2019 Draft Escapement Plan

For the 2019 escapement plan, the Department is seeking input on two escapement options and their components. Consistent with other years, the Department will consider all input provided during final escapement plan development. The final escapement plan that will be included in the final IFMP may be different from the two options described here.

Draft Escapement Plan Options

Option 1- Brood Year (2015) Escapement Plan with Lower Summer TAM and LAER Adjustments

	Harvest Rule Parameters				
Management Unit	Low Abundance ER (LAER)	TAM Cap	Lower Fishery Reference Point	Upper Fishery Reference Point	Pre-season pMA @p50
Early Stuart	10%	60%	108,000	270,000	0.69
Early Summer (w/o misc)	20%	60%	100,000	250,000	0.43
Summer (w/o misc)	20%	60%	1,000,000	2,500,000	0.10
Late (w/o misc)	20%	60%	300,000	750,000	0.54

Option 2- Brood Year (2015) Escapement Plan with Lower TAM and a Lower 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 @p50
Early Stuart	10%	50%	108,000	216,000	0.69
Early Summer (w/o misc)	10%	50%	100,000	200,000	0.43
Summer (w/o misc)	10%	50%	1,000,000	2,000,000	0.10
Late (w/o misc)	20%	50%	300,000	600,000	0.54

Note: Grey cells emphasize changes from the 2015 Brood Year Escapement Plan.

The LAER is not a target as the objective is to allow as many fish to pass to the spawning grounds as possible while allowing some incidental harvest, and in some cases some directed harvest when there is little opportunity for harvest directed on other Fraser sockeye stock groups or species.

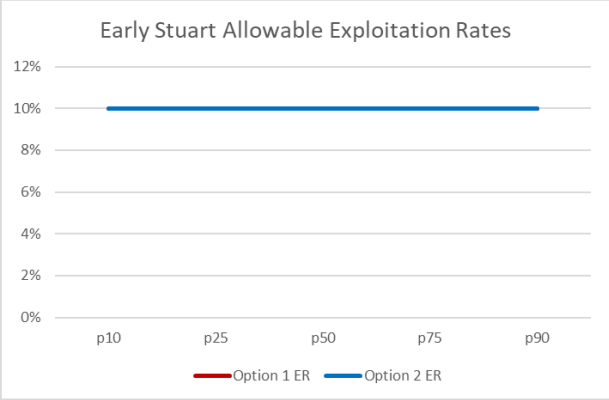
All fishery impacts including test fisheries and fishery induced mortalities (FIM's) are to be accounted for under the LAER. Fisheries are only considered if they provide scientific information necessary for conservation (test fisheries) or have reasonably low catch impacts on Fraser sockeye. Additional considerations under LAER management necessary for fishery planning include: current and projected catch accounting for all United States and Canadian fisheries, the distribution of impacts between gear groups, gear selectivity, release mortality rates, sockeye mortality relative to target species, compliance with licence regulations and environmental conditions.

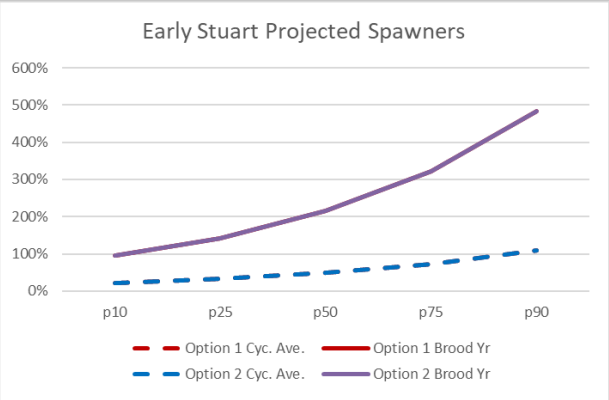
For First Nation FSC fisheries the above considerations apply and a sharing plan may be required to enable a fair distribution of impacts between marine and Fraser River First Nations. When FSC fisheries are prosecuted using the LAER the licence amounts by area (South Coast, Lower Fraser, Middle/Upper Fraser) are generally used to guide low impact fisheries for other species or stocks.

Escapement Plan Summary

- **Early Stuarts**

Although two Options are proposed the lower TAM cap in Option 2 has no bearing on the outcomes as the Early Stuart Sockeye remain in an LAER situation throughout the predicted range of the forecast returns. The projected escapement from this Option is rebuilding at returns exceeding the p10 forecast level, but the escapement remains well below the cycle average until the p90 forecast return is reached.



