

# **Attachment 1**

## **Standardized Bycatch Reporting Methodology Consistency Review for West Coast Fishery Management Plans**

This document provides summary results of the Pacific Fishery Management Council's (Council's) consistency review. It contains fishery management plan (FMP) language that currently exists and, if applicable, proposed to be added to fully describe Standardized Bycatch Reporting (SBRM) for the Coastal Pelagic Species (CPS), Pacific Coast Salmon, and the Highly Migratory Species (HMS) FMPs. The Council found that the Pacific Coast Groundfish FMP is consistent with the final rule; therefore, we only provide background and links to the FMP language and external docs that describe the SBRM language.

Summary Table 1 provides a list of existing and new section references to documents (FMP, Stock Assessment Fishery Evaluation [SAFE], and others) that describe SBRM. Each FMP summary contains current FMP language and language from supporting documents to show where FMPs are consistent with the final rule. It also contains rationale for revisions to FMPs and fishery management supporting documents (i.e., Appendices, SAFE, and Salmon Pre-season III).

At the end of each FMP discussion section for CPS, Salmon, and HMS is a complete set of the proposed amendment language with underlined text to show insertions and strikeouts to show deletions. The revised language is intended to make all FMPs consistent with the standardized bycatch reporting methodologies (SBRM) [final rule](#).

**Table 1. SBRM documents and section references for each FMP.**

FMP/Fishery	Contain SBRM	Meet the Purpose	Consider characteristics of bycatch	Feasibility check	Address data uncertainty	Data use
CPS Sardine/Squid/Mackerel	New FMP 2.6, Existing FMP 2.2.1.1, 2.2.2.7, and 4.7 and SAFE Chapter 4, New SAFE Chapter 4 info	SAFE Chapter 4	FMP 1.4, New FMP 2.6, SAFE Chapter 4	FMP 2.2.2.7, FMP 2.5, New FMP 2.6, SAFE Chapter. 4	New FMP 2.6, SAFE Chapter 4	FMP 2.1.7, 2.2.1.1, 2.7, 4.7 New FMP 2.6, SAFE Chapter 4
Salmon/Commercial Troll and Recreational	FMP 3.5, 3.5.3	FMP 3.5, 3.5.1, 3.5.3	FMP 3.5.1, 3.5.2, 3.5.3 New FMP 3.5.2.1	New FMP 3.5.2.1	New FMP 3.5.2.1, 3.5.3.1, 3.5.3.3, Preseason Report III	FMP 3.5.2, 3.5.3 New FMP 3.5.3.2 SAFE Table 1-7; Preseason Report III Table 6
HMS/Drift Gillnet Fishery for Swordfish and Sharks	FMP 6.2.3 Fishery	FMP 6.3.1	Appendix C.2 and C.3.1	Appendix C.3.1	New language FMP 6.3.1	Summary info is avail, App C describes some use in stock assessments, may need more info
HMS/North Pacific Albacore Surface Hook and Line Fishery	FMP 6.2.3, 6.3.1 Appendix C.3.2	FMP 6.3.1	Appendix C.2 and C.3.2	FMP 6.2.3 Appendix C.5.1.5	New language FMP 6.3.1	Summary info
HMS/High Seas Deep-set Longline Fishery	FMP 6.2.3, 6.3.1	FMP 6.3.1	Appendix C.2 and C.3.2	New language FMP 6.3.1, Appendix C	New language FMP 6.3.1	Limited data collected

FMP/Fishery	Contain SBRM	Meet the Purpose	Consider characteristics of bycatch	Feasibility check	Address data uncertainty	Data use
				Section C.5.1, C.5.2, C.5.5		
HMS/Harpoon Swordfish Fishery	FMP 6.3.1	FMP 6.3.	FMP 6.3.1 Appendix C.2	New language FMP Section 6.3.1	New language FMP 6.3.1	Summary info
HMS/Coastal Purse Seine Fishery	FMP 6.2.3, 6.3.1	FMP 6.3.1	Appendix C.2 and C.3.6	New language FMP Section 6.3.1, Appendix C.5	New language FMP 6.3.1	Summary info
HMS/Recreational Party/Charter Boat Fishery	FMP 6.2.3, 6.3.1	FMP 6.3.1	Appendix C.2 and C.3.7	New language FMP Section 6.3.1, Appendix C.3.7	New language FMP 6.3.1	Summary info, Summary info for California
HMS/Private Recreational Boat Fishery	FMP 6.3.1	FMP 6.3.1	Appendix C.2	New language FMP Section 6.3.1	New language FMP 6.3.1, Appendix C	Summary info by state, Summary info for California.
Groundfish/Trawl Sector	6.4.1.2	6.4.1.2	6.4.1.2	6.4.1.1 & 6.4.1.2	6.4.1.2	6.5.3
Groundfish/Limited Entry Fixed Gear	6.4.1.2	6.4.1.2	6.4.1.2	6.4.1.1 & 6.4.1.2	6.4.1.2	6.5.3
Groundfish/Open Access	6.4.1.2	6.4.1.2	6.4.1.2	6.4.1.1 & 6.4.1.2	6.4.1.2	6.5.3

FMP/Fishery	Contain SBRM	Meet the Purpose	Consider characteristics of bycatch	Feasibility check	Address data uncertainty	Data use
Groundfish/ Recreational	6.4.1.3	6.4.1.3	6.4.1.3	6.4.1.3	6.4.1.3	6.5.3

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## 2 SBRM for the CPS FMP

The CPS FMP contains various sections that discuss authorized data collection via logbooks, observers, fish tickets, and port sampling by state (OR, WA, CA). However, the bulk of reporting and qualitative data collection information are contained in Chapter 4 of the CPS SAFE document. In addition, the Council's CPS Management Team (CPSMT) provided reports with suggested edits to the CPS FMP and SAFE document. Below are links to those documents.

Reference documents:

1. CPS [FMP](#) December 2020
2. CPS [SAFE](#) December 2020
3. CPS SAFE [Appendix A](#) (Fishery Data), December 2020 (Tables 4-3 through 4-14)
4. Agenda Item E.5.a, [Supplemental CPSMT Report 1](#), September 2021
5. Agenda Item C.8.a, [Supplemental CPSMT Report 1](#), November 2021 (Final recommendations)
6. Agenda Item C.8, [Attachment 1](#), November 2021

Although the SAFE identifies that a standardized reporting methodology is required, there is no detailed summary of the methods used for bycatch data collection (e.g., landed catch accounting via fish tickets, port sampling protocols or at-sea discard catch accounting). Bycatch data is summarized in [Appendix A](#) of the SAFE document that displays all species landed for a given fishery or state and typically identifies the data source (e.g., SAFE Table 4-5, California Department of Fish and Wildlife [CDFW] Wetfish Sampling Database). However, there is no description of the methods used. Therefore, the FMP and Chapter 4 of the SAFE document will be revised to comply with the final rule.

A new FMP Section 2.6 was developed to further clarify and generally describe SBRM (See Proposed CPS FMP Amendment Language in next section). In addition, more detailed information was developed for Chapter 4 of the SAFE document to provide the reader with the details of the data collections and how the data is used.

Table 1 provides a summary of the sections that contain SBRM, including reference to new sections that were developed by the CPSMT. We attempt to summarize the information that currently exists and the new information that was developed to show how the FMP complies with the National Marine Fisheries Service (NMFS) SBRM final rule.

### 2.1 Characteristics of Bycatch

A new description of the characteristics of bycatch was developed in the new Section 2.6 '*Standardized Bycatch Reporting Methodology*' of the FMP and Chapter 4 '*Bycatch and Discard Mortality*' of the CPS SAFE document. The new FMP Section 2.6 generally describes the characteristics of bycatch for three fisheries (Sardine/Squid/Mackerel):

**Proposed new CPS FMP language for Section 2.6** - "Bycatch in CPS fisheries is typically low due to the characteristics of the targeted species and the fishing gears. For example, CPS finfish typically school with similarly sized fish and are harvested above the thermocline (not associated with substrate). CPS vessels fish with roundhaul gear (purse seine or lampara nets). Roundhaul fishing tends to reduce unintentional catch, primarily because the fishermen target specific schools of CPS finfish and market squid, and the net can be adjusted when fishing in shallow water to reduce bycatch of benthic species. The most common catch of non-target species in a CPS fishery are other CPS species, which are typically sold and therefore

are not bycatch. Various reviews of catch in CPS fisheries have confirmed that bycatch of non-CPS is extremely low.

The SBRM for CPS fisheries, as established under Amendment 9, is a reflection of the characteristics of bycatch in the fishery and findings from analyses during the development of Amendment 9 that showed bycatch was sufficiently minimized through existing management measures and regulations, and that SBRM could be accomplished cost-effectively through required state programs. The CPS SBRM consists of a suite of reporting and monitoring programs required by the states of California, Oregon, and Washington including logbooks, fish landing receipts, shorebased/dockside sampling, and observer programs for newly developing fisheries. Of these, fish landing receipts are mandated by all three states and apply uniformly to all CPS landings whereas the other programs may vary by fishery and state depending on need.”

Section 1.4 of the current CPS FMP discusses bycatch in CPS fisheries and the Council tracks this catch through existing data collection programs. Specifically, the FMP says:

“A 2010 review of bycatch species in CPS fisheries confirmed that incidental catch and bycatch in CPS fisheries is dominated by other CPS and that bycatch/incidental catch of non-CPS is extremely low. However, two species, jacksmelt and Pacific herring, are infrequently caught with CPS gear and were therefore added to the FMP under Amendment 13 to ensure continued monitoring of incidental catch and bycatch of these species in CPS fisheries through sampling and logbook programs. This information will continue to be reported in the Stock Assessment and Fishery Evaluation (SAFE).”

Chapter 4 of the SAFE describes the amount of bycatch occurring in the fishery, the importance of bycatch in estimating the fishing mortality of fish stocks, and the effect of bycatch on ecosystems.

Specifically, the current SAFE says:

“CPS vessels fish with roundhaul gear (purse seine or lampara nets). These are encircling type nets, which are deployed by a skiff around a school of fish or part of a school. The end of the float line is then attached back to the vessel. With purse seines, the bottom of the net (the lead line) is then pulled closed. Lampara nets do not purse the bottom. The area including the free-swimming fish is diminished by bringing one end of the net aboard the vessel. When the fish are crowded near the fishing vessel, pumps are lowered into the water to pump fish and water into the ship’s hold. Another technique is to lift the fish out of the net with netted scoops (e.g., stocking brails). Roundhaul fishing results in little unintentionally caught fish, primarily because the fishermen target specific schools, which usually consists of one species. CPS typically school with similarly sized fish. The most common incidental catch in the CPS fishery is another coastal pelagic species (e.g., Pacific mackerel incidental to the Pacific sardine fishery). If larger fish are in the net, they can be released alive before pumping or brailing by lowering a section of the cork-line or by using a dip-net. The load is pumped out of the hold at the dock, where the catch is weighed and incidentally-caught fish can be observed and sorted. Because pumping at sea is so common, any incidental catch of small fish would not be sorted at sea. Grates can be used to sort larger non-CPS from the catch. Grates are mandatory in Oregon to sort larger non-CPS from the catch. At-sea observers have recorded discard at one time or another since the year 2000 off the states of Oregon, Washington, and California. Incidental harvest of non-prohibited larger fish are often taken home for personal use or processed.

Historically, market squid have been fished at night with the use of powerful lights, which cause squid to aggregate, allowing fishermen to pump squid directly from the sea or to encircle them with a net. California actively manages the market squid fishery in waters off California and has developed an FMP for the state-managed fishery. Management measures pertinent to bycatch

include establishing a prohibition on use of lights in the Greater Farallones National Marine Sanctuary to eliminate the potential of future negative interactions with seabirds.

