

# Report: Standardized Bycatch Reporting Methodology (SBRM)

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## 1 SBRM Requirements under MSA and final rule

Section 303(a)(11) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires that any fishery management plan (FMP) 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.

On January 19, 2017, the National Marine Fisheries Service (NMFS) published a final rule (82 FR 6317) establishing national guidance for compliance with this requirement. As required by 50 CFR 600.1610(b), Councils, in coordination with NMFS, must review their FMPs and make any necessary changes so all FMPs are consistent with the guidance by February 21, 2022.

The national guidance, codified at 50 CFR 600.1605(a) defines a standardized reporting methodology as “an established, consistent procedure or procedures used to collect, record, and report bycatch data in a fishery.” This information, in conjunction with other relevant sources, is used to assess the amount and type of bycatch occurring in the fishery and inform the development of conservation and management measures to minimize bycatch. **The regulations require that a FMP must identify the required procedure that constitutes the standardized reporting methodology for the fishery and explain how the procedure meets the purpose to collect, record, and report bycatch data.** The proposed and final rules explain that a standardized bycatch reporting methodology (SBRM) could include one or more combination of data collection and reporting programs such as observer programs, electronic monitoring, and industry reports (e.g. landing reports or “fish tickets”). These activities to collect, record, and report bycatch data in a fishery are connected to, but distinct from, the methods used to assess bycatch and the development of measures to minimize bycatch or bycatch mortality. Bycatch assessment methods are the statistical protocols that are used to estimate catch and bycatch in the groundfish fisheries as part of the NMFS Catch Accounting System (CAS). The final rule notes that bycatch assessment procedures are not part of a SBRM, and thus do not need to be described as part of the methodology in a FMP.

The SBRM final rule requires the Council to explain how the SBRMs meet the stated purpose in the rule based on the following four considerations. The Council must address these considerations when reviewing or establishing a SBRM.

- 1) The characteristics of bycatch in the fishery, including:
  - Amount and type of bycatch occurring in the fishery
  - Importance of bycatch in estimating the fishing mortality of fishing stocks
  - Effect of bycatch on ecosystems
- 2) The feasibility of the methodology, from cost, technical, and operational perspectives.
- 3) The uncertainty of the data resulting from the methodology.
  - Uncertainty associated with resulting bycatch data must be able to be described, quantitatively or qualitatively
- 4) How the data resulting from the methodology will be used to assess the amount and type of bycatch occurring in the fishery.

This report comprises the review of the SBRMs on behalf of the North Pacific Fishery Management Council (referred to herein as “Council”) for its respective FMPs for consistency with the national guidance in general, and the four considerations in particular. This may be done by referencing analyses and information in FMPs, FMP amendments, Stock Assessment and Fishery Evaluation (SAFE) reports, or other documents. The NMFS Alaska Regional Office will use this review, along with any other relevant information, to determine whether the SBRMs are fully consistent with the guidance, or if any FMP changes are necessary prior to the February 2022 deadline. As stated in the final rule, NMFS strongly recommends that the Council provide direction, as needed, to NMFS about how to adjust the implementation of a SBRM consistent with the FMPs. Additionally, the Council, in coordination with NMFS, should periodically review SBRMs to verify continued compliance with the MSA and the final rule. Such a review should be conducted at least once every five years.

## Definitions

The MSA defines “bycatch” as fish which are harvested in a fishery, but which are not sold or kept for personal use, including economic discards and regulatory discards. The definition of bycatch does not include fish released alive under a recreational catch and release FMP, therefore, a SBRM is not required for recreational or subsistence fisheries (16 USC § 1802(2)).

The final rule (82 FR 6317) includes a section on the meaning of “standardized” as it refers to a reporting methodology. The methodology must provide a consistent approach for collecting, recording, and reporting bycatch data for all the participants within a fishery. It does not mean that reporting methodologies must be standardized at a regional or national level; a standardized reporting methodology may vary from one fishery to another (including among fisheries managed in the same FMP).

## 2 FMP Compliance with SBRM

### 2.1. BSAI and GOA Groundfish FMPs

The Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) Groundfish FMPs explicitly reference a standardized reporting methodology for bycatch. As stated in the FMPs, “**information collected from industry reports and through the Observer Program constitutes the standardized reporting methodology for the groundfish fisheries**” (NPFMC 2018, section 3.9; NPFMC 2019a, section 3.9). Additionally, the final rule (82 FR 6317) states that the Observer Program “constitutes the SBRM for the fisheries covered thereunder” and allows the Council “to explain in its fisheries research plan how the SBRM for those fisheries meets the statutory purpose of a SBRM”.

The BSAI and GOA Groundfish FMPs include specific sections on accountability measures (Section 3.2.4) as well as monitoring and reporting requirements (Section 3.9). Accountability measures serve

several purposes, one of which is assessing the amount and type of bycatch occurring in the fishery. At the core of the accountability measures, and central to discussions of SBRM compliance, are the North Pacific Observer Program (Observer Program) and the Catch Accounting System (CAS). Information collected through the Observer Program, as well as industry reports, is used to assess the amount and type of bycatch occurring in the fishery and to inform the development of conservation and management measures that, to the extent practicable, minimize bycatch and bycatch mortality. Scientific evaluation of the information that is collected through the Observer Program is used to adjust the sampling plan for observer and electronic monitoring system deployment. The Council may recommend changes to regulations when necessary on the basis of such information. Monitoring and reporting information is also used to judge the effectiveness of regulations guiding standardized reporting methodology. The Observer Program, industry reports, and the CAS are discussed further below.

