



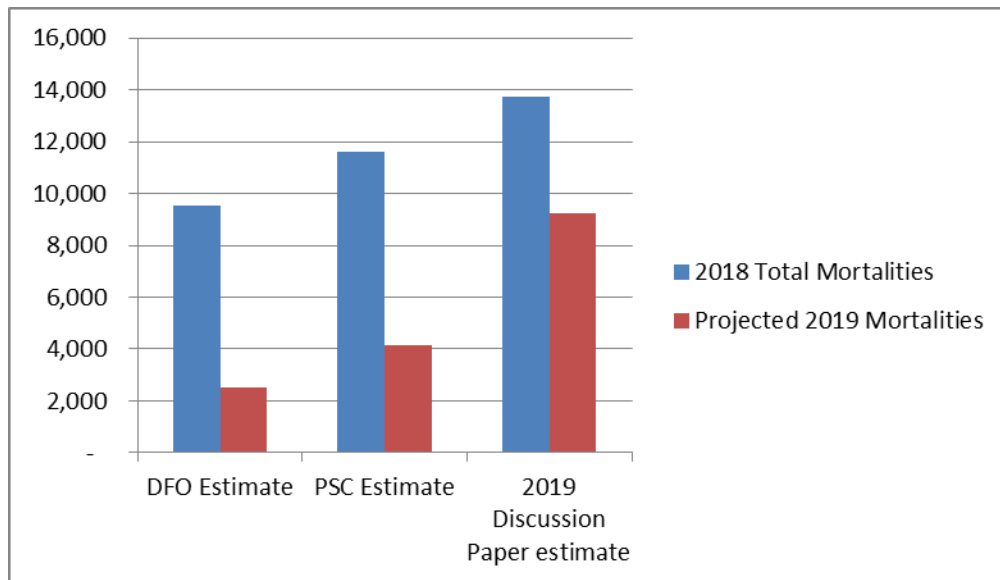
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From: Pacific Marine Conservation Caucus Salmon Sub-committee

Date: April 22, 2019

Subject: **MCC’s Recommendations for Monitoring 2019 South Coast Recreational Fisheries**

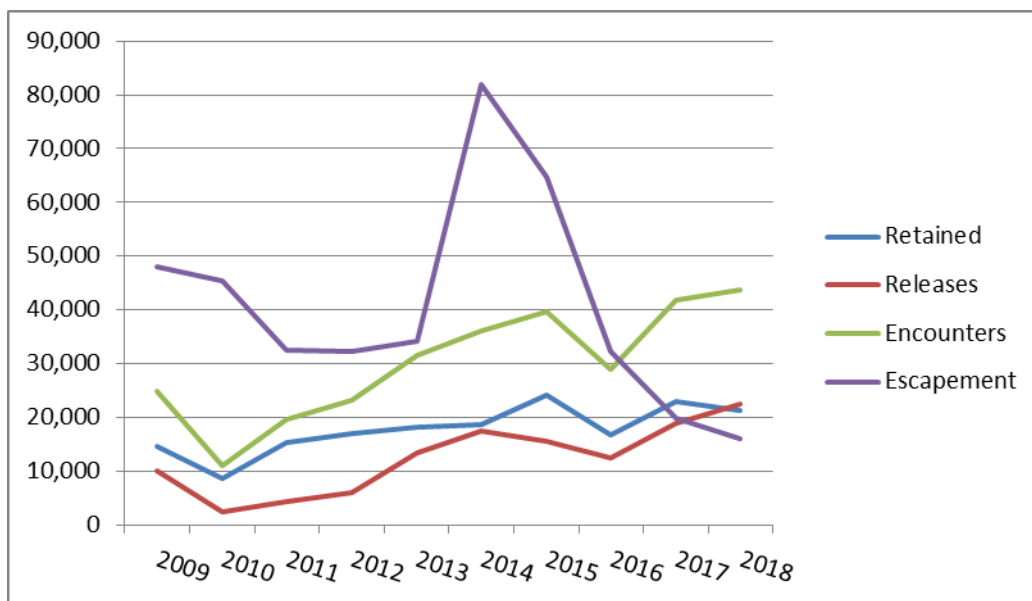
The Department has proposed moving to non-retention in recreational fisheries in areas and times that may impact Fraser 4-2, 5-2 Spring, and 5-2 Summer chinook salmon. Although it not said, the inference is that non-retention fisheries will significantly reduce recreational fishery total mortalities (retained catch and FRIM). However, the evidence is not clear. The reduction may not be as significant as some suggest. DFO’s estimates of Total Mortalities are not credible. The Pacific Salmon Commission produces higher estimates, and the use of DFO Science Recommendations produces higher estimates still.