Additionally, several circumstances in the fishery tend to reduce bycatch:

1. Most of what would be called bycatch under the Magnuson-Stevens Fisheries Conservation and Management Act (Magnuson-Stevens Act or MSA) is caught when roundhaul nets fish in shallow water over rocky bottom. Fishermen try to avoid these areas to protect their gear. Also, they may be specifically prohibited to fish these areas because of closures.
2. South of Pt. Buchon, California, many areas are closed to roundhaul nets under California law and the FMP, which reduces the chance for bycatch.
3. In California, a portion of the sardine caught incidentally by squid or anchovy harvesters can be sold. In Washington, all incidentally caught CPS can be sold when another CPS species is targeted, e.g., Pacific mackerel can be sold when fishing is directed at Pacific sardine or vice versa, or Pacific sardine can be sold when fishing is targets Northern anchovy.
4. A provision in the CPS FMP allowing landings of less than five tons without a limited entry (LE) permit should reduce regulatory discard, because those fish can be landed without penalty. LE permits otherwise are required south of Point Arena, California.
5. From 2007 - 2016, bycatch from the live bait logs was reported with an incidence of 10 percent. The primary species taken as incidental catch was barracuda. Virtually all fish caught incidentally in this fishery are either used for bait, for personal use, or released alive. (See Table 4-11).
6. CDFW's logbook program for the squid fishery collects data including bycatch."

Subsequent monitoring and review of the characteristics of bycatch in CPS fisheries, including the results of a series of separate onboard observing programs conducted by NMFS of California CPS fisheries and the Washington and Oregon fish and wildlife departments of the Pacific sardine fishery, have continued to show that bycatch is extremely low in CPS fisheries and can be sufficiently monitored through existing state programs. These programs are summarized below.

- NMFS initiated a pilot observer program for California-based commercial purse seine fishing vessels targeting CPS in July 2004. A total of 107 trips by vessels targeting CPS (228 sets) were observed from July 2004 to January 2006. Additionally, from January 2006 to January 2008 a total of 199 trips (426 sets) were observed. Data from this program have been compiled in the SAFE (SAFE, Tables 6-1 through 6-4).
- In response to the expansion of the Pacific sardine fishery into the Pacific Northwest in the early 2000s, the Washington Department of Fish and Wildlife (WDFW) conducted a five-year observer program from 2000 through 2004 to document bycatch levels in the Pacific sardine fishery. Overall observer coverage in this program was in excess of 25 percent of trips and unpublished data results showed bycatch of non-targeted species in the Washington sardine fishery to be relatively low ([Culver 2006](#)). The program was discontinued based on the low level of bycatch, particularly of salmon. A comparison of logbook data to observer data indicated that logbook data can under-report catch by 20-80 percent. At the same time, salmon could not be legally retained or landed. Therefore, rates estimated from observer data were used to calculate bycatch of salmon after the observer program was discontinued. Bycatch of other species could be documented via fish receiving tickets because vessels were pumping from their nets directly into the hold of the vessel and Washington did not allow grates which would prevent fish from passing through to the hold.
- Oregon Department of Fish and Wildlife (ODFW) also placed observers on vessels fishing for sardine from 2000-2010, although the coverage was never more than 7 percent of trips in any of



those years. Results of those observer trips showed that bycatch was low. The CPSMT examined and evaluated the [Sardine Fishery Reports](#) published by ODFW that summarized these efforts. To date ODFW has not placed observers on vessels fishing for market squid.

## **2.2 Feasibility Check**

Through provisions in the CPS FMP, the Council relies on data collected by the states of Washington, Oregon, and California under existing state data collection programs (CPS FMP 2.2.2.7 Reporting Requirements, 2.5 Procedures for Reviewing State Regulations). These sections of the FMP provide the background and the authority to collect data along with mechanisms to review and revise the data collection programs as appropriate. Feasibility of these programs were discussed at the time of creation. Per the CPS FMP, Federal reporting requirements are to be implemented only when a state program fails to provide sufficient data to meet management needs or in response to a special need where the information will enhance effective management. This provision ensures the Council and NMFS are able to address future potential problems or needs.

This SBRM was chosen because analyses showed that bycatch was sufficiently minimized through existing management measures and regulations and that SBRM is most feasibly accomplished through state and tribal programs to monitor catch and bycatch dockside or observer programs for newly developing fisheries, and that additional measures were not warranted. For example, it was determined that there was insufficient justification to require observers for the LE fishery or logbooks for all harvesters of CPS as the cost of either program would likely exceed the benefit of any additional information about the amount and variety of bycatch.

Utilizing the state data collection programs was the most cost-effective way to gather the data necessary for monitoring these fisheries. As noted under the above section ‘Characteristics of Bycatch’ studies were conducted using observers to collect data at sea. It was found that these programs were unnecessary for continued monitoring of bycatch at sea and that dock side data collection was sufficient to monitor the fisheries for bycatch.

However, the CPS FMP will be updated to reflect this information to highlight what has already been analyzed and developed.

### **Proposed new CPS FMP language for Section 2.6**

“Additionally, the CPS FMP authorizes federal observers as described in Section 2.2.1.1. This regulation was added to the FMP through Amendment 9 as part of the FMP’s SBRM. Based on the data collected through historical observing programs, bycatch in CPS fisheries is known with reasonable certainty to be low, with the majority of non-target species caught in CPS fisheries being other CPS that are incidental catch rather than bycatch. Hence, CPS fisheries are not currently subject to having mandatory observers aboard. In addition, Washington and Oregon state regulations authorize observers and states may conduct observer programs.

These reporting and monitoring programs have been operating efficiently for many years and have shown to be feasible over time, as evidenced by their continued operation and use of the resulting data.”

The CPS SAFE document will be updated to discuss who and how data is collected by state sampling programs rather than deploying federal agency staff. This reflects how it is a more feasible and efficient process.

“Commercial CPS landings are sampled in port by state personnel, who confirm species identification, collect species composition data, otoliths for ageing, lengths, and other biological data. Each state mandates access to landed catch by authorized state personnel for sampling (Table 4.1). The design of the fishery monitoring programs may vary between states and within each state program by fishery or region, but they serve the same purpose and are intended to meet the objectives consistent with SBRM and the CPS FMP. The various strategies reflect the specific fishery and its characteristics of operation, the coverage needed to accomplish sampling objectives, and agency staffing resources.”

## 2.3 Data Uncertainty

The data collection program includes collecting multiple sources of data from the fishery. Fundamentally this helps reduce the uncertainty of the data collected. As noted previously, several observation programs were conducted to monitor the fisheries for bycatch. Ultimately, the Council and NMFS developed a program whereby all three states have a number of regulations with measures that together comprise the SBRM for CPS fisheries. These include:

- landings made by commercial fishing vessels must be recorded on fish landing receipts (“fish tickets”);
- commercial fishing vessels are subject to having their catch sampled;
- commercial fishing vessels in most CPS fisheries must accommodate observers during fishing trips if requested; and
- logbooks are required for most CPS fisheries.

By utilizing multiple data sources, the Council can minimize uncertainty in the data being collected to support fisheries monitoring and in-season management decision making.

To highlight the existing program the CPS FMP will be updated as such:

### **Proposed CPS FMP language for Section 2.6**

“There is relatively low uncertainty around the suite of data from these [reporting and monitoring] programs because they have been ground-truthed by other more intensive data collection methods, namely observer programs in the 1990s and early 2000s, that were discontinued due to findings that bycatch in CPS fisheries was indeed low.”

In addition, the CPS SAFE document will now include details of the data collection methods utilized by the Council. Suggested language includes, but not limited to:

“Commercial CPS landings are required to be recorded on state fish tickets (Table 4.1). State fish ticket programs provide a continuous, consistent, and long-standing reporting mechanism for CPS SBRM. Catch weight by sorted species category, vessel identification number, and other data elements are required on fish tickets. Fish tickets are produced and issued by the individual states but have been designed and evaluated to ensure they meet record-keeping requirements and/or needs in coordination with state and Federal managers through the Pacific States Marine Fisheries Commission (PSMFC). State fish receiving tickets document landed catch including bycatch (fish landed but not sold, i.e., zero value) and following in-house processing and quality control are reported to the PSMFC Pacific Fisheries Information Network (PacFIN, <http://pacfm.psmfc.org>).

....

Likewise, each state fishery logbook or federal program functions separately. Unlike fish receiving tickets, there is no central repository for CPS logbook data. The data collected through logbook programs are maintained by the state or federal agency. Logbook data provide supplemental bycatch information because most catch is landed in CPS fisheries. When vessels are required to maintain and submit logbooks, they must accurately record information such as: date, identification of catcher vessel, time, position, sea depth, and catch by species of each haul or set; retained and released catch amounts, gear information, if applicable; information on other parties receiving fish or fish products; and any other information deemed necessary. Washington mandates logbooks for directed sardine or mackerel fishing but has not implemented a program for anchovy given the small size of the fishery. Oregon mandates logbooks for all CPS fisheries. Logbooks are not currently required for CPS finfish fisheries in California; however, they are required for the market squid fishery.

CPS are generally not targeted by recreational harvesters and catch of CPS is minimal and a miniscule proportion of CPS total catch. Recreational fishing for CPS is typically done with hook and line gear, or small hand deployed cast nests and therefore includes very minimal amounts of bycatch. CPS are typically targeted recreationally on a very limited scale for use as bait or personal consumption.

Washington, Oregon, and California state regulations require access to recreational catches upon request by authorized personnel (Table 2). In Washington, recreational sampling programs focus on salmon and groundfish and typically do not collect data on CPS because catch is minimal. Oregon sampling of recreational fishing activity also focuses on salmon and groundfish for the same reasons. The California recreational fishery sampling program surveys recreational fishers to determine which fish they are targeting and makes note of discarded fish. State monitoring programs collect, process, and report recreational fishing data to the PSMFC Recreational Fishery Information Network (RecFIN, <http://www.recfin.org>).

Areas of uncertainty in bycatch data produced by these reporting and monitoring systems depend on the data source. Fish tickets will not capture fish released at sea, fish purchasing personnel may misidentify less familiar species, state fish ticket coding systems may use more general categories and not support full reporting to species, or fish may be too degraded to identify accurately. Dockside fishery monitoring programs are typically designed to sample only a percentage of total landings, although they are designed to produce data that is representative of the fishery (i.e., random sampling). These fishery monitoring programs may prioritize the collection of biological data (e.g., length, weight, otoliths) as a primary function and not have species composition sampling or verification of species sorting and identification as a key objective since observer programs have determined that the numbers or volume of bycatch is low. Logbook programs provide valuable information but are dependent on the vessel captain to fully and accurately document observed bycatch. The quality of the data depends on the captain's or vessel crew skill and diligence in identifying and enumerating or estimating bycatch.”

**Table 2. State and federal regulations, including links, that support SBRM. (Rules and numbering may change; this analysis is based on the rules and their numbering in place at the time of this report.)**

<b>Reporting or Data Collection Procedure</b>	<b>Washington Administrative Code (WAC)</b>	<b>Oregon Administrative Regulations (OARs)</b>	<b>California Code of Regulations (CCR)</b>	<b>Federal</b>
Fish Landing Receipts	<a href="#">WAC 220-305-030</a> <a href="#">Chapter 220-352</a>	<a href="#">OAR 635-006-0210</a>	<a href="#">14 CCR § 190</a>	<a href="#">§660.505</a>
Fishery Monitoring-Sampling	<a href="#">WAC 220-305-070</a> <a href="#">WAC 220-356-040</a> <a href="#">WAC 220-360-320</a>	<a href="#">OAR 635-001-0035</a> <a href="#">OAR 635-006-0136</a> <a href="#">OAR 635-011-0100</a>	<a href="#">14 CCR § 105.5</a>	<a href="#">§660.505</a>
Logbook	<a href="#">WAC 220-356-040</a> <a href="#">WAC 220-360-320</a>	<a href="#">OAR 635-004-0376</a> <a href="#">OAR 635-005-0930</a>	<a href="#">14 CCR § 190</a> <a href="#">14 CCR § 149</a>	
Observers	<a href="#">WAC 220-356-040</a> <a href="#">WAC 220-360-320</a>	<a href="#">OAR 635-006-0140</a>	<a href="#">14 CCR § 105.5</a>	<a href="#">§660.519</a>
Bycatch and Fishing Gear Restrictions	<a href="#">WAC 220-356-040</a>	<a href="#">OAR 635-004-0378</a> <a href="#">OAR 635-004-0235</a>	<a href="#">14 CCR §155.05</a>	<a href="#">§660.506</a> <a href="#">§660.511</a> <a href="#">§660.520</a>

## 2.4 Data Use

Sections 2.1.7 Management Measures to Protect Non-Coastal Pelagic Species, 2.2.1.1 Observers Data, 2.2.2.7 Reporting Requirements, and 4.7 Stock Assessment and Fishery Evaluation Report provide the background for why data is collected and how it is used by the Council.

