

SALMON TECHNICAL TEAM REPORT ON  
2011 SALMON METHODOLOGY REVIEW

The Salmon Technical Team (STT) and the Salmon Subcommittee of the Scientific and Statistical Committee (SSC) met in Portland, Oct 4 and 5, to review methodology changes and updates for implementation in the 2012 management season.

**Abundance Based Management framework for Lower Columbia River tule fall Chinook.**

Ray Beamesderfer presented work done by the Tule Chinook Workgroup on evaluating abundance-based management strategies for Lower Columbia natural tule Chinook. The approach employed a population viability model for natural tules with variable exploitation rates determined by the abundance of hatchery tules. Though the model focuses on a hypothetical natural tule population of intermediate productivity, and incorporates a number of simplifying assumptions, it is a reasonable and defensible approach to evaluate the relative risks and benefits of variable harvest rates compared to those of the fixed harvest rate ceiling that is currently the ESA constraint on fishery impacts for tule fall Chinook. The model demonstrated that variable exploitation rate strategies can increase the expected fishing opportunity while reducing risks to natural tule populations. The STT endorses the use of this approach to develop a new consultation standard incorporating abundance-based variable exploitation rates.

**Cohort reconstruction and harvest impacts model for Sacramento winter-run Chinook salmon.**

The NMFS biological opinion for ocean salmon fisheries with respect Sacramento River winter-run Chinook resulted in a jeopardy opinion. The reasonable and prudent alternative included development of analytical tools to assess and forecast fishery impacts. To help implement this alternative, the NMFS Southwest Fishery Science Center has developed a winter-run cohort reconstruction model and winter-run harvest model (WRHM).

Dr. Michael O'Farrell presented the WRHM, and the cohort reconstruction of hatchery winter-run Chinook used to parameterize the model. The cohort reconstruction confirmed that winter-run Chinook impacts in ocean fisheries are negligible north of Point Arena, and that this stock has a very high age-3 maturation rate with few age-4 fish remaining in the ocean. The WRHM has a structure consistent with the Klamath Ocean Harvest Model and the Sacramento Harvest Model, but utilizes information gained from the cohort reconstruction to limit the spatial extent of the model to the Monterey and San Francisco port areas, and restrict the age composition within the model to the age-3 cohort. Both the cohort reconstruction and the WRHM appear to be technically sound, and together provide the capability to assess ocean fishery impact rates on this listed ESU. The STT endorses the use of the WRHM in 2012 if this capability is needed.

### **Application of bias-corrected methods for mark-selective fisheries to Coho FRAM.**

Dr. Bob Conrad presented work done to evaluate the magnitude of fishery impacts in 2009 and 2010, and bias in recent pre-season Coho Fishery Regulation Assessment Model (FRAM) runs arising from mark-selective fishing and the computational structure of Coho FRAM. Bias in FRAM exploitation rates exhibit a general pattern of increasing in time steps 1 through 3, and decreasing in time steps 4 and 5 due to a combination of fewer mark-selective fisheries and bigger non-selective fisheries in the later time steps. Though biases were generally small, bias corrected estimates of fishery impacts for Council adopted management measures would have exceeded the allowable limits on upper Fraser coho in 2009, and lower Columbia natural coho in 2009 and 2010.

Angelika Hagen-Breaux discussed WDFW efforts to incorporate bias correction into Coho FRAM. The algorithms have been coded, but there is still a bug in the code. Washington Department of Fish and Wildlife will present the modifications to FRAM when the code has been debugged. The STT recommends that current FRAM be used for 2012 season planning, pending review of the bias-corrected Coho FRAM next year.

### **Review and evaluation of preseason and postseason mark-selective coho fisheries.**

Dr. Robert Kope presented a review of mark-selective fisheries for coho from 2000 through 2010, comparing preseason expectations of mark rates and impacts to postseason observations. The review documented bias in preseason expectations of mark rates, with forecast mark rates being consistently higher than values observed during the fisheries. Though this bias has resulted in higher contact rates for unmarked fish than expected, because coho landings have frequently been less than the quotas, this has not resulted in greater incidental mortality of unmarked fish than preseason projections. The bias in preseason projected mark rates appears to be the result of under-forecasting and under-accounting of natural coho abundance. However, further work is recommended to identify the causes of bias and correct it.

### **Update on conversion of FRAM from Visual Basic to Visual Studio.**

Andy Rankis of the Model Evaluation Workgroup (MEW) gave an update on the conversion of FRAM from Visual Basic (VB) to Visual Studio (VS). The VB version of FRAM has been converted to a VS FRAM application for both coho and Chinook pre-season modeling, and the VS version is being tested and evaluated. The VS version uses the same algorithms as the VB version, but has some clear advantages. Inputs and outputs to the VS version are through a Microsoft Access database instead of the strictly formatted files that the VB version uses, and the VS version has better debugging capabilities. State and tribal technical staffs have been using the new version for evaluation purposes and are still encountering a few problems with the VS version. The MEW is hopeful that the VS version will be ready for use in the 2012 preseason process.

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