

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON PACIFIC WHITING
HARVEST SPECIFICATION AND MANAGEMENT MEASURES FOR 2009

Dr. Owen Hamel presented the Scientific and Statistical Committee (SSC) with an overview of the Pacific whiting stock assessment (Agenda Item G.1.a, Attachment 1) and Dr. David Sampson summarized the report of the joint Canadian and U.S. Pacific Whiting Stock Assessment and Review (STAR) Panel that occurred February 3-6th in Seattle (Agenda Item G.1.a, Attachment 2). The SSC also received a presentation on an age-structured model developed by Dr. Steven Martell of the University of British Columbia that was not available for review at the STAR Panel. In addition, Mr. Alan Sinclair (Department of Fisheries and Oceans [DFO] Canada) described the process used by DFO to review the assessment conducted by Dr. Martell and presented the review report. It was not possible for the SSC to review this additional assessment in any detail. The SSC notes, however, that there are major differences between the two stock assessments, including: (1) how selectivity was modeled, (2) how the data were aggregated, (3) the weighting of data elements, and (4) productivity assumptions. A thorough evaluation of these differences in model structure, as would normally occur during a STAR Panel review, would be needed for the SSC to judge the reliability of the Canadian assessment.

The 2009 whiting assessment was implemented using new SS3 software, but on the whole the structure of the assessment was similar to the 2008 assessment. Differences between the 2008 and 2009 assessments included more flexible modeling of fisheries selectivity, improved treatment of aging error, and freely estimating the level of recruitment variability. In combination, these changes produced a large downward shift in the absolute scale of biomass. A new data set, consisting of historical California fishery samples from Santa Barbara during 1963-1970, was also added, but this had very little influence on assessment results. The acoustic survey catchability coefficient (q) was freely estimated for the first time in the 2008 assessment, although it was recognized that this parameter was likely to be imprecisely estimated. Survey catchability was again estimated in the current assessment, and the estimate of q increased from 0.46 in the previous assessment to 0.85 in the current assessment. This had the effect of scaling the estimate of population biomass downwards. Imprecisely estimated parameters are expected to change as additional data are added or when changes are made to a model's structure.

The 2009 assessment did not exhibit a marked retrospective pattern, such that recruitment and spawning stock biomass changed systematically as the terminal year of the assessment was reduced. This is a desirable characteristic of assessment models, but was an issue with the last whiting assessment.

The SSC endorses the use of the SS3-based 2009 Pacific whiting assessment as the best available scientific information and recommends that it be used to form the basis for management of the stock. The assessment results indicate that the Pacific whiting stock has continued to decline as the strong 1999 year class passes out of the population and has not replaced by a similar strong year class. Estimates of stock status indicate that the stock is now at the lowest spawning biomass ever observed and is projected to decline further in the next three years under current harvest management. The Canadian assessment generally led to similar findings as the SS3 model, but also showed a sharp increase in fishing mortality within the last few years.

The SSC recommends that the decision table (Table 1 in Agenda Item G.1.b Supplemental GMT Report) based on the posterior distribution be used for management purposes. The three-year projections in Table 1 indicate that the stock is likely to approach or decline below the minimum stock size threshold ($0.25B_0$), which is an important consideration for Council decision-making. The SSC would like to point out several 2009 OY values in the Table.

- A 2009 OY of 253,582 mt (first row) represents the maximum likelihood estimate (MLE) of the OY based on the 40-10 harvest policy adopted for Pacific whiting, but this level of catch would result in a 50 percent probability of overfishing in 2009. Although an ABC calculated from the MLE results in a catch of 291,965 mt, the SSC considers the catch level that produces a 50 percent probability of overfishing a better way to calculate the ABC. The SSC therefore recommends that 253,582 mt should be considered the upper limit of potential 2009 OYs.
- A 2009 OY of 215,000 mt approximates the 40-10 harvest control rule if the ABC is 253,582 mt. The SSC regards this value as the best estimate of a 40:10 OY in 2009 because results from the posterior distribution best account for uncertainty in the assessment, at least in comparison with the MLE result.
- A 2009 OY of 184,000 mt results in a 50 percent probability of the stock dropping below the minimum stock size threshold in 2010. Therefore, a 2009 catch in excess of this amount corresponds to a greater than 50 percent probability of the stock dropping below $0.25B_0$ in 2010, which may lead to the stock being declared overfished, depending on the outcome of the 2010 assessment.

The SSC has previously noted that the population dynamics of Pacific whiting are not well matched to the default harvest policy for groundfish. Whiting biomass would be expected to fluctuate at a level well below $B_{40\%}$ if the fishery were conducted under an $F_{40\%}$ harvest policy for an extended period of time. Given that whiting recruitment is highly variable, application of the 40-10 control rule will lead to excursions into the overfished zone. The SSC reiterates its previous recommendation that the trade-offs achieved by alternative harvest policies for Pacific whiting should be investigated.

Late arrival of the 2008 fishery data left little time for the STAT to analyze, let alone explore, alternative model structures. Future whiting STAR Panels will likely be presented with more than one model to review. An assessment and review process conducted under a compressed timeline, as was done this year, may cause a decline in the quality of the assessment and the review. The SSC recommends that a later date be considered for the whiting STAR Panel, which would allow more time to assemble the prior year's data and would also facilitate the interaction of the U.S. and Canadian analytical teams. Such a delay in schedule might be achieved without disrupting the current fishing seasons if an initial release of quota allowed the fishery to begin prior to finalizing the assessment.

PFMC
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