COASTAL PELAGIC SPECIES ADVISORY SUBPANEL REPORT ON THE 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 Dr. Peter Kuriyama, National Marine Fisheries Service (NMFS) Southwest Fisheries Science Center (SWFSC) on the *Catch-only Projection of the Pacific Sardine Resource in 2021.* (Agenda Item E.4, Attachment 1). The CPSAS also listened to the SSC's discussion, as several members expressed concerns with the results produced by the model's need to triple recruitment artificially to account for the high Mexican catch attributed to the northern sardine stock, which exceeded the total 2020 age 1+ biomass estimate. The catch-only biomass projection for the 2021 fishing year was forecast to be only 14,011 mt, a 50 percent reduction from 2020.

The SSC, as well as the CPSAS, recognize the challenges facing the Stock Assessment Team (STAT) caused by COVID-19, which curtailed National Oceanic and Atmospheric Administration (NOAA) surveys in 2020, forcing this catch-only projection. The STAT followed the Terms of Reference, and we thank them for their quality work. However, numerous serious concerns led the SSC to reject the catch-only projection as unrealistic. The SSC consensus was to revert back to the overfishing limit (OFL) set in 2020 and recommend a Tier 3 acceptable biological catch (ABC) to account for uncertainty. The SSC also discussed recommending a list of high priority research needs. Of key importance was the need to review the sardine habitat model and temperature assumptions related to stock structure and the apportionment of "northern" and "southern" sardines. We note 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)*." The CPSAS repeated that recommendation in our Supplemental CPSAS Report in April 2020 (Agenda Item D.3.a).

The CPSAS concurs with the SSC decision to reject the catch-only biomass estimate. In contrast to assumptions of low biomass and low recruitment, fishermen in California have testified to the abundance of sardines, particularly small sardines, in nearshore waters now. The California Department of Fish and Wildlife (CDFW) conducted an aerial survey in 2020. That survey was limited by restricted air space due to raging fires as well as fog in San Francisco and along the central coast, but it estimated a sardine biomass of close to 10,000 mt (in surface waters) in a small area (Agenda Item E.4.a, Supplemental CDFW Report 1, April 2021). The Department's spring survey in the Southern California Bight in 2021, flown just a week ago in conjunction with NOAA's spring acoustic trawl cruise and a nearshore acoustic survey mounted by California Wetfish Producers Association (CWPA), estimated more than 13,000 mt of sardine in the area from San Diego to San Pedro (Agenda Item E.4.a, Supplemental CDFW Report 3). CWPA's directed biological sampling exempted fishing permit (EFP) conducted in 2020 also produced new fishery age data, including a spike of age 0 sardines in Southern California. Most of the catches

were made in water temperatures under 62 degrees F, which categorize them as northern sardines according to the temperature model.

The CPSAS provides the following recommendations to address the problems identified:

- We ask the Council to support a full benchmark assessment and STAR Panel review in 2022, incorporating all 2021 survey data including the aerial survey, as well as the age data collected in the directed biological sampling EFP and all other available data.

- We recommend developing and utilizing multiple indices in future stock assessments. Relying on only one data source causes problems, as exemplified in 2020. We further note that the Acoustic Trawl Survey was characterized as a relative index during the 2018 Methods Review. The assessment should use all data sources available.

- The CPSAS supports the research recommendations identified by the SSC, including the use of multiple indices, evaluating the catchability (Q) of acoustic trawl surveys as well as reviewing the apportionment of northern vs. southern stock sardines and predicting recruitment (E_{msy}).

- We suggest conducting a workshop that includes fishermen's expertise to discuss and resolve all the problems identified.

The CPSAS also calls attention to the concerns related to sardine expressed in the Supplemental CPSAS Report on Executive Order 13921 (Agenda Item C.2.a, September 2020). Currently, a catch-22 exists for the sardine fishery: sardines found in water temperatures above 16.7 degrees C are assumed to be 'southern' sardines and are subtracted from the 'northern' stock assessment. But all catches, regardless of water temperature, are subtracted from 'northern' sardine catch limits set by the Council and NMFS. Fishermen believe these assumptions led to the northern sardine stock's 'overfished' declaration. The overfished declaration mandates a reduction in incidental catch allowance to a maximum of 20 percent in other fisheries. This has restricted catches in virtually all CPS fisheries, now including market squid (Agenda Item E.4.a, Supplemental CDFW Report 2). This restriction has caused serious socio-economic impacts on our fisheries and fishing communities.

Mexico continues to fish both the northern and southern subpopulation of sardines. Mexican scientists estimated the 1989-2018 average U.S. catch of the southern subpopulation at 12 percent of the Mexican total allowable catch (TAC). Twelve percent of the Mexican 2019 TAC is 16,871 mt. However, the U.S. does not recognize the Mexican stock assessment of the southern stock and does not have a comparable stock assessment for that stock. This is inequitable for U.S fishermen and processors, placing U.S. industry at a competitive disadvantage. In addition, while the northern subpopulation of sardine is declared overfished in the U.S., Mexico has not made a similar declaration for the northern subpopulation. The U.S. has curtailed its catch by closing the directed fishery and imposing restrictive incidental catch limits. Mexico has not implemented parallel conservation measures to rebuild the northern subpopulation.

We would appreciate the Council's review of our recommendations from September 2020 (Agenda Item C.2.a, Supplemental CPSAS Report 1), which were to, in essence, either assess and

manage all sardines found in U.S. waters as one fishery stock, as was done in the past, or if the two-stock assumption continues, then the Council should find an expeditious way to include the southern stock in the CPS Fishery Management Plan.

Management Measures:
The CPSAS supports the CPSMT's recommended management measures for the 2021 – 2022 Pacific sardine fishery, as follows:

Age 1+ Biomass	28,276 mt
OFL	5,525 mt
P* Buffer	0.4
Tier 3 ABC/ACL	3,329 mt
ACT	3,100 mt

- If directed landings in the live bait fishery attain 1,800 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.
- If the ACT of 3,100 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 Pacific Northwest and California are committed to improve the science, and we encourage and welcome increased collaboration with the SWFSC and state agencies to improve the accuracy of stock assessments.

A minority of the CPSAS agrees with the majority on the research and science recommendations above but differs from the majority of the CPSAS on the recommended management measures for 2021-2022. A minority (the Conservation Representative) notes that Pacific sardine are presently thought to be in a low-productivity state – in addition to being declared overfished as of July 2019 – and will remain below the Minimum Stock Size Threshold as of July 1, 2021. Further, concerns have been raised about the current basis for calculating E_{msy}. A minority of the CPSAS recommends the Council set a lower P-star to account for this scientific uncertainty, and an ACL lower than ABC to account for ecosystem considerations and other Optimum Yield factors. A minority also recommends that in order to help prevent a reduced ACL from being exceeded, the Council consider lowering the sardine incidental catch allowance in other CPS fisheries. Overall, these recommendations would allow the Council to take a more precautionary approach that is appropriate in light of the collapsed condition of the stock.

PFMC
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