

# CALIFORNIA WETFISH PRODUCERS ASSOCIATION

PO Box 1951 • Buellton, CA 93427 • Office: (805) 693-5430 • Mobile: (805) 350-3231 • Fax: (805) 686-9312 • www.californiawetfish.org

October 4, 2022

Mr. Brad Pettinger, Chair And Members of the Pacific Fishery Management Council

LETTER OF INTENT TO REQUEST RENEWAL OF EXEMPTED FISHERY PERMIT (EFP) TO ALLOW COLLECTION OF PACIFIC SARDINE BIOLOGICAL SAMPLES IN 2024-25

Dear Chair Pettinger and Council Members,

On behalf of California Wetfish Producers Association (CWPA), I am submitting this request for renewal of the Exempted Fishing Permit (EFP) authorizing sardine fishing to collect biological samples, enabling us to continue the field work begun in May 2020. The proposed EFP is the continuation of a time series of fishery dependent data for use in stock assessments. The Council recommended and NMFS approved similar EFPs from 2020-2021 to 2023-24.

The EFP is necessary to allow the directed harvest of sardines to collect biological/age data representative of fishery dependent data unavailable because of the directed sardine fishery closure. To provide data that are most reflective of typical fishery dependent data streams, we collect EFP sets from two areas: Southern California fishing areas around Los Angeles and more northern areas around Monterey-Central Coast. In our current 2023-24 biological sampling EFP, we succeeded in landing 6 sets to date (July 1, 2023 to September 25, 2023):

Southern California - 37.22 mt in 3 sets on 4 trips Central California - 71.62 mt in 3 sets on 4 trips.

All three sets in Southern California were taken in waters above 16.7°C sea surface temperature (SST) and would likely be classified as southern subpopulation Pacific sardine. All three sets in Central California were collected from waters below 16.7°C SST and would likely be classified as northern subpopulation Pacific sardine. In past years' EFPs we avoided setting in temperatures above the SST threshold for separating the two subpopulations. Since the current year's EFP is being used secondarily for research under a Saltonstall-Kennedy (SK) grant, examining the nearshore stock structure of sardine in the northern and southern subpopulations, no such limit has been applied. To support that research, efforts are being made to collect a sample each month from each area. Vessel availability has and may limit the EFP catches in Central California during winter months, when Monterey EFP vessels transit south to fish for squid, along with the majority of the Monterey CPS fleet. At times multiple trips may be scheduled in a month to compensate for these circumstances. Tables showing the catch under EFPs to date follow this letter. To date 108.8 mt of sardines have been landed. leaving 411.2 mt for the remainder of the current EFP, effective through June 30, 2024. We intend to schedule biological sampling sets in both Southern California and Monterey-Central Coast, to the degree possible, for the remainder of the 2023-24 EFP.



For the 2024-25 period, the EFP will follow its original framework shown in Table 2. As noted above, EFP vessel availability complicates adherence to the proposed framework, but when possible that framework will be followed. All landings under the EFP will be sampled by the California Department of Fish and Wildlife (CDFW) to produce biological data, including age, for potential use in the stock assessment model and, when possible, to corroborate aerial survey estimates. Samples may also be used to test the current temperature assumptions related to stock structure. The Sardine STAR Panel also recommended increasing sampling of CPS identified in aerial surveys and the STAT suggested augmenting both aerial and acoustic samples. To accomplish this, the framework increases the sampling frequency during the months of March-April in S.CA. and August-September in Monterey, to be timed in conjunction with the aerial survey and summer AT survey to the degree possible.

Our initial 2020 EFP was motivated by the need to maintain a consistent time series of fishery dependent data for sardine stock assessments. The 2020 sardine Stock Assessment Review (STAR) Panel review noted that the model used to estimate sardine abundance had lacked fishery dependent biological and age data from 2015 forward due to the closure of the directed sardine fishery. Establishing a data collection that mimics a small, directed sardine fishery fills this void by providing fishery dependent data for use by the Stock Assessment Team (STAT) in its assessments. The EFP's original structure and protocols were developed in coordination with the Southwest Fisheries Science Center's (SWFSC) lead sardine stock assessment scientist and the CDFW to use a systematic framework for collection of sardines that mirror directed fishery landings for the purpose of biological sampling, including age, in both Southern California and the Monterey-Central Coast throughout the usual fishing year.