### *Observer Program*

At the core of the North Pacific groundfish fisheries monitoring system is a comprehensive, industry-funded, at sea and onshore Observer Program, coupled with requirements for total weight measurement of most fish harvested. The Observer Program provides the regulatory framework for NMFS-certified observers or electronic monitoring systems to be deployed onboard vessels and in processing facilities in the groundfish fisheries. Provisions of the Observer Program are developed in consultation with the Council and established in regulations. The purposes of the Observer Program are to obtain information necessary for the conservation and management of the groundfish and halibut fisheries by verifying catch composition and quantity, including catch discarded at sea, and to collect biological information on marine resources. Used in conjunction with reporting and weighing requirements, the information collected by observers or electronic monitoring systems provides the foundation for inseason management and for tracking species-specific catch and bycatch amounts. Scientists use information collected by observers or electronic monitoring systems for stock assessments and marine ecosystem research. To address management and scientific information needs, all vessels fishing for groundfish with a Federal Fishing Permit in Federal waters or in a State of Alaska parallel fishery, and all vessels fishing halibut or sablefish Individual Fishing Quota (IFQ) in Federal or State waters, and shoreside processors that have a Federal Processor Permit or Registered Buyer Permit are included in the Observer Program. All these vessels and processors may be required to accommodate one or more NMFS-certified observers or an electronic monitoring system.

The Observer Program has existed in some capacity since 1973 when observers were initially placed on foreign fishing vessels operating off Alaska. This occurred under the North Pacific Foreign Fisheries Observer Program, then coverage was greatly expanded with the implementation of mandatory observer coverage under the MSA (16 U.S.C. 1862) in 1976. Section 313 of the MSA authorizes the Council, in consultation with NMFS, to prepare a fishery research plan. The purpose of the research plan is to collect data necessary for the conservation, management, and scientific understanding of the groundfish and halibut fisheries off Alaska. NMFS implemented the Council's fisheries research plan through the Observer Program and over time, a series of regulatory and FMP amendments have been implemented to amend the Council's fisheries research plan and make modifications to observer coverage requirements under the Observer Program. The "interim" domestic observer program was authorized in 1989 with the implementation of Amendments 13 and 18 to the groundfish FMPs for the BSAI and GOA (54 FR 50386). The interim Observer Plan implemented in 1990 included coverage levels based on vessel length and processing volume for catcher vessels (CVs) and processors of BSAI and GOA groundfish fisheries. These requirements remained largely unchanged, with the exception of requirements put in place to implement certain limited access programs with bycatch management measures and increased monitoring needs, such as the Community Development Quota Program (CDQ), the American Fisheries Act (AFA) pollock fishery, the GOA Rockfish Program, and Amendments 79 and 80 to the BSAI FMP. The interim Observer Program remained in place until 2013 when the Council restructured the Observer Program under BSAI Amendment 86 and GOA Amendment 76 to the groundfish FMPs.

The restructured Observer Program changed how observers in the partial coverage category are deployed, how observer coverage in the partial coverage category is funded, and which vessels and processors must have some or all of their operations observed. These changes increased the statistical reliability of data collected by the program, addressed cost inequality among fishery participants, and expanded observer coverage to previously unobserved fisheries. All groundfish and halibut vessels and processors are included in one of two coverage categories: partial or full. Generally, CVs and shoreside processors, when not participating in a catch share program with a transferrable PSC limit, are in the partial coverage category. Catcher/processors (C/Ps), motherships, CVs and processors when participating in a catch share program with a transferrable PSC limit, generally are in the full observer coverage category. Some exceptions to these classifications are detailed in regulation. Vessels and processors in the full observer coverage category are required to obtain observer coverage by contracting directly with observer providers to meet coverage requirements in regulation. Vessels and processors in the partial coverage category are subject to an ex-vessel value-based fee not to exceed 2%, as implemented and revised through regulations, and are required to carry an observer or electronic monitoring system as determined by NMFS.

An integral part of the restructured Observer Program is the annual analysis and evaluation of the deployment methods. The restructured Observer Program established an annual process of 1) developing an Annual Deployment Plan (ADP) that describes plans and goals for observer deployment in the partial coverage category in the upcoming year, and 2) preparing an Annual Report providing information and evaluating performance in the prior year. NMFS makes adjustments to the ADP based on scientific evaluation of data collected under the Observer Program.

#### *Industry reports*

Recordkeeping and reporting requirements in the groundfish fisheries are developed in consultation with the Council and established in regulations. Industry reports on catch and bycatch, production, fishing effort and price are required of operators of CVs, C/Ps, motherships, tender vessels, and by representatives of shoreside processor plants.

The Interagency Electronic Reporting System (IERS)—also commonly referred to as the eLandings System—is an electronic data collection system that supports the management of commercial fisheries off Alaska. The IERS is supported through a partnership among NMFS, Alaska Department of Fish and Game (ADF&G), and the International Pacific Halibut Commission (IPHC). The system provides the Alaska fishing industry with a consolidated electronic means of reporting landings of commercial fish and shellfish, seafood production, and vessel logbook information to all three multiple management agencies.

