- 25 Year Return Intervals
- 2011
- 1999
- Current Discharge
- Forecast Discharge
- E.Stuart Threshold ($m^3 \cdot s^{-1}$)[i]
- E.Summer Threshold ($m^3 \cdot s^{-1}$)[ii]

	Pre-season MA	In-season MA
Early Stuart	101,400	236,100
Early Summer	53,100	103,900
Summer	39,100	58,600
Late*	153,300	252,200

* MA estimate is timing based.

- High Fraser River discharge delayed the start of Mission hydro-acoustic estimates. This increased the uncertainty in estimates of sockeye passage at Mission for Early Stuart sockeye and the beginning of the Early Summer-run sockeye.
- High discharge likely had negative impacts on the migration of Early Stuart and some Early Summer stocks.

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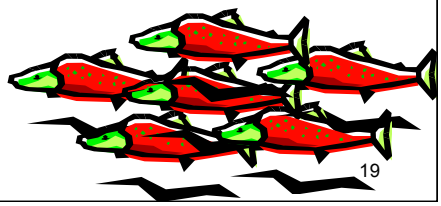
2012 Sockeye Post-Season



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Preliminary Estimates of Fraser Sockeye Catch

Fraser River Sockeye Catch	
Recreational	-
Commercial	-
FN FSC- Marine[a]	53,200
FN FSC- Fraser	454,900
EO/Demo- Fraser	-
Canadian Total	**508,100**
Test Fishing (incl. Albion & Qualark)[b]	36,100
US	111,300
Total[c]	**655,500**

[a] Includes 7,200 sockeye caught by Marine area First Nations in the Fraser River

[b] Includes Fraser sockeye catch in Panel approved Test Fisheries in US waters

[c] Catch rounded to the nearest 100 fish

- Harvest opportunities for First Nations in both the marine and the river. Marine FSC catches lower this year due to high Southern diversion.
- No commercial or recreational harvest opportunities.

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2012 Post-Season Summary

Management Group	Pre-season Run Size	Spawning Escapement Target	pMA	Manage-ment Adjust.	Available Harvest	Allowable Exploitation Rate
Early Stuart	99,000	52,000	1.95	101,400	9,900	10% [a]
Early Summer	277,000	166,000	0.32	53,100	57,900	21%
Summer	1,585,000	651,000	0.06	39,100	894,900	56%
Late	158,000	158,000	0.97	153,300	31,600	20% [a]
Sockeye	**2,119,000**	**1,027,000**		**346,900**	**994,300**	

Management Group	Final In-season Run Size	Spawning Escapement Target	pMA	Manage-ment Adjust.	Available Harvest	Allowable Exploitation Rate	Post-Season Spawning Escapement	Post-Season Final In-season Catch	Post-Season Exploitation Rate
Early Stuart	185,000	74,000	3.19	236,100	10,000	10% [a]	26,224	9,100	5%
Early Summer	530,000	212,000	0.49	103,900	214,100	40%	268,680	81,300	15%
Summer	1,300,000	651,000	0.09	58,600	590,400	45%	567,101	516,500	40%
Late	260,000	260,000	0.97	252,200	23,600	20% [a]	61,501	48,600	19%
Sockeye	**2,275,000**	**1,197,000**		**650,800**	**838,100**		**923,506**	**655,500**	

[a] Exploitation rate floor at the p50 forecast level

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Fraser Sockeye Escapement

Management Group	Escapement Goal @ final in-season run size	Predicted Escapement *	Preliminary Spawning
Early Stuart	74,000	42,000	26,224
Early Summer	212,000	303,200	268,680
Summer	651,000	742,600	567,101
Late-run	260,000	107,500	61,501
Total	***1,197,000***	***1,195,300***	***923,506***

* Based on final in-season catch estimates and predicted differences between estimates

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2012 Escapement Summary

- The spawning escapement for Early Stuart is less than brood year escapement and the cycle average.
- Preliminary spawning ground assessments indicate that the Early Summer-run escapement was the third largest spawning ground escapement for this cycle.
- Summer-run sockeye escapements appear to be slightly below the brood year and the cycle average.
- Preliminary Late-run sockeye assessments appear to be over twice the brood year escapement estimate.

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