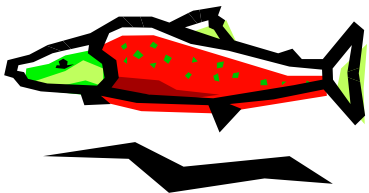
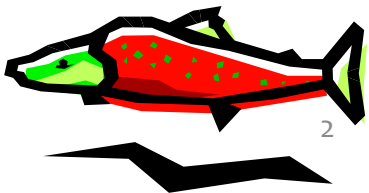
Fraser Sockeye & Pink
2015 escapement options

presented to: First Nations Forum
by: A. Huang
10-March-2015

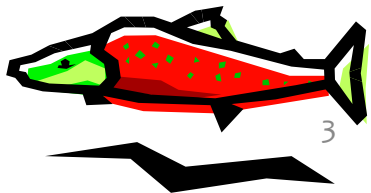


outline

- how to read FR SK escapement options tables
- 2015 escapement tables
  - FR SK escapement options & “expected” aggregate outcomes
    - option 1
    - option 2
  - FR PK escapement plan
- 2015 “expected” outcomes by stock



HOW TO READ FR SK TABLES



2015 Fraser sockeye escapement options evaluations
using adjusted 2011 TAMs

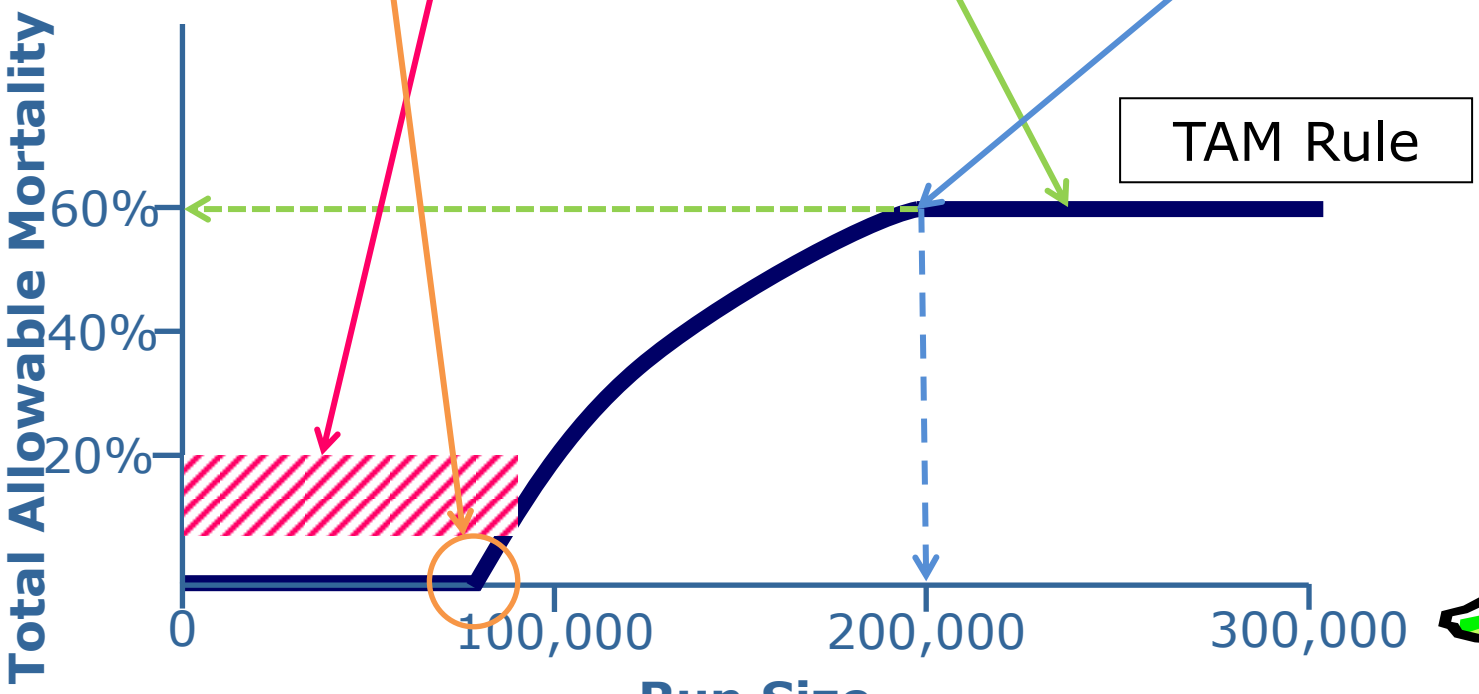
Raft North Thompson & Harrison in Summer Run. Variable Late Run LAER.

