2018 Fraser Sockeye
Draft Escapement Options

presented to: First Nations JTWG & Forum
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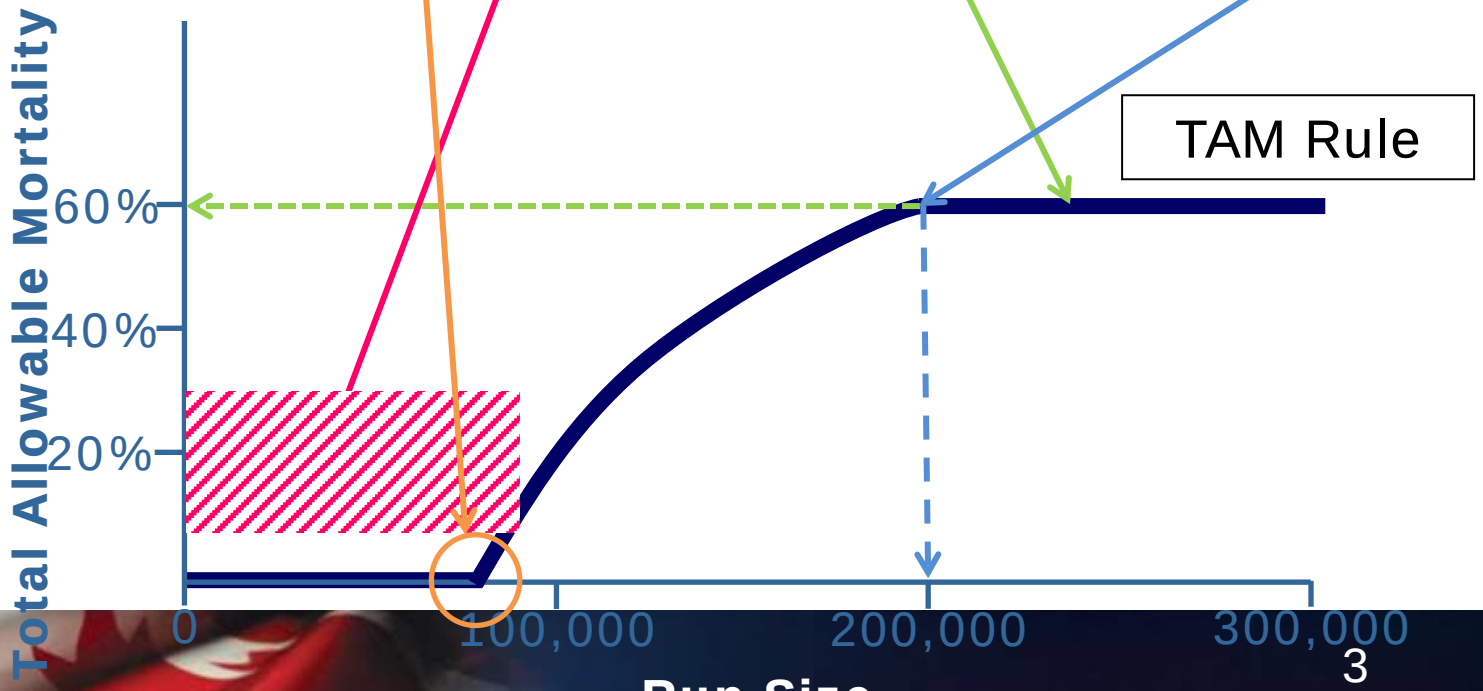
Presentation Outline

- Total Allowable Mortality Rule Explained
- 2018 draft escapement table options
  - FR SK escapement options tables (Option 1 and 2)
  - Comparison of options by run timing group
  - Expected spawning escapement outcomes
  - Escapement Options Summary and Key Questions

Total Allowable Mortality Rule Explained

Management Unit	Harvest Rule Parameters Low Abundance ER (LAER)	TAM Cap	Lower Fishery Reference Point	Upper Fishery Reference Point
Early Stuart	10%	60%	108,000	270,000
Early Summer (w/o misc)	10%	60%	100,000	250,000
Summer (w/o misc)	10%	60%	1,250,000	3,125,000
Late (w/o misc)	20%-30%	60%	300,000	750,000



2018 Escapement Tables

Option 1- Adjusted Brood Year (2014) Escapement Plan (increase LAERs)