Effort has remained relatively stable even as regulations and abundance has changed. Although, it is interesting that in 2018, when the most stringent measures to protect SRKWs were introduced, effort increased. It is unclear whether this was due to improved monitoring of the fishery or some other factor. But it suggests regulatory changes do not necessarily impact effort.

Sum of ESTIMA DISPOSITIO	YEAR										
PFMA	Effort	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
PFMA 18		3,818	2,911	6,968	5,679	7,637	3,083	10,685	6,402	10,546	3,741
PFMA 29		4,337	8,315	9,017	8,354	6,429	22,477	11,188	13,402	18,122	24,863
PFMA 19		16,270	11,492	12,362	16,732	16,157	14,474	19,801	16,563	13,452	17,354
PFMA 20		49,980	35,235	39,437	32,483	38,186	37,396	40,113	32,716	34,152	37,649
PFMA 121		1,855	913	2,449	2,476	2,400	2,088	1,612	2,696	3,456	3,308
<b>Grand Total</b>		<b>76,260</b>	<b>58,866</b>	<b>70,233</b>	<b>65,724</b>	<b>70,809</b>	<b>79,518</b>	<b>83,399</b>	<b>71,779</b>	<b>79,728</b>	<b>86,915</b>

The proportion of releases relative to both total encounters and escapements of 4-2 and 5-2 chinook in May, June, and July in PFMA 18, 19, 20, 121, 29 has been increasing between 2009 and 2018. This is important as the regulations are designed to force the recreational sector to release larger chinook. Research supports the concept that larger chinook in these times and areas tend to be from the Fraser 4-2 and 5-2 populations. It is noticeable that more stringent regulation does not appear to reduce encounters.



DNA sampling supports the idea that a significant proportion of the retained catch in PFMA 18, 19, 20, 121, and 29 in May, June, and July is composed of 4-2 and 5-2 Fraser chinook. It is important to note that all DNA samples have been taken from retained chinook. Releases have not been sampled.

Over time, the composition of 4-2 and 5-2 in the retained catch has declined. This could be caused by both the reduced number of 4-2 and 5-2 Fraser chinook available to the recreational sector due to declining abundance or the increase in the proportion of 4-2 and 5-2 encounters that are released, or a combination of both.

The table below shows the proportion of the catch in PFMA 18, 19, 20, 29, and 121 in May, June, and July comprised of 4-2, 5-2 spring, and 5-2 summer Fraser chinook as estimated by DNA sampling of retained fish (missing years did not have a sampling program). The DNA sampling report notes that new regulations requiring the release of unmarked larger fish were introduced in 2010. The author also notes that the stock composition as estimated based on DNA sampling of retained fish is likely not the same for released chinook.

<b>Year</b>	<b>4-2</b>	<b>5-2 Spring</b>	<b>5-2 Summer</b>	<b>Totals</b>	<b>Escapement</b>
<b>2009</b>	4.93%	28.52%	18.19%	51.64%	48,100
<b>2010</b>	5.97%	10.29%	1.05%	17.31%	45,400
<b>2014</b>	3.79%	30.10%	3.55%	37.44%	81,900
<b>2016</b>	1.64%	5.54%	1.75%	8.93%	32,200
<b>2017</b>	1.92%	8.91%	6.12%	16.95%	19,800
<b>2018</b>	0.40%	6.10%	5.83%	12.33%	16,000

In consideration of the above information, the following monitoring and stock assessment programs should be maintained or implemented in 2019 to determine if non-retention in recreational fisheries is able to (1) significantly reduce harvest impacts of recreational fisheries on Fraser 4-2 and 5-2 chinook and (2) provide the necessary contribution from this fishery to allow DFO to achieve its objective of reducing total mortalities on these populations to between 5 and 7%.

1. Monitoring of effort and encounters should be maintained at 2018 levels in areas open to chinook non-retention.
2. Past DNA sampling has not provided a full picture of stock composition in recreational fisheries because releases have not been sampled. There should be a program in 2019 to collect DNA samples of released chinook. This would provide a clearer picture of stock composition of chinook encountered in the fishery and provide information as to whether non-retention is a sufficient management measure
3. DFO's calculation of total mortalities must be amended to incorporate a more complete understanding of potential total mortalities by incorporating the guidance provided in Patterson et al. (2017). Otherwise, the estimate of total mortalities will undermine the integrity of the objective to reduce total mortalities to between 5 and 7%. The guidance in DFO's SAR and Patterson et al. (2017) can be used to shape monitoring programs to begin to obtain a more complete understanding of total mortalities. See Appendix A.