Prior to the implementation of the IERS, each of the three partner management agencies had developed their own data collection systems to obtain information necessary to manage their fisheries (Northern Economics 2016). NMFS required data to be submitted through two legacy reporting systems, one that supported management and reporting in the federal groundfish fisheries, and another that supported the IFQ halibut and sablefish program. Much of the same information was also required to be submitted to ADF&G on paper “fish tickets.” A fish ticket documents the harvest of fish and shellfish that is sold, discarded (bycatch), or retained by the fisherman for personal use. Implementation of the IERS enabled the management agencies to collect timely commercial catch statistics while also reducing redundant reporting and taking into consideration industry business constraints.

The IERS was first implemented for the Crab Rationalization Program under a final rule published March 2, 2005 (70 FR 10174). The use of eLandings was implemented for groundfish fisheries and the halibut and sablefish IFQ Program through a final rule published December 15, 2008 (73 FR 76136). The use of the “tLandings” component of the IERS for operators of tenders taking deliveries of groundfish in the federally managed fisheries was implemented under a final rule published October 13, 2016 (81 FR 70599).

### *Catch Accounting System (CAS)*

The purpose of CAS is to quantify total catch to allow the inseason monitoring and management of the groundfish fishery. The CAS is not part of the SBRM, but it uses information from the standardized reporting methodology to assess the amount of catch and bycatch occurring in the fishery and provides an integrated data source for fisheries monitoring and inseason decision-making. Each year, accounts are established in the CAS that match the categories listed in the annual harvest specification tables. A combination of observer data, electronic monitoring system data, dealer landing reports, and at-sea production reports are used to generate estimates of total catch, including prohibited species catch (PSC) and at-sea discards. A detailed description of the catch estimation methods was published by Cahalan et al. (2014a). This publication provided an update to the description of the CAS procedures that was published by Cahalan, et al (2010). An important aspect of the CAS is to provide near real-time delivery of accurate data for inseason management decisions. To meet this objective, data from industry are reported through eLandings and fed into the NMFS database every half-hour. Data from observers and electronic monitoring systems are integrated into NMFS databases as soon as they become available and are incorporated into the CAS every night.

### **Evaluation of SBRM Components**

A variety of management programs exist in the Alaska groundfish fisheries. As the groundfish management programs have been developed, the Council and NMFS have established requirements for observer coverage, electronic reporting, and electronic monitoring technologies that vary due to differences in the designs of the management program, the data needed for management, and the characteristics of the fishery. The following sections describe how the Council has evaluated and addressed each of the four components listed in the final rule (and listed in Section 1 above) in the groundfish fisheries through regulatory changes and groundfish FMP amendments, and also through ongoing processes such as the Observer Program ADP and Annual Report.

#### *1) Characteristics of bycatch*

Understanding the characteristics of bycatch in the groundfish fisheries has been an important objective and component in the design of the Observer Program since the Council and NMFS first began placing observers on foreign fishing vessels off Alaska. In the early years, the primary objective of observer coverage was to monitor incidental catch rates of Pacific halibut in groundfish catches and to verify catch statistics in the crab fishery. Observer data collection and compliance monitoring duties have expanded to include data on the incidence of king crab, Tanner crab, and Pacific salmon, and biological data on other important species. Information on catch and bycatch occurring on observed trips the groundfish fisheries is collected through the Observer Program and is used in the CAS to estimate the total amount of catch and bycatch in the fisheries. This information enables NMFS' work on the conservation and management of the groundfish and halibut fisheries and supports NMFS understanding of the effect bycatch has on the ecosystem.

The amount and type of bycatch occurring in the fishery has continued to be a monitoring objective and taken into consideration by the Council and NMFS whenever there have been changes to the Observer Program design. For example, in 2013 the Council restructured the Observer Program and placed vessels into one of two observer coverage categories: 1) Full coverage; and 2) Partial coverage. Part of the rationale for placing vessels in the full coverage category was based on the management structure of the catch and bycatch of prohibited species in the fishery -- catcher vessels with a transferable PSC allocation were placed in the full coverage category to ensure effective monitoring. The impact of modifications to the Observer Program to bycatch, including prohibited species, marine mammals, seabirds, and the ecosystem component have been considered in the Environmental Assessments that supported the Council's modifications to the Observer Program (for examples see: NMFS, 2017 sections 4.3-4.6; NMFS 2015 section 6.2).

Industry reports provide another source of self-reported information on catch and bycatch. The characteristics of bycatch are also considered on an annual basis in the Observer Program ADP process. For example, within the partial coverage category, NMFS optimizes observer sampling effort above a minimum threshold based on the variability of bycatch within each stratum (NMFS 2019a). Because bycatch variability differs among strata in the partial coverage category, each stratum receives a different number of optimized observer trips.

The Council and NMFS have further considered characteristics of bycatch in the groundfish fisheries when implementing reporting requirements for industry reports. For example, the characteristics of Chinook salmon bycatch in the Bering Sea pollock fishery were integral to the implementation of Amendment 91 to the BSAI FMP. A component of the regulations that were published to support this program were requirements for vessel operators to submit industry reports of salmon bycatch counts by species for each haul rather than the daily total that had previously been required. To enable the new reporting requirements, NMFS also implemented regulations for an electronic logbook so that haul-by-haul salmon bycatch counts could be submitted, and data are readily available to NMFS in an electronic format. The haul-by-haul reporting of salmon by the vessel operator ensured that the vessel operator agreed with the salmon counts submitted by observers and that any discrepancies or disagreements about the counts could be resolved quickly (NPFMC 2009a).

