

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

The Coastal Pelagic Species Management Team (CPSMT) reviewed the 2022 Pacific sardine update assessment ([Agenda Item H.4, Attachment 1, April 2023](#)), and newly available scientific information for the northern subpopulation of Pacific sardine considered by the Scientific and Statistical Committee (SSC) for recommending an overfishing limit (OFL) and corresponding acceptable biological catch (ABC) values for 2023-2024 harvest specifications. The new information included results from the summer 2021 and draft results from the summer 2022 Southwest Fisheries Science Center (SWFSC) acoustic-trawl surveys. Additional new information considered by the SSC included outcomes from the 2022 Sardine Stock Structure Workshop, and updated information on the CalCOFI temperature index utilized to determine the E_{MSY} for this stock. The CPSMT also reviewed the SSC report with its recommendations for harvest specifications ([Agenda Item H.4.a, Supplemental SSC Report 1](#)).

The SSC recommended an OFL for the 2023-2024 fishing season based on the 2022 update assessment. The age 1+ biomass estimate used in 2022 to calculate that OFL was 27,369 mt. The summer 2022 survey draft estimate for the total biomass of the northern stock of Pacific sardine was 69,506 mt ([Stierhoff et al. 2023](#)). The stock likely remains below the CUTOFF value of 150,000 mt of age 1+ biomass, and therefore the CPS Fishery Management Plan (FMP) dictates that the primary directed fishery be closed for 2023-2024 fishing year. This does not prohibit allowing exempted fishing permits (EFP), incidental catch, minor directed catch, or catch from live bait, recreational, and tribal fisheries.

Table 1 below presents the OFL and the range of ABC values based on various P^* values provided by the SSC ([Agenda Item H.4.a, Supplemental SSC Report 2, April 2023](#)). The CPSMT recommends a P^* value of 0.40 for use in setting harvest specifications, which produces an ABC of 3,953 mt for the 2023-2024 fishing year, setting the annual catch limit (ACL) equal to ABC, and an annual catch target (ACT) of 3,600 mt for the 2023-2024 fishing year (Table 2). This will afford opportunity to CPS fisheries and accommodate the proposed EFPs requesting a total of 670 mt, while avoiding restricting non-CPS fisheries that may incidentally harvest sardine, since achieving the ACL could result in the prohibition of take in all fisheries. The CPSMT recommends the Council adopt the EFPs in the full amounts requested. The CPSMT also recommends the accountability measures listed below to prevent exceeding the ACL. The CPSMT notes that all sources of catch including any EFP research set-asides, the live bait fishery, and other minimal sources of harvest, such as incidental catch in CPS and non-CPS fisheries, and minor directed fishing, will be accounted for against the ACL. These recommended harvest specifications align with the recently adopted rebuilding plan for Pacific sardine. Table 3 below summarizes the levels of sardine catch in CPS and non-CPS fisheries for the most recent fishing seasons and shows that recent catch in the U.S. has remained below the ACL.

Future Research, Management, and Assessment Recommendations

The CPSMT maintains the position that there is a need for research to address gaps in information that could improve management of the Pacific sardine stock ([Agenda Item E.4, CPSMT Report 1, April 2021](#)).

Following the stock structure workshop, the CPSMT recommends reevaluating E_{MSY} as a near-term priority to help resolve uncertainties associated with the productivity of this stock. The CPSMT notes that this stock has been largely present in waters north of Cape Mendocino since 2014 when the CalCOFI temperature index was first applied, and that the resulting E_{MSY} is based on temperatures in waters that the stock is not utilizing. The CPSMT recognizes substantial regional differences among the northern, central, and southern portions of the California Current Ecosystem (CCE), as noted in the 2022-2023 CCE Status Report ([Agenda Item H.1.a, CCIEA Team Report 1, March 2023](#)). The CPSMT also suggests consideration of methods to determine if E_{MSY} would benefit from a mechanistic understanding of stock productivity given that correlation relationships used for fishery management purposes, like sea surface temperature for sardine, tend to break down as new data are added over time.