Responding to a question from the CPS Management Team regarding the value of these data, senior assessment scientist Dr. Kevin Hill affirmed the continuing importance of maintaining a time series of fishery dependent age data while the sardine fishery remains closed, stating, "Biological samples from EFP fishing permits (directed loads), as well as the live bait fishery, are essential to assessing the sardine population." (Personal Communication, September 22, 2022). The absence of biological sampling from the anchovy fishery after that fishery declined in the early 1980s caused a 25-year gap in fishery dependent data, which limited stock assessment scientists' ability to develop a new model-based anchovy stock assessment. This EFP is intended to prevent that problem from occurring in sardine management by filling the data void arising from the directed fishery closure. To maintain a continuing time series of fishery dependent biological data, we again request 520 mt of sardine.

We are currently exploring the potential for this EFP to support additional research into the stock structure of the southern subpopulation in the Southern California Bight and intermixing with the northern subpopulation that may occur in that area. The SK grant currently underway relies on size and age composition to examine the distributions and mixing of the two subpopulations. Additional data, particularly from a broader area of the Southern California Bight than currently available, would be beneficial to further the understanding of the southern subpopulation and its interaction with the northern subpopulation.

The 2022-23 EFP request for 520 mt of sardines allows for approximately 30 sets of 17 mt on average. This quantity of fish creates a reasonable incentive for fishermen to participate in the EFP, given fuel and crew costs and the potential for some trips to yield no or few sardines. The sale of fish also helps to offset costs for processors who support the EFP through fish handling and bucket sampling the sets. If this EFP secondarily provides data to support the understanding of the southern subpopulation in the Southern California Bight, the EFP could request up to 1,500 mt of sardines. The potential requests acknowledge the current stock status of the northern subpopulation of Pacific sardine, and the need for allocation of available tonnage to other fishery sectors. In light of recent year landings, the 2024-25 ACL should cover the two EFP requests proposed in 2024. In addition, if broadened to include the secondary purpose of studying the southern subpopulation and its intermixing with the northern subpopulations, the additional harvests would be primarily from that southern subpopulation.

We look forward to the opportunity to continue to provide support for sardine stock assessments and the understanding of the Pacific sardine population through this EFP.

Thank ou ver much for your consideration.

Mark Fina

Executive Director

Attachments: 2023-24 Bio Sampling EFP application

Table 1: Catches under the 2023-24 EFP to date (September 25, 2023)

	July 1 '23- June 30 '2	24 – 520 metric tons	S							
	S.CA	260 mt								
		Landing				Capture	Capture		Total Sardine	Sardine
	Set #	Date	Vessel	Port	Processor	Latitude	Longitude	SST	Lbs	MT
	1 - SK	7/18/2023		San Pedro		N 33.18.84	W 118.22.74	68	27,788	12.60
	2 - SK	8/16/2023		No Fish caugh						
SEMESTER	3	8/23/2023		San Pedro			W 118.22.24	66	38,765	17.58
1	4- SK	9/12/23	Provider	San Pedro	Cal Marine	N 33.18.24	W 118.22.48	68	15,502	7.03
Jul-Dec '23										
SEMESTER										
2								62.06		
Jan-Jun '24										
SubTotal									82,055	37.22
S.CA										
Balance S.CA										222.78
	MONTEREY	260 mt								
		Landing				Capture	Capture		Total Sardine	Sardine
	Set #	Date	Vessel	Port	Processor	Latitude	Longitude	SST	Lbs	MT
SEMESTER	1 - SK	7/27/2023	Trionfo	Monterey	SoCal Sfd	N 36.52.982	W 121.51.313	58	16,469	7.47
	2 - SK		King Philip						,	
	3	9/12/2023		Monterey	SoCal Sfd	N 36.37.09 N 36.36.66	W121.51.72 W 121.36.661	59	79,727	36.16
1	4 - SK	9/19/23	King Philip	Monterey	MFC	N 36.40.394	W 121.49.587	61.5	61,689	27.98
Jul-Dec '23										
SubTotal									157,885	71.62
Monterey										
Balance Mor	terey									188.38
TOTAL										108.84
BALANCE										411.16
DALAITEL										

Table 2 Framework for allocating sample sets in 2022 (provided as a guideline, weather dependent)

SOUTHERN C	A			NORTHERN CA	4	
		(Approx.	6 samples per so	emester per area)		
Jul (SSP)	_			Jul		
Aug (SSP)	_			Aug (Aerial)	<u>2</u>	34
Sep (SSP)	_			Sep (Aerial)	<u>3</u>	51
Oct	<u>1</u>	17		Oct	<u>1</u>	17
Nov	<u>2</u>	34		Nov	<u>2</u>	34
Dec	<u>3</u>	51		Dec	<u>1</u>	17
Semester 1	<u>6</u>	102	(NSP)	255	<u>9</u>	153
2023						
Jan				Jan	<u>1</u>	17
Feb	<u>1</u>	17		Feb	<u>2</u>	34
Mar	<u>1</u>	17		Mar	<u>1</u>	17
Apr (Aerial)	<u>4</u>	68		Apr	<u>1</u>	17
May	<u>1</u>	17		May	<u>1</u>	17
Jun				Jun	<u>2</u>	34
Semester 2	7	119	(NSP)	255	8	136
2022-23	13	221		510*	17	289
TOTAL				520 MT		

