

COASTAL PELAGIC SPECIES ADVISORY SUBPANEL REPORT ON  
PACIFIC SARDINE ASSESSMENT, HARVEST SPECIFICATIONS AND MANAGEMENT  
MEASURES – FINAL ACTION

The Coastal Pelagic Species Advisory Subpanel (CPSAS) attended the Scientific and Statistical Committee (SSC) webinar and heard a presentation from Peter Kuriyama on the 2020 sardine stock assessment. The CPSAS thanks the Chair and members of the Stock Assessment Review (STAR) Panel, the Acoustic Trawl (AT), and Stock Assessment (STAT) teams for all their work.

We appreciate the recognition that a significant biomass of sardines resides in nearshore waters in California inshore of the AT survey footprint as well as the efforts to use the 2019 aerial survey abundance data provided by the California Department of Fish and Wildlife (CDFW). Although the survey covered only a small portion of the central coast, it represented close to 30 percent of the 33,632 mt of sardine estimated coastwide by the AT survey. Using the 2019 aerial estimate to develop a nearshore correction factor resulted in reducing Q for the AT survey from 1+ to 0.733, acknowledging that the AT survey does not ‘see’ all the fish.

Although fishermen disagree with the low stock assessment projection, this new method using aerial survey estimates as a nearshore correction factor sets a precedent that can be utilized in update assessments until nearshore sampling in conjunction with the aerial survey is complete enough to include directly in the model. We hope the extensive collaboration with industry will provide data that will be used in the next stock assessment update.

The AT abundance data in the stock assessment report indicate a strong increase from 2017-2019, yet the assessment model predicts a continuing decline – a clear inconsistency that was not explored during the STAR Panel. The CPSAS asks why the assessment model indicates a continuing decline in age 1+ biomass when the AT abundance data show a strong increase.

The CPSAS is troubled to find that most of the recommendations from the 2014 and 2017 STAR Panel reports and the 2011 and 2018 Methodology Reviews have not been addressed or resolved. The 2020 stock assessment report stated that some of those issues require a management strategy evaluation or methodology review, which have not occurred.

Several core issues continue to impact sardine stock assessments: For example:

- The first recommendation of the 2019 SSC CPS Subcommittee Report (April 2019 Agenda Item E.3.a, Supplemental SSC Report 1), related to the 2020 benchmark assessment was the “Need to review the basis for the habitat model and refine estimates of both the catch and biomass attributable to the NSP (northern subpopulation) and SSP (southern subpopulation)”
- Assigning 16.7°C Sea Surface Temperature as the boundary of the ‘northern’ stock has eliminated most California sardines from the ‘northern’ stock assessment
- AT estimates should be considered relative (not absolute) indices of abundance for all CPS, as recommended in the 2018 AT Methodology Review Panel Report (April 2018 Agenda Item C.3, Attachment 2)

- Species composition attributed to acoustic backscatter is a serious problem identified by scientists on the 2018 AT Methodology Review Panel, who questioned the current protocol to collect acoustic backscatter during daytime and return at night to collect species composition data, a practice unique to this AT survey
- Age composition data from the fishery have not been updated in the model since 2015

One critically important point: the draft assessment report states that recruitment has not been observed, and the population is still declining. However, recruitment has been evident in live bait pens and observed by fishermen since 2015. Recruitment has also been documented in other independent surveys (i.e. juvenile rockfish survey) not approved for consideration, yet the model has not updated age data since the directed fishery closed in 2015. The CPSAS agrees with the recommendation of the SSC to use biological samples taken from incidental catch in other fisheries as well as the directed live bait fishery (April 2019 Agenda Item E.3.a, Supplemental SSC Report 1).

For this reason, the CPSAS supports the continuing collaborative exempted fishing permit (EFP) work in both the Pacific Northwest and California. In addition, the CPSAS supports the new EFP submitted by the California Wetfish Producers Association (CWPA) (Agenda Item D.3.b, Supplemental Public Comment 1), with the objective to target sardines in limited directed fishing over the year to produce new biological data, including age. The CPSAS recognizes the urgent need for new age data to inform the stock assessment model.

