

## **Update and Clarification of Estimates of Total Mortalities of Endangered and Threatened Fraser Chinook Salmon in South Coast Recreational Fisheries**

In a press release and backgrounder sent out on February 5<sup>th</sup>, 2020, the MCC provided an estimate of total mortalities of endangered and threatened Fraser 4<sub>2</sub> and 5<sub>2</sub> Chinook in south coast recreational fisheries. This estimate was based on the recreational fishery in Areas 17, 18, 19, 20, 29 and 121 (roughly Juan de Fuca, Victoria through to the entrance of the Fraser River and south Strait of Georgia) and its potential impacts on Fraser 5<sub>2</sub> and 4<sub>2</sub> Chinook stocks of concern (early timed Chinook which spend several months in freshwater before migrating into the marine environment).

Since those preliminary estimates were released, the authors of the original discussion paper have invested considerable time refining input data (genetic stock ID information) in collaboration with DFO. We also incorporated additional information and perspectives to inform the model's 'risk factors'. During the review of the genetic stock ID data, it was decided to drop Fraser 4<sub>2</sub> Chinook from the new analysis as GSI estimates for 4<sub>2</sub> were highly uncertain. It is therefore difficult to directly compare the February 5<sup>th</sup> estimate to the current estimate.

The new estimate of total mortalities applies only to Fraser 5<sub>2</sub> Chinook. The elimination of 4<sub>2</sub> from the analysis, in addition to the refined model inputs, reduces the estimated number of total mortalities attributed to the south coast recreational fishery to between 1,000 and 2,000, from the February 5<sup>th</sup> estimate for both 4<sub>2</sub> and 5<sub>2</sub> Chinook of 3,500.

It is difficult to refine this estimate further without improvements in fishery monitoring and increased understanding of the long-term mortality of Chinook released in the fishery. There is insufficient genetic stock composition information (GSI) for the years 2011-2019. DFO only sampled retained catch in a few sub-areas and did not sample releases at all until 2019 when releases were sampled in a few select areas. Collecting GSI from released fish is critical as it is assumed a relatively high proportion of fish released due to regulatory requirements (size restrictions) would be endangered Chinook.

We also do not have enough information to populate the 'risk factors' in the model on a sub-area resolution. Risk factors are the probability a released chinook will die prior to spawning because of drop-off from, or interaction with, recreational gear and anglers. These risk factors likely vary by fisher experience, handling practices, gear used, pinniped presence, and sub-area fished. Taken together along with GSI and catch and release information, they provide estimates of Fishery Related Incidental Mortality (FRIM) of fish encountered in fisheries.

Resolving these issues are of the utmost importance not only for the conservation and recovery of these endangered Chinook populations but also to support sustainable fisheries. This is because current, and future, management actions will likely require a ceiling of total allowable mortalities for endangered and threatened salmon populations. To accurately estimate total mortalities associated with any given fishery, and compare

to total mortality ceilings, it is important to identify times and areas where stocks of concern are present, and when they are not, along with estimates of FRIM. These estimates can provide the necessary information to allow a fishery to adapt to conservation objectives while maintaining opportunity.

We believe working with fishers to collect GSI and refine risk factors by sub-area will allow us to use our model to engage with fishers to design fisheries that reduce threats to endangered Chinook populations while maintaining, or even increasing, fishing opportunities.

It is important to note the south coast recreational fishery is only one of about ten fisheries that may impact these Chinook. Many of these other fisheries have less capacity to effectively estimate total mortalities than does the recreational fishery.

The authors look forward to continuing our engagement with the DFO, recreational fishers, and First Nations as we further develop our capacity to evaluate fishery specific total mortalities using GSI and FRIM.

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March 12, 2020