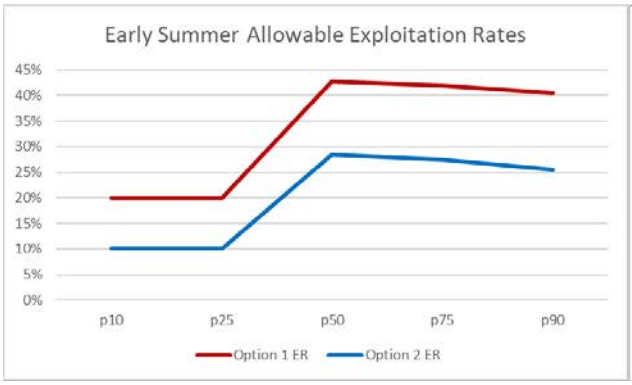


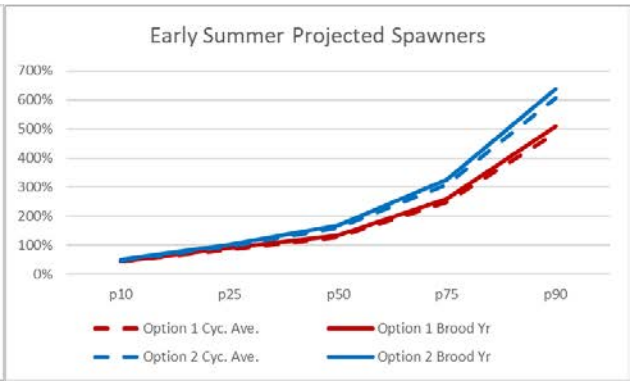
- **Early Summers**

There are two Options proposed for Early Summers (Option 1- 20% LAER and 60% TAM cap; Option 2- 10% LAER and 50% TAM cap). For both Options, the LAER is only in affect at the p10 and p25 forecast level, with allowable ERs exceeding the LAER with returns greater than the p25 forecast. In terms of projected spawners, at the lower end of the forecast (p10 and p25) both Options produce similar escapements (red and blue lines overlap in the projected spawners graph) and are below the cycle and brood year averages. For returns greater than the p25 forecast level, both Options are above cycle line and brood year escapements and projected to rebuild.

Considerations:

- There are some COSEWIC endangered listed stocks in this aggregate
- The reduction in the TAM cap to 50% (Option 2) provides more protection for smaller stocks within the aggregate if returns come in above the p25.
- Increasing the LAER from 10% to 20% provides more harvest flexibility for Summer Run Sockeye if the Early Summer return is at or below the p25 forecast level.



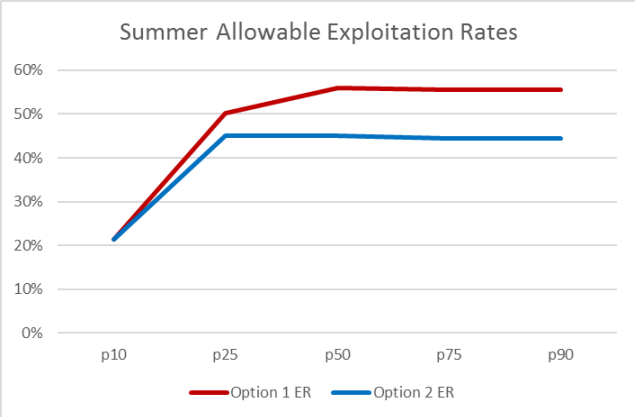


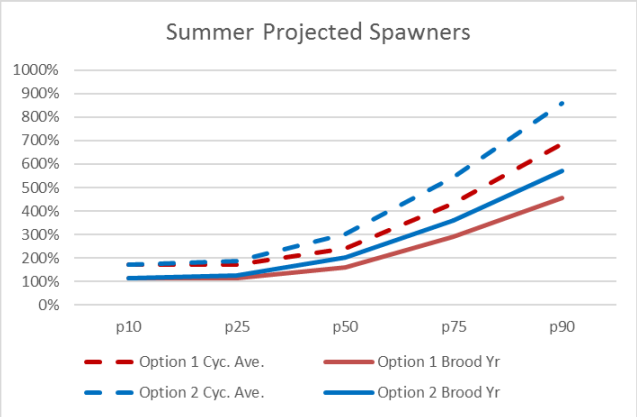
- **Summers**

There are two Options proposed for Summers (Option 1- 20% LAER and 60% TAM cap; Option 2- 10% LAER and 50% TAM cap). Given pre-season assumptions presented in the escapement plans, International TAC is likely for Options 1 and 2 for the entire forecast range. Above the p10 forecast level the ER is lower using the Option with the 50% TAM cap. At returns greater than the p10 forecast, both Options 1 and 2 have projected spawners that exceed the brood year and cycle line average escapements and continued rebuilding is expected over the forecast range.

