

SCIENTIFIC AND STATISTICAL COMMITTEE STATEMENT ON
FINAL ACTION ON SARDINE ASSESSMENT, SPECIFICATIONS, AND
MANAGEMENT MEASURES

Dr. Kevin Hill presented the 2015 sardine update assessment to the Scientific and Statistical Committee (SSC). This update was reviewed by the SSC Coastal Pelagic Species (CPS) Subcommittee on March 6, 2015. The update assessment was complete and well documented and followed the Terms of Reference for update assessments. The SSC endorses an overfishing limit (OFL) of 13,227 mt and the tier-1 default sigma (σ) of 0.36 to be used in determining the ABC.

New data in the 2015 update include catch data for 2014 (and updated catch data from 2013), indices from both the spring and summer 2014 Acoustic Trawl Method (ATM) surveys, and 2013 fishery and survey conditional age-at-length data and 2014 length composition data. Age data were not available for the 2014 fisheries or surveys in time for inclusion in the update. The 2014 Daily Egg Production Method (DEPM) estimate was not included in the 2015 update because the CalVET gear used for that index caught no eggs during the 2014 California Cooperative Oceanic Fisheries Investigations (CalCOFI) survey, and therefore a usable index for the model could not be produced. Dr. Hill noted that very low and zero egg counts had occurred previously when the biomass of Pacific sardine was at very low levels. The issue of how to include zero and near zero biomass indices should be addressed prior to the next full assessment.

The spring and summer 2014 ATM surveys produced biomass indices of 35,339 mt (CV = 0.4) and 26,280 mt (CV = 0.7), respectively. These surveys were conducted in a similar manner to previous ATM surveys, and the biomass indices are both far below those produced in 2014 (each was over 300,000 mt). Both fishery fleets saw, on average, larger fish in 2014 and 2013 than were seen in previous years. This appears to reflect a lack of smaller fish due to poor recent recruitment.

In the course of reviewing the update assessment it became evident that the base model used in the 2014 assessment did not correspond to the best fit to the data. Upon further exploration, a better fit was achieved (Table 9, column "T-2014 Revised", Agenda Item G.1.a). This revised 2014 model resulted in selectivity patterns similar to those in the 2015 update, while differences in selectivity patterns between the two assessments had been a point of concern in reviewing the 2015 update. The 2014 stock biomass in the revised 2014 model is lower than that reported in the 2014 assessment (275,705 vs. 369,506 mt). Application of the OFL control rule to the 2014 biomass estimate in the revised 2014 model results in a value of 29,256 mt (vs. 39,210 mt), while application of the HG control rule in place in 2014 to the revised 2014 biomass estimate results in a value of 16,405 mt (vs. 28,646 mt). It is not appropriate, in this context, to contemplate what the 2014/2015 OFL would have been based upon the 2014 biomass estimate from the 2015 assessment.

Recent assessments, including the 2014 assessment, have estimated the most recent recruitment from the stock-recruitment curve. However, this approach has been found to consistently overestimate the recruitment in recent years (based upon subsequent information). Because of this, the stock assessment team (STAT) recommended averaging the estimates of the previous three years' recruitments (as has been done previously in the Pacific mackerel assessment). The SSC considers this approach to be consistent with recent observed patterns and supports this method for estimating the 2014 recruitment. The SSC finds the 2015 update with this recruitment estimation approach to represent both an appropriate update of the 2014 sardine assessment model and the best available science. The biomass estimate (96,688 mt) and management quantities for this model are shown in part (b) of the table on page 12 of Agenda Item G.1.a, Assessment Report Executive Summary. The SSC endorsed 2015/16 Pacific sardine OFL of 13,227 mt is in that table.

The SSC notes that the 2014 ATM surveys were fairly influential in the final update assessment results. However, given the above SSC endorsed approach for estimating 2014 recruitment, the biomass estimate for 2015 remains below 150,000 mt (145,785 mt; Kevin Hill, pers. comm.) even when the 2014 ATM surveys are not included in the model.

The fits to the abundance indices and composition data in the assessment update remain poor, and the fits are worse in recent years than earlier in the time series. This lack of fit is concerning, and it is not clear how this can be fixed without better data. The catchability and selectivity of the acoustic and trawl portions of the ATM surveys in particular remain large sources of uncertainty in the assessment. The SSC recommends prioritizing a methodology review of the ATM survey over a full assessment next year. If the Council also considers this a priority, the SSC CPS subcommittee will work with the Southwest Fisheries Science Center (SWFSC) to evaluate progress on recommendations from the last ATM survey review and prepare for the recommended methodology review.

PFMC
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