<sup>\*</sup>Note: The total EFP request is for 520 mt. The framework guideline total of 510 mt allows for an extra 10 mt to account for sets that might come in above the guideline set volume of 17 mt.

The total of all sets will be tallied against the requested EFP amount of 520 mt, as was done in 2021, and total number of sets will be adjusted accordingly to ensure this EFP does not exceed the total volume allowed.



# CALIFORNIA WETFISH PRODUCERS ASSOCIATION

PO Box 1951 • Buellton, CA 93427 • Office: (805) 693-5430 • Mobile: (805) 350-3231 • Fax: (805) 686-9312 • www.californiawetfish.org

March 10, 2023

Mr. Marc Gorelnik, Chair And Members of the Pacific Fishery Management Council

REQUEST RENEWAL OF EXEMPTED FISHERY PERMIT (EFP)

TO ALLOW FISHING OF PACIFIC SARDINE FOR BIOLOGICAL SAMPLES IN 2023-24 NEARSHORE RESEARCH PROGRAM

Dear Chair Gorelnik and Council Members,

On behalf of CWPA, I am submitting this request for renewal of the EFP authorizing sardine fishing to collect fishery dependent biological samples, continuing the field work begun in May 2020.

Date of Application (4a): March 10, 2023

#### Applicant Name and Mailing Address (4b):

California Wetfish Producers Association PO Box 1951, Buellton, CA 93427 (805) 693-5430

## Purpose and Goals/Justification/Disposition of Catch (4c and d)

The proposed EFP will continue to serve the primary objective of the continuation of a time series of fishery dependent biological data for use in stock assessments. The EFP will secondarily be used to collect monthly biological data from two primary fishing areas to study the stock structure and dynamics of the northern and southern subpopulations of Pacific sardine under a Saltonstall-Kennedy (SK) grant. In 2020-2021, 2021-2022, and 2022-23 the Council recommended and NMFS approved EFPs allowing up to 520 mt of Pacific sardine harvests based on the first of these objectives. To maintain a continuing time series of fishery dependent biological data (and conduct the research under the SK grant) we again request 520 mt of Pacific sardine, although we have adopted a strategy to reduce catch of sardines under the EFP, as described below. The amount requested would come from the 2023-24 ACL for use during the fishing year from July 1, 2023 to June 30, 2024. Based on recent catches, we believe that the 2023-24 ACL would sufficiently cover the three EFP requests proposed for 2023, as well as all other uses approved.

Our initial 2020 EFP was motivated by the need to maintain a consistent time series of fishery dependent age and growth data for Pacific sardine stock assessments. The 2020 Pacific sardine STAR Panel review noted that the model used to estimate abundance had lacked fishery dependent biological and age data from 2015 forward due to the closure of the directed Pacific sardine fishery. Establishing a data collection that mimics a small directed sardine fishery fills this void by providing fishery dependent data for use by the Stock Assessment Team (STAT) in its assessment models. The EFP's

structure and protocols were developed in coordination with the Southwest Fisheries Science Center's lead Pacific sardine stock assessment scientist and the California Department Fish and Wildlife (CDFW) to use a systematic framework for carefully controlled collection of sardines that mirror directed fishery landings for biological information, including age, in both Southern California and Monterey-Central Coast throughout the usual fishing year.

Responding to a question from the CPS Management Team regarding the value of these data, senior assessment scientist Dr. Kevin Hill affirmed the continuing importance of maintaining a time series of fishery dependent age data, while the Pacific sardine fishery remains closed stating, "Biological samples from EFP fishing permits (directed loads), as well as the live bait fishery, are essential to assessing the sardine population. It is important to correctly characterize fishery removals with this sampling, because samples collected from incidental catches do not necessarily reflect local population demographics accurately due to size-selective schooling with other species (e.g. anchovy, mackerels)." (Personal Communication, September 2, 2022). The absence of biological sampling from fishery dependent data after the anchovy fishery declined in the early 1980s caused a 25-year gap in fishery dependent data, which limited stock assessment scientists' ability to develop a new model-based anchovy stock assessment. This EFP is intended to prevent that problem from occurring in Pacific sardine management by filling the data void arising from the directed fishery closure.

