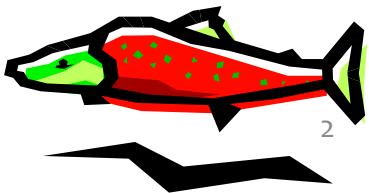
2016 Post-season Review

Fraser Sockeye

presented to: Fraser Forum
by: Jennifer Nener
date: 24-Jan-2017

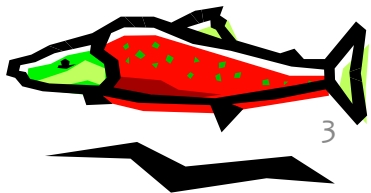
Overview

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



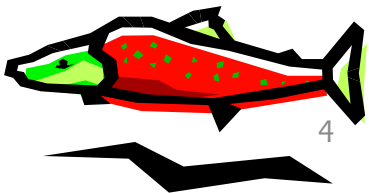
Fraser Sockeye

BACKGROUND



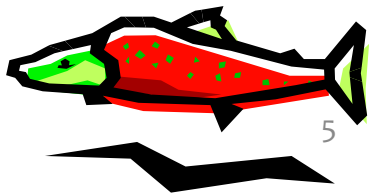
Fraser Sockeye Life History

- Currently there are 24 WSP Conservation Units identified for Fraser Sockeye
- Generally Fraser Sockeye that rear in lakes return predominantly as 4 year olds spending two years in freshwater and two years in the marine environment (4_2). Some stocks can exhibit strong 5 year old components (5_2) (i.e. Pitt River).
- Some Fraser sockeye stocks that rear temporarily in the estuary of the Fraser River return predominantly as three year olds (3_1) or four year olds (4_1) where less time is spent in freshwater (Harrison).



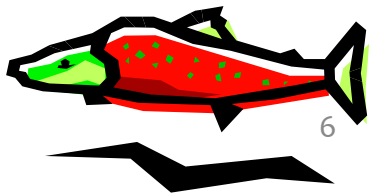
Harvest Management: FR Sockeye

- The four Fraser sockeye aggregates managed under the PST Annex generally contain stocks with similar return timing in the marine area.
  - The stocks within the 4 aggregates was adjusted in 2012 so that Harrison, Raft, and North Thompson stocks are now considered Summer run.
- Canada's escapement plan specifies escapement requirements that vary with run size for each run timing aggregate and includes an abundance below which there are very limited directed harvests allowed and a total mortality cap.
- At low sockeye aggregate abundances, low abundance exploitation rates (LAERs) are implemented to protect the majority of the run timing aggregate while allowing for fisheries on more abundant co-migrating run timing groups and/or species
- In-season assessments of run size, timing and environmental conditions and concerns for other sockeye stocks and species directly influence harvest opportunities



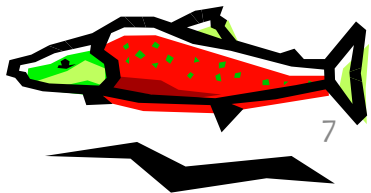
Fraser Sockeye

2016 PRE-SEASON



Run size forecasts

- run size forecasts are expressed as a range of values that largely reflect the density-independent survival (such as environmental and biological conditions) stocks have historically experienced.
- The 2016 cycle has the smallest average return of the four cycles.

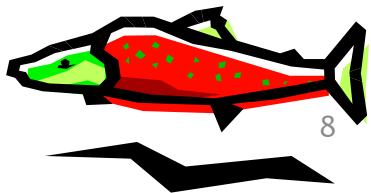


2016 FR SK run size forecast

run size forecast

	p10	p25	p50	p75	p90
Early Stuart	13,000	22,000	36,000	59,000	89,000
Early Summer (w/ misc)	120,000	217,000	447,000	1,003,000	2,703,000
Summer (w/ misc)	640,000	992,000	1,677,000	2,962,000	5,023,000
Late (w/ misc)	41,000	65,000	111,000	203,000	366,000
TL Sockeye	814,000	1,296,000	2,271,000	4,227,000	8,181,000

The Fraser Panel started the season at p50 forecast for all sockeye run timing groups

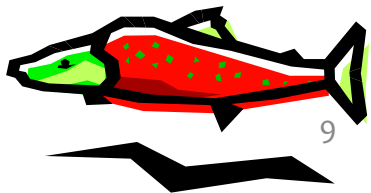


2016 FR SK Escapement Plan

escapement plan - SK

	Harvest Rule Parameters								
Management Unit	Low Abundance ER (LAER)	TAM Cap	Lower Fishery Reference Point	Upper Fishery Reference Point	Pre-season pMA	Pre-season MA	esc. goal @p50 forecast	Harvestable Surplus	ER @p50 forecast
Early Stuart	10%	60%	108,000	270,000	NA	-	36,000	-	10%*
Early Summer	10%	60%	156,000	390,000	0.59	105,500	178,800	162,700	36%
Summer	10%	60%	722,000	1,805,000	0.11	79,400	722,000	875,600	52%
Late	20%	60%	396,000	990,000	NA	-	111,000	-	20%*

