



## AGENDA ITEM SUMMARY

### BACKGROUND

This agenda item presents two issues for consideration: 1) adoption of updated federal harvest specifications and management measures for the Pacific sardine fishery for July 2022 through June 2023; and 2) a revision to Oregon Administrative Rule (OAR) regarding fishing gear for squid to align rules for purse seine net fishing gear allowed in the market squid fishery with practical net construction considerations.

State rules governing fisheries for Coastal Pelagic Species (CPS), including Pacific sardine, Pacific mackerel, jack mackerel, northern anchovy, market squid, and krill, are based on federal regulations. These measures continue a closure of the directed sardine fishery due to the depressed stock status, while providing for very low harvest allowances in other fishing sectors across the West Coast. The Oregon Fish and Wildlife Commission (Commission) usually adopts these federal rules by reference.

#### **Pacific Sardine Management Measures**

The Pacific sardine stock status is assessed annually by the National Marine Fisheries Service (NMFS). The Pacific Fishery Management Council (Council) reviews the assessment and the best available science as recommended by the Council's Scientific and Statistical Committee (SSC), the harvest specifications framework and harvest control rule specified in the Council's fishery management plan (FMP), advice from technical and industry advisors, and public input when determining federal harvest limits and management measures. ODFW participates via a voting seat on the Council and as representatives on its CPS Management Team and SSC.

The Council adopted sardine harvest specifications and management measures for the 2022-23 season in April 2022 (Attachment 5). The FMP and harvest specifications framework recognize the forage value of sardines and account for uncertainty in assessment of the stock and management/monitoring of the fishery. The specifications adopted for 2022-23 use a buffer for uncertainty in the biomass estimate, resulting in conservative catch limits while also accounting for socio-economic needs of the fishing industry and the public. The Council transmitted its recommendations to the National Marine Fisheries Service (NMFS), which will publish them in the Federal Register prior to July 1.

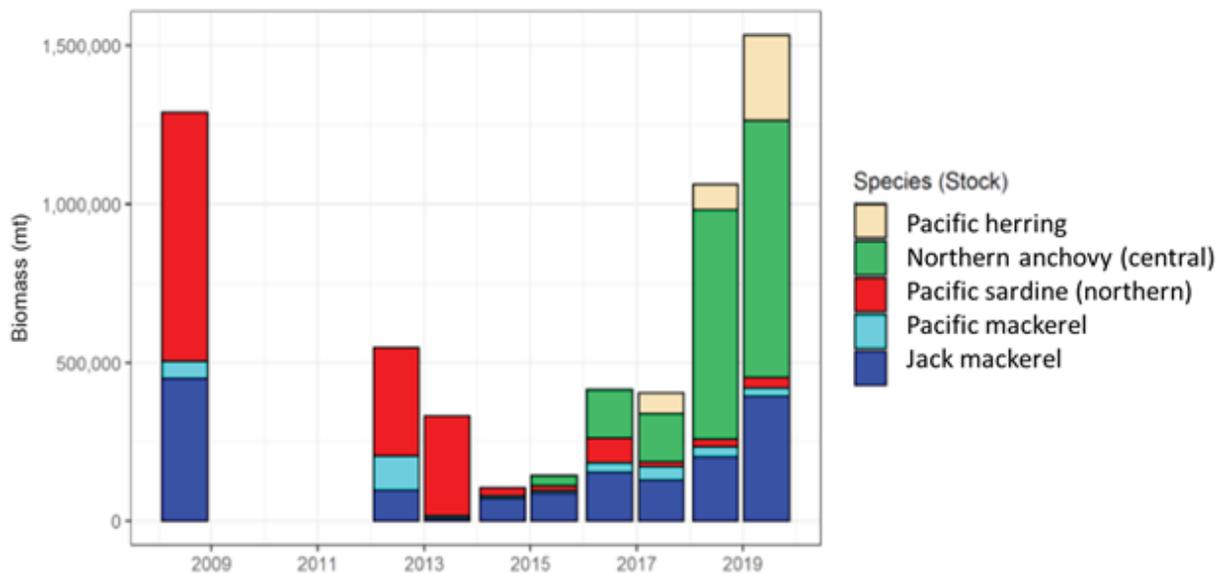
#### *Pacific Sardine Biology and Ecosystem Role*

Pacific sardines (*Sardinops sagax*) are small schooling fish. When their abundance is high, they can be found from the tip of Baja California to southeastern Alaska, with the bulk of the population off central and southern California. Fisheries in waters off Oregon encounter sardines in only a small portion of this range.