The EFP would allow the harvests to collect biological and age data representative of fishery dependent samples unavailable because of the directed fishery closure. To provide data that are most reflective of typical fishery dependent data streams, we collect EFP sets from two areas: Southern California and Monterey-Central Coast. Harvests under the EFP would be limited to 520 mt of sardines (30 sets of approximately 17 tons each), but we anticipate using substantially fewer tons by reducing catches any time grant monies are available to help support the harvests on a trip. Sale of EFP catches have been (and will continue to be) used to fund the fishing activity under the EFP. In cases where external funding is available to support a set, we plan to reduce the catches in that set from 17 mt to 10 mt.

#### **Broader Significance (4e)**

Beginning in October of 2022, biological and age data from this EFP and other sources (including prior EFPs) have been used for the analysis proposed by the SK project "Investigating Seasonal Nearshore Dynamics of Pacific Sardine (*Sardinops sagax*) in California" (a collaboration that includes Juan Zwolinski, a member of the SWFSC's Acoustic Trawl team, and that is supported by the California Department of Fish and Wildlife). The study will examine the northern and southern sardine subpopulation distributions and associated management challenges and complexities and is motivated by some of the same concerns that were the focus of the SWFSC's Pacific sardine stock structure workshop in November 2022. The project relies on a framework and protocol for collection and analysis of biological data year-round (including the fishery dependent data authorized by this EFP and monthly observations from fishermen targeting other CPS and live bait operators) to examine hypotheses related to the distribution and separation of the northern and southern subpopulations (including the 16.7°C (62° F) SST division). Analysis of these biological data and examination of Pacific sardine morphology compared with environmental indices and trends is intended to shed light on the stock structure and inform and improve Pacific sardine fishery management. We began this study in October 2022 and the project continues until March 31, 2024. See appendix 2 for a summary of preliminary data.

This project will also attempt to coordinate with spring and summer CDFW aerial surveys. When area and timing can be coordinated during survey months, vessels will attempt to capture schools identified by the CDFW observer to provide samples to corroborate aerial survey observations to further validate information collected by those surveys as suggested by the STAT and Stock Assessment Review panel. Since the spring of 2020, CWPA and CDFW have coordinated 13 sets (or approximately 20 percent of the sets under the EFP with the CDFW aerial surveys. We will again make efforts to coordinate sets with aerial survey observations starting in early April of 2023.

#### Continuation of the EFP (4f)

The EFP is proposed to be continued as long as the ongoing need for fishery dependent biological samples for the stock assessment exists. Continuation also depends on the economic feasibility of the EFP, as determined by funding to support this fishing and the marketability of catches from the EFP.

#### Vessels, Processors and Captains in the EFP (4g)

CWPA has identified 5 vessels that meet the criteria for this research project: 2 in Central California and 3 in Southern California. These vessels also participated in our 2021-22 and 2022-23 EFP work.

VESSEL			USCG	CPS
NAME	SKIPPER	OWNER	/REG	PERMIT
Southern CA				
		Triton Fishing		
Triton	Pete Ciaramitaro	Inc.	CF7218UH	14
Provider	Jamie Ashley	Provider LLC	D572344	1
	Nick Jurlin /	South Sound		
Eileen	Corbin Hanson	Fisheries Inc.	D252749	38
Monterey				
King Philip	Anthony Russo Aniello	Sea Wave Corp	D1061827	9
Trionfo	Guglielmo	Neil Guglielmo	D625449	45

Note: All vessels also are listed on our 2023-24 EFP renewal application to conduct point sets for the aerial survey.

Four processors have been identified to participate in the EFP, 1 in Southern California and 2 in Central California:

Cal-Marine Fish Co., 220 Cannery Street, San Pedro, CA 90731 (offloads FV Eileen, FV Provider, Contact; Vince Torre)

J. DeLuca Fish Company, 2194 Signal Place, San Pedro, CA 90731 (offloads FV Triton; Contact: John DeLuca)

Monterey Fish Company, 960 South Sanborn Road, Salinas, CA 93901, offloading in Moss Landing, CA (offloads FV King Philip; Contact Anthony Tringali, or Ken Towsley)

Southern Cal Seafood, Pillar Point Harbor, Half Moon Bay or Monterey, CA; Contact Pete Guglielmo (offloads FV Trionfo)

#### Species to be harvested (4h)

Under this project, purse seine vessels will be directed to capture up to 17 mts of sardines from a school of sardines each month in each area, with total catch of at most 520 mt. An EFP is necessary because the directed Pacific sardine fishery is closed and is anticipated to remain closed in 2023-24. No measurable impacts to non-target species are anticipated.

