

DATE: October 15, 2021  
MEMORANDUM FOR: Southern Oregon / Northern California Coastal (SONCC) Coho Workgroup  
FROM: Jeromy Jording, National Marine Fisheries Service (NMFS) staff  
SUBJECT: Incorporation of freshwater mortality into a total exploitation rate framework

#### BACKGROUND

In April and June 2020, the Pacific Fishery Management Council (Council) formed an Ad Hoc SONCC Coho Workgroup (Workgroup), and adopted a Terms of Reference and Timeline that describes the Workgroup's purpose, membership, milestones, and timeline. The Workgroup's primary task is to develop a range of harvest control rule alternatives for Council consideration from which the Council would adopt a preferred alternative for recommendation to NMFS.

This memo briefly characterizes how freshwater fishery harvest rates could be converted into exploitation rates (ER). These could then be combined with ocean fishery ERs generated by the Salmon Technical Team (STT) to calculate a total ER, should the Council choose to adopt a total ER control rule from the alternatives currently under consideration.

#### EXAMPLE

The Council's STT has indicated they have considered the technical aspects of calculating a total ER and has tentatively concluded that it can conduct the necessary analysis for the preseason salmon process and post season evaluation ([Agenda Item F.3.a, Supplemental STT Report 1, September 2021](#)). Given current data sets are not sufficient to estimate preseason population specific SONCC coho salmon abundances at this time, the following equation will convert freshwater fishing mortality estimates into an ER equivalent:

$$ER_F = MR_F^1 * (1 - ER_O)$$

Where:

$ER_F$  = Freshwater exploitation rate equivalent<sup>2</sup>  
 $MR_F$  = Freshwater fishing mortality rate estimate (FW mortalities / river run size)  
 $ER_O$  = Ocean exploitation rate

This equation does not require estimates of coho salmon abundance, and each  $MR_F$  estimate would be supplied to the STT from the respective co-managers during the preseason prior to the conclusion of the March Council meeting (*e.g.*, Rogue River freshwater mortality estimates would come from the Oregon Department of Fish and Wildlife, whereas Klamath River basin mortality estimates would come from the California Department of Fish and Wildlife, Hoopa Valley Tribe, or Yurok Tribe, respectively for their fisheries).

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<sup>1</sup> Freshwater fishing mortality rate may be estimated by one of the following methods: 1) (Fishery mortalities) / (river run size); or 2) (Sum of TRH and IGH clipped fish mortalities)/(Escapement of TRH and IGH clipped fish to the basin). There are pros and cons to each method, depending upon the availability of complete run size data and stray rates of clipped hatchery fish.

<sup>2</sup> This estimate represents the freshwater exploitation rate of age-3 natural origin recruits similar to estimates found in Appendix B of the SONCC Workgroup Risk Assessment ([Agenda Item F.3.a, Supplemental SONCC Workgroup Report 1, September 2021](#)).

Review of each mortality estimate inputs provided to the STT would occur among the co-managers prior to them being provided, ensuring they represented the best scientific information annually available. The freshwater exploitation rate equivalents would be added to the ocean ER to calculate a total ER.