** LAER*

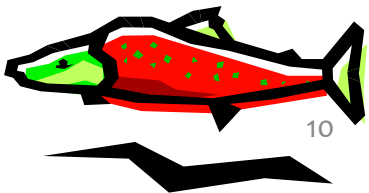


Projected Catch & Escapement at p50 forecast

Run timing group	historical escapement		PSE*	p50 PSE comparisons		potential
	cycle yr	brood year	@p50	to cycle	to BY	catch@p50
Early Stuart	35,861	26,233	19,000	53%	72%	3,600 **
Early Summer	132,183	276,018	179,000	135%	65%	162,700
Summer	656,591	559,387	722,000	110%	129%	875,600
Lates	134,046	61,209	60,000	45%	98%	22,200**

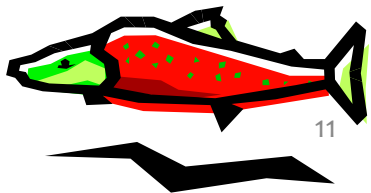
* PSE = potential spawning escapement (after catch & pMA taken into account)

** catch projected using LAER



Fraser Sockeye

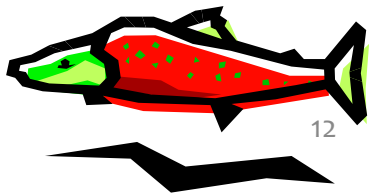
2016 IN-SEASON



run size

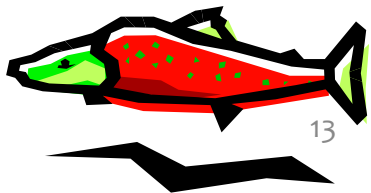
	p10	p25	p50	p75	p90	Final In Season	Escapement*
Early Stuart	13,000	22,000	36,000	59,000	89,000	18,000	8,612
Early Summer (w/ misc)	120,000	217,000	447,000	1,003,000	2,703,000	240,000	156,678
Summer (w/ misc)	640,000	992,000	1,677,000	2,962,000	5,023,000	520,000	NA
Late (w/ misc)	41,000	65,000	111,000	203,000	366,000	75,000	NA
TL Sockeye	**814,000**	**1,296,000**	**2,271,000**	**4,227,000**	**8,181,000**	**853,000**	**NA**

* preliminary post-season estimates November 2016, will be updated in Febuary



A20 Timing

	Cycle medians	Update (July)	post-season (December)
Early Stuart	03-Jul	03-Jul	03-Jul
Early Summer	21-Jul	21-Jul	20-Jul
Summer	02-Aug	06-Aug	31-Jul
Lates	05-Aug	14-Aug	08-Aug