#### Justification of the amount of harvest (4i)

The request for 520 mt of sardines to support this EFP will allow for approximately 30 sets of approximately 17 mts each spread throughout the year. As noted above, the targeted catch amount in sets will be reduced to 10 mt when funding is available to subsidize the trip. The quantity of fish requested creates a reasonable incentive for fishermen to participate in the EFP, given fuel and crew costs and the potential for some trips to yield no or few sardines. The sale of fish also helps to offset costs for processors who support the EFP through fish handling and bucket sampling the sets. This request acknowledges the current stock status of the northern subpopulation of Pacific Sardine, and the need for allocation of available tonnage to other fishery sectors.

Although sale of EFP catches have been (and will continue to be) used to fund the fishing activity under the EFP, we will use grant monies to offset vessel operational costs, reducing the target catch amount from 17 mt per trip to 10 mt per trip when external monies are available. So, while harvests under the EFP would be limited to 520 mt of sardines (30 sets of approximately 17 tons each), we anticipate using substantially fewer tons by reducing catches any time grant monies are available to help support the harvests on a trip.

Fishermen will maintain a log to identify the location and time of each set (see Appendix 3). Upon landing, biologists will take a subset of each set at the dock for processing to obtain biological characteristics and age of individual fish. Processors will maintain bucket sample records of the weight of Pacific sardine and other species groups, to validate species composition.

CWPA will notify NMFS and CDFW Enforcement at least 12 hours before a vessel goes out to inform them of vessel's name and locations to be targeted for sampling, and the processor who will be receiving research fish that day. The survey plan anticipates sending no more than one vessel per month in each area, except during aerial survey months.

CWPA will also maintain a record of the volume/total weight of sardines captured on each trip and will monitor progress toward the EFP limit. These weights and species composition per set will also be included in a final report.

#### Data collection methods (4k)

All trip catches will be subsampled by CDFW biologists dockside upon landing. CDFW biologists will obtain a 5-gallon subsample of fish at quarterly intervals of pumping each set, using a quantitative bucket sampling method. Up to 50 fish per species (if set consists of mixed fish) per set will be collected by a CDFW biologist/sampler upon landing of the daily catch. The four collected fish subsamples will be stored in plastic bags and preserved on ice. At the CDFW laboratories these samples will be measured for biological characteristics (length, weight, sex, maturity, and age).

Scientific data collection and analysis will be supervised by CDFW and NOAA scientific staff, who will collaborate on procedures to ensure and evaluate data quality during the survey, and data analysis methodology through completion of the project.

#### Vessel selection (41)

Vessels were identified for participation in the research based on vessel size, equipment, skippers' experience, and commitment to the research. The five vessels identified have committed to participate voluntarily in this research, notwithstanding any other fishing opportunities during the project period. All vessels have participated in EFP work in prior years and have demonstrated the ability to carry out the required protocols.

#### Fishing time, place, and gear (4m)

This project will take place in nearshore waters of the Central Coast of California (Monterey – Half Moon Bay) and the Southern California Bight. We plan to follow the same protocols as currently employed (including taking at least one set per month in both Monterey-Central Coast and Southern California to have samples distributed throughout the year) following the protocol recommended by sardine stock assessment scientists and the scientists collaborating on the SK grant project, with possible additional sampling attempted during survey months. Fishing gear used is purse seine net of suitable mesh size and length for capturing CPS schools.

We look forward to the opportunity to continue to provide support for sardine stock assessments and furthering the understanding of sardine stock structures through this EFP.

Thank you very much for your consideration.

Sincerely,

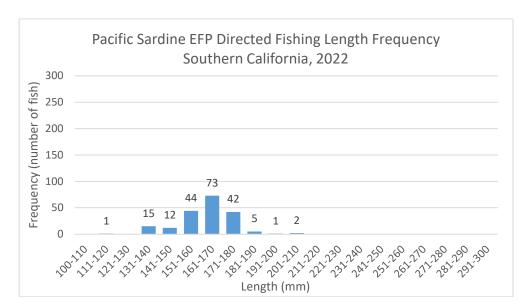
Mark Fina Executive Director Appendix 1 – Summary of data collected in the 2021-22 EFP and the 2022-23 EFP to date.