Considerations:

- For returns at the lower end of the forecast (p10 and p25), the harvest of Summer Run Sockeye will likely be constrained by the escapement plan options for Early Summer and Late Run Sockeye.
- Given that escapements are rebuilding and above brood year and cycle averages throughout the predicted range of the forecast returns, should a lower TAM cap be considered for Summers?





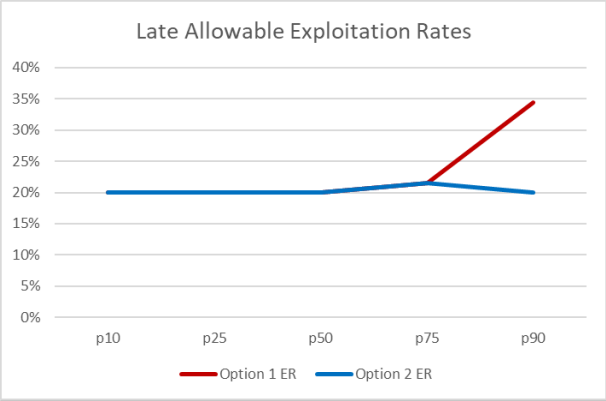
- Late Runs

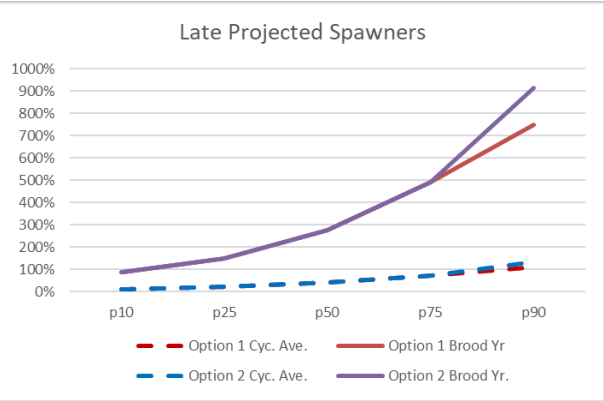
There are two Options proposed for Lates (Option 1- 20% LAER and 60% TAM cap; Option 2- 20% LAER and 50% TAM cap). Given the forecast and expected return timing of the Late Run there is a high probability of managing to a LAER at returns as high as the p75 forecast level, however the Exploitation Rate graph below shows the ER slightly exceeding 20% at the p75 forecast level. This slight change in exploitation rate is related to the MA calculations and the difference in stock proportions at the different plevels. Also given Cultus is not expected to reach rebuilding objectives it is possible that the Cultus will be managed to the Late Run LAER.

Returns at the p75 result in projected spawners approaching the cycle average escapement for this group, but projected spawners exceed the brood year average escapements for returns greater than the p10 forecast level however many COSEWIC endangered stocks are low.

Considerations:

- The decreased TAM cap in Option 2 does allow for some additional spawners to reach the spawning grounds for returns at the upper end of the forecast range (>p75).
- Given how low the escapement is relative to the cycle average would a lower LAER be appropriate? A lower LAER would likely constrain FSC harvest of Summer Run Sockeye.





The Table below describes the difference between harvest and projected escapement between the two Options over the forecast range.

	p10	p25	p50	p75	p90
Option 1					
Allowable Harvest (TF, US, CDN)	378,900	1,318,200	2,475,700	4,445,900	7,372,600
Total projected spawners	1,246,000	1,349,500	1,961,200	3,548,700	5,728,500
Option 2					
Allowable Harvest (TF, US, CDN)	367,700	1,166,900	1,976,900	3,533,300	5,687,400
Total projected spawners	1,253,900	1,482,600	2,399,300	4,344,500	7,133,000
Difference (Option 2 - Option 1)					
Allowable Harvest (TF, US, CDN)	(11,200)	(151,300)	(498,800)	(912,600)	(1,685,200)
Total projected spawners	7,900	133,100	438,100	795,800	1,404,500

Historical Reference Points TAMS and LAERs

See below the historical selection of reference points including the Brood Year.