2016 Run Timing Curves

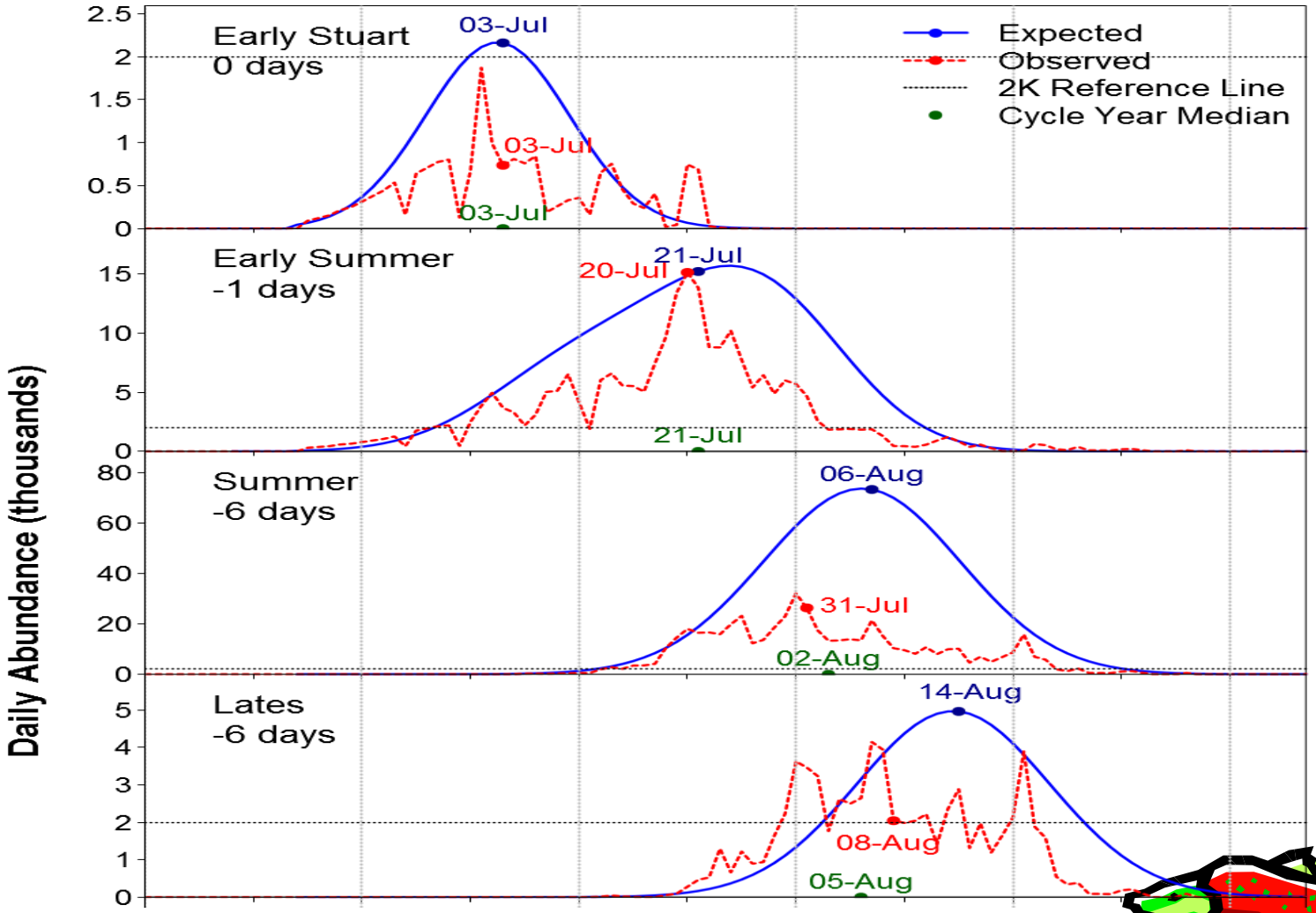


Figure courtesy of PSC

Diversion Rate