Pacific sardines commonly live for about six years, although they can reach 14 years. Most sardines landed in fisheries are three to six years old. Most adults measure 12 inches long or less, but sardines up to 16 inches long have been found. Pacific sardines reproduce beginning at age one or two and spawn multiple times per season. Spawning occurs in schools in the upper 50 meters of the water column; eggs are fertilized externally and hatch in about three days.

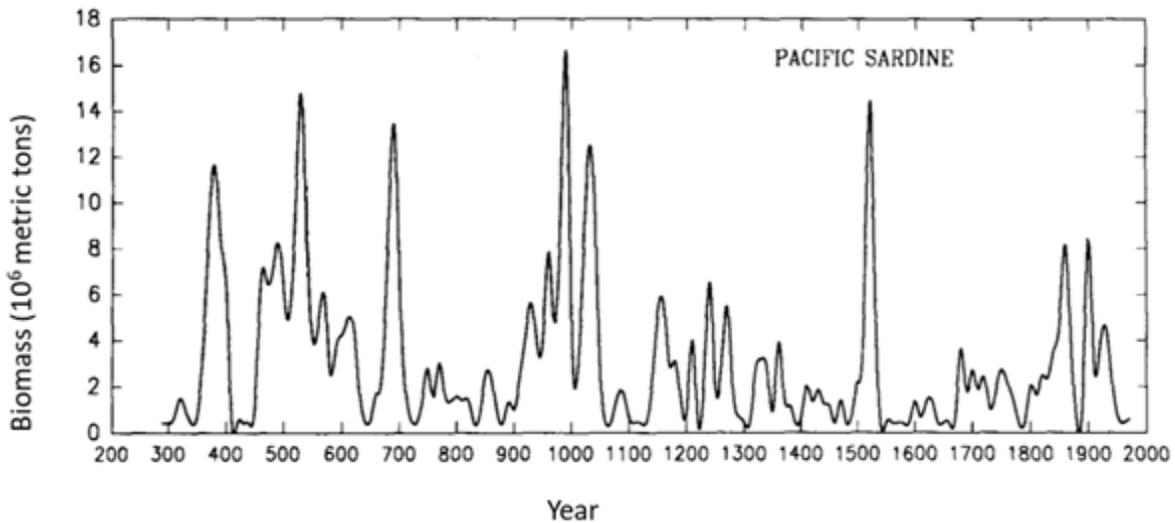
Pacific sardines feed on plankton. They are prey for many other fish, marine mammals, and seabirds, and are an important component of the forage base in the California Current Ecosystem (CCE). At times of high abundance, Pacific sardine can compose a substantial portion of biomass in the CCE. The CCE forage base consists of many species of fish and invertebrates, and the composition shifts on various time scales, likely related to environmental influences on the abundance of each of these species.

The estimated biomass of CPS finfish stocks in the CCE between 2008 and 2019 is illustrated in Figure 1. The predominant stock most recently has been northern anchovy (central subpopulation).



**Figure 1.** Cumulative biomass (mt) of the five most abundant CPS stocks in the CCE, 2008 and 2012-2019 (surveys not conducted in 2009-2011 or 2020 and results from the 2021 survey have not yet been published.). Biomasses of northern anchovy prior to 2015 and Pacific herring prior to 2017 not reported. Figure reproduced from [NOAA Technical Memorandum NMFS-NWFSC-160, October 2020](#).