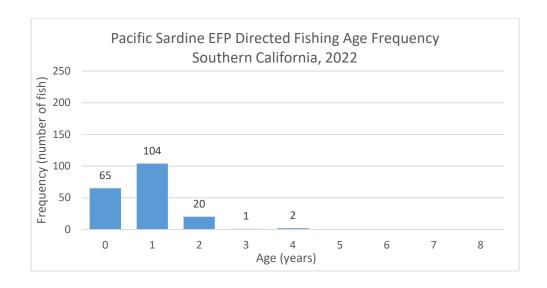
July 1 '22- June 30 '23 - 520 metric tons

	S.CA	260 mt								
		Landing				Capture	Capture		Total Sardine	Sardine
	Set #	Date	Vessel	Port	Processor	Latitude	Longitude	SST	Lbs	MT
SEMESTER	1 - SK	11/15/22	Provider	San Pedro	Cal Marine	N 33.36.55	W 118.59.23	62	29,308	13.29
1 Jul-Dec '22										
SEMESTER	2 - SK	1/30/23	Provider	San Pedro	Cal Marine	N33.42.10	W 118.16.81	57	40,840	18.52
2 Jan-Jun '23	3 - SK	2/10/23	Provider	San Pedro	Cal Marine	N 33.42.69	W 118.08.33	58	41,062	18.63
SubTotal S.CA									111,210	50.44

MONTEREY	260 mt								
	Landing		[		Capture	Capture		Total Sardine	Sardine
Set #	Date	Vessel	Port	Processor	Latitude	Longitude	SST	Lbs	MT
1	9/7/22	King Philip	Moss Landing	MFC	N 36.52.08	W 121.50.63	61	78,452	35.59
2	9/8/22	Trionfo	Monterey	SoCal Sfd	N 36.44.88	W 121.49.040	58	90,936	41.25
3 - SK	10/4/22	Trionfo	Monterey	SoCal Sfd	N 36.37.71	W 121.54.15	60	41,789	18.96
								211,177	95.79
	Set #	Set # Landing Date  1 9/7/22 2 9/8/22	Set # Landing Date Vessel  1 9/7/22 King Philip 2 9/8/22 Trionfo	Set # Landing Vessel Port  1 9/7/22 King Philip Moss Landing 2 9/8/22 Trionfo Monterey	Set #Landing DateVesselPortProcessor19/7/22 King PhilipMoss Landing MFC29/8/22 TrionfoMontereySoCal Sfd	Set #Landing DateVesselPortProcessorCapture Latitude19/7/22 King PhilipMoss Landing MFCN 36.52.0829/8/22 TrionfoMontereySoCal SfdN 36.44.88	Set #Landing DatePortProcessorCapture LatitudeCapture Longitude19/7/22 King PhilipMoss Landing MFCN 36.52.08W 121.50.6329/8/22 TrionfoMontereySoCal SfdN 36.44.88W 121.49.040	Set #         Landing Date         Vessel         Port         Processor         Capture Latitude         Capture Longitude         SST           1         9/7/22 King Philip 2         Moss Landing MFC N 36.52.08         N 36.52.08         W 121.50.63         61           2         9/8/22 Trionfo Monterey         SoCal Sfd N 36.44.88         W 121.49.040         58	Set #         Landing Date         Vessel         Port         Processor         Capture Latitude         Capture Longitude         Total Sardine SST         Lbs           1         9/7/22 King Philip         Moss Landing MFC         N 36.52.08         W 121.50.63         61         78,452           2         9/8/22 Trionfo         Monterey         SoCal Sfd         N 36.44.88         W 121.49.040         58         90,936           3 - SK         10/4/22 Trionfo         Monterey         SoCal Sfd         N 36.37.71         W 121.54.15         60         41,789

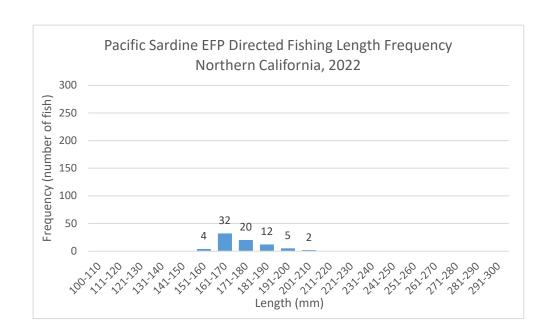
Appendix 2. Preliminary data collected under EFP 2022 (including some comparisons to 2020 and 2021).

