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

Mr. Dale Sweetnam presented the 2016 sardine update assessment to the Scientific and Statistical Committee (SSC). The update had previously been reviewed by the SSC Coastal Pelagic Species (CPS) Subcommittee on March 10th, 2016. The update assessment was complete and well documented and followed the Terms of Reference for update assessments. The SSC endorses the update assessment as the best available science, an overfishing limit (OFL) of 23,085 mt and the Category-2 default sigma (σ) of 0.72 to be used in determining the acceptable biological catch (ABC). The update assessment was assigned a Category-2 designation due to increased uncertainty relative to previous full and update assessments as evidenced by poor fits to recent survey biomass indices and length composition data, and the uncertainty associated with the size of the 2015 recruitment, which represents a large portion of the current biomass given the low overall stock size.

The spring and summer 2015 Acoustic-Trawl Method (ATM) surveys produced biomass indices of 29,048 mt (CV = 0.30) and 15,870 mt (CV = 0.80), respectively. These surveys were conducted in a similar manner to previous ATM surveys, with the exception that the spring survey was shifted substantially to the north compared to the area usually surveyed during this time of year. The habitat model indicated that sardine habitat in spring 2015 was shifted northward from the usual area due to warm ocean temperatures, and information from the fishery supported this prediction. The estimates of abundance are both below the respective indices produced in 2014 (~ 35,000 mt in spring and 26,000 mt in summer).

The SSC agrees with the Stock Assessment Team (STAT) that the summer 2015 ATM length compositional data should be excluded from the update assessment. The 2015 recruitment is estimated to be implausibly large when the summer 2015 ATM survey lengths are included in the assessment. This is due to the estimated low survey selectivity on very small fish, which results in any small fish encountered being expanded up to an extremely large number. Selectivity is a model feature that cannot be addressed in an update according to the Terms of Reference for update assessments, and therefore removing these length data is an appropriate approach.

However, there are other indicators of the 2015 sardine recruitment being larger than those in recent years. These include: 1) a large number of sardine late larvae and juveniles (young-of-the-year) caught during the 2015 Southwest Fisheries Science Center (SWFSC) Rockfish Recruitment survey in all three latitudinal areas (in contrast to virtually none over the previous three years); and 2) a large number of larval sardine caught along the Newport Hydrographic Line. The magnitude of encounters with larval and juvenile sardine in these surveys depends on oceanographic and spatial distribution factors as well as the overall size of the age class at the time of the survey. Therefore, it is difficult to include these types of data directly, even when conducting a full assessment. The SSC was also informed by Mr. Sweetnam that the Spring 2016

ATM survey, although not yet complete, has encountered small sardine of a size-class consistent with there being a significant 2015 recruitment.

In 2015, the SSC endorsed the approach of setting the 2014 recruitment to be the average of the previous three estimated recruitments to be more consistent with recent observed patterns in recruitment, and given retrospective patterns in recruitment estimation. In contrast to the approach used in 2015, this year the SSC concluded that allowing the model to estimate the terminal year recruitment value, after removing the summer 2015 ATM survey length data, and therefore (lacking informative data) taking the value off of the estimated spawner-recruit curve, is appropriate for estimating the 2015 recruitment.

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. Sample sizes for compositional data have been consistently small for the survey, and have been small in recent years for the fisheries due limited fishing. The lack of fit is concerning. It is not clear how this can be addressed 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. These issues should be considered in more detail during the 2017 full assessment. In addition, the SSC continues to recommend a methodology review of the ATM survey in 2017.

PFMC
04/10/16