Sardine population size is primarily driven by environmental conditions and varies naturally. Periods of low recruitment can lead to low population abundance over extended periods. An analysis of fish scale deposits in deep ocean sediments off southern California found layers of sardine and anchovy scales, with scale deposition rates indicating a series of major population spikes and declines over a 1700-year period (A.D. 270 to 1970). This illustrates the cyclical boom and bust nature of sardines and anchovies. Biomass estimates of Pacific sardine between Baja California, Mexico and Monterey, California from this study are shown in Figure 2.



**Figure 2.** 1700-year hindcast series of Pacific sardine biomass off California and Baja California ([Baumgartener, 1992](#)).

Fluctuating oceanographic conditions can have significant effects on the abundance and distribution of CPS stocks. The El Niño/Southern Oscillation (ENSO) and the Pacific Decadal Oscillation (PDO) are important climate drivers, and alterations in their patterns of temperature, upwelling, and other oceanographic features impact CPS stocks directly and indirectly. Based on past data, sardines appear to become abundant during warm PDO periods, and anchovy during cool PDO periods. However, the mechanisms involved are uncertain, and whether the past correlations will persist into the future, with changing ocean conditions, is uncertain.

The Council adopted a [Fishery Ecosystem Plan](#) (FEP) in 2013 to enhance species-specific management with more ecosystem science, broader ecosystem considerations, and policies that coordinate management across the Council’s FMPs and the CCE. One outcome of the FEP is an annual report by NMFS’ California Current Integrated Ecosystem Assessment (CCIEA) program, which provides biophysical and socioeconomic information on climate conditions, climate change, habitat conditions, and ecosystem interactions. The [March 2022 CCIEA report](#) suggests average or above-average productivity in the CCE compared to recent prior years, with signs of a healthy forage base, noting:

1. Oceanographic signals show neutral conditions in the Niño Index with an outlook for continued La Niña conditions into the summer of 2022 and a continued trend toward negative PDO. These conditions are generally associated with higher productivity in the CCE.
2. Foraging conditions appear to be above average, based on measures of the zooplankton community including a high abundance of nutritious northern copepods off Oregon, continued high abundance of anchovies and production of offspring at seabird and sea lion colonies.

The [ENSO diagnostic discussion website](#) updated April 14, 2022 indicates La Niña conditions are favored to continue through at least the summer and possibly into the fall.

## Market Squid Fishing Gear

At its February meeting the Commission adopted rules for purse seine gear used in the market squid fishery. That rule language does not accurately describe the purse rings and bridles and does not reflect the way that nets are constructed. Staff consulted with a net manufacturer, the Market Squid Advisory Panel (MSAP), and enforcement personnel on how to improve rule clarity. Based on this input, staff propose minor revisions to the rule text that remain consistent with the intent of the Commission while considering practical net construction.

## PUBLIC INVOLVEMENT

### Pacific Sardine Management Measures

A significant public process was conducted by the Council in the development of the federal harvest regulations for commercial fisheries for Pacific sardine in 2022-2023. Comments were provided to the Council by individuals and groups representing commercial and recreational fisheries and conservation organizations. In addition, the Council received input from its Coastal Pelagic Species Advisory Subpanel (CPSAS), which represents the commercial and recreational fishing industry, tribes, the public, and conservation interests.

### Market Squid Fishing Gear

Staff consulted the MSAP, which is composed of members of the public involved in the market squid fishery, and a net manufacturer regarding rule changes to purse seine fishing gear for market squid.

## ISSUE 1

Harvest Specifications and Management Measures for Commercial Sardine Fisheries in 2022-2023

## ANALYSIS

This section provides information on Pacific sardine fisheries, the federal management process, and the federal harvest specifications and management measures for July 2022-June 2023 which staff recommend adopting by reference.

### *Pacific Sardine Fisheries – Harvest History*

The Council produces an annual [CPS Stock Assessment and Fishery Evaluation](#) (SAFE) document which contains a detailed history of sardine fishing on the west coast, from which the information here is excerpted/summarized:

In the 1930s and 1940s, Pacific sardine supported the largest commercial fishery in the western hemisphere, accounting for nearly 25 percent of all the fish landed in the United States by weight. Peaking in 1936-37, landings from the west coast plus British Columbia reached a record 717,896 metric tons (mt). In the 1940s, the sardine fleet consisted of 376 vessels and more than 100 canneries and reduction plants, which employed thousands from San Francisco to San Diego, California. The fishery declined and collapsed in the late 1940s following extremely high catches and changes in environmental conditions and remained at low levels for nearly 40 years.