Specifically, Section 2.1.7 of the FMP says:

“CPS fishing activities may directly impact certain non-CPS species including birds, marine mammals, and other fishes. This FMP authorizes implementation of measures to control CPS fishing to support conservation objectives identified under overfishing definitions adopted by the Council, the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), or other applicable law, while minimizing disruption of the CPS fishery. Any measures described in this FMP may be employed to control fishing impacts on non-CPS species.

Data collected by the state programs are used in the development of the CPS SAFE, a requirement of the Magnuson-Stevens Act, where bycatch for CPS fisheries is documented on an annual basis.”

And 2.2.1.1 says:

“All fishing vessels operating in this management unit, including catcher/processors, at-sea processors, and vessels that harvest in Washington, Oregon, or California and land catch in another area, may be required to accommodate NMFS certified observers on board to collect scientific data. An observer program will be considered only for circumstances where other data collection methods are deemed insufficient for management of the fishery.”

Section 2.2.2.7 Reporting Requirements - Other Reporting and Record Keeping Requirements provides more details:

“Catch, effort, biological, and other data necessary for implementation of this FMP will continue to be collected by the states of Washington, Oregon, and California under existing state data collection provisions. Federal reporting requirements, such as logbooks, will be implemented only when data collection and reporting systems operated by state agencies fail to provide the Secretary with statistical information for adequate management.”

4.7 Stock Assessment and Fishery Evaluation Report provides further details of what must be collected. In summary:

“The CPSMT will prepare an annual SAFE report describing the status of the CPS fishery. The SAFE report provides information to the councils for determining annual harvest levels for each stock, documenting significant trends or changes in the resource, marine ecosystems, and fishery over time, and assessing the relative success of existing state and Federal fishery management programs.”

Finally, text will be added to the CPS FMP to explicitly cite that how the data is used:

**Proposed CPS FMP language for Section 2.6**

“The data from these programs are used each year by the Council, usually in the annual SAFE document, to assess the type and amount of bycatch in CPS fisheries.”

These programs support management of CPS fisheries and stock assessments through the collection and processing of biological and catch data. The objectives of the monitoring programs are to: (1) collect biological data, such as size and otoliths for ageing from commercially landed fish to support research and stock assessments; and (2) collect catch, including bycatch, data via fish receiving tickets, commercial fisheries logbooks, and species composition sampling, to support fisheries monitoring and in-season management decision making.

Based upon further review of the CPS SBRM and its documentation, the CPSMT determined that information could be added to the SAFE including:

- a. the source of bycatch data reported in the SAFE document (i.e., logbooks, fish tickets, port sampling),
- b. links to or summaries of state sampling data collection methodologies, and
- c. a description of the methods used for evaluating bycatch.

An example of the type of information that will be added to the SAFE that is cited throughout this document is also contained in Agenda Item E.5.a, Supplemental CPSMT Report 1, September 2021.

## 2.5 Final Proposed Language to Amend the CPS FMP

This section contains a summary of all proposed FMP language that was cited and discussed in the previous sections. Underlined text shows insertions and strikeouts show deletions to clearly show what will be added or removed in each FMP.

### **New Section 2.6 Standardized Bycatch Reporting Methodology**

As required under Magnuson-Stevens Act, all FMPs must “establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery” (16 U.S.C. § 1853(a)(11)). Standardized bycatch reporting methodology (SBRM) is an established, consistent procedure or procedures used to collect, record, and report bycatch data in a fishery, which may vary from one fishery to another. This section describes the SBRM for CPS fisheries and how it meets the purpose of SBRMs.

### **Characteristics of Bycatch**

Bycatch in CPS fisheries is typically low due to the characteristics of the targeted species and the fishing gears. For example, CPS finfish typically school with similarly sized fish and are harvested above the thermocline (not associated with substrate). CPS vessels fish with roundhaul gear (purse seine or lampara nets). Roundhaul fishing tends to reduce unintentional catch, primarily because the fishermen target specific schools of CPS finfish and market squid, and the net can be adjusted when fishing in shallow water to reduce bycatch of benthic species. The most common catch of non-target species in a CPS fishery are other CPS species, which are typically sold and therefore are not bycatch. Various reviews of catch in CPS fisheries have confirmed that bycatch of non-CPS is extremely low.

The SBRM for CPS fisheries, as established under Amendment 9, is a reflection of the characteristics of bycatch in the fishery and findings from analyses during the development of Amendment 9 that showed bycatch was sufficiently minimized through existing management measures and regulations, and that SBRM could be accomplished cost-effectively through required state programs. The CPS SBRM consists of a suite of reporting and monitoring programs required by the states of California, Oregon, and Washington including logbooks, fish landing receipts, shorebased/dockside sampling, and observer programs for newly developing fisheries. Of these, fish landing receipts are mandated by all three states and apply uniformly to all CPS landings whereas the other programs may vary by fishery and state depending on need.

### **Data Uncertainty**

Additionally, the CPS FMP authorizes federal observers as described in Section 2.2.1.1. This regulation was added to the FMP through Amendment 9 as part of the FMP’s SBRM. Based on the data collected through historical observing programs, bycatch in CPS fisheries is known with reasonable certainty to be low, with the majority of non-target species caught in CPS fisheries being other CPS that are incidental catch rather than bycatch. Hence, CPS fisheries are not currently subject to having mandatory observers aboard. In addition, Washington and Oregon state regulations authorize observers and states may conduct observer programs.

### **Feasibility Check and Data Use**

These reporting and monitoring programs have been operating efficiently for many years and have shown to be feasible over time, as evidenced by their continued operation and use of the resulting data. The data from these programs are used each year by the Council, usually in the annual SAFE document, to assess the type and amount of bycatch in CPS fisheries. There is relatively low uncertainty around the suite of data from these programs because they have been ground-truthed by other more intensive data collection

methods, namely observer programs in the 1990s and early 2000s, that were discontinued due to findings that bycatch in CPS fisheries was indeed low.

### 3 SBRM for the Pacific Coast Salmon FMP

The current FMP contains a section on bycatch (Section 3.5), that includes the definition of bycatch and management intent (Section 3.5.1), the occurrence of bycatch (Section 3.5.2), and a description of standard reporting methodology. These sections reflect the intent of SBRM and meet the general requirement of addressing bycatch and SBRM.

The consistency review focused on characterizing bycatch occurring in salmon fisheries, the feasibility of implementing the SRBM, the uncertainty in the data, and how the data will be used to assess the type and amount of bycatch occurring in the fishery. Through this review we recommend adding new descriptions of procedures used to collect, record, report, and assess salmon bycatch in Preseason Report III and amending the FMP to meet the purpose of SBRM. These documents will be updated and augmented to better document how SBRM requirements are met, identify where descriptions of bycatch estimation methodologies can be found, document sources of bycatch estimates, and describe the uncertainty inherent in bycatch estimates.

Reference documents:

1. [Pacific Coast Salmon FMP Through Amendment 20](#)
2. [2021 Pre-season Report III](#)
3. [SAFE Annual report 2020](#)
4. Agenda Item E.5.a, [Supplemental STT Report 1](#), September 2021
5. Agenda Item C.8.a, [Supplemental STT Report 1](#), November 2021 (Final recommendations)

This section provides a summary of where SBRM requirements are met and what information is needed to comply with final rule. We describe the monitoring programs that generate bycatch estimates for commercial and recreational ocean salmon fisheries, how SBRM requirements are met, and propose draft new language for the salmon FMP that would provide further details on SBRM for salmon fisheries.

#### 3.1 Characteristics of Bycatch

Section 1.1 and 3.5.1, 3.5.2 of the FMP provides basic information regarding the characteristics of bycatch for commercial and recreational salmon fisheries. The SAFE document provides further details about the species composition of bycatch. Additional information cited in this section will be added to the FMP as a new section 3.5.2.1 and the SAFE document.

FMP 3.5.1 contains general language that identifies the bycatch that occurs in the fishery. The underlined sentence will be added to explicitly identify that groundfish species are also caught:

“Under the salmon FMP, the primary bycatch that occurs is bycatch of salmon species. Therefore, the Council’s conservation and management measures shall seek to minimize salmon bycatch and bycatch mortality (drop off and hooking mortality) to the greatest extent practical in all ocean fisheries. Very limited bycatch of groundfish species occurs as well.”

And

“Shared EC Species, identified in Table 1-4, could continue to be taken incidentally without violating Federal regulations, unless regulated or restricted for other purposes, such as with bycatch minimization regulations. The targeting of Shared EC Species is prohibited.”

FMP 1.1:



“Table 1-4 lists the non-target Shared EC Species that are not in the fishery, for which future fishery development is prohibited until and unless the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem.”

Section 3.5.2 of the FMP will be revised to include more information about the occurrence of bycatch. Edits are identified through strikeout (removed) and underlined text (added).

### **“3.5.2 Occurrence of Bycatch**

~~The present~~ Current bycatch and bycatch mortality estimates and methodologies for salmon in salmon fisheries are documented by the STT annually in the SAFE and Preseason Report III documents. Descriptions of bycatch estimation methodologies are included in an appendix to Preseason Report III. Bycatch of salmon in Pacific Coast trawl fisheries is documented in Amendment 12 (PFMC 1997a). More recent information is reported in a Section 7 biological opinion regarding salmon bycatch in the groundfish fishery (NMFS 2006), and a subsequent report that summarizes the bycatch of salmon in recent years (Bellman et al. 2011). Salmon fisheries or fishery practices that lack or do not have recent observation data or estimates of bycatch composition and associated mortality rates will be identified by the Council for future research priority in their biannual Research and Data Needs Report to NMFS.

~~Future~~ Changes in the procedures and to the methodologies from prior years will occur only if a comprehensive technical review ~~of existing biological data justifies~~ supports a modification and the modification is approved by the STT, SSC, and Council. ~~All of these changes will~~ Any changes to methodologies for estimating bycatch will be considered ~~occur~~ within the schedule and process established for Salmon Methodology Review and apart from the preseason planning process (Council Operating Procedure 15; PFMC 2008), unless the Council determines additional review is necessary. Salmon fisheries or fishery practices that lack or do not have recent observation data or estimates of bycatch composition and associated mortality rates will be identified by the Council for future research priority in their biannual Research and Data Needs Report to NMFS.

~~Bycatch of fish other than salmon in salmon fisheries is generally very limited. Only hook and line gear is allowed in ocean salmon fisheries and regulations allow for retention of most groundfish species and limited numbers of Pacific halibut that are caught incidentally while salmon fishing.”~~

In addition, a new section 3.5.2.1 was added to further describe the characteristics of the bycatch in salmon fisheries. Existing text was revised and supplemented to create the new section.

#### **“3.5.2.1 Characteristics of Bycatch in the Salmon Fishery**

Salmon bycatch, consistent with the definition above, occurs when salmon are discarded due to regulatory reasons (e.g., undersized salmon not legal to retain or non-target species are captured such as Chinook salmon in coho salmon directed fishery), boat limits are reached (additional encounters are discarded and therefore not sold or kept for personal use), and also includes salmon that encounter fishing gear but do not result in harvest of fish (drop off and release mortality).