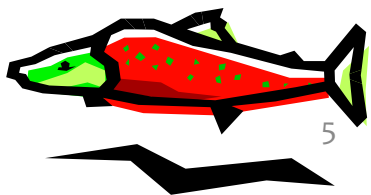
	Harvest Rule Parameters				
Management Unit	**Low Abundance ER (LAER)**	**TAM Cap**	**Lower Fishery Reference Point**	**Upper Fishery Reference Point**	**Pre-season pMA**
Early Stuart	10%	60%	108,000	270,000	0.68
Early Summer (w/o misc)	10%	60%	100,000	250,000	0.51
Summer (w/o misc)	10%	60%	1,000,000	2,500,000	0.18
Late (w/o misc)	20-30%	60%	300,000	750,000	1.14

Management Unit		**Pre-season Forecast Return**				
		p10	p25	**p50**	p75	p90
Early Stuart	forecast	8,000	16,000	**30,000**	58,000	108,000
	TAM Rule (%)	0%	0%	**0%**	0%	0%
	Escapement Target	8,000	16,000	**30,000**	58,000	108,000
	MA	5,400	10,900	**20,400**	39,400	73,400
	Esc. Target + MA	13,400	26,900	**50,400**	97,400	181,400
	LAER	10%	10%	**10%**	10%	10%
	ER at Return	0%	0%	**0%**	0%	0%
	Allowable ER	10%	10%	**10%**	10%	10%
	available harvest	800	1,600	**3,000**	5,800	10,800
	2014 Performance					
	Projected S (after MA)	4,000	9,000	**16,000**	31,000	58,000
	BY Spawners	1,000	1,000	**1,000**	1,000	1,000
	Proj. S as % BY S	400%	900%	**1600%**	3100%	5800%
	cycle avg S	51,000	51,000	**51,000**	51,000	51,000
	Proj. S as % cycle S	8%	18%	**31%**	61%	114%

Harvest Rule Parameters

Management Unit	Low Abundance ER (LAER)	TAM Cap	Lower Fishery Reference Point	Upper Fishery Reference Point	Pre-season pMA
Early Stuart	10%	60%	108,000	270,000	0.68
Early Summer (w/o misc)	10%	60%	100,000	250,000	0.51
Summer (w/o misc)	10%	60%	1,000,000	2,500,000	0.18
Late (w/o misc)	20-30%	60%	300,000	750,000	1.14





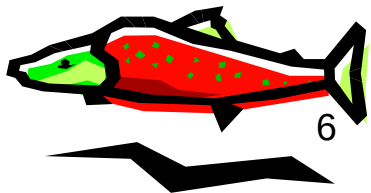
Run Size = 100K

Esc. Goal = 1-TAM = 40K fish

pMA = 30% = esc.goal*30% = 12K fish

TAM = 60% = 60K fish

ER = run size – (esc. goal + MA) = 48K fish = 48%



2015 Fraser sockeye escapement options evaluations
using adjusted 2011 TAMs

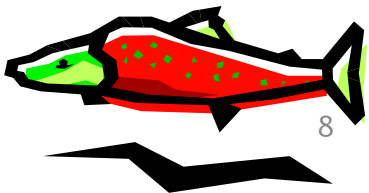
Raft North Thompson & Harrison in Summer Run. Variable Late Run LAER.