	Harvest Rule Parameters			
Management Unit	Low Abundance ER (LAER)	TAM Cap	Lower Fishery Reference Point	Upper Fishery Reference Point
Early Stuart	10%	60%	108,000	270,000
Early Summer (w/o misc)	20%	65%	180,000	514,000
Summer (w/o misc)	20%	65%	1,020,000	2,914,000
Late (w/o misc)	20%-30%	65%	1,100,000	3,143,000

Option 2- Adjusted 2010 Escapement Plan (decrease Late LAER)

	Harvest Rule Parameters			
Management Unit	Low Abundance ER (LAER)	TAM Cap	Lower Fishery Reference Point	Upper Fishery Reference Point
Early Stuart	10%	60%	108,000	270,000
Early Summer (w/o misc)	10%	60%	180,000	450,000
Summer (w/o misc)	10%	60%	1,020,000	2,550,000
Late (w/o misc)	20%	60%	1,100,000	2,750,000

Early Stuart Options Comparison

Early Stuart	forecast	p10 37,000	p25 54,000	p50 84,000	p75 133,000	p90 199,000
Option 1	Allowable ER	10%	10%	10%	10%	10%
	Projected S (after MA)	19,600	28,700	44,600	70,600	105,700
	Proj. S as % BY S	29%	42%	65%	103%	154%
	Proj. S as % cycle S	59%	86%	134%	212%	318%
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 584,000	p25 1,102,000	p50 2,155,000	p75 3,765,000	p90 6,587,000
Option 1	Allowable ER	29%	45%	45%	45%	45%
	Projected S (after MA)	266,600	388,000	757,500	1,321,700	2,309,100
	Proj. S as % BY S	41%	60%	117%	204%	356%
	Proj. S as % cycle S	81%	117%	229%	400%	699%
Option 2	*Allowable ER*	29%	38%	38%	38%	38%
	Projected S (after MA)	266,600	443,400	865,800	1,510,600	2,639,000
	Proj. S as % BY S	41%	68%	134%	233%	407%
	Proj. S as % cycle S	81%	134%	262%	457%	799%

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 1,470,000	p25 2,473,000	p50 4,344,000	p75 7,669,000	p90 13,173,000
Option 1	Allowable ER	20%	53%	62%	61%	61%
	Projected S (after MA)	1,063,200	1,062,200	1,515,300	2,694,200	4,616,000
	Proj. S as % BY S	37%	37%	53%	95%	163%
	Proj. S as % cycle S	130%	130%	186%	330%	566%
Option 2	Allowable ER	20%	53%	56%	56%	56%
	Projected S (after MA)	1,063,200	1,062,200	1,731,800	3,079,100	5,275,300
	Proj. S as % BY S	37%	37%	61%	109%	186%
	Proj. S as % cycle S	130%	130%	212%	378%	647%

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 3,174,000	p25 4,794,000	p50 7,398,000	p75 11,370,000	p90 16,934,000
Option 1	Allowable ER	50%	50%	50%	50%	50%
	Projected S (after MA)	1,113,100	1,681,400	2,595,200	3,989,500	5,943,400
	Proj. S as % BY S	48%	73%	113%	173%	258%
	Proj. S as % cycle S	42%	63%	98%	150%	224%
Option 2	Allowable ER	43%	43%	43%	43%	43%
	Projected S (after MA)	1,272,000	1,921,700	2,966,000	4,559,400	6,792,400
	Proj. S as % BY S	55%	83%	129%	198%	295%
	Proj. S as % cycle S	48%	72%	112%	172%	256%