Based on prior examinations of groundfish bycatch in the salmon fishery (2006 EA), coupled with declining levels of salmon fishing effort since the last examination, bycatch of fish other than salmon in salmon fisheries is generally very limited and expected to continue to be low. Only hook-and-line gear is allowed in ocean salmon fisheries and regulations allow for retention of most groundfish species. Incidental groundfish catch is also considered part of the open access groundfish fishery. And The limited numbers of incidental Pacific halibut caught incidentally while commercial salmon fishing are managed under the North Pacific Halibut Act of 1982 (U.S. Congress, 1982).

All non-salmon species (except halibut and highly migratory species) must be released when fishing in the federal Rockfish Conservation Area (RCA) unless a vessel is equipped with Vessel Monitoring System (VMS). Vessels with VMS may retain a limited quantity of some groundfish. However, the proportion of salmon vessels equipped with VMS is thought to be relatively small.

In addition, the number of active salmon permits and the number of vessels landing salmon in Washington, Oregon, and California indicate that fishery participation has generally decreased or been stable since at least 1980. In addition, the commercial salmon troll fishery has not had changes in gear type, structural changes in fishery regulations, or major expansion of open fishing areas. Based on this information it is unlikely that characteristics of groundfish bycatch in the salmon fishery have increased over time, nor is it expected to increase in the future.”

The consistency review revealed that more information may be needed to help describe the fisheries and how they are monitored to understand the bycatch that is being summarized. Salmon bycatch projections for the upcoming salmon seasons, and postseason salmon bycatch estimates from the previous season are presented in Table 6 of Preseason Report III. Footnotes to Table 6 describe aspects of the bycatch enumeration methodology, but do not fully describe the methods used. To more comprehensively describe the methods used to make preseason and postseason estimates of bycatch, the Salmon Technical Team (STT) will develop an *Appendix to Preseason Report III*. The appendix will describe the data and methods used to generate bycatch projections and estimates, and how the methods differ for commercial and recreational fisheries and along the coast.

The following additions to the Preseason Report III that supports describing the characteristics of the fisheries may include:

**“Descriptions of salmon bycatch estimation from ocean salmon fisheries.**

The term “salmon bycatch” is referred to in the following sections. In this summary, salmon bycatch is defined as salmon caught during an ocean salmon fishery which are not sold or kept for personal use, and includes all discards both economic and regulatory, as well as mortality of any salmon due to an encounter with fishing gear that does not result in capture of fish. Releases occur for a variety of reasons, which include releasing salmon under the legal size limit required for retention, or releasing salmon species in an area or time of the year when a fishery is open for another species of salmon (*e.g.*, release of coho salmon when Chinook salmon are the only legal salmon available to keep), or when an area is open for multiple species and the vessel has achieved its limit of one species and therefore releases additional encounters of that species while trying to obtain its vessel limit of other species.

*Treaty Indian troll salmon fishery*

All landed salmon in the Treaty Troll fishery are reported to the tribe on a tribal fish ticket. Those catch data are compiled and shared with state co-managers in a timely manner. This information is also shared with the STT to complete Preseason reports. Each treaty Indian tribe in western Washington maintains a monitoring staff that samples salmon that are caught in fisheries. No information is gathered on released salmon from the Treaty Troll fishery as Chinook and coho bycatch and bycatch mortality estimates are not produced using observational data collected during a fishery. Instead, historical retained species contact information and current year abundance forecasts are used by the STT to project the number of salmon, by species, which will be contacted (bycatch) and then total bycatch mortality estimates (retained fish, release mortality, and drop off mortality) are made.

### *Washington non-tribal commercial troll salmon fishery*

All landed salmon in the Washington commercial troll salmon fishery are recorded on state fish receiving tickets by commercial fish buyers. Additional sampling by WDFW for the duration of the commercial troll salmon season, typically May through September, provides a verification of fish ticket catch accounting. No information is gathered on released salmon from the commercial troll fishery. Chinook and coho bycatch and bycatch mortality estimates are not produced using observational data collected during a fishery. Instead, historical retained species contact information and current year abundance forecasts are used by the STT to project the number of salmon, by species, which will be contacted (bycatch) and then total bycatch mortality estimates (retained fish, release mortality, and drop off mortality) are made.

### *Oregon commercial troll salmon fishery*

All landed salmon in the Oregon commercial troll salmon fishery are recorded on state fish receiving tickets by commercial fish buyers. Additional sampling by ODFW for the duration of the commercial troll salmon season provides a verification of fish ticket catch accounting. No information is gathered on released salmon from the commercial troll fishery. Chinook and coho bycatch and bycatch mortality estimates are not produced using observational data collected during a fishery. Instead, historical retained species contact information and current year abundance forecasts are used by the STT to project the number of salmon, by species, which will be contacted (bycatch) and then total bycatch mortality estimates (retained fish, release mortality, and drop off mortality) are made.

### *California commercial troll salmon fishery*

All salmon landed in the California commercial troll fishery are recorded on state commercial landing receipts and reported in a state electronic fish ticket system. The CDFW has an extensive sampling program which monitors commercial salmon landings at all major salmon ports in California. All salmon landed on each sampled vessel are observed and counted, and interviews are conducted to assess the number of sublegal-sized Chinook released during the trip. The target sampling rate for the commercial salmon fishery is a minimum of 20 percent of total pounds landed per major port and half month period. Estimates of total salmon bycatch are made for each time-area cell by expanding interview totals by that cell's sampling expansion. Total bycatch mortality for each species is then calculated by applying a hook-and-release mortality rate to the number of released fish and adding in the number of estimated losses resulting from drop-off mortality.

### *Washington recreational salmon fishery*

Landings and releases of salmon are estimated through a dockside sampling program conducted by WDFW in Washington's ocean access ports. Primary ports of ocean access and ports that contribute ocean salmon angling effort of significance are monitored for the duration of the recreational ocean salmon season, typically mid-June through September. All landed salmon on interviewed vessels are counted, and the individuals on the boat are questioned as to any releases that occurred. The releases are recorded by species but are not narrowed to reason for release (i.e., too small, not using legal gear for salmon, closed season, etc.). Both retained and released fish are expanded by the number of recreational boats within the sampling strata divided by the number of interviewed recreational boats within the same sampling strata. Estimates of salmon that are retained as well as salmon that are released are provided to the Recreational Fishery Information Network (RecFIN, [recFIN.org](http://recFIN.org)).

Chinook and coho bycatch is estimated from a combination of dockside interview data, on-board observer data, and voluntary on-water trip reports (VTRs) completed by anglers while fishing. Charter and private boats are systematically sampled at a minimum target rate of 20 percent within each boat type. Total encounters are estimated from collected data on species, size class, and mark status. Total bycatch mortality is then calculated by applying the hook-and-release mortality rate (14 percent) to the number of released

fish and adding in the number of estimated losses resulting from drop-off mortality (5 percent). The hook-and-release mortality rate is defined as the mortality rate on fish that are brought to the boat and released. The drop-off mortality rate is defined as the mortality rate on fish that encounter fishing gear but escape from the hook before being brought to the boat (often attributed to a predation event).

#### *Oregon recreational salmon fishery*

Landings and releases of salmon are estimated through a comprehensive dockside sampling program along the Oregon Coast by ODFW. Several ports are monitored year-round, others from March through October, others from May through September/October, and a few others from June through September. All landed salmon on interviewed vessels are counted, and the individuals on the boat are questioned as to any releases that occurred. The releases are recorded by species but are not narrowed to reason for release (i.e., too small, not using legal gear for salmon, closed season, etc.). Numbers of both retained and released fish are expanded by the number of recreational boats within the sampling strata divided by the number of interviewed recreational boats within the same sampling strata. Details are available on the sampling project and estimation process at [http://www.dfw.state.or.us/MRP/salmon/docs/ORBS\\_Design\\_2021.pdf](http://www.dfw.state.or.us/MRP/salmon/docs/ORBS_Design_2021.pdf). Estimates of salmon that are retained as well as salmon that are released are provided to RecFIN.

Chinook and coho bycatch is estimated from dockside interview data. Charter and private boats are systematically sampled at a minimum target rate of 20 percent within each boat type. Total encounters are estimated from collected data on species, size class, and mark status. Total bycatch mortality is then calculated by applying the hook-and-release mortality rate (14 percent) to the number of released fish and adding in the number of estimated losses resulting from drop-off mortality (5 percent).

#### *California recreational salmon fishery*

CDFW has extensive sampling programs monitoring recreational ocean salmon landings and releases made by both Commercial Passenger Fishing Vessels (CPFVs) and private recreational skiffs. Sampling is conducted in all major ports and primary access sites with active salmon vessels. All salmon landed on each sampled vessel are counted and observed, and interviews are conducted to assess gear type used (trolling or mooching) and the number of sublegal-sized Chinook released during the trip. In the CPFV sector, a minimum of 20 percent of total salmon-targeting CPFV trips are sampled per major port and half month period. In the private skiff sector, a random stratified sampling design is used to target a minimum of 20 percent of available site-days per major port and half month period.

Estimates of salmon bycatch are made for each recreational sector and time-area cell by expanding interview totals by that cell's sampling expansion. Total bycatch mortality is then calculated by applying gear specific hook-and-release mortality rates to the number of released fish and adding in the number of estimated losses resulting from drop-off mortality.

### **Descriptions of groundfish bycatch estimation from ocean salmon fisheries**

For commercial ocean salmon fisheries, no observational data are gathered on released groundfish species. A requirement to collect such data would be cost prohibitive. In the following sections we describe how groundfish encounters are treated and review how levels of potential groundfish bycatch may have changed since the last time a review on the level of groundfish bycatch was conducted for the ocean salmon fishery.

### *Treaty Indian troll salmon fishery groundfish bycatch*

Each treaty tribe on the coast has their own version of a regulation that pertains to incidental groundfish catch, essentially if the groundfish species is legally allowed to be retained then the fisher is required to land and document it on a fish ticket. No information is gathered on released groundfish from the treaty troll salmon fishery.

### *Washington non-tribal commercial troll salmon fishery groundfish bycatch*

All landed fish species in the Washington commercial troll salmon fishery are recorded on fish receiving tickets by commercial fish buyers. No information is gathered on released fish from the commercial troll fishery. Estimates of groundfish bycatch and bycatch mortality in the commercial troll fishery are not produced.

### *Oregon commercial troll salmon fishery groundfish bycatch*

All landed fish species in the Oregon commercial troll salmon fishery are recorded on fish receiving tickets by commercial fish buyers. For non-salmon species, there is not a requirement to provide the number of fish, only the pounds landed. No information is gathered on released fish from the commercial troll fishery. Estimates of groundfish bycatch and bycatch mortality in the commercial troll fishery are not produced.

### *California commercial troll salmon fishery groundfish bycatch*

All salmon landed in the California commercial troll fishery are recorded on commercial landing receipts and reported in an electronic fish ticket system. No data on released fish of any species are reported on commercial landing receipts. No information is collected on released fish (non-salmon) as part of CDFW's commercial salmon sampling program. Estimates of groundfish bycatch and bycatch mortality in the commercial troll fishery are not produced.

### *Washington recreational salmon fishery groundfish bycatch*

Landings and releases of all species are estimated through a dockside sampling program present in Washington's ocean access ports by WDFW. Primary ports of ocean access and ports that contribute ocean angling effort of significance are monitored for the duration of ocean recreational seasons, typically mid-March through mid-October. All landed fish on interviewed vessels are counted by species, and the individuals on the vessel are questioned as to any releases that occurred. The releases are recorded by species but are not narrowed to reason for release (i.e., too small, illegal species, closed season, etc.). Both retained and released fish are expanded by the number of recreational boats within the sampling strata divided by the number of interviewed recreational boats within the same sampling strata. Stratified estimates of both groundfish retained and released during all trips, including trips when salmon are the target species, are produced monthly by WDFW. Estimates of all fish that are retained as well as those released (by species) are provided to RecFIN. Depth-dependent mortality is estimated by RecFIN for released groundfish.

