

COASTAL PELAGIC SPECIES MANAGEMENT TEAM REPORT ON THE PACIFIC
SARDINE REBUILDING PLAN FISHERY MANAGEMENT PLAN AMENDMENT – FINAL
ACTION

As a result of a recent U.S. District Court order, the Pacific Fishery Management Council has scheduled an agenda item to consider changes to the rebuilding plan for the northern subpopulation of Pacific sardine (NSP). At this meeting the Council is scheduled to take final action for revising the rebuilding plan (i.e., a management approach) for the NSP stock. The Coastal Pelagic Species Management Team (CPSMT) reviewed and discussed a revised Pacific sardine rebuilding plan and Environmental Assessment (EA) ([Agenda Item J.2 Attachment 1](#), November 2024). This rebuilding plan presented alternatives based on the original Rebuilder modeling and analysis.

In this report, the CPSMT presents its recommendations for a preferred rebuilding management approach, including a target biomass and timeline. The CPSMT also provides guidance on amended language for a Fishery Management Plan (FMP) amendment that will be required to implement the Council’s choice for a rebuilding plan.

As in the 2020 analysis, the CPSMT considered several factors:

- Environmental conditions are key to stock rebuilding;
- Between the 2015-2016 and 2023-2024 fishing years, U.S. fishery catches averaged 472 metric tons (mt), or less than one percent of the NSP 1+ stock biomass. This was a result of a high proportion of the total catches being designated as southern subpopulation (SSP) (Pacific Sardine Rebuilding Analysis Based on the 2020 Stock Assessment, September 2020 [Agenda Item G.1.a, NMFS Report 1; Table 1](#));
- Rebuilder modeling does not fully capture environmental dynamics because it does not include data from high productivity time periods;
- The Rebuilder model isn’t capturing changes from the revised habitat model (e.g., Mexico isn’t catching the NSP and the NSP isn’t in southern California);
- Stock biomass projections several decades into the future are uncertain due to Pacific sardine being strongly affected by environmental conditions. Environmental conditions are proxied by two different (and overlapping) productivity time periods — both are shorter than the projection period;
- The Rebuilder analysis assumed that catch comprised only NSP, even though in recent years a high portion is estimated as SSP;
- Uncertainty in biological projections and the degree to which economic impacts are driven by biological projections, have implications on the evaluation of relative short- and long-term impacts;
- National Standards;
- Fishery impacts

The CPSMT did not strictly rely on the Rebuilder analysis to inform its deliberations. The recommendations and rationales presented below also consider Pacific sardine population dynamics, the fishery, and existing management measures.

MANAGEMENT APPROACHES

Six alternatives are fully described in the Council’s Revised Draft Pacific Sardine Rebuilding Plan ([Agenda Item J.2 Attachment 1](#), November 2024):

- Alternative 1 – No Action
- Alternative 2 – Zero Harvest Rate
- Alternative 3 – Five Percent Fixed U.S. Harvest Rate
- Alternative 4 – Constant Catch
- Alternative 5 – Modified Constant Catch
- Alternative 6 – Mixed Rate U.S. Harvest

Alternative 1 - No Action

The CPSMT does not recommend this alternative. According to the model results (Hill et al., 2020), under Alternative 1 Status Quo management, when the full ABC is taken, there is never a greater than 50% probability that the stock will rebuild to the selected rebuilding biomass target of 150,000 mt 1+ biomass within the modeled timeframe.

Alternative 2 - Zero Harvest Rate

The CPSMT does not recommend this alternative. By closing sardine fisheries such as the live bait and minor directed fisheries, and drastically curtailing or disallowing incidental catch, this alternative would cause severe economic hardship to CPS and non-CPS fisheries.

Alternative 3 – Five Percent Fixed U.S. Harvest Rate

The CPSMT does not recommend this alternative. This alternative may accommodate fishery needs depending on biomass and relative to average catches. However, at biomasses less than 45,000 mt, the ACLs (declining from 2,250 mt) under this alternative are less than recent average catches. Additional actions to reduce harvest across fisheries catching Pacific sardine would need to be taken, negatively affecting CPS and non-CPS fisheries.

Alternative 4 – Constant Catch

The CPSMT does not recommend this alternative. This alternative sets ACLs as the lesser of 2,200 mt or ABC. This alternative was modeled in 2020 to represent average catch levels from recent fishing years; however, setting an ACL at this level would set a maximum annual catch level, not an average catch level. An ACL at this level would have been less than annual catch levels reported from the 2018-2019 and 2020-2021 fishing years ([Agenda Item J.2, Supplemental Attachment 4, Table 4](#)), and thereby would have constrained total catch in the live bait, minor directed, and incidental CPS and non-CPS fisheries.

Alternative 5 – Modified Constant Catch

The CPSMT recommends that the Council choose a modified Alternative 5 (“Alternative 5-1”) as its preferred alternative to rebuild the NSP stock.

Alternative 5 was originally described in the Revised Draft Sardine Rebuilding Plan ([Agenda Item J.2, Attachment 1](#)) as setting an ACL at the lesser of 3,200 mt or the ABC, and was based on recent 2015-2016 to 2023-2024 sardine landings ([Agenda Item J.2 Attachment 1, Table 2](#)). The value of 3,200 mt was selected based on a buffer of approximately 300 mt above the highest seasonal landings from that time period (2,865 mt in 2020-2021). These landings data were found to have been incorrectly reported and have been revised in a subsequent report ([Agenda Item J.2 Supplemental Attachment 4](#)). The corrected data show the highest seasonal landings value of 2,498

mt in 2020-2021. The CPSMT modified Alternative 5 to correct this error, creating Alternative 5-1.

