

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

The Scientific and Statistical Committee (SSC) reviewed the 2020 stock assessment of the northern subpopulation of Pacific sardine (NSP). Dr. Peter Kuriyama (Southwest Fisheries Science Center) presented the results of the stock assessment and Dr. André Punt (SSC) provided an overview of the Stock Assessment Review (STAR) panel report. The SSC appreciates the effort by the stock assessment team to improve the assessment model in response to recommendations from previous full and update assessment reviews.

The SSC endorses the 2020 NSP base case assessment model as the best available science for use in management of the NSP. Major improvements from the last benchmark assessment in 2017 and the 2018 and 2019 updates include: 1) adjusting recent catchability of the Acoustic-Trawl (AT) survey to account for biomass seen inshore of the AT survey by the aerial survey; 2) using vessel monitoring system location information for the Ensenada fleet to estimate the catch of the NSP; and 3) estimating time-varying age-0 selectivity for the AT survey. The base case model uses an integrated assessment approach (Stock Synthesis v.3.30.14) to estimate age-1+ biomass at the start of the 2020/2021 fishing year (July 1, 2020).

There is no information on the strength of the 2019 year-class from any data source in the assessment, so it was estimated from the stock-recruitment relationship. A substantial proportion of estimated total biomass available for the 2020-2021 fishing year may be from the 2019 year-class. The lack of an empirical estimate of age-0 biomass adds unquantified uncertainty to the biomass estimated to be available in 2020-2021. In addition, the Mexican fishing mortality rate on the NSP in January-June of 2020 is assumed to be the same as during that period in 2019, which influences the estimate of sardine biomass at the start of the 2020/2021 fishing year. The approach taken to determine AT catchability from 2015-2019 is the best available, but makes assumptions about selectivity that cannot be substantiated using available data. Consequently, there is considerable uncertainty associated with the estimate of age-1+ biomass in 2020 and 2021. There are additional uncertainties associated with the natural mortality rate, AT target strength and species composition, and the lack of fishery age composition data now spanning five years, that influence the biomass estimate.

The estimate for total age-1+ biomass on July 1, 2020, is 28,276 mt (Table 15 of [Agenda Item D.3, Attachment 1](#)). The SSC recommends an overfishing limit (OFL) of 5,525 mt and that the base model be considered a category 2(d) assessment with a sigma ( $\sigma$ ) of 1.0 when determining the acceptable biological catch. This designation is primarily due to the points highlighted above. The resulting acceptable biological catch (ABC) values as a function of P\* can be found in row “ABC<sub>tier2</sub>” in Table 22 of [Agenda Item D.3, Attachment 1](#).

The SSC endorses the research recommendations of the STAR panel to improve future assessments. The SSC reiterates that the assessment and OFL apply to the NSP, although a substantial proportion (e.g., 71 percent in 2018-2019) of the U.S. catch in recent years is inferred

to be from the southern subpopulation (see Table 2 of [Agenda Item D.3, Attachment 1](#)). There may be benefits to the survey-based management approach advocated by the stock assessment team, and the use of the aerial survey data to adjust catchability of the AT survey is an important step towards that approach. There would be less uncertainty in the calculation of the OFL when using a survey-based approach if the time-lag between conducting the survey and the start of the fishing year was minimized. The SSC continues to recommend further evaluation of a survey-based assessment approach using a management strategy evaluation, which should include consideration of how to handle situations were the survey not to occur in a given year.

PFMC  
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