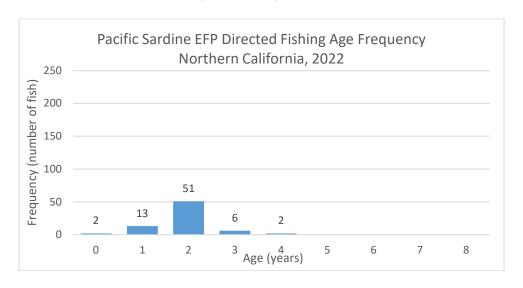




## South

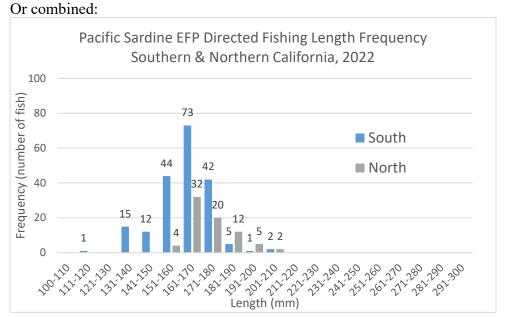
	# of samples		<u># of</u>
<u>Month</u>	<u>taken</u>		<u>fish</u>
January		0	0
February		0	0
March		2	50
April		1	25
May		0	0
June		4	95
July		0	0
August		0	0
September		0	0
October		0	0
November		1	25
December		0	0
Totals		8	195

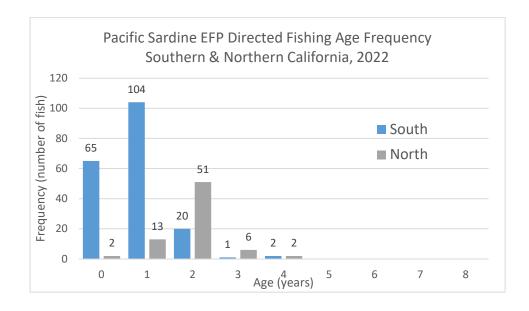


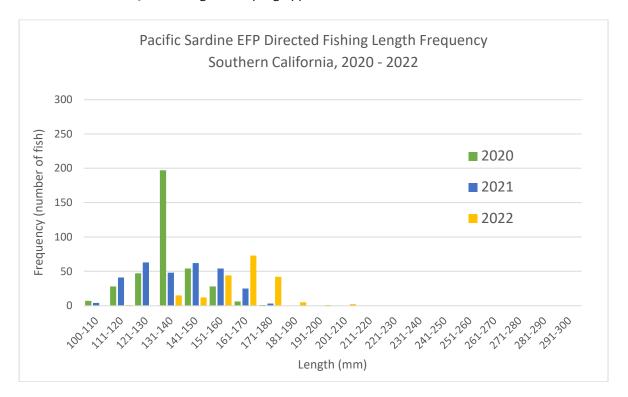


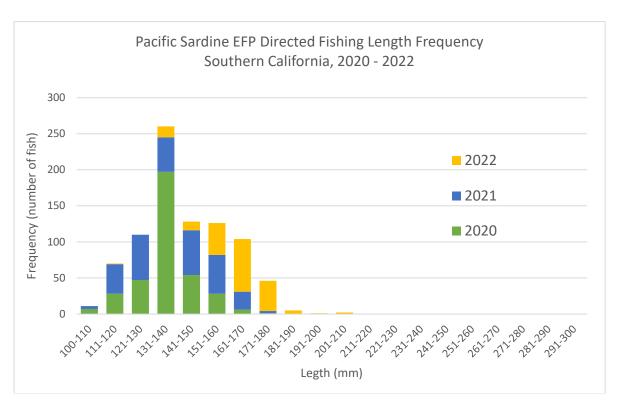
## North

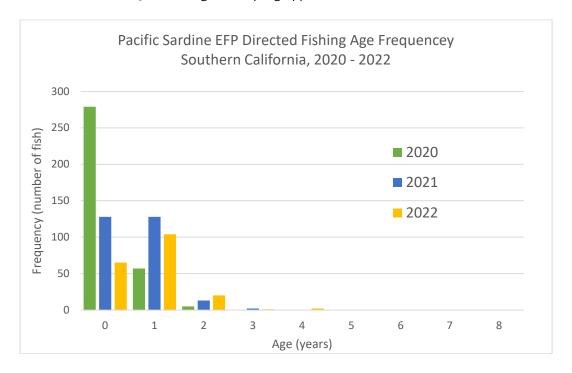
Month	# of samples taken		# of fish
January		0	0
•		_	-
February		0	0
March		0	0
April		0	0
May		0	0
June		0	0
July		0	0
August		0	0
September		2	50
October		1	25
November		0	0
December		0	0
Totals		3	75