## Appendix A

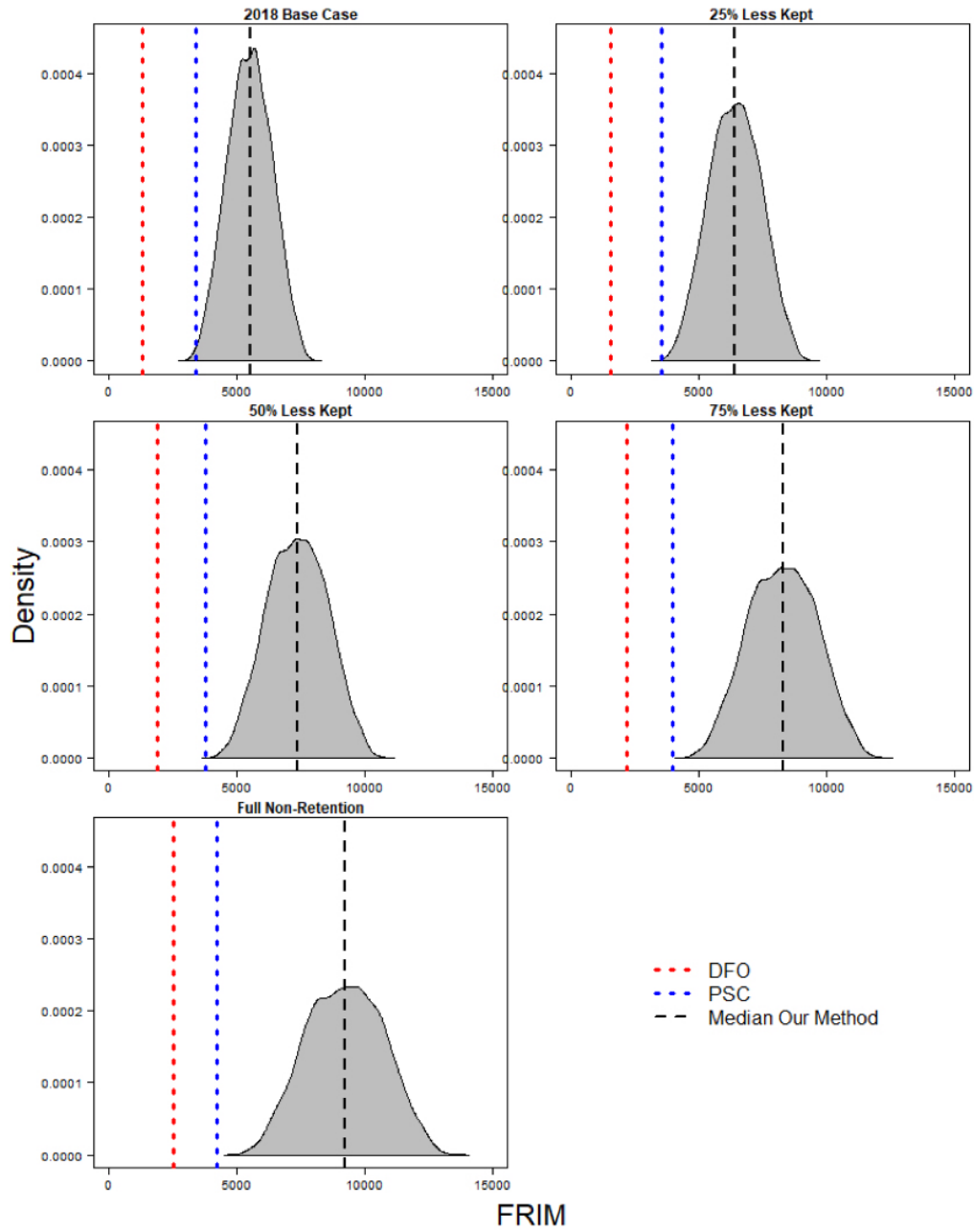


Figure 4: FRIM for 4 non-retention scenarios and the 2018 base case for Fraser River 4<sub>2</sub>/5<sub>2</sub> chinook in recreational fisheries in Areas 18,19,20,29,121 and 123. The grey shaded area represents the probability distribution of the stochastic model output for each scenario. The dashed black line is the median value of the probability distribution, the dotted blue line is the PSC estimate and the dotted red line is the DFO estimate in each scenario.