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

Option 1- Projected Escapements Relative to Cycle Average and Brood Year

Run timing group / Stocks	Total Escapement Cycle Ave	Total Escapement Brood Year	Comparisons @p10 Cycle Ave	Comparisons @p10 Brood Year	Comparisons @p25 Cycle Ave	Comparisons @p25 Brood Year	Comparisons @p50 Cycle Ave	Comparisons @p50 Brood Year	Comparisons @p75 Cycle Ave	Comparisons @p75 Brood Year
Early Stuart	**33,275**	**68,613**	**59%**	**29%**	**86%**	**42%**	**134%**	**65%**	**212%**	**103%**
Early Summer	**330,355**	**647,784**	**81%**	**41%**	**117%**	**60%**	**229%**	**117%**	**400%**	**204%**
Bowron	5,767	12,210	55%	26%	73%	34%	121%	57%	212%	100%
Upper Barriere	5,365	11,467	76%	36%	91%	43%	162%	76%	300%	140%
Gates	4,274	16,928	117%	30%	164%	41%	311%	79%	622%	157%
Nadina	4,127	61,389	492%	33%	686%	46%	1296%	87%	2464%	166%
Pitt	25,593	36,507	52%	36%	58%	41%	96%	67%	152%	107%
Scotch	141,006	135,134	29%	30%	41%	43%	82%	85%	186%	194%
Seymour	92,481	114,013	103%	83%	132%	107%	210%	170%	335%	272%
Misc (EShu)	43,798	252,793	192%	33%	332%	58%	763%	132%	1233%	214%
Misc (Taseko)	1,733	114	0%	0%	6%	88%	12%	175%	17%	263%
Misc (Chilliwack)	2,620	3,470	19%	14%	38%	29%	88%	66%	198%	150%
Misc (Nahatlatch)	5,324	3,873	26%	36%	45%	62%	85%	116%	163%	225%
Summer	**820,977**	**2,862,856**	**130%**	**37%**	**129%**	**37%**	**185%**	**53%**	**328%**	**94%**
Chilko	375,259	1,029,313	161%	59%	154%	56%	211%	77%	358%	131%
Late Stuart	36,661	50,691	109%	79%	117%	30%	191%	48%	372%	94%
Quesnel	211,016	832,835	100%	25%	103%	75%	142%	103%	242%	175%
Stellako	124,282	507,777	134%	33%	120%	29%	158%	39%	255%	62%
Harrison	63,070	399,557	12%	2%	18%	3%	38%	6%	100%	16%
Raft	5,197	17,102	279%	85%	258%	78%	323%	98%	531%	161%
Misc (N. Thomp. Tribs)	1,250	1,170	112%	120%	136%	145%	200%	214%	424%	453%
Misc (N. Thomp River)	3,121	21,602	580%	84%	689%	100%	942%	136%	1983%	287%
Misc (Widgeon)	1,121	2,809	54%	21%	62%	25%	71%	28%	152%	61%
Late	**2,647,383**	**2,297,272**	**42%**	**48%**	**64%**	**73%**	**98%**	**113%**	151%	174%
Cultus	14,602	4,411	1%	2%	1%	5%	3%	9%	6%	20%
Late Shuswap	2,438,497	2,208,177	44%	48%	65%	72%	99%	110%	150%	165%
Portage	13,650	24,275	56%	32%	113%	63%	262%	147%	601%	338%
Weaver	58,362	24,646	23%	54%	47%	111%	90%	213%	191%	452%
Birkenhead	122,272	35,763	18%	60%	31%	107%	56%	191%	100%	340%
Misc. non-Shuswap	4,803	6,112	77%	61%	137%	108%	267%	209%	510%	401%

