MODEL EVALUATION WORKGROUP REPORT
ON SALMON METHODOLOGY REVIEW

At the Salmon Methodology Review meeting, in October, the Model Evaluation Workgroup (MEW) presented progress to the Salmon Subcommittee of the Scientific and Statistical Committee (SSC) and the Salmon Technical Team (STT) on two tasks:

1) Evaluation of bias, introduced by Mark Selective Fisheries (MSF), in Fisheries Regulation Assessment Model (FRAM) calculations of exploitation rates for unmarked stocks.

2) Development of alternative methods for estimation of pre-season abundance of Columbia River Chinook stocks.

Since the advent of MSF, there has been concern that fish released in MSF may potentially be encountered more than once, but the FRAM model does not currently have the ability to model multiple encounters within a model time step. Ideally, each time a fish is landed and released it should be subjected to a modeled release mortality rate. The MEW quantified the MSF bias introduced to FRAM calculations of unmarked stock exploitation rate by modeling the same simplified coho fishery with FRAM and with another model developed with multiple encounter capability. The MEW report to the SSC/STT, ‘Multiple Encounters in salmon mark selective fisheries: bias levels introduced in FRAM estimated exploitation rate of unmarked coho and Chinook stocks’ is available as Agenda Item H.1.a, Attachment 1.

We found that FRAM produced unmarked exploitation rates that are biased low when MSF are implemented. At low levels of MSF this bias may not be a concern, but it still exists. Various ways to address this bias were discussed at the October meeting. The MEW agrees that the preferred solution would be to modify FRAM to enable accounting for multiple encounters. This is complicated by drop-off mortality and mark recognition error rates of both marked and unmarked salmon. However, the great majority of bias is introduced by the release mortality of multiple encountered unmarked fish in MSF. Equations to adjust unmarked exploitation rates were discussed, and are being evaluated by the MEW at this time. The equation confirmed within the group as appropriate could be added to the FRAM code and results from the revised FRAM compared to the results from the multiple encounter model. If this work proceeds on schedule, in January the MEW will be prepared to present results to the SSC/STT to evaluate the potential use of the revised FRAM for 2010 pre-season modeling.

This proposed FRAM modification will be for coho only; similar work for Chinook is more complicated and will proceed over the next year. Chinook MSF have not yet been implemented in Council fisheries, and thus MSF bias is not as big of a concern. Solutions for MSF exploitation rate bias for unmarked Chinook stocks could be on the agenda for the 2010 October Model Review meeting.

For the second task of deriving pre-season abundance forecasts for Columbia River Chinook stocks, progress reports on two methods were presented at the October meeting. This topic is not ready for a full evaluation at this point, but work will continue.