	Pre-season	post-season
Sockeye	75%	50%

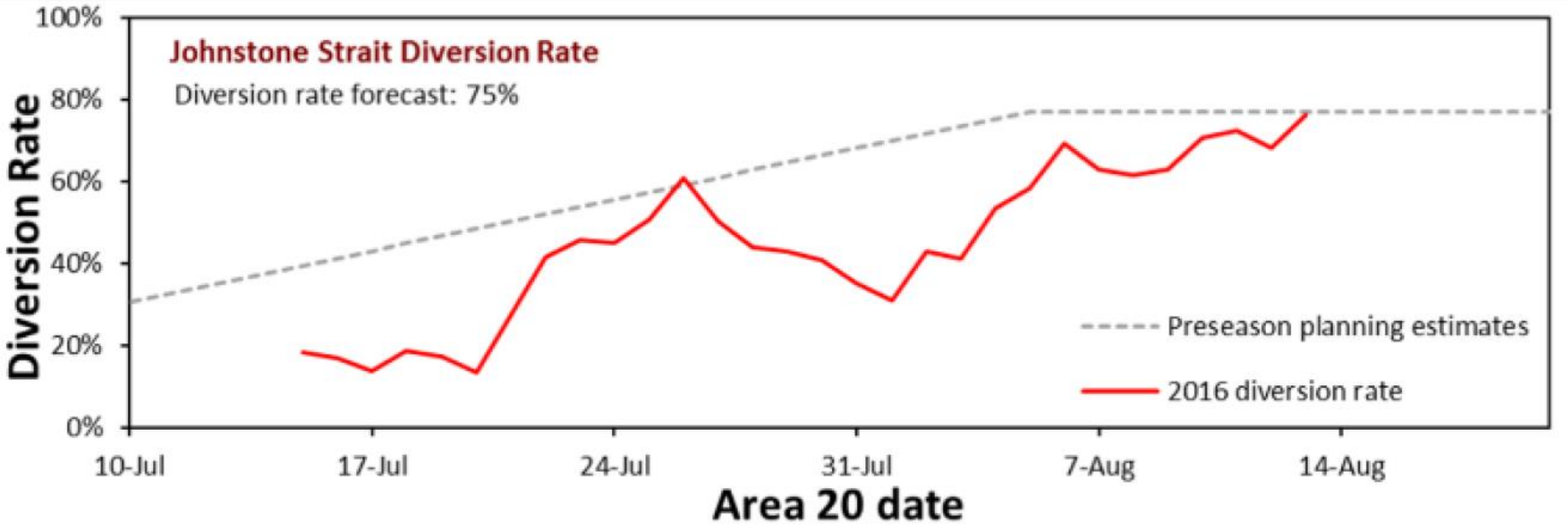
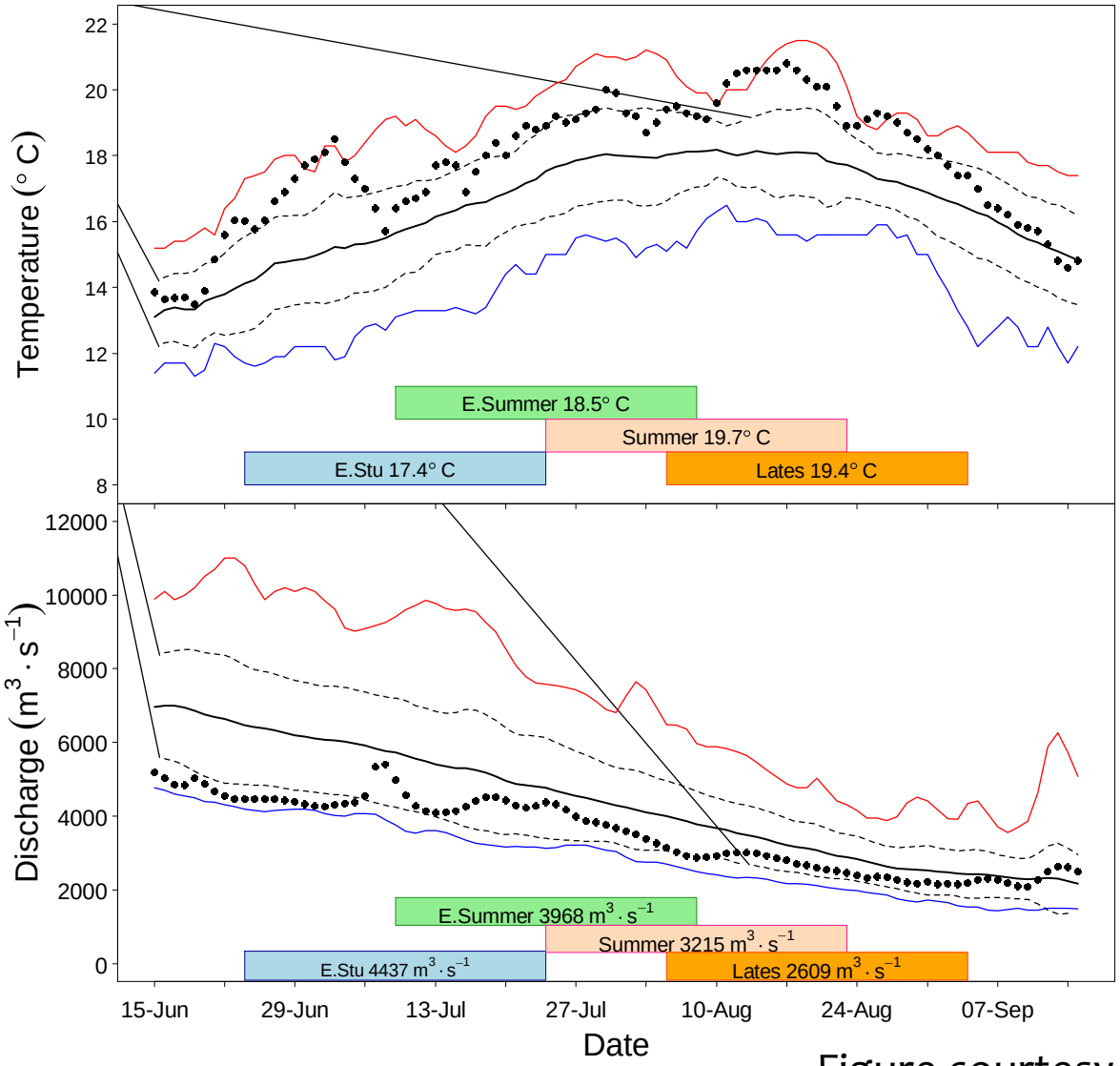