The SSC identified issues with the DISTRIBUTION term as well, noting that much of the catch in California is attributed to the southern stock of Pacific sardine. This can be seen by comparing Table 3 in this report to Table 5 in the 2022 Pacific sardine update assessment ([Agenda Item H.4, Attachment 1, April 2023](#)), even before the habitat model was updated. Given the new archetypes being utilized as part of the operational definition of the northern and southern stocks of Pacific sardine ([Agenda Item H.1.a, Supplemental REVISED NMFS Report 1, April 2023](#)), the CPSMT agrees with the SSC that E_{MSY} be reexamined, and recommends that the SSC CPS Subcommittee conduct a workshop after the 2024 Pacific sardine assessment to revisit all the analyses and assumptions that have been used to inform the Pacific sardine harvest control rule.

Table 1. Pacific sardine harvest formulas for 2023-2024 based on the Scientific and Statistical Committee recommended OFL and corresponding ABC values based on a year 2 buffer for a category 2 assessment.

2023-2024 OFL		5,506 mt				
		Category 2 (baseline $\sigma = 1.0$)				
	P*	0.45	0.4	0.35	0.3	0.25
<i>Year 1 buffer</i>		<i>11.8%</i>	<i>22.4%</i>	<i>32.0%</i>	<i>40.8%</i>	<i>49.1%</i>
Year 2 buffer		15.2%	28.2%	39.6%	49.7%	58.7%
2023-2024 ABC (mt)		4,669	3,953	3,326	2,770	2,274

Table 2. 2023-2024 Scientific and Statistical Committee recommended OFL, CPSMT-recommended P* Buffer, ABC, ACL, and ACT.

OFL	5,506 mt
P* Buffer	0.40
ABC _{Tier 2}	3,953 mt
ACL	3,953 mt
ACT	3,600 mt

List of CPSMT-Recommended Accountability Measures

1. Incidental landing limit in CPS fisheries of 20 percent.
2. If landings in the live bait fishery attain 2,500 mt, a per landing limit of one mt of Pacific sardine per trip will apply to the live bait fishery.
3. If the ACT of 3,600 mt is attained, a per trip limit of one mt of Pacific sardine applies to all CPS fisheries.
4. An incidental per landing allowance of two mt of Pacific sardine in non-CPS fisheries until the ACL is reached.

Table 3. Pacific sardine landings (mt) by fishery and harvest specifications for previous sardine fishing seasons (July 1-June 30).

Fishing Season	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023⁶
CPS Incidental¹	517	275	272	249	131	186	161
Non-CPS Incidental²	1	14	14	5	1	30	15
EFP³	-	-	470	728	976	327	146
Live Bait⁴	1,614	1,894	1,694	1,008	1,308	1,192	866
Tribal	85	0	0	0	0	0	0
Minor Directed⁵	N/A	10	57	70	82	34	39
Total	2,217	2,192	2,507	2,060	2,498	1,769	1,227
ACT	n/a	n/a	n/a	4,000	4,000	3,000	3,800
ACL	8,000	8,000	7,000	4,514	4,288	3,329	4,274

¹Incidental Pacific sardine limited to 40% landed weight in CPS fisheries and was reduced to 20% incidental starting in the 2019-2020 season

²Non-CPS incidental includes at-sea Pacific whiting total mortality from PacFIN

³Exempted Fishing Permit (EFP) take ([PFMC April 2018](#), [PFMC April 2019](#), [PFMC November 2020](#), [PFMC April 2021](#), [PFMC April 2022](#), [PFMC April 2023](#))

⁴Based on voluntary logbook submissions through 2018 and based on electronic fish tickets since 2019.

⁵Minor directed fishery allowed under CPS FMP Amendment 16 beginning March 2018

⁶2022-2023 data as of April 3, 2023 and subject to change