Management Unit Fishery Reference Points	**Early Stuart**		**Early Summer[a]**		**Summer[a]**		**Late[a b]**	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
2011	108,000	270,000	120,000	300,000	520,000	1,300,000	400,000	1,000,000
2012	52,000	130,000	100,000	250,000	640,000	1,600,000	300,000	750,000
2013	108,000	270,000	100,000	250,000	1,250,000	3,125,000	300,000	750,000
2014	108,000	270,000	180,000	450,000	1,020,000	2,550,000	1,100,000	2,750,000
2015	**108,000**	**270,000**	**100,000**	**250,000**	**1,000,000**	**2,500,000**	**300,000**	**750,000**
2016	108,000	270,000	100,000	250,000	640,000	1,600,000	300,000	750,000
2017	108,000	270,000	100,000	250,000	1,250,000	3,125,000	300,000	750,000
2018	108,000	270,000	100,000	250,000	1,250,000	3,125,000	300,000	750,000

Notes:
a) For Early Summers, Summers, and Lates, the fishery refernce points may be scaled up annually to account for the expected contribution of unforecasted miscellaneous stocks in the MU.
b) A separate management objective is identified for Cultus Lake sockeye in the salmon IFMP and includes an exploitation rate constraint that limits harvest of Late run sockeye.

See below the historical selection of reference points including the Brood Year.

	LAERs				TAMs			
MU/Year	**2015**	2016	2017	2018	**2015**	2016	2017	2018
E. Stuart	**10%**	10%	10%	10%	**60%**	60%	60%	60%
E. Summer	**10%**	10%	10%	20%	**60%**	60%	60%	60%
Summer	**10%**	10%	10%	20%	**65%**	60%	60%	60%
Lates	**20-30%**	20%	20-30%	20-30%	**60%**	60%	60%	60%

Key Escapement Plan Questions and Considerations

Although two proposed options are provided, the actual escapement plan in the final IFMP may look different than either option after feedback is received in consultations this spring. Some questions you may want to consider when providing feedback on the proposed options include:

- 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 and the alternative for Lates?
- 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 the return forecast distribution and potential constraints to access allowable harvest should additional harvest in terminal areas where surpluses are expected be considered?
- 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?

Option 1: Projected escapement relative to cycle average and brood year.

Note: Colours are a means of comparing to brood year and cycle line average and not related to WSP status.

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

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	**44,409**	**10,096**	**22%**	**95%**	**32%**	**142%**	**49%**	**216%**	**73%**	**321%**
Early Summer	**144,830**	**137,845**	**44%**	**46%**	**86%**	**91%**	**128%**	**135%**	**248%**	**260%**
Bowron	16,904	3,875	20%	88%	30%	129%	35%	155%	57%	250%
Upper Barriere	8,051	1,420	21%	120%	35%	197%	50%	282%	96%	542%
Gates	9,889	20,326	68%	33%	124%	61%	166%	81%	333%	162%
Nadina	16,814	34,434	96%	47%	196%	96%	307%	150%	683%	334%
Pitt	32,655	38,478	27%	23%	42%	35%	51%	43%	86%	73%
Scotch	9,791	6,614	22%	33%	51%	76%	78%	115%	157%	233%
Seymour	34,955	7,897	14%	63%	26%	114%	33%	147%	64%	282%
Misc (EShu)	3,705	12,697	453%	132%	1028%	300%	1687%	492%	2772%	809%
Misc (Taseko)	5,955	980	7%	41%	18%	112%	24%	143%	44%	265%
Misc (Chilliwack)	1,799	6,710	33%	9%	83%	22%	206%	55%	723%	194%
Misc (Nahatlatch)	4,312	4,414	39%	39%	79%	77%	111%	109%	216%	211%
Summer	**651,121**	**977,005**	**171%**	**114%**	**170%**	**114%**	**241%**	**160%**	**434%**	**289%**
Chilko	412,471	662,707	202%	126%	197%	122%	270%	168%	471%	293%
Late Stuart	18,039	11,124	24%	39%	35%	58%	88%	142%	238%	386%
Quesnel	46,078	45,678	157%	158%	176%	177%	293%	295%	609%	614%
Stellako	102,375	101,422	124%	125%	117%	118%	146%	147%	228%	230%
Harrison	60,926	115,715	67%	35%	83%	44%	154%	81%	344%	181%
Raft	5,457	16,054	304%	103%	277%	94%	385%	131%	607%	206%
Misc (N. Thomp. Tribs)	333	932	210%	75%	420%	150%	601%	215%	1231%	440%
Misc (N. Thomp River)	4,792	23,072	392%	81%	507%	105%	751%	156%	1578%	328%
Misc (Widgeon)	650	301	15%	33%	15%	33%	46%	100%	77%	166%
Late	**465,982**	**68,022**	**13%**	**89%**	**22%**	**148%**	**40%**	**275%**	**72%**	**490%**
Cultus	20,701	1,220	0%	8%	0%	8%	1%	16%	3%	49%
Late Shuswap	310,704	9,688	1%	38%	3%	90%	7%	212%	15%	477%
Portage	3,793	36	0%	0%	3%	278%	13%	1389%	66%	6944%
Weaver	29,300	3,032	8%	79%	15%	145%	31%	300%	62%	597%
Birkenhead	99,123	45,049	48%	106%	77%	168%	135%	297%	226%	497%
Misc. non-Shuswap	2,361	8,997	271%	71%	496%	130%	966%	253%	1770%	465%