Figure courtesy of PSC

environmental conditions & DBE

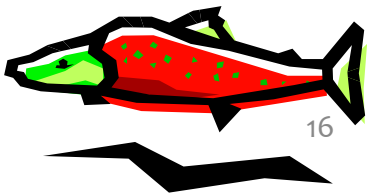


	adopted DBEs	
	pre-season*	in-season**
Early Stuart	-41%	NA
Early Summer	-37%	-37%
Summer	-10%	-10%
Lates	-32%	NA

**DBE adopted in season prior to determination of LAER status*

***No DBE or MA used for fisheries management when in LAER status*

Figure courtesy of PSC

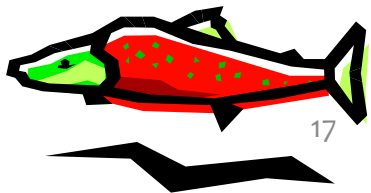


Fraser Sockeye

2016 POST-SEASON*

* relative to fisheries management season

…it's still in-season for Stock Assessment!

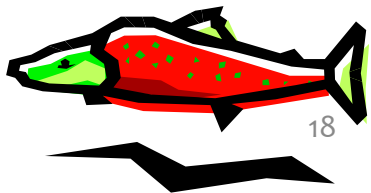


TAC, Catch, & Preliminary Exploitation Rates

	EStu	ESum	Summer	Late	tl Sockeye
Run Size*	**18,000**	**240,000**	**520,000**	**75,000**	**853,000**
TAC*	**-**	**-**	**-**	**-**	**-**
*TF deduction***	*200*	*2,500*	*5,700*	*600*	**9,000**
catch (as of 12-Jan)	**1,700**	**27,600**	**124,300**	**6,300**	**159,900**
US	*-*	*600*	*900*	*100*	*1,600*
CDN	*1,500*	*24,500*	*117,700*	*5,600*	*149,300*
ER	**9%**	**12%**	**24%**	**8%**	**19%**