## 2) *Feasibility*

Section 600.1610(a)(2)(ii) of the SBRM final rule requires that the implementation of a standardized reporting methodology be feasible from a cost, technical, and operation perspective. Any time the Council considers implementation or modification of industry reporting requirements or modifications to the Observer Program, the analysis considers feasibility and evaluates the balance of the need for the information with the costs and operational burden.

Evaluation of feasibility, from an operational perspective, has also initiated changes to regulations. Several regulatory and FMP amendments to make specific modifications to observer coverage requirements under the Observer Program were specifically implemented to address feasibility, including:

- BSAI Amendment 112 and GOA Amendment 102 revised observer coverage requirements for C/Ps (81 FR 17403). This rule allows small, non-trawl C/Ps that met specific criteria to choose to be in the partial observer coverage category. Effective 29 March 2016.
- BSAI Amendment 109 revised observer coverage requirements and placed CVs less than or equal to 46 ft LOA when groundfish fishing under a Community Development Quota (CDQ) into the partial coverage category (81 FR 26738). Effective 3 June 2016.
- A regulatory amendment (81 FR 67113) revised observer coverage requirements for BSAI trawl CVs and allows the owner of a trawl CV to request, on an annual basis, placement in the full observer coverage category for all directed fishing for groundfish using trawl gear in the BSAI for 1 year. Effective 31 October 2016.

Feasibility has also been assessed each year in the development of the ADP. The Council uses the ADP to describe how NMFS and the Council annually deploys observers given changes in funding, costs, and effort. For example:

- Each ADP since 2013 has implemented a “no selection” pool where vessels have no probability of carrying an observer on any trips. The no selection pool includes vessels fishing with hook-and-line or pot gear that are less than 40 feet and all jig vessels. The no selection pool was created specifically to address the operational challenges of putting observers on small vessels. Inclusion in this pool is re-evaluated each year in the ADP and could change in the future.

- In the ADP, NMFS simulates a range of fishing effort scenarios every year, each with its own associated cost (NMFS 2019a, Figure B-2). Selection rates are then adjusted in order to meet the acceptable risk tolerance of going over budget. In each Annual Report, NMFS then retrospectively evaluates the actual cost of the program against the budget for the given year (AFSC and AKRO 2019, Figure 3-1).

### 3) *Data Uncertainty*

The uncertainty of the data resulting from the SBRM has been evaluated through analyses associated with regulatory and FMP amendments implementing the Observer Program. Two analyses in particular addressed uncertainty in the amount of observer and electronic monitoring data that could be collected. In 2015, NMFS completed an analysis to supplement the 2011 Environmental Assessment for Restructuring the Program for Observer Procurement and Deployment in the North Pacific. NMFS prepared a supplemental analysis (NMFS 2015) in response to a Court Order to consider whether the restructured Observer Program would yield reliable, high quality data given likely variations in costs and revenues. The analysis considered the uncertainty in the amount of observer data that could be collected under a variety of costs and fee revenue scenarios. The analysis also evaluated data reliability by examining the degree to which estimates of discarded catch are available to inform fishery management decisions under a range of observer coverage scenarios. Additionally, it examined where gaps in data may occur in catch estimation at different spatial resolutions in groundfish fisheries in the BSAI and the GOA. Lastly, the analysis illustrated the risk of not having enough observer data to generate estimates of discarded catch under varying observer coverage rates.

The second example of an analysis that considered uncertainty was the Environmental Assessment / Regulatory Impact Review for Proposed Regulatory Amendment to adjust the partial coverage observer fee (NPFMC 2019b). The analysis considered uncertainty of varying budget scenarios and the impact on the amount of observer data that can be collected. The analysis also showed that as funding levels increase, a higher proportion of trips are selected for coverage, which in turn reduces the total number of gaps and allows more unobserved trips to obtain data from observed trips that are geographically closer and occur in a smaller time span (resulting in higher resolution data). The document included a qualitative analysis of the relationship between variance and sample size in groundfish fisheries (NPFMC 2019b, Section 4.2.3). Having area-specific observer information generally allows inseason managers to manage based on the characteristics of that fishery. When less observer information is available, managers must account for the increased uncertainty. These management decisions in turn influence the fleet's ability to fully utilize the resource and operate in an efficient manner. Further, the risk of making a conservative decision is increased when information is unavailable for a fishery, potentially resulting in a fishery closure that is too early or too late based on variable or biased information.

The supplemental Environmental Assessment (NMFS 2015) also considered whether the design of the Observer Program enables uncertainty associated with the resulting data to be quantitatively or qualitatively described. The restructured Observer Program complies with the MSA requirement that the program be reasonably calculated to gather reliable data by stationing observers on all or a statistically reliable sample of fishing vessels and processors necessary for conservation, management, and scientific understanding of the fisheries covered by the fisheries research plan (16 U.S.C. 1862(b)(1)(A)). A major accomplishment of the restructured Observer Program was the implementation of a scientific sampling plan for deploying observers to collect data in the groundfish fishery. A general description of sampling involves the collection of information from a subset of individuals within a population to estimate characteristics of a whole population. In the case of fishery information, bias is introduced when the sample (i.e., observed trips) does not represent fishing activity to which it is expanded (i.e., population of all fishing trips). The restructured Observer Program was specifically designed to reduce bias in fishery-dependent data by using a scientific method to deploy observers. The scientific sampling plan results in better spatial and temporal distribution of observer coverage across all fisheries (Gasper et al. 2019). The

design of the program with random deployment enables NMFS to evaluate the statistical properties of estimators, quantitatively characterize uncertainty, and improve catch estimation procedures through the Annual Report and ADP process and other ongoing evaluations (e.g Cahalan et al. 2015; Cahalan et al. 2014a; Gasper et al. 2019; Gasper et al. 2015).