### *Oregon recreational salmon fishery groundfish bycatch*

Landings and releases of all species are estimated through a comprehensive creel program along the Oregon Coast by ODFW. Several ports are monitored year-round, others from March through October, others from May through September/October, and a few others from June through September. All landed fish on interviewed vessels are counted by species, and the individuals on the vessel are questioned as to any releases that occurred. The releases are recorded by species but are not narrowed to reason for release (i.e., too small, illegal species, closed season, etc.). Both retained and released fish are expanded by the number of recreational boats within the sampling strata divided by the number of interviewed recreational boats within the same sampling strata. Details on the estimation process for the Ocean Recreational Boat Survey

can be found at [http://www.dfw.state.or.us/MRP/salmon/docs/ORBS\\_Design\\_2021.pdf](http://www.dfw.state.or.us/MRP/salmon/docs/ORBS_Design_2021.pdf). Estimates of all fish that are retained as well as those released (by species) are provided to RecFIN.

#### *California recreational salmon fishery groundfish bycatch*

CDFW's recreational sampling programs monitor landings and releases of all species made by both CPFVs and private recreational skiffs. While sampling salmon-targeting CPFV trips, data are collected on the number of landed and released salmon, but no data are collected on non-salmon releases. While sampling salmon-targeting private skiff trips, data are collected on all landed and released species. Estimates of all fish that are retained as well as those released (by species) are provided to RecFIN.

#### Assessment of current commercial troll salmon fishery groundfish bycatch

After a review of the commercial troll (tribal and non-tribal) and recreational ocean salmon fisheries, it was discovered that the bycatch of groundfish in the salmon-directed commercial fisheries was not being reported in either salmon or groundfish documents. Groundfish bycatch in the salmon troll fishery appears to have been last assessed when developing the 2006 Environmental Assessment (EA) which reads "Bycatch of fish other than salmon in salmon fisheries is generally very limited. Only hook-and-line gear is allowed in ocean salmon fisheries and regulations allow for retention of most groundfish species and limited numbers of Pacific halibut that are caught incidentally while salmon fishing."

Several factors contributed to this finding. As the 2006 EA indicated, the levels of salmon catch fluctuate from year to year and the amount of groundfish taken as incidental catch remained very low every year, so changes in the salmon fishery do not substantially alter the projections for harvest-related mortality in the groundfish fishery (projections made as part of the development of the groundfish annual specifications). In 2006, eight species of groundfish were considered overfished, however, half of these species were unlikely to be caught because they occur in habitats outside areas where salmon trolling occurs. The 2006 EA listed the optimal yields (OY) for the reported overfished species which were encountered as bycatch in the salmon fishery. At the time, the available data indicated the estimated groundfish bycatch represented at the highest, 3.4 percent of a given groundfish species' OY, but generally represented on average 0.3 percent of a given groundfish species' OY. Based on these estimates, the 2006 EA indicated it does not appear likely that a substantial increase in groundfish catch would be expected with any increases in salmon harvest. Because this remained consistent in the analysis, assuming incidental catch (groundfish encountered, including those retained or discarded) in the salmon fishery is low regardless of salmon abundance is still reasonable. However, bycatch is also function of salmon fishing effort, so the STT evaluated observed changes in fishery participation to determine if salmon fishing activity has increased since 2006, which would alter the continued assumption that groundfish encounters and discards are still low.

The STT examined the number of active permits and the number of vessels landing salmon in California, Oregon, and Washington, which showed fishery participation has decreased or stayed stable since at least 2003 (Figure 1). The commercial salmon troll fishery has not had notable changes in gear type, structural changes in fishery regulations, or major expansion of open fishing areas. While some groundfish stocks have now rebuilt to higher biomass levels than in 2006, it is possible that groundfish encounters in the salmon fishery could have increased. However, the rate of groundfish encounters (as a proportion of stock abundance) is unlikely to have increased, given the stability or decrease in commercial salmon fishery participation. Furthermore, all non-salmon species (except halibut and highly migratory species) must be released when fishing in the federal Rockfish Conservation Area (RCA) unless a vessel is equipped with Vessel Monitoring System (VMS). Vessels with VMS may retain a limited quantity of some groundfish. However, the proportion of salmon vessels equipped with VMS is thought to be relatively small.

Thus, after its examination of the information available, the STT has concluded that (1) the 2006 EA statement that "...regulations allow for retention of most groundfish species..." is no longer accurate since

retention of most groundfish stocks is prohibited in the federal RCA for much of the salmon fleet and (2) the 2006 EA statement that “Bycatch of fish other than salmon in salmon fisheries is generally very limited” likely holds true today.

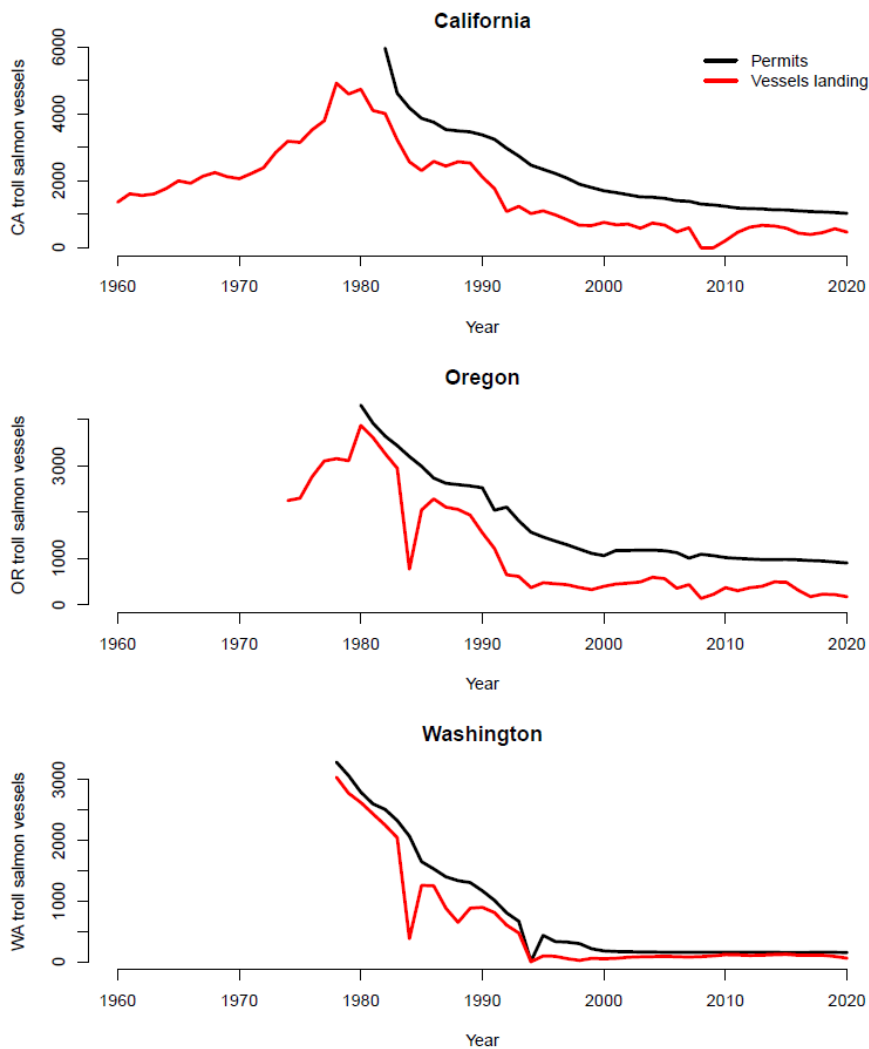


Figure 1. The number of active permits and vessels landing salmon in the commercial salmon troll fishery by state. Data sourced from PFMC 2021, Appendix D.

## 3.2 Feasibility Check

A new FMP section (3.5.3 and 3.5.3.1) will be added to provide details about the data collection methods and the feasibility of these methods. The SAFE document will provide detailed descriptions of the methods used by each state agency to collect the information from troll and recreational fisheries for management of the salmon fisheries and how bycatch is estimated or monitored based on current information.

### “3.5.3 Standardized Bycatch Reporting Methodology

#### 3.5.3.1 Data collection, recording, and reporting on bycatch in the salmon fishery

Consistent procedure(s) used to collect, record, and report salmon bycatch data have been established to assess the amount and type of bycatch occurring in ocean salmon fisheries. The data used to assess salmon

bycatch in the ocean salmon fishery is collected through sampling and monitoring programs conducted by the states of Washington, Oregon and California, and the tribes, in various ports along the west coast. Data from the commercial salmon troll fisheries are documented on commercial landing receipts and reported in an electronic fish ticket system. Data from recreational ocean fisheries are estimated through a comprehensive dockside sampling program, and estimates of salmon that are retained as well as salmon that are released are provided to RecFIN (recFIN.org).

Section 7.2.2 of this plan details the methods for obtaining data, stating the local fishery management authorities (states, Indian tribes) will collect the necessary catch and effort data and will provide the Secretary with statistical summaries adequate for management. The local management authorities, in cooperation with and subject to review by the National Marine Fisheries Service, will continue this data collection. Section 7.3 of this plan authorizes local management authorities to determine the specific reporting requirements for those groups of fishermen under their control and to collect that information under existing local data-collection provisions. Data regarding released salmon in the salmon recreational fisheries is collected by the states through dockside interview programs. There are no reporting requirements for salmon bycatch in the commercial salmon fishery, however, released salmon may be voluntarily reported on fish tickets. Bycatch concerns are very low in the commercial salmon fishery due to the selectivity of gear, seasonality, and the implementation of closed areas during times of the year when bycatch is generally highest. If this data collection and/or reporting becomes insufficient to manage the salmon fishery, federal data collection may need to be implemented.

These data collection efforts are feasible, as they have been implemented in the fishery for a number of years.

As noted under the Characteristics of Bycatch section, draft language for the Preseason III report identifies additional information regarding bycatch estimations. Some of that information is in support of the feasibility check of SBRM.

### **3.3 Data Uncertainty**

The FMP lacks specific language regarding data uncertainty; therefore, a new section will be added to the FMP (3.5.3.3) to describe the uncertainty:

#### **“3.5.3.3 Data uncertainty regarding bycatch in the salmon fishery**

For some fishery sectors there is not any direct observation or reporting of salmon bycatch, and in those cases historical data from when full retention occurred in the fishery can be used to model expected encounter rates given contemporary effort and abundance estimates. In such cases, standard bycatch rates developed using the best scientific information will be used to estimate bycatch. The use of standard rates can introduce uncertainty in the bycatch estimates. Although this uncertainty cannot be described quantitatively, the majority of the bycatch estimation uncertainty is assumed to be from release and drop-off mortality estimates which are based on the best scientific information available, which have been reviewed by the STT (STT, 2000).

Salmon fisheries or fishery practices that lack recent bycatch data or estimates of bycatch composition and associated mortality rates will be identified by the Council for future research priority in their biannual Research and Data Needs Report to NMFS.

The STT will annually continue to assess the number of active permits and the number of vessels landing salmon in California, Oregon, and Washington to determine if fishery participation levels change over time to gauge potential changes in bycatch of groundfish since the last examination occurred (2006 EA [NMFS 2006]), and will document their findings annually in the Preseason III report.”



### 3.4 Data Use

The FMP provides general statement regarding how data is used for the development of conservation and management measures in Section 3.5.1:

“When bycatch cannot be avoided, priority will be given to conservation and management measures that seek to minimize bycatch mortality and ensure the extended survival of such fish. These measures will be developed in consideration of the biological and ecological impacts to the affected species, the social and economic impacts to the fishing industry and associated communities, and the impacts upon the fishing, management, and enforcement practices currently employed in ocean salmon fisheries (see also Section 6.5.3).”

