

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

The Coastal Pelagic Species Advisory Subpanel (CPSAS) heard a presentation by Dr. Kevin Hill on the Assessment of the Pacific Sardine Resource in 2018 for U.S. Management in 2018-19 (Agenda Item C.5 Attachment 1, Stock Assessment Report).

The CPSAS majority is extremely disappointed to learn that the 2018 updated Biomass estimate for Pacific sardine continues to trend downward. This despite record observations of sardine in the 2015 juvenile rockfish survey, the large catch of small sardines in the 2015 summer Acoustic Trawl cruise, and a fourfold increase of sardines observed in the 2016 acoustic trawl method (ATM) survey. This is coupled with fishermen on the water, live bait operations and seeing substantially more sardines in various age classes. Contrary to these observations, the Stock Assessment Report indicated no evidence of recruitment for several years.

How can this discrepancy be explained? The 2018 assessment is an update generated by Model ALT, which was endorsed, despite significant concerns, by the 2017 sardine Stock Assessment Review (STAR) panel for use in management. The 2017 surveys did not cover all habitat where sardines are located. We also are concerned that trawl survey data collection may have been compromised by the sheer volume of pyrosomes located in the survey area.

The 2017 sardine STAR Panel report noted, "...the results are generally robust to assuming that selectivity is a logistic function of length (but that implies that some age-1+ animals are not available to the ATM survey)." The STAR panel report acknowledged that assuming the acoustic survey 'sees' all the fish leads to lower biomass estimates. The STAR Panel report also stated: "The estimate of age 1+ biomass is less than the estimate of age 1+ biomass on 1 July 2016 from the 2016 stock assessment (106,137t). This is a consequence of the change in assessment methodology, in particular that selectivity for the ATM survey is assumed to be uniform for fish aged 1 and older (assuming that selectivity is logistic in model ALT increases the estimate of 1+ biomass from 86,586t to 153,020t)."

It is obvious to a majority of the CPSAS and fishermen that the survey selectivity is not uniform. The survey missed a large volume of fish. Yet Model ALT estimated a Q of 1.15 in the 2018 update assessment, despite the 2017 sardine STAR panel review statement that a Q of 1.1 was "unlikely, given some sardine are not available to the survey, owing to being inshore of the survey area."

For the 2019 Stock Assessment Update, the CPSAS requests the Council task the Stock Assessment Team to include a sensitivity analysis running Model ALT under the assumption that selectivity is logistic, as was done in 2017.

We request that the Council convene a workshop as soon as possible to address these unresolved issues:

- Research and data needs identified in both the 2017 sardine STAR panel review and 2018 ATM methods review regarding assessment methodology;
- Inflexibility in the Terms of Reference for Update stock assessments, and
- Current schedule that will not address these serious problems until the next STAR panel in 2020.

Consideration of current assumptions such as selectivity in ATM surveys should be analyzed along with other issues identified, as well as how to incorporate all available indices, for example the juvenile rockfish survey and nearshore surveys, into future stock assessments.

The CPSAS strongly encourages the use of multiple surveys, as each survey type has strengths and weaknesses. Other fishery-independent research, i.e. the juvenile rockfish survey, was informative in 2016 and should be utilized to provide information for future sardine stock assessments, as this could serve as another indicator of recruitment.

The CPSAS majority does not support the stock assessment team's recommendation to move to a single, survey-based assessment, nor to change the fishery start date back to January 1. We note that the fishery start date was changed only a few years ago because the stock assessment team indicated they did not have time to process and analyze data in time for a January 1 start date. Further, the assumed birthdate for sardine is July 1. If the start date reverted to January 1, the stock assessment team would still need to project biomass, so similar issues would exist.

Clearly the small sample size, inadequate biological composition data, and time invariant age-length key are causing serious problems in assessing the sardine (and anchovy) resource. Industry has offered to help collect data, and we hope this offer will be accepted so that such information will be incorporated into future stock assessments.

As we have noted in the past, industry supports and needs a sustainable resource. Current sardine stock assessment assumptions and harvest policies are precautionary. With support from the Council, Science Centers and States, we are encouraged that we can develop a truly collaborative research program for sardines and the CPS complex.

A majority of the CPSAS asks the Council to direct the management team to examine the feasibility of providing a live bait set aside should the sardine Biomass estimate fall below 50,000 mt. Under the current CPS-FMP (Sec 5.1.4), if the stock is declared overfished, the live bait fishery would be reduced to landing sardines incidentally, and not to exceed 15%. Current take of live bait is negligible. Due to the nature of their use, ninety (90%) of sardines harvested for live bait are returned to the ocean alive. Because of the low level of mortality, the fishery has a small impact on the resource. In fact, essentially all the fish serve an ecosystem function. The majority believes the practices of the live bait fleet, and vessels which rely upon them, poses no problems should the Biomass estimate fall below 50,000 mt. Directing the CPSMT to assess the impact of the live bait fishery on sardines when the population is low provides a scientific basis for sound management.

## **Management Measures**

The majority of the CPSAS recommends that the Council continue the management measures adopted in 2017, with the addition of 610 mt sardine in the annual catch limit (ACL) earmarked for exempted fishing permit research.

A minority of the CPSAS recommends setting incidental catch for Pacific sardine at a precautionary level that both protects the spawning stock while not unduly constraining other fisheries, including other CPS fisheries. Of an 8,000 mt ACL for the current season, less than 2,000 mt in sardine landings have been recorded so far, suggesting that the current ACL on its own is not having a constraining effect on other fisheries. Given that the July 2018 projected biomass for Pacific sardine is lower than the estimated biomass from the past three years, and the OFL and ABC for the coming season will necessarily be reduced from the 2017-2018 specifications, the Council could consider and adopt an ACL for 2018-2019 that is commensurately reduced from last year's ACL. A minority of the CPSAS suggests that a high level of precaution is appropriate in setting incidental catch, given Pacific sardine's continued low abundance and its essential role as forage in the California Current Ecosystem.

Finally, the CPSAS minority echoes the majority of the CPSAS's support for cooperative research to improve the capacity of acoustic surveys to survey inshore waters.

PFMC  
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