SALMON TECHNICAL TEAM REPORT ON METHODOLOGY REVIEW

The Salmon Technical Team (STT), the chair of the Model Evaluation Workgroup (MEW), and the Scientific and Statistical Committee (SSC) Salmon Subcommittee met remotely on October 12-13, 2022, to discuss the following Salmon Methodology Review topics:

1. Technical review of the updates associated with 'Round 7.1.1' of the Fishery Regulation Assessment Model (FRAM) base period as they relate to modeled abundances of Chinook salmon stocks used in determining the Southern Resident Killer Whale (SRKW) Chinook salmon abundance threshold,
2. Technical review of the updates to Chinook salmon ocean distribution models that derive from two publications (Shelton et al. 2019, 2021) and are used to apportion the modeled abundance of Chinook salmon stocks among ocean regions,
3. Progress report on any new and updated information available for the documentation of technical details of FRAM,
4. Discussion of whether the Sacramento Index (SI) forecast should be expressed as a mean or median, and,
5. Review of the basis behind the Sacramento River Fall Chinook (SRFC) conservation objective.

Technical review of the updates associated with Round 7.1.1 of the FRAM base period

Mr. Jon Carey (National Marine Fisheries Service [NMFS], STT, MEW) provided a summary of FRAM base period round 7.1.1 updates that could potentially impact the Pacific Fishery Management Council's (Council or PFMC) Chinook salmon abundance threshold for SRKW. This focused on four categories of changes that are expected to account for the majority of effects to stock-specific starting cohort sizes: (1) updated coded-wire-tag recovery information, (2) accounting for inter-dam loss for Columbia River stocks that originate upstream of Bonneville Dam, (3) updated terminal run sizes, (4) and updated catches in Canadian sport fisheries. Round 7.1.1 was used in the planning of 2022 fisheries and will be used for fishery planning for the foreseeable future. After reviewing these changes, the STT finds that FRAM base period Round 7.1.1 represents an improvement over the previous base period (Round 6.2).

Technical review of the updates to Chinook salmon ocean distribution models

Dr. Ole Shelton (NMFS, Scientific and Statistical Committee [SSC]) provided an overview of two models (Shelton et al. 2019 and Shelton et al. 2021) that can be used to estimate stock-specific spatial distributions of fall Chinook salmon for use in setting a North of Falcon fisheries threshold for SRKW. The Shelton et al. (2021) model features several improvements to the Shelton et al. (2019) model, including: the incorporation of additional, more contemporary coded-wire tag recovery data, improved stratification of Chinook stocks, and new information from hake fisheries. Furthermore, a sea surface temperature (SST) covariate was added to the model. The addition of SST information allows for year-specific estimates of stock distributions that depend on SST patterns. In considering these updates, the STT finds that the 2021 configuration of the Shelton et

al. ocean distribution model represents an overall improvement compared to the 2019 configuration of the model. Should the Council decide to move forward in using the 2021 configuration of the model, the STT recommends using long term average stock-specific distribution parameters. While there may be value in using distributions that vary annually based on SST, further investigation would be required before implementation is considered.

While reviewing the improved stock stratification in the Shelton et al. 2021 configuration of the ocean distribution model, the STT also considered the FRAM/Shelton et al. model stock crosswalks, as provided in Table 5.1.a of the Ad-hoc SRKW Workgroup's Risk Assessment. For future assessments, the STT recommends one correction, specifically, mapping the 'Lower Columbia River Wild' FRAM stock to the 'UPCOL' or 'URB' stocks of the Shelton et al. 2019 and 2021 model configurations, respectively. This FRAM stock represents the Lewis River Wild stock, which is a "bright" stock that exhibits ocean distribution patterns more similar to Upriver Brights than to Lower Columbia River Tules.

Progress report on the documentation of FRAM technical details

Ms. Angelika Hagen-Breaux (Washington Department of Fish and Wildlife, MEW) provided an overview of updates to documentation of FRAM. The STT appreciates the continued work on comprehensive documentation of FRAM and notes that substantial progress has been made on this task in recent years.

Use of the mean vs. median for the Sacramento Index forecast

Dr. Will Satterthwaite (NMFS, SSC) provided an assessment of whether the SI forecast should be expressed as the mean (status quo) or median. Results of the analysis suggest that forecast accuracy would have been improved if the SI were expressed as the median rather than the mean. The STT appreciates the work that went into this analysis and is supportive of expressing the SI forecast as the median beginning in 2023.

Review of the Sacramento River fall Chinook conservation objective

Dr. Will Satterthwaite (NMFS, SSC) provided a detailed review of the origins of the current SRFC conservation objective. The SRFC conservation objective was established in the 1980s using data from the 1950s through the 1980s. The review found that the objective was difficult to reproduce using historical documents and available data. The Council has frequently discussed formation of a working group to address updating the SRFC conservation objective with more contemporary data and methods during its workload planning agendas. Given the conservation concerns and importance of this stock to salmon fisheries south of Cape Falcon, the STT supports elevating and prioritizing work toward developing a new conservation objective for SRFC.

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