### Management Measures

A majority of the CPSAS recommends the following management measures for the 2020 – 2021 Pacific sardine fishery:

Age 1+ Biomass	28,276 mt
OFL	5,525 mt
P* Buffer	0.4
ABC/ACL	4,288 mt
ACT	4,000 mt

- If directed landings in the live bait fishery attain 2,500 mt, a per-landing limit of 1 mt of Pacific sardine per trip will apply to the live bait fishery.
- The balance of the annual catch target (ACT) can accommodate both incidental catches in other fisheries, the three EFP applications, and small-scale fishery landings. According to preliminary landings records for 2019, more than 2,500 mt of sardine were not caught in 2019.
- If the ACT of 4,000 mt is attained, a per-trip limit of 1 mt of Pacific sardine applies to all CPS fisheries.
- An incidental per-landing allowance of 2 mt of Pacific sardine in non-CPS fisheries.

Industry in both the PNW and California are committed to improve the science, and we encourage and welcome increased collaboration with the Southwest Fisheries Science Center (SWFSC) and state agencies to improve the accuracy of stock assessments.

Our strong recommendation continues to be to consider and utilize multiple indices at various times of year in future stock assessments, not just one summer acoustic trawl survey with no replication. We also suggest finding ways to expand the use of aerial surveys, which are capable of providing replication needed to document the dynamic nature of CPS, including sardine.

The northern vs. southern stock delineation (the two-stock scientific consensus) has a major impact on the U.S. sardine fishery and fishery management. There is no genetic evidence that there are two separate stocks. If U.S. fishermen catch sardines, they are counted against the northern subpopulation, and when surveyed, many of these fish are attributed to the southern stock and subtracted from the “northern” sardine biomass estimate. This creates a paradox in management decision-making. This is a huge issue for industry. A determination needs to be finalized if these are two stocks or one. If it is determined that two stocks exist, management needs to be prepared to manage two stocks to achieve optimum yield and the goals of the CPS Fishery Management Plan.

If the ‘northern’ vs. ‘southern’ stock assumption persists, the CPSAS recommends that AT surveys begin in California when the water temperature is below 16.7°C, and survey the Pacific Northwest later in summer, when sardines are more likely to be present.

The CPSAS also offers the following High Priority Recommendations:

- Conduct a Methodology Review of the basis for the habitat model, as suggested by the SSC
- Conduct a Methodology Review of the Juvenile Rockfish Survey so it can be used as an indicator of recruitment
- Conduct a management strategy evaluation to evaluate the use of AT surveys to inform stock assessments, as recommended in 2018 AT Methodology Review
- Consider other data sources, such as forage fish surveys conducted by the Northwest Fisheries Science Center and states, and sardine bycatch in the Pacific whiting, market squid, and other fisheries
- Re-evaluate model assumptions to learn why the assessment model predicts a sharp decline in age 1+ biomass when AT survey abundance data show a strong increase
- Support all EFPs proposed to improve the science surrounding sardine stock assessments

#### Minority statement

The Conservation Representative differs from the majority on the recommended management measures. The stock assessment indicates the northern Pacific sardine stock is presently in a low-productivity state, in addition to having been declared overfished in July 2019 and remaining below minimum stock size threshold as of July 1, 2020. Further, concerns have been raised about the current basis for calculating  $E_{msy}$ , which may overestimate sardine productivity. The Conservation Representative supports development of an alternate method for calculating  $E_{msy}$ , based on best available science. Until such a review can be undertaken, a minority recommends use of a lower  $P^*$  (or higher buffer between overfishing limit and acceptable biological catch) to account for scientific uncertainty in the  $E_{msy}$  value, and that the annual catch limit for 2020-2021 be set lower than acceptable biological catch to account for ecosystem considerations and other Optimum Yield factors, as well as the need to rebuild an overfished stock. Specifically, an annual catch limit of 1,414 mt would represent a 5 percent exploitation rate (if fully attained), and would

allow the Council to take a more precautionary approach that the environmental community believes is appropriate given the stock's overfished declaration, while accommodating some level of incidental, live bait, small-scale, and EFP fishing.

The entire CPSAS appreciates the work of the Federal, state, and industry partners in their efforts to accurately assess the Pacific sardine and other CPS stocks. Thank you for your consideration.

PFMC  
4/5/2020