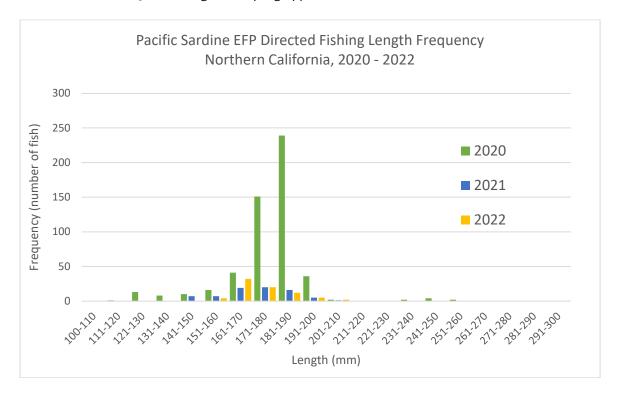


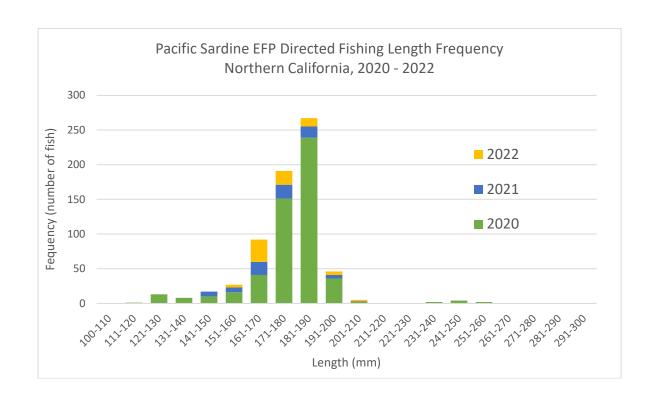


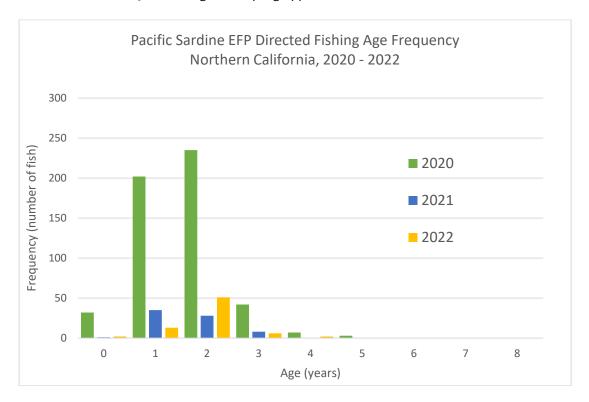




South	<u># of s</u>	amples ta	<u>ken</u>		# of fish	
<u>Month</u>	2020	2021	2022	2020	2021	2022
January	0	0	0	0	0	0
February	0	2	0	0	50	0
March	0	1	2	0	25	50
April	0	1	1	0	25	25
May	4	1	0	100	25	0
June	6	1	4	150	25	95
July	0	1	0	0	25	0
August	0	0	0	0	0	0
September	0	2	0	0	50	0
October	1	1	0	25	25	0
November	3	1	1	75	25	25
December	1	1	0	25	25	0
Totals	15	12	8	375	300	195







North	# of s	amples ta	<u>ken</u>		# of fish	
<u>Month</u>	2020	2021	2022	2020	2021	2022
January	0	0	0	0	0	0
February	0	3	0	0	75	0
March	0	0	0	0	0	0
April	0	0	0	0	0	0
May	3	0	0	75	0	0
June	11	0	0	275	0	0
July	0	0	0	0	0	0
August	0	0	0	0	0	0
September	5	0	2	125	0	50
October	1	0	1	25	0	25
November	1	0	0	25	0	0
December	0	0	0	0	0	0
Totals	21	3	3	525	75	75

# Appendix 3. Fisherman's log form

# CPS Biological Sample Sardine EFP Fisherman's Log Form

Date: \_\_\_\_\_ Captain: \_\_\_\_\_

		(st)				Fish Ticket	No	
		Hydroacousti	c Gear		Net	Dimension	s	
	Type Sounder	Make Mo	odel Frequ	uency	Net Length (fm)	Net Depth (fm)	Mesh Size (in)	
	Sonar							
			Sch	ool and Ocea	n Data			
Set Start Time	Latitude	Longitude	Top Depth of School (fm)	Bottom Depth of School (fm)	Ocean Depth (fm)	SST (F)	Weather Condition	Picture of Sonar (Y/N)
		calm, clear; 2= li ar interpretati	-	l visibility; 3= ma	oderate wind, fa	ir visibility; 4:	= poor fishing c	onditions