	Harvest Rule Parameters				
Management Unit	**Low Abundance ER (LAER)**	**TAM Cap**	**Lower Fishery Reference Point**	**Upper Fishery Reference Point**	**Pre-season pMA**
Early Stuart	10%	60%	108,000	270,000	0.68
Early Summer (w/o misc)	10%	60%	100,000	250,000	0.51
Summer (w/o misc)	10%	60%	1,000,000	2,500,000	0.18
Late (w/o misc)	20-30%	60%	300,000	750,000	1.14

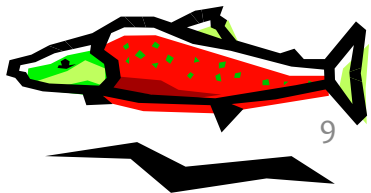
Management Unit		**Pre-season Forecast Return**				
		p10	p25	**p50**	p75	p90
Early Stuart	forecast	8,000	16,000	**30,000**	58,000	108,000
	TAM Rule (%)	0%	0%	**0%**	0%	0%
	Escapement Target	8,000	16,000	**30,000**	58,000	108,000
	MA	5,400	10,900	**20,400**	39,400	73,400
	Esc. Target + MA	13,400	26,900	**50,400**	97,400	181,400
	LAER	10%	10%	**10%**	10%	10%
	ER at Return	0%	0%	**0%**	0%	0%
	Allowable ER	10%	10%	**10%**	10%	10%
	available harvest	800	1,600	**3,000**	5,800	10,800
	2014 Performance					
	Projected S (after MA)	4,000	9,000	**16,000**	31,000	58,000
	BY Spawners	1,000	1,000	**1,000**	1,000	1,000
	Proj. S as % BY S	400%	900%	**1600%**	3100%	5800%
	cycle avg S	51,000	51,000	**51,000**	51,000	51,000
	Proj. S as % cycle S	8%	18%	**31%**	61%	114%

forecast	p10 8,000
TAM Rule (%)	0%
Escapement Target	8,000
MA	5,400
Esc. Target + MA	13,400
LAER	10%
ER at Return	0%
Allowable ER	10%
available harvest	800

2015 Performance	
Projected S (after MA)	4,000
BY Spawners	1,000
Proj. S as % BY S	400%
cycle avg S	51,000
Proj. S as % cycle S	8%

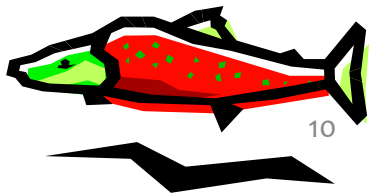


2015 ESCAPEMENT TABLES



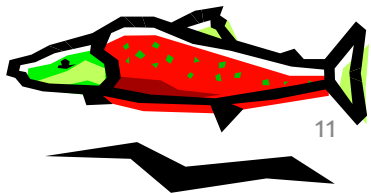
FR SK: Option 1

	Harvest Rule Parameters				
Management Unit	Low Abundance ER (LAER)	TAM Cap	Lower Fishery Reference Point	Upper Fishery Reference Point	Pre-season pMA
Early Stuart	10%	60%	108,000	270,000	0.68
Early Summer (w/o misc)	10%	60%	100,000	250,000	0.51
Summer (w/o misc)	10%	60%	1,000,000	2,500,000	0.18
Late (w/o misc)	20-30%	60%	300,000	750,000	1.14



FR SK: Option 2

	Harvest Rule Parameters				
Management Unit	Low Abundance ER (LAER)	TAM Cap	Lower Fishery Reference Point	Upper Fishery Reference Point	Pre-season pMA
Early Stuart	10%	60%	108,000	270,000	0.68
Early Summer (w/o misc)	10%	65%	100,000	286,000	0.51
Summer (w/o misc)	10%	65%	540,000	1,543,000	0.18
Late (w/o misc)	20-30%	65%	300,000	857,000	1.14



