

## SALMON TECHNICAL TEAM REPORT ON STANDARDIZED BYCATCH REPORTING METHODOLOGY – FINAL ACTION

### Introduction

The Salmon Technical Team (STT) was first briefed at their November 9, 2020 online meeting by Pacific Fishery Management Council (Council) Staff Officer Brett Wiedoff on the National Marine Fisheries Service (NMFS) final rule requiring all fishery management plans (FMPs) to establish a standardized bycatch reporting methodology (SBRM) to assess the amount and type of bycatch occurring in its fisheries (82 FR 6317). Since that meeting, the STT was briefed at the June 2021 meeting, met to discuss this topic in August 2021, and briefed again at the September 2021 Council meeting where the STT provided a report and a recommendation to amend the salmon FMP. After additional discussion, the STT is providing this report for Council consideration, which is a revision of the [September 2021 STT report](#) and includes more detail and clarification.

SBRM is used to estimate bycatch as it is defined by the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Bycatch 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. Our review of the salmon FMP 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 the STT recommends 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.

In this report, we (1) describe monitoring programs that generate bycatch estimates for commercial and recreational ocean salmon fisheries, (2) describe how SBRM requirements are met, and (3) propose draft new language for the salmon FMP that would provide further details on SBRM for salmon fisheries.

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

The term “salmon bycatch” is referred to in the following sections. In this report, 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, that 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 Washington Department of Fish and Wildlife (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, that 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 Oregon Department of Fish and Wildlife (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, that 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 California Department of Fish and Wildlife (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 of 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 Commercial Passenger Fishing Vessels (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.

#### STT 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.

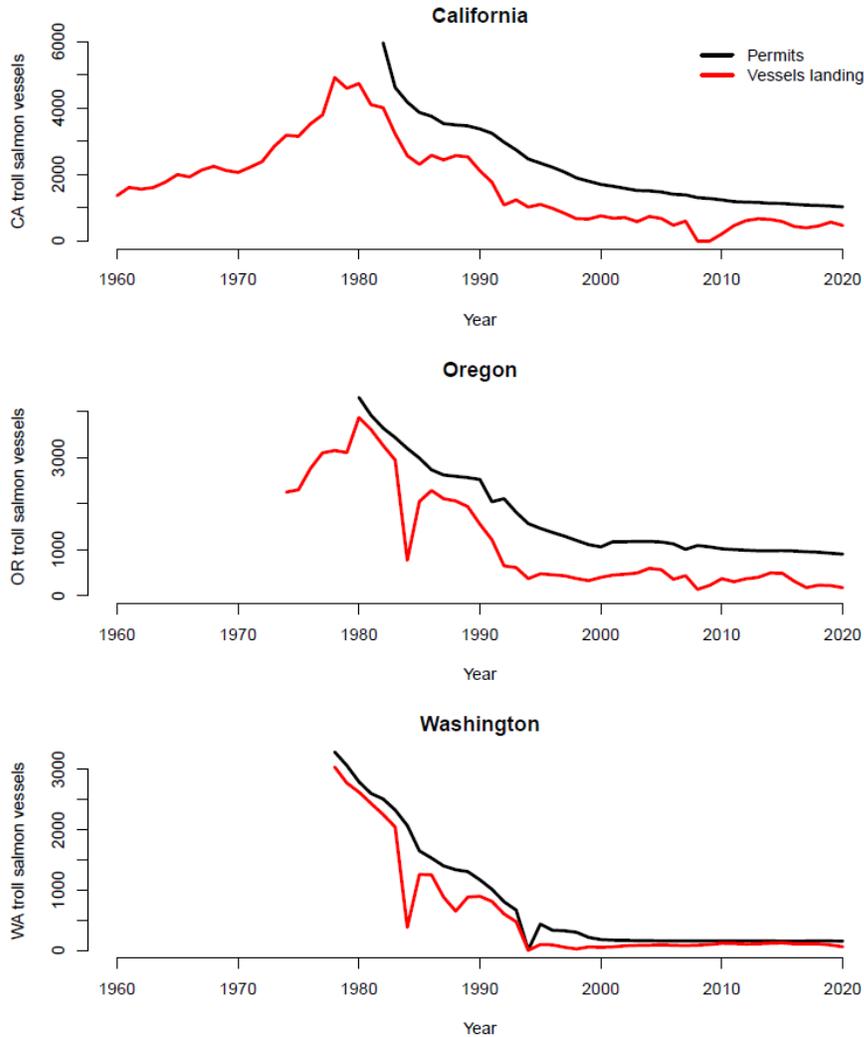


Figure 1. The number of active permits and vessels landing salmon in the commercial salmon troll fishery by state. Data sourced from PFMC 2021, Appendix D.

### Meeting SBRM requirement

#### *Appendix to Preseason Report III*

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 STT will develop an appendix to future versions of 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.

*STT recommendation: FMP amendment*

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 but could 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. As such, the STT recommends that new language be inserted in Section 3.5 of the FMP (see [Agenda Item C.8. Attachment 1](#)). Changes to the current FMP Language are also intended to provide consistency across FMPs in addressing SBRM.

PFMC

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