And new Section 3.5.3.2 was revised to further discuss data use:

#### **“3.5.3.2 Assessing bycatch in the salmon fishery**

Anticipated bycatch in the fishery is addressed in the salmon preseason planning process and documented annually at conclusion of the preseason planning process in the Preseason Report III. In the pre-season planning process, the STT uses existing bycatch data and modeling methodologies to describe the salmon bycatch that would be expected to result from each of the management alternatives developed in the preseason process. Post-season estimated incidental mortality of salmon is reported in the annual Review of Ocean Salmon Fisheries

~~Within the salmon preseason planning process,~~ The management alternatives will be assessed for the effects on the amount and type of salmon bycatch and bycatch mortality. Estimates of salmon bycatch and incidental mortalities associated with salmon fisheries will be included in the modeling assessment of total fishery impact and assigned to the stock or stock complex projected to be impacted by the proposed management measures. The resultant fishery impact assessment reports for the ocean salmon fisheries will specify the amount of salmon bycatch and bycatch mortality associated with each accompanying management alternative. ~~The Preseason III report of Council-adopted~~ recommended management measures will contain an assessment of the total salmon bycatch and bycatch mortality ~~for~~ estimated to result from the ocean salmon fisheries, and include the percentage that these estimates represent compared to the total harvest projected for each species, as well as the relative change from the previous year’s total bycatch and bycatch mortality levels.”

### 3.5 Final Proposed Language to Amendment the Salmon FMP

This section contains a summary of all proposed FMP language that was cited and discussed in the previous sections. Underlined text shows insertions and strikeouts show deletions to clearly show what will be added or removed in each FMP.

#### **“3.5 BYCATCH**

*“Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.”*

*Magnuson-Stevens Act, National Standard 9*

*“...Establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority*

*(A) minimize bycatch; and*

*(B) minimize the mortality of bycatch which cannot be avoided;”  
Magnuson-Stevens Act § 303(a)(11)*

### **3.5.1 Definition and Management Intent**

“Bycatch” for the purposes of this fishery management plan is defined as fish harvested (caught) in an ocean salmon fishery which are not sold or kept for personal use and includes economic discards, regulatory discards, and fishery mortality due to an encounter with fishing gear that does not result in capture of fish. Bycatch does not include any fish that legally are retained in a fishery and kept for personal, tribal, or cultural use, or that enter commerce through sale, barter, or trade. In addition, under the provisions of the MSA, bycatch does not include salmon released alive under a recreational catch-and-release fishery management program.

Under the salmon FMP, the primary bycatch that occurs is bycatch of salmon species. Therefore, the Council’s conservation and management measures shall seek to minimize salmon bycatch and bycatch mortality (drop off and hooking mortality) to the greatest extent practical in all ocean fisheries. Very limited bycatch of groundfish species occurs as well. When bycatch cannot be avoided, priority will be given to conservation and management measures that seek to minimize bycatch mortality and ensure the extended survival of such fish. These measures will be developed in consideration of the biological and ecological impacts to the affected species, the social and economic impacts to the fishing industry and associated communities, and the impacts upon the fishing, management, and enforcement practices currently employed in ocean salmon fisheries (see also Section 6.5.3).

Shared ecosystem component (EC) Species, identified in Table 1-4, could continue to be taken incidentally without violating Federal regulations, unless regulated or restricted for other purposes, such as with bycatch minimization regulations. The targeting of Shared EC Species is prohibited.

### **3.5.3 Standardized Bycatch Reporting Methodology**

#### **3.5.3.1 Data collection, recording, and reporting on bycatch in the salmon fishery**

Consistent procedure(s) used to collect, record, and report salmon bycatch data have been established to assess the amount and type of bycatch occurring in ocean salmon fisheries. The data used to assess salmon bycatch in the ocean salmon fishery is collected through sampling and monitoring programs conducted by the states of Washington, Oregon and California, and the tribes, in various ports along the west coast. Data from the commercial salmon troll fisheries are documented on commercial landing receipts and reported in an electronic fish ticket system. Data from recreational ocean fisheries are estimated through a comprehensive dockside sampling program, and estimates of salmon that are retained as well as salmon that are released are provided to RecFIN(recFIN.org).

Section 7.2.2 of this plan details the methods for obtaining data, stating the local fishery management authorities (states, Indian tribes) will collect the necessary catch and effort data and will provide the Secretary with statistical summaries adequate for management. The local management authorities, in cooperation with and subject to review by the National Marine Fisheries Service, will continue this data collection. Section 7.3 of this plan authorizes local management authorities to determine the specific reporting requirements for those groups of fishermen under their control and to collect that information under existing local data-collection

provisions. Data regarding released salmon in the salmon recreational fisheries is collected by the states through dockside interview programs. There are no reporting requirements for salmon bycatch in the commercial salmon fishery, however, released salmon may be voluntarily reported on fish tickets. Bycatch concerns are very low in the commercial salmon fishery due to the selectivity of gear, seasonality, and the implementation of closed areas during times of the year when bycatch is generally highest. If this data collection and/or reporting becomes insufficient to manage the salmon fishery, federal data collection may need to be implemented.

These data collection efforts are feasible, as they have been implemented in the fishery for a number of years.

### **3.5.3.2 Assessing bycatch in the salmon fishery**

Anticipated bycatch in the fishery is addressed in the salmon preseason planning process and documented annually at conclusion of the preseason planning process in the Preseason Report III. In the pre-season planning process, the STT uses existing bycatch data and modeling methodologies to describe the salmon bycatch that would be expected to result from each of the management alternatives developed in the preseason process.—Post-season estimated incidental mortality of salmon is reported in the annual Review of Ocean Salmon Fisheries

Within the salmon preseason planning process, The management alternatives will be assessed for the effects on the amount and type of salmon bycatch and bycatch mortality. Estimates of salmon bycatch and incidental mortalities associated with salmon fisheries will be included in the modeling assessment of total fishery impact and assigned to the stock or stock complex projected to be impacted by the proposed management measures. The resultant fishery impact assessment reports for the ocean salmon fisheries will specify the amount of salmon bycatch and bycatch mortality associated with each accompanying management alternative. The Preseason III report of Council-adopted recommended management measures will contain an assessment of the total salmon bycatch and bycatch mortality for estimated to result from the ocean salmon fisheries, and include the percentage that these estimates represent compared to the total harvest projected for each species, as well as the relative change from the previous year's total bycatch and bycatch mortality levels.

### **3.5.3.3 Data uncertainty regarding bycatch in the salmon fishery**

For some fishery sectors there is not any direct observation or reporting of salmon bycatch, and in those cases historical data from when full retention occurred in the fishery can be used to model expected encounter rates given contemporary effort and abundance estimates. In such cases, standard bycatch rates developed using the best scientific information will be used to estimate bycatch. The use of standard rates can introduce uncertainty in the bycatch estimates. Although this uncertainty cannot be described quantitatively, the majority of the bycatch estimation uncertainty is assumed to be from release and drop-off mortality estimates which are based on the best scientific information available, which have been reviewed by the STT (STT, 2000).

Salmon fisheries or fishery practices that lack recent bycatch data or estimates of bycatch composition and associated mortality rates will be identified by the Council for future research priority in their biannual Research and Data Needs Report to NMFS.

The STT will annually continue to assess the number of active permits and the number of vessels landing salmon in California, Oregon, and Washington to determine if fishery participation levels change over time to gauge potential changes in bycatch of groundfish since the last examination occurred (2006 EA [NMFS 2006]), and will document their findings annually in the Preseason III report.

#### LITERATURE CITED

~~Bellman, M., J. Jannot, and J. Majewski. 2011. Observed and estimated total bycatch of salmon in the 2009 US west coast groundfish fisheries. West Coast Groundfish Observer Program. National Marine Fisheries Service, NWFSC, 2725 Montlake Blvd., Seattle, WA 98112. 32 p.~~

STT. 2000. STT Report B.2. (Final) “STT Recommendations for Hooking Mortality Rates in 2000 Recreational Ocean Chinook and Coho Fisheries”. Available at [www.pcouncil.org](http://www.pcouncil.org)

United States Congress. 1982. Northern Pacific Halibut Act of 1982. Available at [www.GOVINFO.gov](http://www.GOVINFO.gov)

Environmental Assessment for the Proposed 2006 Management Measures for the Ocean Salmon Fishery Managed Under the Pacific Coast Salmon Plan. (Document prepared by the Pacific Fishery Management Council for the National Marine Fisheries Service.) Pacific Fishery Management Council, 7700 NE Ambassador Place, Suite 200, Portland, Oregon 97220-1384.”

## 4 SBRM for the HMS FMP

Section 6.3.1 of the current HMS FMP provides a general statement to note compliance with the SBRM and identifies the data collection methods used to meet the SBRM requirements. Additional sections of the FMP provide some fishery-specific information such as authorizations for observer requirements, what method is used to collect data for a fishery, and some discussion of how the data is used.

[Appendix C](#) of the FMP provides further descriptions of SBRM and data collection efforts as well as qualitative discussions regarding bycatch monitoring. The current [SAFE](#) document is online and contains commercial and recreational catch, landings, and revenue tables. We note that bycatch data for each fishery is collected through various sources but mainly through observers, logbooks, and dockside or telephone interviews. We also note that the bycatch information is usually not reported or displayed in SAFE document tables; however, the data *is* collected by the states and available if desired or necessary to address management concerns. In addition, [Commercial fishery descriptions and recent data summaries](#) can also be found within the SAFE document along with [recreational fishery information](#) with data summaries for albacore targeted fisheries and other HMS species.

Even though Appendix C and the SAFE documents provide the majority of SBRM information and all methods for data collection in each fishery are standardized, the information that describes the bycatch data collection, recording and reporting procedures for each fishery is lacking. Therefore, we propose fishery specific FMP language to address this in FMP section 6.3.1. Some qualitative descriptions of the uncertainty around the data collected exists for only a few fisheries such as the harpoon and hook-and-line albacore fishery. Therefore, a description of data uncertainty and how the data is used in management was also added.

When the FMP was developed in 2003, NMFS was tasked with the development of the observer sampling designs, in consultation with the Council, the states, and industry, and the sampling program was to be at a level sufficient (in combination with other monitoring efforts) to provide reliable estimates of bycatch in each sector. This is now complete, and the fisheries are observed; therefore, this information has been updated to address how feasibility for SBRM and reflect which fisheries are observed. References to the source of this information was also added where applicable.

Reference documents:

1. HMS [FMP](#) Through Amendment 5 - April 24, 2018
2. HMS FMP [Appendix A](#) – Description of the Fisheries
3. HMS FMP [Appendix C](#) – Bycatch of Fish in HMS Fisheries
4. HMS FMP [Environmental Impact Statement](#) - 2004
5. Stock Assessment and Fishery Evaluation ([SAFE](#))
6. Recommendations for U.S. West Coast Highly Migratory Species Observer Programs with Options for Levels of Significance – Exhibit E.1.attachment 2, June 2005
7. Agenda Item C.2.a, [Supplemental HMS Report 1](#), June 2021
8. Agenda Item E.5.a, [Supplemental HMS Report 1](#), September 2021
9. Agenda Item C.8.a, [Supplemental HMS Report 1](#), November 2021 (Final recommendations)
10. Agenda Item C.8, [Attachment 1](#), November 2021

The following sections contain some descriptions and references to the FMP language that addresses the SBRM categories. New FMP language was developed for each fishery to address all categories. SBRM language that is in Appendix C and the SAFE is also referenced to provide as much detail as possible for the consistency review; however, it is generally not repeated in this document.

## 4.1 Characteristics of Bycatch

FMP section 6.3, and Appendix C contain general language that describes the characteristics of bycatch in the fisheries. Table 1 provides cross references to sections that currently exist. However, section 6.3.1 was revised to include general statements about the characteristics of the bycatch encountered in each fishery and is not repeated here (See Final Proposed Language to Amend the HMS FMP at the end of this section). Some of the FMP language was developed using existing language and analytical to clearly state what is known about each fishery under the FMP. Details about the bycatch species (type, pounds, etc.) are found in the annual SAFE document.

Appendix C.2 provides a general statement regarding bycatch reduction and monitoring of bycatch (esp. sharks). This provides the overall context of the characteristics of bycatch in the HMS fisheries and that the information is summarized in the SAFE document.