Evaluating uncertainty related to observer data collection has also been an important ongoing consideration under the restructured Observer Program and is incorporated into the ADP. For example, the quantitative equations that NMFS has used to optimize partial coverage observer effort by stratum come from Cochran (1977) and are designed to minimize the resulting variance (uncertainty) for a given cost (NMFS 2019b).

#### 4) *Data Use*

Understanding how industry reports and Observer Program data are used to assess the amount and type of bycatch occurring in the fishery has been an important element of regulatory and FMP amendments to modify the reporting requirements or make changes to the Observer Program. For example, changes in observer coverage have been implemented to support monitoring needs of many catch share programs in Alaska, including CDQ, AFA, and the GOA Rockfish Program. Allocations of exclusive harvest privileges under a catch share program can increase incentives to misreport as compared to open-access fisheries. Independent and verifiable data are important in catch share programs because quota share recipients are prohibited from exceeding their allocation. Transferable bycatch limits present additional challenges for accurate accounting because these species are not retained for sale. The use of data to support management needs was evaluated as the Council and NMFS implemented a more intensive suite of monitoring tools for each of the catch sharing programs.

When the Council restructured the Observer Program and later incorporated electronic monitoring into the program, understanding the information collected by observers and through electronic monitoring was necessary in order to evaluate the proposed alternatives and support the Council's decision-making process. The analysis to support both of those Council actions considered how data collected by observers and electronic monitoring contribute to best available scientific information used to manage fisheries in the North Pacific (NPFMC 2011b; NMFS 2017). These data are needed to comply with the MSA, the Marine Mammal Protection Act, the Endangered Species Act, and other applicable Federal laws and treaties. Information collected by observers and electronic monitoring provides a reliable and verifiable method for NMFS to gain information about fish and shellfish intercepted by commercial fisheries, as well as data concerning seabird and marine mammal interactions with commercial vessels. Observers record total catch; composition of catch; species weights, size, and sex; information on bycatch and protected species interactions; and collect a suite of biological samples.

The use of observer data to assess the amount and type of bycatch occurring in the fishery is also incorporated into the annual evaluation of observer deployment through the ADP. For example, NMFS currently uses a minimum coverage threshold, or "hurdle", beyond which the number of observed trips in the partial coverage category are optimized (NMFS 2019a). The hurdle value was based largely on evidence that suggests it is the point at which there is a substantial decrease in data gaps that could negatively impact the ability of NMFS staff to manage fisheries (Gasper et al. 2019).

Information from both the Observer Program and industry reports are also considered in an ongoing process through their use in estimating catch and bycatch. Data collected through the Observer Program and industry reports are used by NMFS in the CAS to generate estimates of total groundfish catch, including at-sea discards, as well as estimates of PSC and other non-groundfish bycatch. NMFS is continually evaluating and improving the procedures used to estimate total catch and discard for Alaskan groundfish and halibut fisheries including evaluating estimators and developing measures of uncertainty (see Cahalan et al. 2015; Cahalan et al. 2014a; Cahalan et al. 2014b; Cahalan et al. 2010; Gasper et al. 2019; Gasper et al. 2015).



## 2.2. BSAI Crab FMP

**The FMP delegates reporting requirements to the State. A SBRM is not explicitly identified in the FMP for Bering Sea/Aleutian Islands King and Tanner Crabs (BSAI Crab FMP). However, the State of Alaska's BSAI Crab Observer Program and industry reports may fulfill the function of a SBRM.**

### *Observer Program*

Primary bycatch data collection and reporting is done through the State of Alaska's BSAI Crab Observer Program. The State currently requires onboard observers on all C/P or floating-processor vessels processing king or Tanner crab, and on all vessels participating in the Aleutian Islands red or golden king crab fisheries. The State currently may require observers on selected CVs taking red or blue king crab in the Norton Sound section, if the ADF&G provides funding for observer presence. The State may also require onboard observers in other crab fisheries (e.g., the Pribilof Islands Korean hair crab fishery) to, in part, monitor bycatch of king or Tanner crab. Onboard observers provide effort data and data on the amount and type of bycatch occurring in each observed fishery, including estimates of bycatch by species, sex, size, and shell-age/shell-hardness for each observed fishery. These are currently provided in annual reports by ADF&G.

### *Industry Reports*

Reporting of crab catches by individual vessel operators was required as early as 1941. Current requirements include submission of the following information through eLandings: reporting the company or individual that purchased the catch; the full name and signature of the permit holder; the vessel that landed it with its license plate number; the type of gear used; the amount of gear (number of pots, pot lifts); the weight and number of crab landed including deadloss; bycatch that is discarded; the dates of landing and capture; and the location of capture. Any crab retained for personal use are also recorded on the fish ticket. Processing companies are required to report this information for each landing purchased, and vessel operators are required to provide information to the processor at the time of landing.