** Final adopted in-season Run Size and TAC*

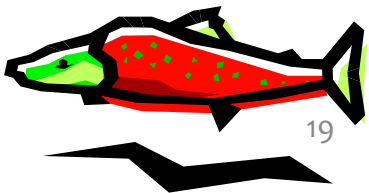
*** TF deduction = catch*



Preliminary Catch by Group

		Sockeye	
		Total	**Fraser**
Canada		*149,800*	***149,200***
Commercial		-	-
FSC		149,000	148,400
	mrne	32,900	32,300
	LFrA	55,000	55,000
	BCI	61,100	61,100
FN Demo		-	-
Recreational		-	-
Charter (Albion TF)		800	800
United States		*1,800*	***1,700***
Commercial		*900*	***800***
C&S		*900*	***800***
FRP Test Fisheries		*9,400*	***8,800***
Total		*161,100*	***159,700***

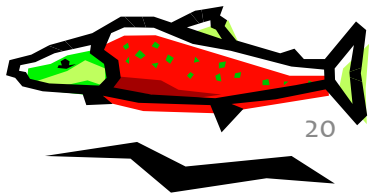
*data from Jan 12th C&R table



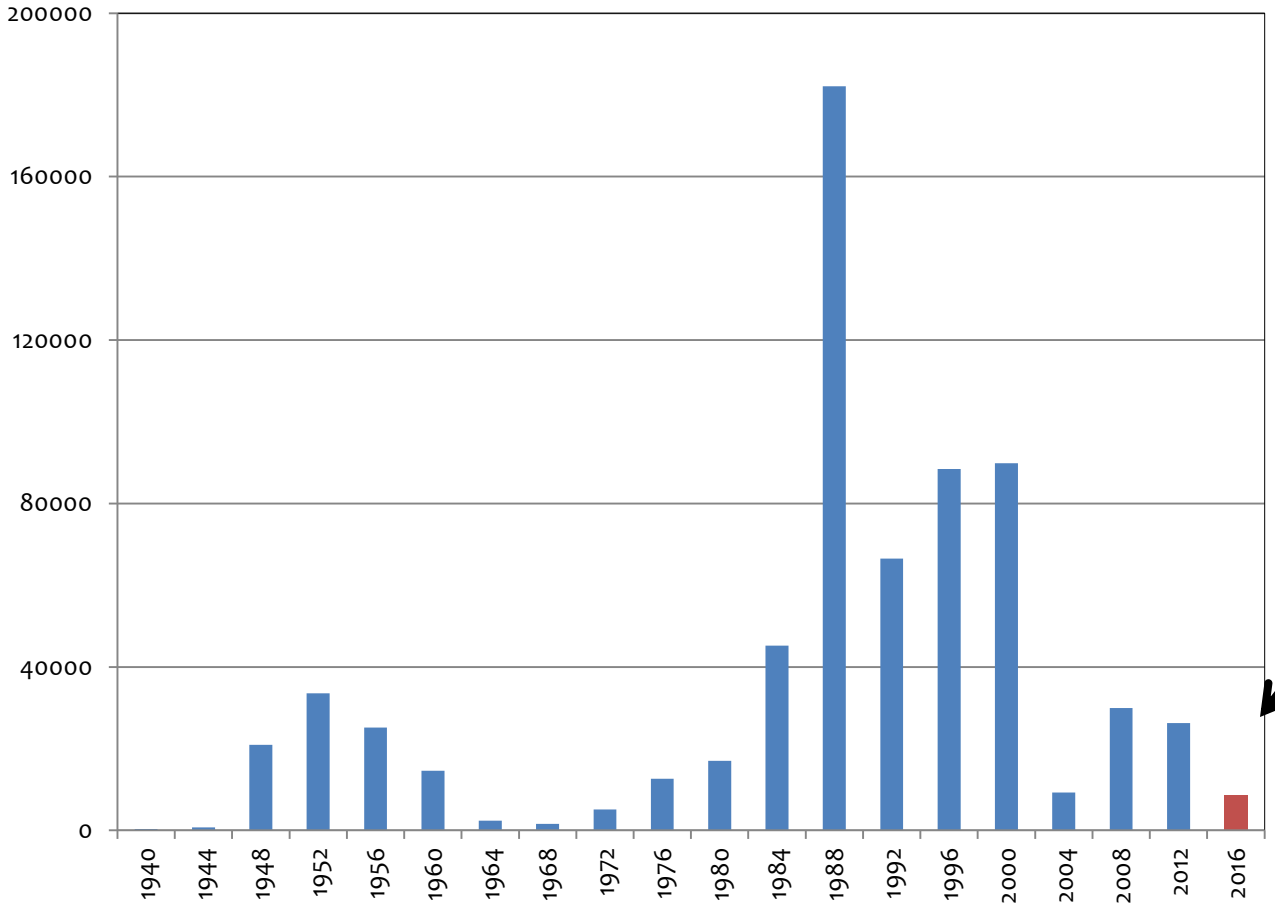
Escapement Overview

	Escapement			spawning success	
	2016	brood yr	%BY	2016	average
Early Stuart*	8,612	26,233	33%	78.9%	88.4%
Early Summer*	156,678	276,018	57%	92.8%	89.5%
Summer*	275,917	561,040	49%	91.3%	90.2%
Lates*	44,081	61,209	72%	72.9%	85.9%