“There are many benefits associated with the reduction of bycatch, including the reduction of uncertainty concerning total fishing-related mortality, which improves the ability to assess the status of stocks, to determine the appropriate relevant controls, and to ensure that overfishing levels are not exceeded. It is also important to consider bycatch of HMS, especially sharks, as a source of mortality from fisheries that target species other than HMS. To maintain sustainable fisheries, it makes sense to work with fishery constituents on an effective, flexible bycatch strategy. This strategy may include a combination of management measures in the domestic fishery, and if appropriate, will incorporate multi-lateral measures recommended by international fora (e.g., MHLC, FAO Shark Global Plan of Action). The bycatch in each fishery will be summarized annually in the SAFE report for HMS fisheries. The effectiveness of the bycatch reduction measures will be evaluated based on this summary. Any regulatory changes will be made using a framework procedure.

A limited number of options are currently available for bycatch reduction in HMS fisheries, some of which are being used. These are the measures:

### Commercial

1. Gear Modifications
2. Time/Area Closures
3. Full Retention of Catch
4. Performance Standards
5. Education
6. Effort Reduction
7. Limited Soak Time
8. Forbidden to Set on Floating Objects

### Recreational

1. Use of Dehooking Devices (Mortality Reduction Only)
2. Use of Circle Hooks (Mortality Reduction Only)
3. Full Retention of Catch
4. Formal Voluntary Catch-and Release Program for all Fish
5. Formal Voluntary Catch-and Release Program for Striped Marlin Only

There are probably no fisheries in which there is no bycatch because none of the currently legal fishing gears are perfectly selective for the target of each fishing operation (with the possible exception of the swordfish harpoon fishery). Therefore, to eliminate bycatch of every species in HMS fisheries would require eliminating fishing. That is not practicable.”

And:

“Establishing uses for bycatch species may encourage fishers to retain such species. Often, catch is discarded in a fishery because of undesirable species, size, sex, or quality, or for other reasons, including economic discards (e.g., blue sharks). If certain species could be marketed, then they would be retained, not discarded, and therefore would not be considered bycatch.”

Fishery specific information about the type, quantity and disposition (discarded or alive) or reason for discard (i.e., economic discard) of bycatch can be found in Appendix C and is not repeated here (Table 1 provides section reference to Appendix C and section C.3 for this information). That information documents the fisheries under the FMP currently being managed, to describe the bycatch characteristics for each fishery and assist managers in identifying appropriate monitoring of each fishery.

## **4.2 Feasibility Check**

Appendix section C.3 provides the background for each fishery and how it was monitored at the time or how monitoring was tested and developed. Much of this information was used to settle on how data could feasibly be collected to monitor catch and bycatch in the fisheries. Since this information was developed, new FMP language was added to Section 6.3.1 to provide a general statement regarding the feasibility of the bycatch monitoring methods that were developed for each fishery. It now includes references to Appendix C and the SAFE for further information. Existing fishery specific information can be found in Appendix C and is not repeated here (Table 1 provides section reference to Appendix C for this information).

“When designing and developing monitoring data collection programs under the SBRM, the Council and NMFS, in consultation with the states, considered the feasibility and need for various monitoring methods in light of the level of bycatch in each fishery and the risk that such bycatch poses to affected fish stocks. Catch and bycatch characteristics for the fisheries managed under this FMP are addressed in this Section, and in further detail in Appendix C of the FMP and the Stock Assessment and Fishery Evaluation (SAFE) reports, which are updated annually. In addition to reporting catch and bycatch in Appendix C and the yearly SAFE reports, logbook data is used to report aggregated catch (including bycatch) and effort to the respective RFMOs and RFMO science providers, which use the information to produce stock assessments for HMS. SBRM for some HMS fisheries incorporates state-run programs sufficient for meeting federal requirements. If conditions in a fishery change such that the amount or nature of bycatch changes, or a state-run program is no longer sufficient for meeting federal requirements, the Council could use the framework procedures described in Section 5.1 to implement additional bycatch monitoring and reporting methodologies.”

## **4.3 Data Uncertainty**

Section 6.3.1 was revised to include fishery specific information about the uncertainty of the bycatch encountered and is not repeated here (See Final Proposed Language to Amend the HMS FMP at the end of this section.)

## **4.4 Data Use**

Section 6.3.1 was revised to include fishery specific information about the characteristics of the bycatch encountered and is not repeated here (See Final Proposed Language to Amend the HMS FMP at the end of this section.)

## 4.5 Final Proposed Language to Amendment the HMS FMP

### 6.3 Bycatch Monitoring and Minimization

The MSA requires that bycatch in fisheries be assessed, and that the bycatch and bycatch mortality be reduced to the extent practicable. Specifically, National Standard 9 states that an FMP shall establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery; and include conservation and management measures to the extent practicable and in the following priority: 1) minimize bycatch; and 2) minimize the mortality of bycatch which cannot be avoided.

~~Bycatch has been identified as a concern in HMS drift gillnet and longline fisheries and large-vessel purse seine fisheries (see Appendix C). Anecdotal accounts indicate bycatch in the small-vessel HMS purse seine and albacore troll fishery is relatively low, but these fisheries have not had formal observer programs. The harpoon fishery is thought to have little, if any, bycatch due to the selective nature of the gear.~~

#### 6.3.1 Standardized Bycatch Reporting Methodology

MSA Section 303(a)(11) requires that FMPs establish a standardized bycatch reporting methodology (SBRM) to assess the amount and type of bycatch occurring in any fishery managed under the FMP. An SBRM is an established, consistent procedure or procedures used to collect, record, and report bycatch data in these managed fisheries, and the methods may vary from one fishery to another. The SBRM is used to estimate bycatch as its defined by the MSA and includes fish which are harvested in a fishery, but which are not sold or kept for personal use and includes economic discards and regulatory discards. SBRMs, as described in the FMP, focus on reporting methods and inform procedures to assess bycatch and the development of measures to minimize bycatch or bycatch mortality (section 6.3.2).

When developing this FMP, the Council examined existing bycatch reporting methodologies, and found that current logbook requirements for the various fisheries (states, NMFS and IATTC), together with periodic recreational fishing surveys and port sampling, have provided an important source of information on catch and bycatch for all HMS fisheries (Appendix C, section 5). Nonetheless, certain additional measures were considered to provide improved standardization of logbook reporting and better ground-truthing of the logbook data through pilot observer programs for some of the presently unobserved fisheries. Observer programs are authorized consistent with observer sampling plans prepared by NMFS (Section 6.2.3). All commercial and recreational party or charter/CPFV fishing vessels must maintain and submit to NMFS logbook records containing catch and effort statistics, including bycatch. ~~These measures, together with existing reporting requirements, should provide for a comprehensive standardized bycatch reporting system.~~ (Section 6.2.2).

When designing and developing monitoring data collection programs under the SBRM, the Council and NMFS, in consultation with the states, considered the feasibility and need for various monitoring methods in light of the level of bycatch in each fishery and the risk that such bycatch poses to affected fish stocks. Catch and bycatch characteristics for the fisheries managed under



this FMP are addressed in this Section, and in further detail in Appendix C of the FMP and the Stock Assessment and Fishery Evaluation (SAFE) reports, which are updated annually. In addition to reporting catch and bycatch in Appendix C and the yearly SAFE reports, logbook data is used to report aggregated catch (including bycatch) and effort to the respective RFMOs and RFMO science providers, which use the information to produce stock assessments for HMS. SBRM for some HMS fisheries incorporates state-run programs sufficient for meeting federal requirements. If conditions in a fishery change such that the amount or nature of bycatch changes, or a state-run program is no longer sufficient for meeting federal requirements, the Council could use the framework procedures described in Section 5.1 to implement additional bycatch monitoring and reporting methodologies.

The authorized gear types enumerated in Section 6.1 define the following fisheries to which SBRMs apply:

- Surface hook-and-line fishery targeting albacore tuna
- Harpoon fishery
- Coastal purse seine fishery when targeting HMS MUS
- California large mesh drift gillnet fishery
- Pelagic longline fishery
- Recreational party/charter boat fishery
- Private recreational boat fishery

Appendix C also describes bycatch monitoring measures for the tropical tuna purse seine fishery. However, this fishery is not actively managed under the HMS FMP, because no vessels in the fishery make landings on the West Coast. Conservation measures for the fishery are adopted by the IATTC and applied to U.S. vessels by regulations pursuant to the Tuna Conventions Act and the High Seas Fishing Compliance Act, rather than the MSA.

### **Surface hook-and-line fishery targeting albacore tuna**

NMFS began collecting data from the fishery in 1974. Each year the SWFSC publishes a summary of the fishery and its associated statistics in an administrative report. Discard rates of non-marketable albacore are not known definitively, but limited observer sample data from the North Pacific albacore troll fishery during the 1990s indicated that these rates are likely low and if accounted for, would not substantially inflate the estimates of the landed catch. Typically, the troll fishery discards fish that are smaller than roughly 4.1 kg (58 cm or 2-year-old fish). According to information in Appendix C (Section C.3.2) small amounts of skipjack tuna, bluefin tuna, dorado, and billfish were observed as incidental catch and are generally sold according to data from the limited observer program run by NMFS (27 trips in 8 years) in the 1990s and in 2006, and from commercial landings data.

According to information compiled in Appendix C (Section C.3.2), the live bait boat component of this fishery is very selective in catching larger fish, so discards are low.

Data collection for this fishery under the SBRM includes a mandatory Federal logbook program. Logbooks provide information about bycatch through self-reporting. Given that available information does not indicate a concern for the amount or type of bycatch in the fishery, which

can be characterized by type with reasonable certainty, logbooks represent the most feasible data collection method for this fishery. as they are relatively low in cost compared to other methods such as onboard observers. Bycatch information is periodically presented in the aforementioned administrative reports prepared by the SWFSC, and any uncertainty arising from use of data collected by logbooks can be qualitatively described and considered in relevant analyses.

### **Harpoon fishery**

This gear is highly selective and it is likely that a bycatch in this fishery would be economic discards of swordfish or shark species, or fish not successfully harpooned and landed. Data collection consists of a logbook and commercial landing receipts to characterize effort and catch, including bycatch. There is no observer requirement for the harpoon fishery and in the absence of comprehensive direct observation, it cannot be confirmed that absolutely no bycatch occurs. There are anecdotal accounts of individuals targeting unmarketable species such as blue shark with harpoon as “practice” for catching swordfish. However, these reports are not common or verified. Given the selective nature of this fishing gear to target one fish at a time and the status of the blue shark stock available off the U.S. West Coast, impacts of “harpoon practice” would have minimal impact to the blue shark population. Due to the year-to-year variability in availability of swordfish in surface waters and the open access structure of the permits, the number of harpoon participants varies; but has remained relatively low and generally stable over time. Given that bycatch in this fishery is of very little concern for the overall health of any stocks, logbooks are the most feasible data collection method due to low cost, compared to other methods, such as observers.

### **Coastal purse seine fishery when targeting HMS MUS**

As documented in the HMS SAFE Report, the fishery only targets tunas, largely Pacific bluefin tuna, when available. Anecdotal accounts indicate bycatch in the small-vessel coastal purse seine fishery is relatively low, but this fishery has not been subject to a formal observer program under the MSA or MMPA authority. This fishery is classified on the MMPA List of Fisheries as a Category III fishery with remote likelihood of and no known incidental death or serious injury of marine mammals. Bycatch that may occur would likely consist of tuna species (e.g., skipjack) discarded, although in the absence of comprehensive direct observations, bycatch estimates may be uncertain. This fishery is required to submit logbooks when targeting HMS MUS that provide information on kept and discarded catch by species. Given that available information does not indicate a concern for the amount or type of bycatch in the fishery, which can be characterized by type with reasonable certainty, logbooks represent the most feasible data collection method. Logbooks are relatively low in cost compared to other methods such as onboard observers.

### **California large-mesh drift gillnet fishery**

Bycatch has been identified as a concern in this fishery (see Appendix C), although the majority of non- target finfish catch is marketable and usually retained. The most common bycatch species are mola mola and blue shark, with observer data indicating that the vast majority of mola and a large proportion of blue shark are returned alive. While the post-release mortality rate of both is unknown, mola are believed to have a very high survival rate. Striped marlin, bigeye thresher shark, smooth hammerhead shark, pelagic stingray, and bat ray also occur as bycatch in this fishery.