**While the infrastructure of a compliant SBRM likely exists in the FMP, it may need to be amended in order to explicitly indicate the standardized methodology and to explain how it meets the purpose of collecting, recording, and reporting bycatch. Additionally, some discussion of potential uncertainty may be helpful.**

## **Evaluation of SBRM Components**

### *1) Characteristics of bycatch*

Bycatch in the BSAI crab fisheries are predominantly sublegal crab, female crab, non-target crab species, and to a lesser extent groundfish. A primary bycatch concern in crab fisheries is the impact of bycatch mortality on non-target crab stocks. For example, bycatch mortality of red king crab in the Tanner or snow crab fisheries. While all of these species are fishery targets, red king crab cannot be retained or sold in Tanner or snow directed crab fisheries, or vice versa. The Crab Observer Program provides information on the amount of bycatch occurring in the crab fisheries by recording bycatch on observed trips which allows for statistically robust extrapolation to unobserved trips. This data is used by inseason management to estimate the total amount of bycatch in the fisheries. This information is important because it helps estimate mortality on commercially important stocks as well as ecosystem components. From this information management action can be informed in order to mitigate adverse impacts to the extent practicable.

### *2) Feasibility*

Feasibility is an important element of the Crab Observer Program and is addressed in several ways. First, depending on the data needs of each program fishery, observer coverage levels range from 20% to 100% in C/V categories, and 100% for all C/Ps. This helps ensure that the required data is collected and avoids unnecessary oversampling.

Second, ADF&G has developed a diversified funding portfolio for the Crab Observer Program. Funds come from a combination Crab Rationalization Program cost recovery, test fishery revenues, ADF&G funds, and direct from industry in the “pay-as-you-go” C/P category.

Additionally, the Crab Observer Oversight Task Force was implemented to allow for industry feedback and input regarding the operation and development of the Crab Observer Program. This helps ensure that the program continues to operate in a practicable manner for fishery participants.

### 3) *Data Uncertainty*

Addressing data uncertainty is a key objective of the Crab Observer Program. Throughout the iterations of the Crab Observer Program, it has been amended to better address data concerns (FMP Amendments 3 and 6). Also, in order to ensure high quality data and minimize uncertainty, observers must also undergo training and maintain an observer certification before conducting their duties.

### 4) *Data Use*

Data from the Crab Observer Program is included in Crab Rationalization Program stock assessments to evaluate the biological characteristics of the stock and the impact of bycatch mortality. Specific use of the data varies with each program fishery. Generally, discard losses are determined by multiplying the appropriate handling mortality rate by observer estimates of bycatch discards. These estimates are incorporated into overfishing limits and acceptable biological catch calculations for BSAI crab stocks. The State also frequently uses observers to address important research questions in the crab fisheries through special projects.

## 2.3. Scallop FMP

**The FMP delegates reporting requirements to the State. A SBRM is not explicitly identified in the Scallop FMP. However, the Scallop Observer Program may fulfill the function of a SBRM.**

Primary bycatch data collection and reporting is done through the State’s onboard Scallop Observer Program. The focus of the scallop observer program is to monitor bycatch and to collect biological samples and fishery data relating to weathervane scallop harvest and discarded catch. Observer coverage is specified in State of Alaska regulations. The State currently requires 100% onboard observer coverage for all vessels fishing for scallops in the BSAI or GOA outside the Cook Inlet Area as a condition for obtaining a permit (Scallop FMP Section 3.2.11). For vessels fishing for scallops in the Cook Inlet Area (Kamishak Bay District), ADF&G staff may be deployed as observers; since there is only partial observer coverage, observer data would be extrapolated to any unobserved trips. The Observer Program is designed to answer questions necessary for successful management of the resource.

The Scallop Observer Program collects a variety of biological when the fishery is open. Each fishing day, the observer’s goal is to sample a single dredge from one tow for species haul composition and a single dredge from five different tows for crab and halibut bycatch and discarded scallop catch. For bycatch samples, observers identify, count, measure, classify, and record the number and condition of crab and halibut caught in the dredge. The discarded scallop catch is collected and weighed, and a subsample is examined to determine the weight and number of broken and intact scallops. Shell heights are measured from samples of both retained and discarded scallops, and shells are collected for age determination.

Observers report scallop harvest, number of tows, area fished, and crab bycatch to ADF&G at minimum three times per week during the season by radio or email; these data are used extensively by ADF&G for

inseason fishery management. For example, regulations in some scallop fishing areas specify bycatch rate or catches that result in closures or area modifications. ADF&G Reports summarize all data collected by the Observer Program and are made available to the public.

**While the infrastructure of a compliant SBRM likely exists in the FMP, it may need to be amended in order to explicitly indicate the standardized methodology and to explain how it meets the purpose of collecting, recording, and reporting bycatch. Additionally, some discussion of potential uncertainty may be helpful.**

## Evaluation of SBRM Components

### 1) *Characteristics of bycatch*

Monitoring bycatch in the scallop fishery has been an important objective of the FMP since it was implemented due to the potentially high impact nature of dredge gear. The primary bycatch concerns are crab species and Pacific halibut. Some groundfish bycatch also occurs in the fishery. The Scallop Observer Program provides information on the amount of bycatch occurring in the scallop fisheries by recording bycatch on observed trips which allows for statistically robust extrapolation to unobserved trips. This data is used by inseason to estimate the total amount of bycatch in the fisheries. This information is important because it helps estimate mortality on commercially important stocks as well as ecosystem components. From this information management action can be informed in order to mitigate adverse impacts to the extent practicable. Scallop fishing areas may be closed based on observed bycatch amounts or rates.