Sardines began to return to abundance in the late 1970s, when the PDO shifted to a warm cycle again. Fishery managers adopted a highly precautionary management approach as sardine fishing began again. The sardine resource grew substantially in the 1980s and early 1990s, with strong recruitment. In 1998, biomass was slightly more than 1 million mt. The sardine recovery appeared to level off during 1999-2002.

In 2007, California landings were the highest since the 1960's, at nearly 81,000 mt of the 152,564 mt harvest guideline (HG). The HG generally declined from 2008 through 2015, except for 2012. There was further evidence of a natural sardine decline in 2013 as they disappeared from Canadian waters.

The directed sardine fishery on the west coast, including Oregon, was closed beginning July 1, 2015, when the biomass estimate dropped below the 150,000 metric ton threshold specified in the CPS Fishery Management Plan (FMP), which will be described in more detail below. While directed sardine harvest has been closed, small sardine landings have been allowed in CPS fisheries targeting other species such as anchovy and mackerel, as well as in non-CPS sectors, to enable continued operation of those fisheries while protecting the sardine resource. Coastwide sardine landings in these fisheries since the closure have totaled approximately 1-2% of the historical peak (Table 1), and landings in Oregon are a very small fraction of this coastwide total.

To control and monitor fishing effort and catch, federal limited entry permits for all CPS finfish were required in the area south of approximately Point Arena in north-central California beginning in 2000. In 2002, the Council established a total fishing capacity goal, and methods for monitoring effort, to ensure fishing capacity is in balance with resource availability. Currently, there are 65 federal limited entry permits for CPS finfish.

In Oregon, the fishery was managed by ODFW as a developmental fishery beginning in 1999 when targeting of sardine in Oregon resumed. In 2005, the Commission created a limited entry permit system in response to industry request, with 20 state-issued permits available to qualifying participants. The Commission amended the eligibility criteria in August 2006, which resulted in an addition of six permits, for a total of 26 Oregon sardine fishery permits. There are currently 24 permits issued, as two were not renewed. If the number of permits drops below 24, a lottery may be held, up to a maximum of 26 permits.

### *Pacific Sardine Stock Assessments, Fishery Research, and Harvest*

Since Pacific sardine are a federally managed species, the NMFS's Southwest Fisheries Science Center (SWFSC) is primarily responsible for conducting the science and stock assessments necessary for management. The California Department of Fish and Wildlife, the Scripps Institute of Oceanography, and the CPS fishing industry are also involved with scientific data collection. Efforts are underway to address priority research and data needs, such as supplementing federal surveys to improve stock assessments and biomass estimates, an improved understanding of stock structure, and exploring how environmental covariates (such as sea surface temperature) influence abundance and productivity.

Pacific sardine abundance remained low following the June 2015 directed fishery closure. The 2019 stock assessment indicated that biomass had dropped below the overfished threshold of 50,000 mt defined in the CPS FMP, and NMFS declared the northern subpopulation of Pacific sardine overfished, but not subject to overfishing (see Appendix 1 for definition of these terms under the federal Magnuson Stevens Fishery Conservation and Management Act, MSA). In September 2020, the Council adopted a rebuilding plan that maintains the existing management framework for the Pacific sardine fishery, as this framework already includes measures to

minimize fishing mortality when the stock is at low biomass levels. This includes closing the primary directed fishery when biomass is lower than 150,000 mt (three times the overfished threshold) and limiting incidental landings of Pacific sardine in other CPS fisheries when the stock is considered overfished.

The closure of the primary directed fishery since 2015 drastically reduced catch of Pacific sardine and has kept harvest at very low levels since that time. Fishing mortality since the closure (of which Oregon catch has accounted for less than one percent, as shown in Table 1) is not considered to be the primary constraining factor on rebuilding the Pacific sardine stock.