The SBRM for this fishery includes 20-30 percent observer coverage annually. The data contains catch, effort, bycatch, and biological data collected by NMFS observers aboard California-based large-mesh drift gillnet vessels fishing off the California coast. The main objective of this program is to monitor marine mammal interactions and mortality as required under the MMPA; however, finfish bycatch data are also collected. At the inception of the observer program, a minimum 20 percent observer coverage level was recommended in MMPA legislation for monitoring of marine mammal mortality in “Category 1” fisheries (Barlow 1989); this is the level that was adopted for use in the DGN observer program. Given that monitoring finfish bycatch is fundamentally similar to monitoring marine mammal bycatch, the 20 percent coverage level standard is considered sufficient for SBRM purposes.

Subsequently, NMFS evaluated the costs relative to revenues and variable profits of the fleet and reported on the feasibility of industry funding to cover costs of onboard observers or electronic monitoring (Agenda Item G.7, Attachment 3, June 2018). Additionally, NMFS funded a study to consider the potential uncertainty for reliably estimating bycatch when some vessels in the fleet were unobservable (Agenda Item F.1.a, NMFS Report 2, June 2021). The results did not detect any observer bias and support current observer coverage levels as sufficient and practicable to estimate finfish bycatch.

Under the HMS FMP, the DGN fishery also has a logbook requirement. Until 2019, this requirement was met using a logbook distributed by the state of California for all gillnet fisheries. In 2019, CDFW removed the state requirement for the large-mesh DGN fishery to complete these logs, and NMFS developed a Federal logbook specific to this fishery. The Federal logbooks are used to collect information on catch by species, effort, and disposition by date and area of catch (CDFG block).

While estimation of bycatch for marine mammals and turtles has been completed for many years by NMFS scientists, with new methodologies being developed to more accurately model the fishery’s catch of protected species, estimated catch of finfish species of concern (such as billfish other than swordfish, prohibited sharks, etc.) had not been produced. To address this, the Council adopted finfish performance metrics, using the regression tree methodology recently developed and applied to estimate marine mammal, sea turtle, and seabird bycatch in the fishery, as described in Carretta et al. (2020). These were first presented to the Council in June 2019 and updated in June 2021.

### **Pelagic longline fishery**

Almost all pelagic longline (both deep and shallow-set pelagic longline [DSLL, SSSL]) vessels making landings on the West Coast are permitted and managed under the WPFMC Pelagics FEP; fewer than six DSLL vessels are exclusively permitted under this FMP. Considering that swordfish-targeting SSSL gear is not authorized under the HMS FMP, these vessels mainly target bigeye tuna and also catch some related species at depth.

Bycatch has been identified as a concern in both longline fisheries (see Appendix C). Similar to the DGN fishery, a large proportion of finfish catch in DSLL is marketable and often retained and sold. The largest areas of bycatch concern are those of incidentally caught striped marlin, which

cannot be legally landed to the West Coast, resulting in regulatory discards, and blue shark bycatch, where economic discards reflect the absence of a West Coast consumer market.

SBRM elements for this fishery include 20 percent observer coverage and mandatory logbooks. The fishery was subject to 100 percent observer coverage for the first decade of its operation under the HMS FMP and higher than 20 percent coverage in years since. As noted above, this level of observer coverage is sufficient to estimate commonly caught finfish bycatch. Observers collect information on catch, effort, and biological data are also used to monitor and manage the fishery and to contribute to stock assessments of billfish and tunas. Therefore, there is a high level of certainty in bycatch estimates for this fishery.

### **Commercial Passenger Fishing Vessel fishery**

Albacore is targeted coastwide in recreational fisheries while catch of other HMS is largely confined to the Southern California Bight.

Bycatch in the commercial passenger fishing vessel (CPFV, or party/charter boat) fleet is minimal when targeting HMS and consists largely of catch and release due to overage on bag limits, or release of striped marlin and large sharks (off Southern California). CPFV trips that target HMS generally fish in areas where other species (such as groundfish) are not present or common, such as far offshore. Most non-target catch is landed as long as it is legal (not prohibited, within bag limits, correct size, etc.). Bycatch on CPFV trips is unlikely to cause any significant impacts to stocks. There is also anecdotal information on size-grading in the fishery, where smaller, often dead fish are thrown back once an angler lands a larger fish of the same species. The degree of this practice is unknown, but it is not believed to be substantial. There is uncertainty about post-release mortality for many species, although studies do exist for some and vary greatly from species to species. Given the nature of the fisheries, that bycatch is not of concern based on the best available information, and the existing CPFV logbook program, additional methods of collecting bycatch data are not feasible considering the costs.

State-run monitoring programs, with some variation among the three U.S. West Coast states, are sufficient to satisfy federal monitoring requirements for this fishery. In California, data collection includes onboard observers/samplers and dockside sampling through the [California Recreational Fishing Survey](#) (CRFS), and mandatory state daily logbook reporting. Logbooks require information on both kept and released catch.

In Oregon, the Oregon Department of Fish and Wildlife's (ODFW) Ocean Recreational Boat Survey (ORBS) is responsible for estimating the effort and catch of the recreational ocean boat fishery (CPFV and private). CPFV fishing for HMS must submit daily logbooks reporting the amount of retained species and any bycatch.

In Washington, most all anglers access marine waters from just four ports. Washington Department of Fish and Wildlife (WDFW's) Ocean Sampling Program tracks and estimates recreational catch and effort from Washington ports and from both CPFV and privately owned vessels.

Recreational data for the CPFV fleet in Oregon and Washington is submitted to PSMFC's RecFIN program and reported in the SAFE. Estimates of California CPFV catch, including discards (bycatch), are reported in the HMS SAFE.

### **Private recreational boat fishery**

Bycatch characteristics in the private recreational boat fishery for HMS are similar to those in the CPFV fleet. As is the case for the CPFV fishery, state-run monitoring programs, with some variation among the three U.S. West Coast states, are sufficient to satisfy federal monitoring requirements for the private recreational boat fishery.

In California, the SBRM includes samplers stationed at public boat ramps and marinas and phone surveys of recreational license holders are also conducted. Since samplers cannot reach anglers returning to private marinas, the phone survey component of CRFS is the only sampling method. However, it is not believed to accurately estimate bycatch from this portion of the fleet, although bycatch is believed to be similar in composition to both the CPFV fleet and other private vessel sectors. Anecdotal information suggests vessels docked at private marinas are larger and can fish farther offshore, targeting HMS that are typically found farther offshore like North Pacific albacore, Pacific bluefin tuna and swordfish. Given the nature of the fisheries, that bycatch is not of concern based on best available information, and the existing data collection, additional methods of collecting bycatch data are not feasible considering the costs.

In Oregon and Washington anglers go on offshore trips targeting North Pacific albacore with few other species encountered. In general, few fish are reported released on these trips. Similar to California, Oregon and Washington samplers monitor private recreational activity in recreational ports and randomly select vessels to conduct interviews including information on released catch, examine landed catch, and collect biological data. Recreational data for the private recreational fleet are submitted to PSMFC's RecFIN program. Estimates of private recreational catch, including discards (bycatch), are reported in the HMS SAFE.

### **6.3.2 Minimizing Bycatch and Bycatch Mortality**

Additional actions that will have the effect of reducing bycatch and bycatch mortality are discussed in Appendix C and under the various fishery-specific actions in Sections 6.6.1 (drift gillnet fishery), and 6.6.2 (pelagic longline fishery).

The FMP provides for a fishery-by-fishery review of measures to reduce bycatch and bycatch mortality (see Appendix C); establishes a framework for implementing bycatch reduction, adopts measures to minimize bycatch in pelagic longline and drift gillnet fisheries (Section 6.6), and adopts a formal voluntary "catch-and-release" program for HMS recreational fisheries. This meets the goals of the MSA and of this FMP and the requirements for estimating bycatch and for establishing measures to reduce bycatch and bycatch mortality in HMS fisheries.

The framework procedure may be used to implement additional bycatch ~~reporting and~~ reduction measures. Potential measures/methods include but are not limited to:

- ~~logbooks~~
- ~~observers~~

- time/area closures
- gear restrictions or modifications, or use of alternative gear
- educational programs
- performance standards
- ~~real time data collection programs (e.g., VMS, electronic logbooks)~~

The voluntary “catch-and-release” program promotes reduction of bycatch mortality and waste by encouraging the live release of unwanted fish. Its rationale and origination for recreational fisheries is explained in Appendix C, Section C.7. The establishment of the catch-and-release program removes live releases in the recreational fisheries from the “bycatch” category as defined in the MSA in Section 3(2) and also promotes the handling and release of fish in a manner that minimizes the risk of incidental mortality, encourages the live release of small fish, and discourages waste.

Shared EC Species, identified in Section 3.3, could continue to be taken incidentally without violating Federal regulations, unless regulated or restricted for other purposes, such as with bycatch minimization regulations. The targeting of Shared EC Species is prohibited.

*Add to Section 8.0, Literature Cited:*

Barlow, J. 1989. Estimating sample size required to monitor marine mammal mortality in California gillnet fisheries. Southwest Fisheries Science Center Administrative Report LJ-89-08, 8 pp.

## 5 SBRM for the Groundfish FMP

Section 6.4 of the groundfish FMP provides a general statement regarding SBRM and the various data collection methods used to assess total mortality for commercial and recreational groundfish fisheries. The FMP also provides details of bycatch methodologies in several sections of the FMP (6.4.1.2 for Commercial Fisheries and 6.4.1.3 for Recreational Fisheries). The FMP provides the framework for SBRM while several supporting documents, such as the SAFE and annual discard estimates provide the details regarding data use and uncertainty. Therefore, the Council believes that the FMP and supporting documents are consistent with the SBRM final rule for all groundfish fisheries.

### Reference documents:

1. [Pacific Coast Groundfish FMP](#)
2. Groundfish FMP [SAFE](#)
3. Oregon's Ocean Recreational Boat Survey ([ORBS](#)), Washington's Ocean Sampling Program ([OSP](#)) and California Recreational Fisheries Survey ([CRFS](#)).
4. Example for annual discard and catch: "[Estimated Discard and Catch of Groundfish Species in the 2018 West Coast Fisheries](#)"

All commercial fisheries include an observer component to estimate bycatch. These [observation rates](#) and standardized methodologies to estimate bycatch were developed for each sector over time since 2001 per the Council. The Council has set the priority for observing these fishery sectors throughout the years and observation rates vary from 100 percent to roughly 5 percent, depending on the sector observed and the Council's priorities for monitoring bycatch. Bycatch estimation methods were developed for each sector and modified as needed by the Northwest Fisheries Science Center.

The main source of information that documents the methodologies, data uncertainty and use of the data can be found in [NMFS annual reports](#) that estimate bycatch and mortality. Specifically, groundfish mortality reports such as "[Estimated Discard and Catch of Groundfish Species in the 2018 U.S. West Coast Fisheries](#)" provides qualitative and quantitative information regarding the methodologies used for each fishery sector and the statistical uncertainty of the data for the estimates. Some discussion of variance in the data is provided in the state sampling methodologies; therefore, it may be prudent to clarify in the SAFE document the current process for estimating recreational fishery bycatch information, reference where to find the state methodologies, and add qualitative discussions regarding the uncertainty of the bycatch estimations (e.g., some information could be taken from the state sampling methodologies).

We note that some information may be outdated regarding recreational fishery estimation methods, such as references to the use of Marine Recreational Fisheries Survey as a recreational fishery sampling and estimation method. This method is no longer the main source of information since standardized state methodologies are now used. These methodologies are briefly described in the FMP along with how the data is stored and utilized to estimate total bycatch in the groundfish fishery. The details of the data collection methods are provided in external document as noted in the reference section above.

We note that these items may not be necessary since all of the criteria is already met for the SBRM final rule.