### 2) *Feasibility*

Observer coverage is scaled depending on potential bycatch concerns. In Cook Inlet, where smaller vessels fish smaller dredges, there is not a 100% observer requirement, but ADF&G observers must be accommodated on request. This makes the observer data collection methodology feasible for smaller vessels that typically harvest smaller quantities of scallops. In all other registration areas, 100% observer coverage is required.

### 3) *Data Uncertainty*

Due to the high potential bycatch mortality that can occur in the scallop fishery, 100% observer coverage is required in all areas but the Cook Inlet Area (Kamishak Bay District). For portions of the fishery that are observed, data are collected in a way that allows for estimates of uncertainty around expected values (e.g. confidence intervals given in Rosenkranz and Spafard 2014). In the Kamishak Bay District, where there is partial observer coverage, allowable dredge size is smaller which helps to offset the increased uncertainty. Vessels operating in the area must accommodate an ADF&G observer on request.

### 4) *Data Use*

The primary purposes of the Scallop Observer Program are to collect essential biological and fishery-based data, monitor bycatch and provide for regulatory enforcement.

Data collected through the Scallop Observer Program and industry reports are integral to management of the scallop fishery. The State uses the information to make inseason adjustments to state harvest limits, fishing seasons, bycatch limits, and close areas in State and Federal waters to scallop fishing. In making such adjustments, the State may consider all available data on factors such as: (1) overall fishing effort; (2) catch per unit effort and rate of harvest; (3) rate of bycatch; (4) relative scallop abundance; (5) attainment of the upper end of guideline harvest ranges or bycatch limits; (6) general information on stock

condition; (7) timeliness and accuracy of catch reporting; and (8) other factors that affect the State's ability to meet objectives of the FMP (Scallop Plan Team 2018).

Additionally, information gained through the observer program and fishermen's observations have led to a better understanding of the biology, environmental requirements, and behavior of Alaska's scallop stocks. Because management decisions are made inseason based on fishery data from the fleet, the State's catch and processing reporting requirements are an important component in achieving the management objectives of the FMP (Rosenkranz and Spafard 2014).

## 2.4. Salmon FMP

**ADF&G fish tickets serve as a standardized reporting method documenting all retained harvest from both state and EEZ waters** (Salmon FMP Section 8.1.8 Bycatch Management).

The Fishery Management Plan for the Salmon Fisheries in the EEZ Off Alaska (Salmon FMP) generally divides management into two areas; a West Area and an East Area with the boundary at Cape Suckling. The Salmon FMP authorizes sport salmon fishing in both areas, prohibits commercial salmon fishing in the West Area (except in three traditional drift gillnet fishing areas excluded from the FMP, managed by the State of Alaska), and authorizes commercial troll fishing in the East Area.

As currently amended, the Salmon FMP excludes the three traditional salmon drift gillnet fishing areas that occur in the EEZ from the FMP and subsequently Federal management. Without inclusion in the FMP, there is no requirement for a SBRM or other management measures. However, in response to litigation, the Salmon FMP is in the process of being amended to incorporate these areas and the salmon drift gillnet fisheries that occur there. SBRM compliant measures are in development and the current alternatives can be found in the April 2019 Revisions to the FMP.

### East Area Commercial Troll Fisheries

The Salmon FMP's management measures currently focus primarily on the troll fishery in the East Area and the sport fishery. Management of the commercial troll fishery in the EEZ, including many reporting requirements, is delegated to the State of Alaska and the fishery is managed as a single unit throughout federal and state waters. ADF&G regulations require that fish tickets record the type of gear used as well as the number, pounds, delivery condition, and disposition of all fish species harvested and retained for both commercial and personal use (5 AAC 39.130(c)). All harvest information on bycatch in the commercial troll fishery comes from catch reported on fish tickets. Maximum retainable allowances (MRAs) of certain non-salmon allow for bycatch to be treated as incidental catch so that those species can be utilized. In addition, non-retention requirements when MRAs are achieved create incentives to avoid those species taken as bycatch. Specified closure areas during those times of the year when bycatch is generally highest serves to significantly reduce the amount of bycatch taken.

### West Area Commercial Salmon Net Fisheries

Commercial salmon fisheries in the west area are not authorized except for three traditional net fishing areas managed by the State of Alaska. There are no management measures in the FMP regarding these fisheries as they are currently excluded from the FMP, thus, none are required. **The FMP is currently being amended, with a final amendment anticipated by 2022, to incorporate these fisheries, including a compliant SBRM.**

The current SBRM under consideration for these fisheries is eLandings. There are almost no existing bycatch data available for these salmon fisheries. Self-reported information collection at the time of landing would provide valuable baseline bycatch data and be practicable for fishery participants and allow for evaluation of the level of uncertainty relative to the potential impact of bycatch occurring in the

fishery. This would likely be similar to the SBRM of fish tickets currently used in salmon troll fisheries under this FMP.

## **Evaluation of SBRM Components**

### *1) Characteristics of bycatch*

Bycatch in the directed commercial salmon fisheries primarily consists of groundfish species and the incidental catch of immature salmon. State and federal management measures minimize bycatch to the extent practicable and minimize the mortality of bycatch.