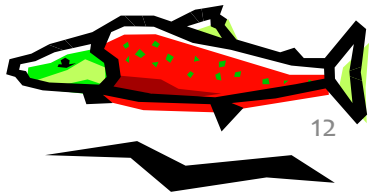
Early Stuart Options Comparison

Early Stuart	forecast	p10 8,000	p25 16,000	p50 30,000	p75 58,000	p90 108,000
Option 1	Allowable ER	10%	10%	10%	10%	10%
	Projected S (after MA)	4,000	9,000	16,000	31,000	58,000
	Proj. S as % BY S	400%	900%	1600%	3100%	5800%
	Proj. S as % cycle S	8%	18%	31%	61%	114%
Option 2	*same as option 1*					

forecast p-level is below lower fisheries reference point

forecast p-level is between lower & upper fisheries reference point

forecast p-level is above upper fisheries reference point



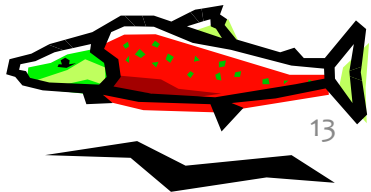
Early Summer Options Comparison

Early Summer	forecast (incl. misc)	p10 236,000	p25 424,000	p50 837,000	p75 1,603,000	p90 2,963,000
Option 1	Allowable ER	14%	**40%**	**40%**	**40%**	**40%**
	Projected S (after MA)	134,000	170,000	335,000	641,000	1,185,000
	Proj. S as % BY S	61%	78%	153%	293%	541%
	Proj. S as % cycle S	89%	113%	223%	427%	790%
Option 2	Allowable ER	14%	**47%**	**47%**	**47%**	**47%**
	Projected S (after MA)	134,000	148,000	293,000	561,000	1,037,000
	Proj. S as % BY S	61%	68%	134%	256%	474%
	Proj. S as % cycle S	89%	99%	195%	374%	691%

forecast p-level is below lower fisheries reference point

forecast p-level is between lower & upper fisheries reference point

forecast p-level is above upper fisheries reference point



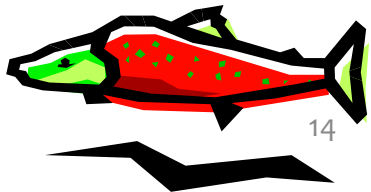
Summers Options Comparison

Summer	forecast (incl. misc)	p10 1,701,000	p25 2,681,000	p50 4,675,000	p75 8,764,000	p90 16,511,000
Option 1	Allowable ER	**10%**	**36%**	**53%**	**53%**	**53%**
	Projected S (after MA)	1,297,000	1,448,000	1,870,000	3,506,000	6,604,000
	Proj. S as % BY S	70%	78%	100%	188%	354%
	Proj. S as % cycle S	167%	186%	240%	451%	849%
Option 2	Allowable ER	**46%**	**59%**	**59%**	**59%**	**59%**
	Projected S (after MA)	782,000	938,000	1,636,000	3,067,000	5,779,000
	Proj. S as % BY S	42%	50%	88%	164%	310%
	Proj. S as % cycle S	101%	121%	210%	394%	743%

forecast p-level is below lower fisheries reference point

forecast p-level is between lower & upper fisheries reference point

forecast p-level is above upper fisheries reference point



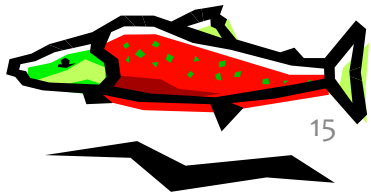
Lates Options Comparison

Lates	forecast (incl. misc)	p10 419,000	p25 703,000	p50 1,236,000	p75 2,210,000	p90 3,998,000
Option 1	Allowable ER	20%	20%	**20%**	30%	30%
	Projected S (after MA)	157,000	263,000	462,000	723,000	1,308,000
	Proj. S as % BY S	32%	53%	94%	146%	265%
	Proj. S as % cycle S	30%	51%	89%	139%	252%
Option 2	Allowable ER	20%	20%	**25%**	30%	30%
	Projected S (after MA)	157,000	263,000	433,000	723,000	1,308,000
	Proj. S as % BY S	32%	53%	88%	146%	265%
	Proj. S as % cycle S	30%	51%	83%	139%	252%

forecast p-level is below lower fisheries reference point

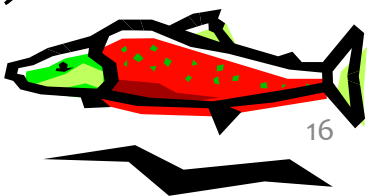
forecast p-level is between lower & upper fisheries reference point