**Table 1.** Pacific sardine mortality estimate (metric tons) by fishery sector, and key harvest specifications, for sardine fishing seasons (July 1-June 30 annually) since the coastwide directed fishery closure began in July 2015. Coastwide total landings for each category are shown as well as Oregon landings (in parentheses).

<b>Fishing Season</b>	<b>2015-2016</b>	<b>2016-2017</b>	<b>2017-2018</b>	<b>2018-2019</b>	<b>2019-2020</b>	<b>2020-2021</b>	<b>2021-Mar 2022<sup>6</sup></b>
<b>CPS Incidental<sup>1</sup></b>	165 (0.07)	517 (2.5)	275 (0)	272 (0.04)	249 (0.06)	131 (0.05)	159 (0.19)
<b>Non-CPS Incidental<sup>2</sup></b>	1	1	14	14	5	1	30
<b>EFP<sup>3</sup></b>	-	-	-	470	728	976	139
<b>Live Bait<sup>4</sup></b>	2,097 (0.6)	1,614 (0.05)	1,894 (0)	1,694 (0)	1,008 (0)	1,308 (0)	878 (0)
<b>Tribal</b>	66 (0)	85 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
<b>Minor Directed<sup>5</sup></b>	N/A	N/A	10 (2.8)	57 8.1)	70 5.2)	82 (2.9)	12.45 (0.5)
<b>Total</b>	2,329	2,217	2,192	2,507	2,060	2,498	1,219
<b>ACT</b>	n/a	n/a	n/a	n/a	4,000	4,000	3,000
<b>ACL</b>	7,000	8,000	8,000	7,000	4,514	4,288	3,329

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

<sup>2</sup>Non-CPS incidental includes at-sea whiting total mortality from WCGOP and landings from PacFIN that are coastwide and can not be broken down to the state level.

<sup>3</sup>Exempted Fishing Permit (EFP) take ([PFMC April 2018](#), [PFMC April 2019](#), [PFMC November 2020](#), [PFMC November 2021](#))

<sup>4</sup>Based on voluntary logbook submission through 2018 and based on electronic fish tickets since 2019.

<sup>5</sup>Minor directed fishery allowed under CPS-FMP Amendment 16 beginning March 2018

<sup>6</sup>2021-2022 data as of March 31, 2022 and subject to change.

## *Pacific Sardine Federal Harvest Quota Determination*

NMFS manages the Pacific sardine fishery in the U.S. exclusive economic zone off the Pacific coast (California, Oregon, and Washington) in accordance with the CPS FMP, requirements of the Magnuson-Stevens Fishery Conservation and Management Act, and recommendations by the Council. The primary focus of federal management of CPS stocks is on biomass because of the importance of these stocks as forage in the ecosystem.

The CPS FMP contains an annual harvest specification framework and harvest control rules for sardine and other CPS fisheries. Biological reference points and formulas used in the framework and control rules to describe stock status and calculate catch limits are described in Appendix 2

Each year, the SWFSC presents the stock assessment and biomass estimate to the Council and its advisory bodies during public meetings. The Council’s CPS Management Team, CPS Advisory Subpanel, and SSC review the assessment and the status of the fishery and recommend annual catch limits (ACLs) and management measures to the Council. SSC review and endorsement of the stock assessment and biomass estimate as best available science is a critical step in the decision-making process, and the SSC’s characterization of the scientific uncertainty related to the biomass estimate is an essential component of determining how large a buffer is applied to the ABC. Following review and public comment, the Council adopts a biomass estimate, harvest specifications, and management measures.

### *2022-2023 Pacific Sardine Biomass Estimate and Fishery Regulations*

An update stock assessment was conducted in 2022. The Council accepted the SSC’s recommendation and adopted the Pacific sardine biomass estimate of 27,369 mt as the best scientific information available.