Option 2: Projected escapement relative to cycle average and brood year

Note: Colours are a means of comparing to brood year and cycle line average and not related to WSP status.

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

Run timing group / Stocks	Total Escapement		Comparisons @p10		Comparisons @p25		Comparisons @p50		Comparisons @p75	
	Cycle Ave	Brood Year	Cycle Ave	Brood Year	Cycle Ave	Brood Year	Cycle Ave	Brood Year	Cycle Ave	Brood Year
Early Stuart	**44,409**	**10,096**	**22%**	95%	**32%**	**142%**	**49%**	**216%**	**73%**	**321%**
Early Summer	**144,830**	**137,845**	**50%**	**52%**	97%	102%	**161%**	**169%**	**310%**	**325%**
Bowron	16,904	3,875	22%	98%	34%	147%	44%	194%	72%	315%
Upper Barriere	8,051	1,420	24%	134%	40%	225%	62%	352%	119%	676%
Gates	9,889	20,326	77%	37%	141%	68%	207%	101%	416%	202%
Nadina	16,814	34,434	109%	53%	221%	108%	384%	188%	854%	417%
Pitt	32,655	38,478	30%	26%	47%	40%	63%	54%	107%	91%
Scotch	9,791	6,614	26%	38%	58%	86%	97%	144%	197%	292%
Seymour	34,955	7,897	16%	72%	29%	128%	41%	184%	80%	353%
Misc (EShu)	3,705	12,697	510%	149%	1155%	337%	2108%	615%	3466%	1011%
Misc (Taseko)	5,955	980	8%	51%	20%	122%	29%	173%	54%	327%
Misc (Chilliwack)	1,799	6,710	39%	10%	94%	25%	256%	69%	906%	243%
Misc (Nahatlatch)	4,312	4,414	44%	43%	88%	86%	139%	136%	271%	265%
Summer	**651,121**	**977,005**	**171%**	**114%**	**188%**	**126%**	**301%**	**200%**	**542%**	**361%**
Chilko	412,471	662,707	202%	126%	217%	135%	337%	210%	589%	367%
Late Stuart	18,039	11,124	24%	39%	39%	64%	109%	177%	297%	482%
Quesnel	46,078	45,678	157%	158%	194%	196%	366%	369%	761%	768%
Stellako	102,375	101,422	124%	125%	129%	130%	182%	184%	285%	288%
Harrison	60,926	115,715	67%	35%	92%	49%	193%	102%	430%	226%
Raft	5,457	16,054	304%	103%	306%	104%	482%	164%	759%	258%
Misc (N. Thomp. Tribs)	333	932	210%	75%	450%	161%	751%	268%	1532%	547%
Misc (N. Thomp River)	4,792	23,072	392%	81%	559%	116%	939%	195%	1972%	410%
Misc (Widgeon)	650	301	15%	33%	31%	66%	46%	100%	92%	199%
Late	**465,982**	**68,022**	**13%**	89%	**22%**	**148%**	**40%**	**275%**	72%	490%
Cultus	20,701	1,220	0%	8%	0%	8%	1%	16%	3%	49%
Late Shuswap	310,704	9,688	1%	38%	3%	90%	7%	212%	15%	477%
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Birkenhead	99,123	45,049	48%	106%	77%	168%	135%	297%	226%	497%
Misc. non-Shuswap	2,361	8,997	271%	71%	496%	130%	966%	253%	1770%	465%