forecast p-level is above upper fisheries reference point



Notes

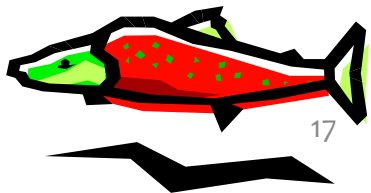
- at p50 forecast
  - under both options, all mgmt groups except EStu, are at TAM caps
- at p25 forecast
  - option 1: only ESum is at TAM cap
  - option 2: ESum & Sum at TAM cap
- Late Run ER
  - option 1: at LAER at all run sizes (@ pMA), with some identified ER below LAER amount
  - option 2: above LAER at p50 (but not p75)



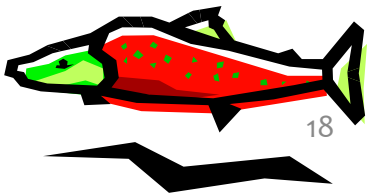
Fraser Pinks

lower FRP	7,059,000
upper FRP	20,000,000
cap	70%

	Pre-season Forecast Return				
	p10	p25	**p50**	p75	p90
forecast	7,661,000	10,385,000	14,455,000	20,450,000	27,776,000
escapement target	6,000,000	6,000,000	6,000,000	6,135,000	8,333,000
allowable ER	22%	42%	58%	70%	70%

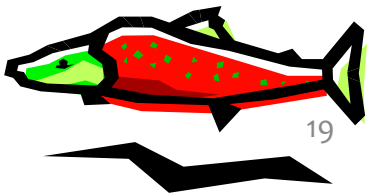


FR SK “EXPECTED” OUTCOMES



assumptions

- These are the "expected" spawners to the grounds assuming:
  - perfect implementation of the "allowable ER" in the options tables
  - all stocks within a management group:
    - return at the same p-level (or nearly)
    - are subject to the same ER
  - the pMA is as shown in options 1 & 2
- Note that pre-spawn mortality is *not* included



FR SK: option 1

Run timing group	Total Escapement		Projected esc. across range of run size forecasts at specified					comparisons @p50	
Stocks	cycle yr	brood yr	10%	25%	50%	75%	90%	to cycle	to BY
Early Stuart	**52,800**	**800**	**4,000**	**9,000**	**16,000**	**31,000**	**58,000**	30%	2000%
Early Summer			134,000	170,000	335,000	641,000	1,185,000		
(total excluding misc.)	**133,500**	**185,900**	**109,000**	**130,300**	**249,700**	**502,200**	**936,600**		
Bowron	17,600	4,100	3,400	4,400	8,400	16,000	28,800	48%	205%
Fennell (cycle avg since 1974)	10,900	9,900	5,700	6,400	10,800	18,800	31,200	99%	109%
Gates	7,800	55,900	26,100	31,700	56,400	112,000	200,800	723%	101%
Nadina	19,000	10,100		6,000	12,400	26,000	50,400	65%	123%
Pitt	28,000	56,000	18,700	20,400	31,600	48,000	76,000	113%	56%
Scotch (cycle avg since 1983)	9,800	33,800	27,300	34,100	74,000	171,900	337,900	755%	219%
Seymour	40,400	16,100	23,300	27,300	56,000	109,600	211,600	139%	348%
Misc (EShu & Taseko)									
Misc (Chilliwack)									
Misc (Nahatlatch)									
Summer			1,297,000	1,448,000	1,870,000	3,506,000	6,604,000		
(tl excl. NThmisc, incl. Har)	**778,300**	**1,866,100**	**1,290,900**	**1,439,900**	**1,859,200**	**3,484,400**	**6,562,000**		
Chilko g	502,500	916,600	851,700	857,100	954,800	1,525,400	2,388,700	190%	104%
Late Stuart	19,900	3,800	9,100	13,500	21,600	47,200	98,000	109%	568%
Quesnel	58,400	45,500	82,300	106,400	146,800	273,600	568,400	251%	323%
Stellako	117,500	85,400	141,800	141,000	156,000	220,800	329,200	133%	183%
Raft h	5,100	9,200	11,400	12,400	14,400	22,400	34,800	282%	157%
Harrison	74,900	805,600	194,400	309,500	565,600	1,395,000	3,143,000	755%	70%
Misc (N. Thomp. Tribs)									
Misc (N. Thomp River)									
Late			157,000	263,000	462,000	723,000	1,308,000		
(total excluding misc.)	**518,000**	**474,000**	**149,900**	**251,000**	**439,600**	**688,000**	**1,246,200**		
Cultus (high hatchery contrib.)	18,300	6,900	400	1,100	2,200	3,900	7,200	12%	32%
Late Shuswap	361,600	165,700	63,000	109,600	193,300	302,300	575,200	53%	117%
Portage	4,100	1,100	400	1,100	3,000	6,200	18,000	73%	273%
Weaver	34,100	72,600	41,200	70,700	129,300	207,700	358,300	379%	178%
Birkenhead	99,900	227,700	45,000	68,500	111,800	167,800	287,600	112%	49%