Based on this biomass estimate, harvest control rules in the CPS FMP, and the uncertainty and risk tolerance buffer, the Council adopted the following harvest specifications and management measures for 2022-2023, **which staff recommend the Commission adopt by reference to federal rules:**

- **Overfishing Level (OFL)** = **5,506 mt**
- **Allowable Biological Catch (ABC)** = **4,274 mt**
- **Annual Catch Limit (ACL)** = **ABC**
- **Harvest Guideline (HG)** = **zero\*\***
- **Annual Catch Target (ACT)** = **3,800 mt\*\*\***

\*\* “Zero HG” means no commercial Pacific sardine catch except as part of the live bait, tribal, or minor directed fisheries, incidental catch in other fisheries, or under an exempted fishing permit (i.e., no catch allowed in the primary nontribal directed sardine fishery)

\*\*\* “Annual Catch Target”, set at 69% of the OFL and 89% of the ABC/ACL for 2022-23, triggers further restrictions on fisheries (see below) when coastwide sardine catch reaches this level, providing an additional conservative buffer

- 1. A 20-percent incidental per landing by weight catch allowance applies to fisheries directed at other CPS.**
- 2. If landings in coastwide live bait fisheries reach 2,500 mt, then a 1-mt per trip limit of sardine would apply to the live bait fishery.**
- 3. If the ACT of 3,800 mt (25% lower than last year) is attained, then a 1-mt per trip limit of sardine would apply to all CPS fisheries regardless of target species.**
- 4. An incidental per-landing allowance of 2 mt of sardine applies to fisheries for non-CPS species.**

All sources of sardine catch will be accounted for against the ACT and ACL.

### *Expected Impact of Proposed Regulations*

As noted in the subsection on stock status, current coastwide fishing mortality is not considered to be the primary constraining factor in rebuilding Pacific sardine; Oregon catch has accounted for less than one percent of the recent fishery mortality. The federal regulations will maintain the primary directed fishery closure and continue to limit other harvest to very low levels to ensure that fishing mortality is not interfering with the stock's potential to rebuild when environmental conditions become favorable.

In Oregon, the federal management measures will maintain protections for the sardine stock. The management measures are not expected to significantly constrain existing fishing activities beyond continuing the directed sardine closure for a seventh year. Commercial fishing for other CPS in waters off Oregon in recent years has primarily targeted market squid and northern anchovy (anchovy primarily in 2016), and vessels fishing for these species have maintained incidental Pacific sardine catch well below the 20 percent per landing limit.

## **OPTIONS**

Option 1. Adopt federal regulations, by reference, for Coastal Pelagic Species fisheries as shown in Attachment 3.

Option 2. Adopt other/additional measures.

## **ISSUE 2**

Purse Seine Fishing Gear for Market Squid Fishery

## **ANALYSIS**

In February 2022, the Commission adopted rules related to purse seine gear for use in the market squid fishery in Oregon. One of the purposes of the rule was to help minimize bycatch of benthic organisms, disturbance of market squid egg cases already deposited on the bottom sediments, disturbance of crab pots, and disturbance of benthic habitat. The language specific to the placement of rings and bridles to purse the nets did not align well with practical net construction considerations and nets that had already been modified to meet the intention of the rule adopted by the Commission.

In consultation with industry representatives on the MSAP, net makers, and Oregon State Police, staff are proposing minor modifications to the text of that rule. The modifications will better align with practical net construction practices and add clarity for enforcement of the rule.

## **OPTIONS**

Option 1. Adopt revised OAR with modifications as shown in Attachment 4.

Option 2. Adopt other/additional measures.

## STAFF RECOMMENDATION

Issue 1, Option 1. Adopt federal regulations, by reference, for Coastal Pelagic Species fisheries as shown in Attachment 3.

Issue 2, Option 1. Adopt revised OAR with modifications as shown in Attachment 4.

## DRAFT MOTIONS

### **Pacific Sardine Management Measures**

I move to adopt the staff recommendations for the 2022-23 coastal pelagic species fisheries as shown in Attachment 3.

EFFECTIVE DATE: Upon filing

### **Market Squid Fishing Gear**

I move to adopt the staff recommendations for market squid purse seine gear as shown in Attachment 4.

EFFECTIVE DATE: June 17, 2022