= or > 125%
< 125%
< 75%
< 25%

Option 2- Projected Escapements Relative to Cycle Average and Brood Year

Run timing group / Stocks	Total Escapement Cycle Ave	Total Escapement Brood Year	Comparisons @p10 Cycle Ave	Comparisons @p10 Brood Year	Comparisons @p25 Cycle Ave	Comparisons @p25 Brood Year	Comparisons @p50 Cycle Ave	Comparisons @p50 Brood Year	Comparisons @p75 Cycle Ave	Comparisons @p75 Brood Year
Early Stuart	**33,275**	**68,613**	**59%**	**29%**	**86%**	**42%**	**134%**	**65%**	**212%**	**103%**
Early Summer	**330,355**	**647,784**	**81%**	**41%**	**134%**	**68%**	**262%**	**134%**	**457%**	**233%**
Bowron	5,767	12,210	55%	26%	83%	39%	139%	66%	243%	115%
Upper Barriere	5,365	11,467	76%	36%	104%	49%	186%	87%	343%	160%
Gates	4,274	16,928	117%	30%	187%	47%	356%	90%	711%	180%
Nadina	4,127	61,389	492%	33%	783%	53%	1480%	100%	2816%	189%
Pitt	25,593	36,507	52%	36%	66%	47%	110%	77%	174%	122%
Scotch	141,006	135,134	29%	30%	47%	49%	93%	98%	212%	222%
Seymour	92,481	114,013	103%	83%	151%	122%	240%	195%	383%	310%
Misc (EShu)	43,798	252,793	192%	33%	379%	66%	872%	151%	1410%	244%
Misc (Taseko)	1,733	114	0%	0%	6%	88%	12%	175%	17%	263%
Misc (Chilliwack)	2,620	3,470	19%	14%	46%	35%	99%	75%	225%	170%
Misc (Nahatlatch)	5,324	3,873	26%	36%	53%	72%	98%	134%	188%	258%
Summer	**820,977**	**2,862,856**	**130%**	**37%**	**129%**	**37%**	**211%**	**60%**	**375%**	**108%**
Chilko	375,259	1,029,313	161%	59%	154%	56%	241%	88%	409%	149%
Late Stuart	36,661	50,691	109%	79%	117%	30%	218%	55%	426%	108%
Quesnel	211,016	832,835	100%	25%	103%	75%	163%	118%	277%	200%
Stellako	124,282	507,777	134%	33%	120%	29%	180%	44%	291%	71%
Harrison	63,070	399,557	12%	2%	18%	3%	44%	7%	114%	18%
Raft	5,197	17,102	279%	85%	258%	78%	369%	112%	606%	184%
Misc (N. Thomp. Tribs)	1,250	1,170	112%	120%	136%	145%	224%	239%	488%	521%
Misc (N. Thomp River)	3,121	21,602	580%	84%	689%	100%	1077%	156%	2265%	327%
Misc (Widgeon)	1,121	2,809	54%	21%	62%	25%	89%	36%	169%	68%
Late	**2,647,383**	**2,297,272**	**48%**	**55%**	**73%**	**84%**	**112%**	**129%**	172%	198%
Cultus	14,602	4,411	1%	2%	1%	5%	3%	9%	8%	25%
Late Shuswap	2,438,497	2,208,177	50%	55%	75%	82%	114%	126%	171%	189%
Portage	13,650	24,275	64%	36%	129%	73%	299%	168%	686%	386%
Weaver	58,362	24,646	26%	62%	53%	127%	103%	244%	218%	517%
Birkenhead	122,272	35,763	20%	69%	36%	122%	64%	218%	114%	389%
Misc. non-Shuswap	4,803	6,112	87%	69%	156%	123%	304%	239%	583%	458%

= or > 125%
< 125%
< 75%
< 25%

Escapement Options- Summary

- It is expected that there will be significant harvestable surplus at the full forecast range (p10-p90)

	p10	p25	p50	p75	p90
Option 1					
Allowable Harvest (TF, US, CDN)	2,060,400	4,202,600	7,353,700	12,091,550	19,524,150
Total projected spawners	2,462,500	3,160,300	4,912,600	8,076,000	12,974,200
Option 2					
Allowable Harvest (TF, US, CDN)	1,833,500	3,773,900	6,417,600	10,559,300	17,068,600
Total projected spawners	2,621,400	3,456,000	5,608,200	9,219,700	14,812,400
Difference (Option 2 - Option 1)					
Allowable Harvest (TF, US, CDN)	(226,900)	(428,700)	(936,100)	(1,532,250)	(2,455,550)
Total projected spawners	158,900	295,700	695,600	1,143,700	1,838,200

- Under current assumptions projected spawners for Early Stuart, Early Summer and Summer will be well above the cycle average and near average for the Late Run for both escapement options at the p50
- If the run is lower relative to forecast (similar to previous 3 years) the returns relative to cycle average are near or lower than cycle average except for Summer Run

Escapement Options-Summary

- **Reference Points-** Draft options consider historical reference points on this cycle line. These reference points are at the higher end and were initially selected to increase escapement if the in-season returns were less than expected (2010 after the return in 2009).

- **LAER-** Draft options consider LAERs consistent with prior years escapement plans with adjustments to the Late Run LAER (20-30%→ 20%) and the Early Summer and Summer LAERs (10%→20%). Given this is a dominant cycle year the LAERs generally have little impact on the escapement plan with two exceptions:
  - If the runs sizes are very low (p10) and the MAs are higher than expected there will be some influence on harvest and escapement.
  - It is likely that Cultus sockeye will constrain Late run harvest. Currently it is expected that the Cultus exploitation will equal the Late run LAER.

- **TAM Caps-** Draft options consider historical TAMs on this cycle; 60% (2010) and 65% (2014). The TAM of one group may impact the harvest of another group.

Escapement Options- Key Questions

- Given recent returns and uncertainty in the forecast are there additional actions that should be considered to address returns at the lower end of the forecast?
- Do you support an increase in LAERs for Early Summer and Summer run sockeye?
- Are there additional measures that should be considered for specific stocks within the aggregates that are a concern as far as expected escapements, large or weak?
- Given this is a dominant cycle outcomes from the plan may result in escapement levels above cycle average escapements for the aggregate and some individual stocks within. Should additional harvest in those terminal areas where surpluses are expected to occur be considered?