Groundfish incidentally taken by hand and power troll gear being operated to take salmon (consistent with applicable laws and regulations) can generally be legally retained, subject to closures or maximum retainable amounts. For example, the bycatch allowance for demersal shelf rockfish is limited to 10 percent of the round weight of all salmon onboard the vessel. All demersal shelf rockfish (DSR) in excess of 10 percent must be weighed and reported as bycatch overage on an ADF&G fish ticket. DSR bycatch overages may be kept for a person's own use but fish retained for that purpose must be reported on fish tickets.

Halibut is also incidentally caught in salmon troll fisheries. Any retention of halibut is subject to IFQ Program regulations.

Fish tickets provide information on the amount of bycatch occurring in the salmon fisheries by recording bycatch at the time of landing. This data is used by inseason to estimate the total amount of bycatch in the fisheries. This information is important because it helps estimate mortality on commercially important stocks as well as ecosystem components. From this information management action can be informed in order to mitigate adverse impacts to the extent practicable. Limited impacts to non-retained bycatch are expected because hook and line troll gear used in the fishery allows for nearly all discarded species to be released with limited mortality.

### *2) Feasibility*

ADF&G fish tickets are an extremely feasible method to collect bycatch data. They impose almost no additional time or cost burden on fishery participants or agencies beyond the reporting of basic and already required landings data.

### *3) Data Uncertainty*

Self-reported bycatch data does increase uncertainty. However, the low volume of the fishery, combined with the low mortality from troll gear helps mitigate potential bycatch concerns. Additionally, retention and utilization of more common bycatch, such as DSR, is allowed subject to MRAs. This incentivizes utilization within reasonable limits, and therefore accounting of expected bycatch. Unreported harvest and discard-at-sea mortality is not estimated but is thought to be low given the nature of troll gear and the times and locations fished. Thus, it has been determined that additional management measures are not necessary to document bycatch interactions within salmon fisheries.

### *4) Data Use*

Bycatch data is used to develop management measures that minimize bycatch. For example, the State of Alaska closes Chinook salmon high abundance waters after the first summer period, which affects both the bycatch of groundfish and the incidental catch of non-target salmon species.

The State of Alaska also reports the amount and type of groundfish harvested incidentally in the Southeast Alaska troll fishery in the Southeast region groundfish report prepared for the State Board of Fisheries on a 3-year cycle. Reported harvest of groundfish from EEZ waters is small when compared to harvest totals

from all of Southeast Alaska and occurs during the months of July, August, and September when the summer troll season is open.

## 2.5. Arctic FMP

No commercial fishing for target species identified in Table 3-3 is authorized in the Arctic Management Area, and thus no standardized bycatch reporting methodology is specified. This FMP will be amended to establish a SBRM, if a commercial fishery is authorized in the Arctic Management Area.

Under the Arctic FMP (NPFMC 2009b), no commercial fishing for target species (identified in Table 3-3 in the Arctic Management Area) is authorized. Thus, no conservation or management measures to specifically address catch accounting are included in the FMP, and no recordkeeping or reporting requirements are specified at this time. Recordkeeping and reporting requirements, including the type and quantity of fishing gear used, catch by species, number of hauls, and time and location in which fishing occurs, may be specified in an exempted fishing permit issued under authority of this FMP. This FMP may be amended to specify recordkeeping, reporting, and observer requirements, including specific data to be submitted to NMFS and the Council, to ensure effective management of the fishery.

The Council intends that, should any future commercial fisheries be authorized in the Arctic Management Area, they will be prosecuted so that accurate catch accounting occurs and will specify those measures necessary to ensure accurate enumeration of target species, economic discards, and regulatory discards, and SBRMs, at a minimum, in the amended Arctic FMP. Monitoring of fishing activities may be required to ensure compliance with regulations. The Council may consider mandatory use of observers, electronic logbooks, vessel monitoring systems, or other measures to assure compliance with regulations, gather data on marine species and performance of the fishery, and enforcement of the closures of the Arctic Management Area.

## 3 Recommendations

Based on the above analysis, the analysts have provided the following recommendations for improving FMP compliance with the SBRM guidance in the final rule:

- The BSAI and GOA Groundfish FMPs explicitly identify the Observer Program, or fishery research plan, as the SBRM and explain how this SBRM collects, records, and reports bycatch. Evaluation of the SBRM components indicates that these FMPs are in compliance with current SBRM guidance. No amendments are recommended.
- The BSAI Crab FMP does not explicitly identify a SBRM, though the elements of SBRM are included in the FMP. **An amendment which explicitly identifies the SBRM and explains how it meets the purpose of a SBRM is recommended for the Crab FMP.** This could occur through a new amendment or be incorporated with the next FMP amendment as long as it is prior to the February 2022 deadline.
- The Scallop FMP does not explicitly reference SBRM, though the elements of SBRM are included in the FMP. **An amendment which explicitly identifies the SBRM and explains how it meets the purpose of a SBRM is recommended for the Scallop FMP.** This could occur through a new amendment or be incorporated with the next FMP amendment as long as it is prior to the February 2022 deadline.
- As the Salmon FMP undergoes development revisions and amendments, it is recommended that the SBRM is explicitly identified in the FMP.
- As the Arctic FMP currently states, if fishing is authorized in the Arctic Management Area, a SBRM would be developed. No amendment is recommended at this time.

## 4 Preparers and Persons Consulted

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