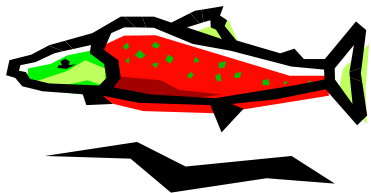
**preliminary escapement estimates, near final estimates available in February*



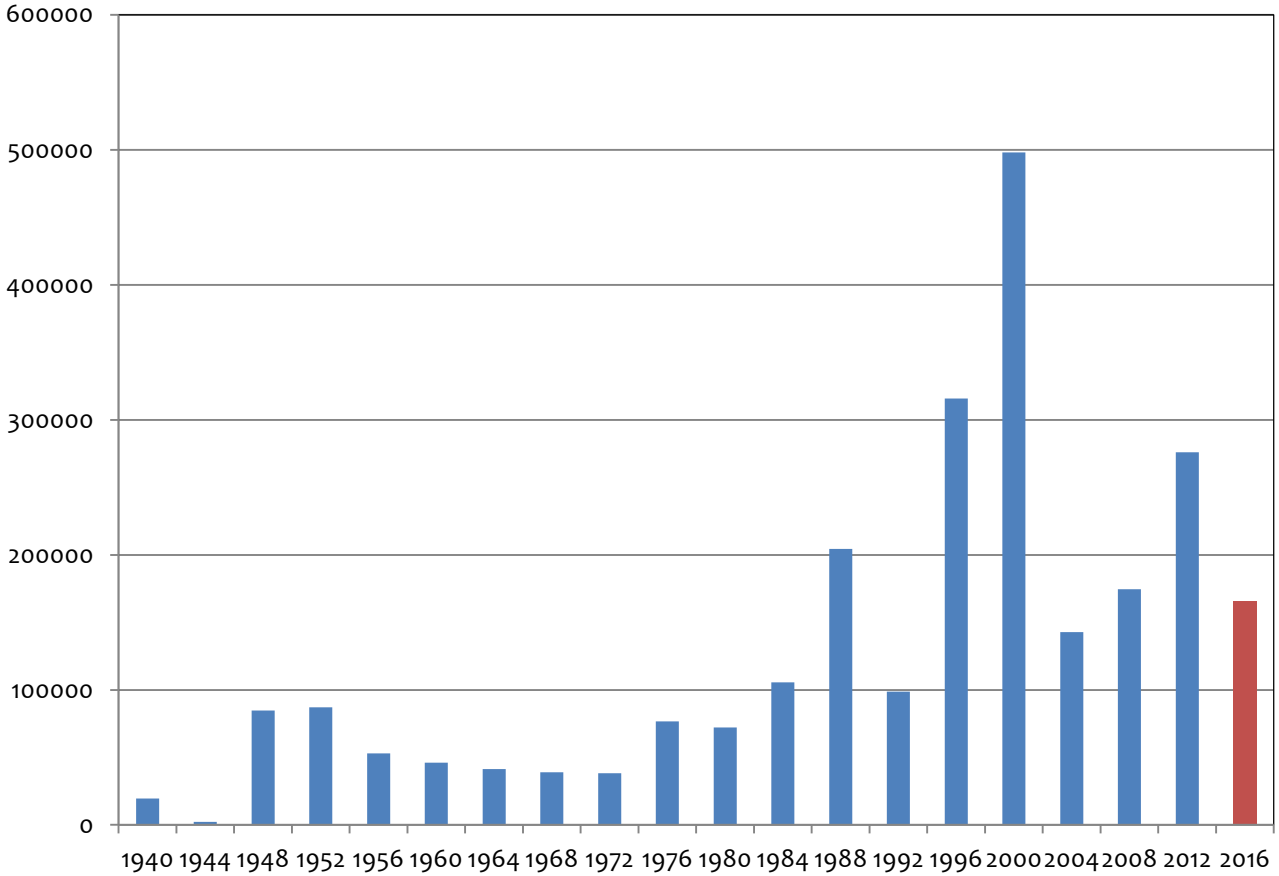
2016 Cycle Early Stuart Escapements



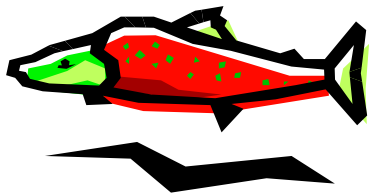
Preliminary Spawning Escapement: 8,612



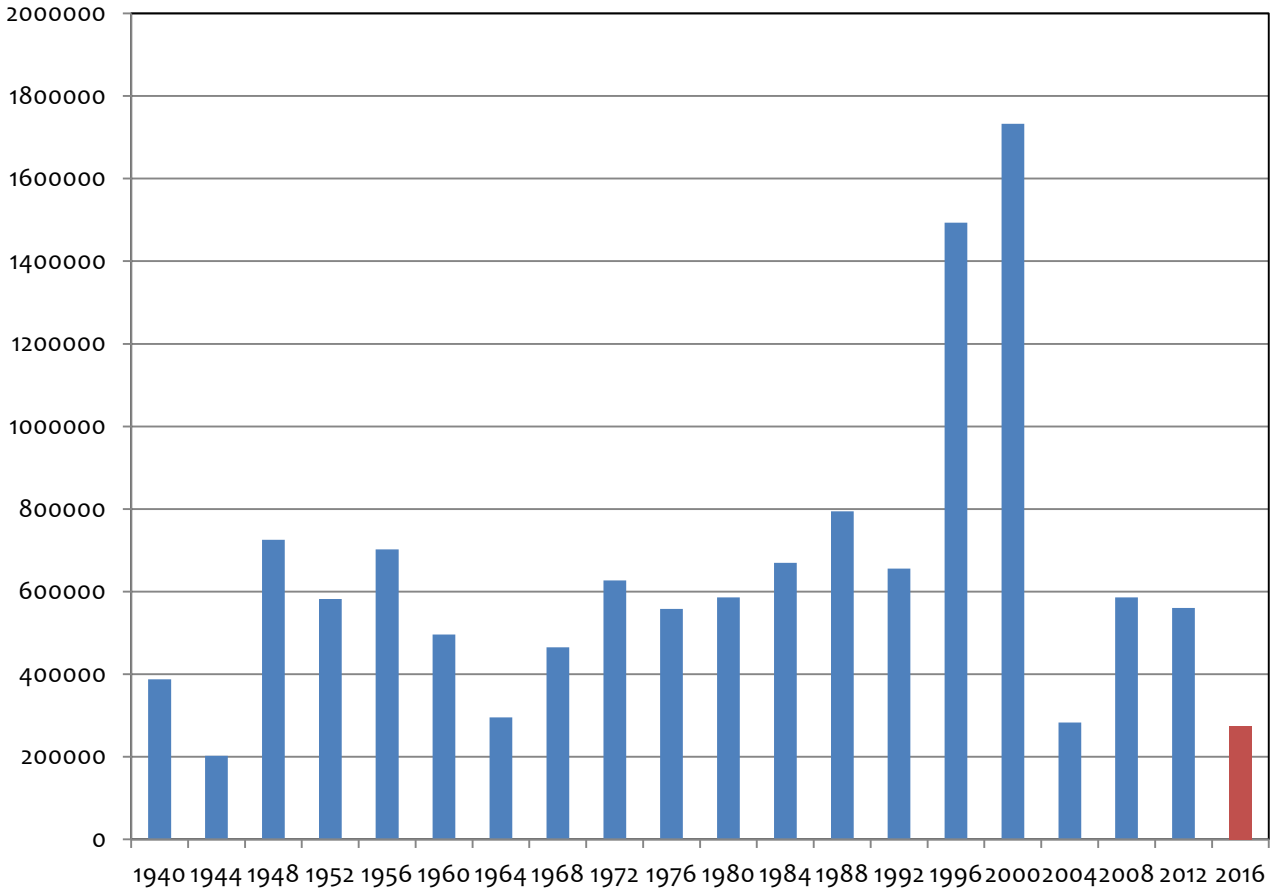
2016 Cycle Early Summer Escapements



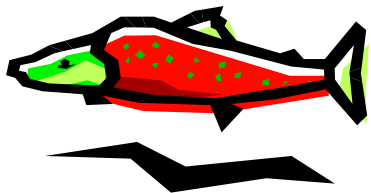
Preliminary Spawning Escapement: 156,678