FR SK: option 2

Run timing group	Total Escapement		Projected esc. across range of run size forecasts at specified					comparisons @p50	
Stocks	cycle yr	brood yr	10%	25%	50%	75%	90%	to cycle	to BY
Early Stuart	**52,800**	**800**	**4,000**	**9,000**	**16,000**	**31,000**	**58,000**	30%	2000%
Early Summer			134,000	148,000	293,000	561,000	1,037,000		
(total excluding misc.)	**133,500**	**185,900**	**109,000**	**113,400**	**218,400**	**439,600**	**819,700**		
Bowron	17,600	4,100	3,400	3,800	7,400	14,000	25,200	42%	180%
Fennell (cycle avg since 1974)	10,900	9,900	5,700	5,600	9,500	16,500	27,300	87%	96%
Gates	7,800	55,900	26,100	27,600	49,400	98,000	175,700	633%	88%
Nadina	19,000	10,100		5,200	10,900	22,800	44,100	57%	108%
Pitt	28,000	56,000	18,700	17,800	27,700	42,000	66,500	99%	49%
Scotch (cycle avg since 1983)	9,800	33,800	27,300	29,700	64,800	150,500	295,800	661%	192%
Seymour	40,400	16,100	23,300	23,700	49,000	95,900	185,200	121%	304%
Misc (EShu & Taseko)									
Misc (Chilliwack)									
Misc (Nahatlatch)									
Summer			782,000	938,000	1,636,000	3,067,000	5,779,000		
(tl excl. NThmisc, incl. Har)	**778,300**	**1,866,100**	**778,300**	**932,800**	**1,626,600**	**3,048,100**	**5,742,200**		
Chilko g	502,500	916,600	513,500	555,300	835,300	1,334,400	2,090,200	166%	91%
Late Stuart	19,900	3,800	5,500	8,700	18,900	41,300	85,800	95%	497%
Quesnel	58,400	45,500	49,600	68,900	128,400	239,400	497,400	220%	282%
Stellako	117,500	85,400	85,500	91,300	136,500	193,200	288,100	116%	160%
Raft h	5,100	9,200	6,900	8,000	12,600	19,600	30,500	247%	137%
Harrison	74,900	805,600	117,200	200,500	494,800	1,220,300	2,750,300	661%	61%
Misc (N. Thomp. Tribs)									
Misc (N. Thomp River)									
Late			157,000	263,000	433,000	723,000	1,308,000		
(total excluding misc.)	**518,000**	**474,000**	**149,900**	**251,000**	**412,000**	**688,000**	**1,246,200**		
Cultus (high hatchery contrib.)	18,300	6,900	400	1,100	2,100	3,900	7,200	11%	30%
Late Shuswap	361,600	165,700	63,000	109,600	181,100	302,300	575,200	50%	109%
Portage	4,100	1,100	400	1,100	2,800	6,200	18,000	68%	255%
Weaver	34,100	72,600	41,200	70,700	121,200	207,700	358,300	355%	167%
Birkenhead	99,900	227,700	45,000	68,500	104,800	167,800	287,600	105%	46%