Alternative 5-1 would set the ACL at the lesser of 2,800 mt or the ABC. An ACL of 2,800 mt was again based on setting a buffer of 300 mt above the highest recent seasonal landing (corrected to 2,498 mt in 2020-2021). Under a closed directed fishery, this alternative would allow for current landing levels of sardine in live bait and incidental catch in CPS and non-CPS fisheries, while setting a catch limit to support rebuilding and long term viability of the stock. The CPSMT examined ABC and ACL values under this alternative at various biomass levels, for E_{msy} between 5% and 25%, and buffers at P-star of 0.40 and Sigma categories 1, 2 and 3. At the lowest biomass levels, the ABC will supersede the constant catch ACL, limiting allowable catch to levels below 2,800 mt. Alternative 5-1 provides sufficient catch limits at most biomass, E_{msy} , and buffer levels while reducing catch when the ABC value is lower (e.g., at low biomass and E_{msy} values).

Under Alternative 5, the Revised Draft Rebuilding Plan states that it is likely that the time to rebuild Pacific sardine with a greater than 50 percent probability to the rebuilding target of 150,000 mt 1+ biomass is within 17 years (i.e., T_{target}), or by 2038. As is the case for all of the proposed alternatives, the SSP makes up a large portion of the landings counted towards the ACL. According to the 2024 stock assessment, from the 2015-2016 fishing year through the 2023-2024 fishing year, NSP averaged approximately 23 percent (with a maximum of 32 percent) of catch counted towards the ACL, with the remaining 77 percent from the SSP (Kuriyama et al., 2024). Based on these data, even if a 2,800 mt ACL is fully attained, only approximately 644 mt of annual landings would be from the NSP. The buffer added to the highest recent catch to derive the 2,800 mt ACL is therefore conservative, as average NSP landings are expected to remain below the previously modeled 2,200 mt ACL under Alternative 4. Given that true landings of NSP would be less than 2,200 mt annually, it can reasonably be assumed that with a 2,800 mt ACL, the stock will still rebuild within 17 years (i.e., the modeled rebuilding time for Alternative 4), or by 2038.

Alternative 6 – Mixed Rate U.S. Harvest

The CPSMT is not recommending this alternative. This alternative sets ACLs as the lesser of 2,200 mt or ABC when the biomass is less than 50,000 mt, and at 5% of biomass when the biomass is greater than 50,000 mt. The ACLs in this alternative would have been less than annual catch levels reported from the 2020-2021 fishing year, and thereby would have constrained total catch in CPS and non-CPS fisheries. At biomass levels less than 50,000 mt, this alternative results in more restrictive catch limits than Alternative 5-1, until the ABC is lower than the ACL.

The CPSMT recognizes the CPSAS' interest in Alternative 6 as a rebuilding strategy that allows for ACLs to increase as biomass increases above a stock biomass of 50,000 mt. However, landings since 2011, even at higher biomass levels, have not exceeded levels that would be constrained by Alternative 5-1, thus the CPSMT does not think Alternative 6 would provide a tangible benefit to the fishing industry over Alternative 5-1.

MAGNUSON-STEVENSON ACT NATIONAL STANDARDS GUIDELINES

The CPSMT concurs with the analysis in Agenda Item J.2 Supplemental Attachment 3. In particular, National Standards 1, 5, and 8 are important for the Council to consider in selecting a final preferred alternative. The CPSMT's recommended final preferred alternative, Alternative 5-1, would support a higher net benefit to the Nation compared to Alternatives 2, 3, and 4, as consistent with National Standard 1. Consistent with National Standard 5, Alternative 5-1 would allow for current harvest levels with room for flexibility as opportunities for recreational fishing,

incidental encounters or markets dictate. Lastly, consistent with National Standard 8, Alternative 5-1 would likely adequately provide for sustained participation for the smaller sectors of the fishery, thus minimizing additional and unnecessary adverse economic impacts. Alternatives 2, 3 and 4 would impose additional and unnecessary socioeconomic impacts.

REBUILDING TIMELINES

Given the reasoning under Alternative 5-1 and the previous Rebuilder analysis, the CPSMT recommends that the Council choose $T_{\text{target}} = 17$ years.

REBUILDING STATUS REVIEW

The CPSMT notes that there is not a pre-specified process for assessing progress toward rebuilding, nor any Terms of Reference for rebuilding CPS. Although the CPSMT does not have a specific proposal on a process for that review at this time, the CPSMT would like to coordinate with the CPS Subcommittee of the Science and Statistical Committee on developing an appropriate review process for future reviews.

In conclusion, the CPSMT recommends:

Alternative 5-1 - Modified Constant Catch

- $ACL = 2,800$ mt; or $ACL = ABC$, whichever is less
- $T_{\text{target}} = 17$ years

FMP Language

The CPSMT recommended Alternative 5-1 results in the following changes to the CPS FMP Amendment XX ([Agenda Item J.2 Supplemental REVISED Attachment 2](#)):

4.5.1 Rebuilding Plan for Pacific Sardine

$T_{\text{target}} = 17$ years

The ACL will be set annually to the lesser of 2,800 mt or the ABC.

References

Hill, K. T., Kuriyama, P. T., & Crone, P. R. (2020). Pacific sardine rebuilding analysis. PFMC September 2020 Briefing Book Agenda Item G.1.a. Portland, Oregon: Pacific Fishery Management Council.

Kuriyama, P. T., Akselrud, C. A., Zwolinski, J. P., & Hill, K. T. (2024). Assessment of the Pacific sardine resource in 2024 for U.S. management in 2024-2025. PFMC April 2024 Briefing Book Agenda Item I.3 Attachment 1. Portland, Oregon: Pacific Fishery Management Council.

PFMC
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