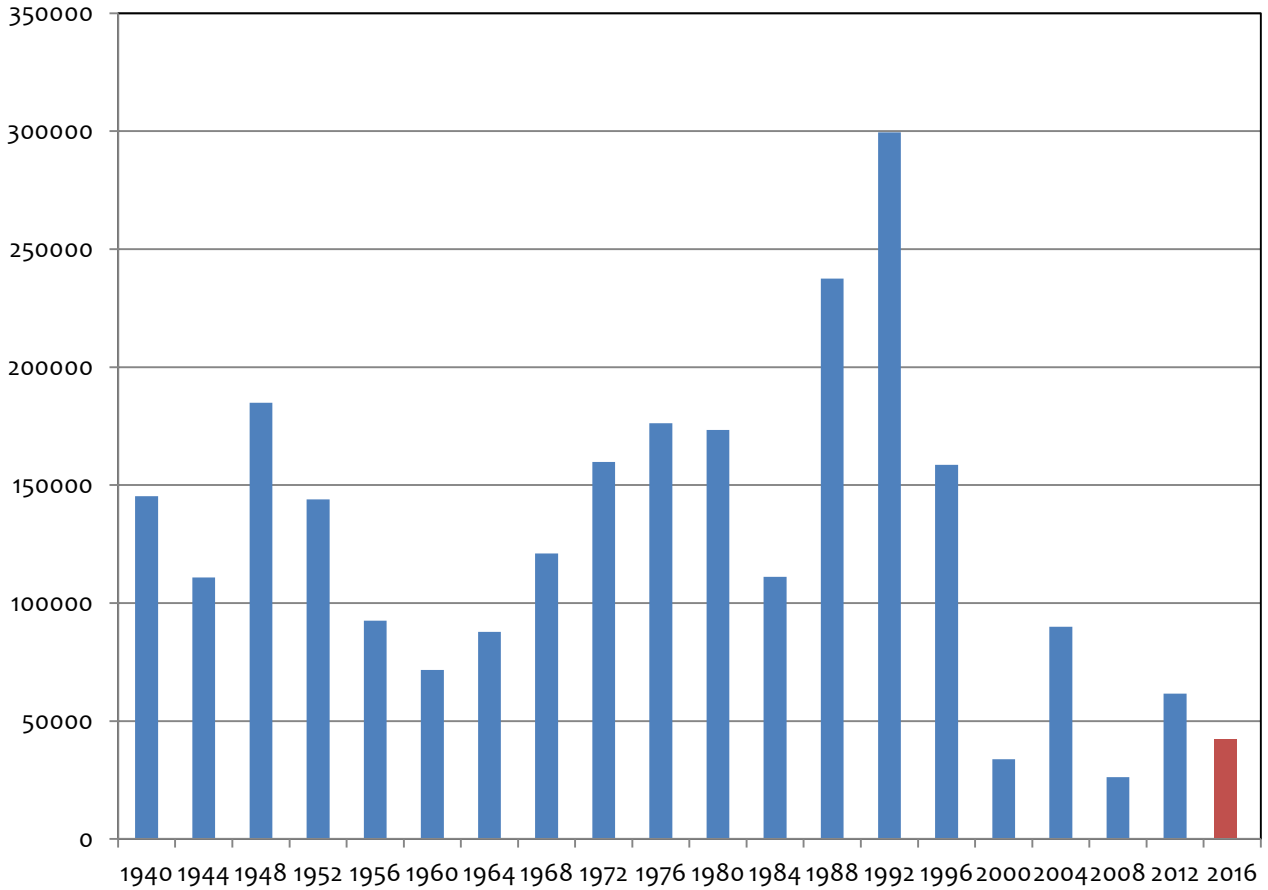
2016 Cycle Summer Escapements



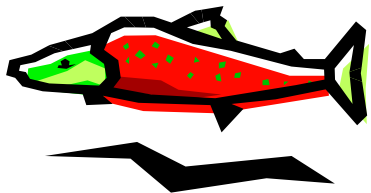
Preliminary Spawning Escapement: 275,917



2016 Cycle Late Escapements



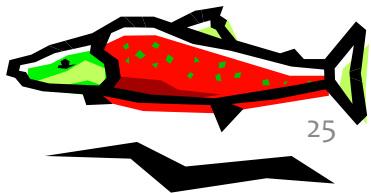
Preliminary Spawning Escapement: 44,081



Preliminary Escapement & potential spawning escapement (PSE)

	esc goal	Run size - catch	DBE %	DBE #fish	PSE after DBE	escapement (#fish)	esc vs esc goal	esc vs PSE
EStu	18,000	16,300	NA			8,612	-9,388	NA
ESum	156,000	212,400	-37%	-78,588	133,812	156,678	678	22,866
Sum	520,000	*395,700*	-10%	-39,570	356,130	275,917	-244,083	-80,213
Lates	75,000	*68,700*	NA			44,081	-30,919	44,081

near final escapement estimates will be available Febuary



pre&post season comparisons

pre-season

Mgmt group	run size @p50	SpnEsc target	pMA	MA	avail. harvest (incl TF)	allowable ER
Early Stuart	36,000	36,000	NA	NA	0	10%
Early Summer	447,000	178,800	0.59	105,500	162,700	36%
Summer	1,677,000	722,000	0.11	79,400	875,600	52%
Late	111,000	111,000	NA	NA	0	20%
Sockeye	**2,271,000**	**1,047,800**		**184,900**	**1,038,300**	**46%**

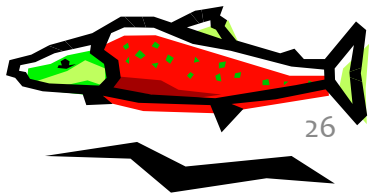
run sizes shown are at p50 forecast, for 2016, FRP chose to start the season @p50

post-season

Mgmt group	In Season run size	SpnEsc target	pMA	MA	avail. harvest (incl TF)	allowable ER*	prelim ER	near final SpnEsc**	prelim post-season catch
Early Stuart	18,000	18,000	NA	NA	0	10%	9%	8,612	1,700
Early Summer	240,000	156,000	0.59	92,000	0	10%	12%	156,678	27,600
Summer	520,000	520,000	0.11	57,200	0	10%	24%	275,917	124,300
Late	75,000	75,000	NA	NA	0	20%	8%	44,081	6,300
Sockeye	**853,000**	**769,000**		**149,200**	**0**		**17%**	**TBD**	**159,710**

* *Lower abundance exploitation rate (LAER) permitted as incidental harvest in the event there is no available harvest. The LAER is not shown in "available harvest" column.*

** *final run size estimates pending RSA work*



Next Steps & Timelines

- Escapement
  - Lates (Jan)
  - near finals: Feb
- 2017 FR SK/PK forecasts
  - Pre-Publication February
- FR SK escapement plan
  - options in draft IFMP
- Draft IFMP
  - early March release date
  - comments due: 13-Apr