

Analysis to Integrate Electronic Monitoring into the North Pacific Groundfish and Halibut Observer Program

Discussion paper

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1 Introduction

The North Pacific Fishery Management Council (Council) has established an intention to integrate electronic monitoring (EM) tools into the Observer Program for vessels using fixed gear. As such, staff has begun work preparing an analysis to integrate EM as a tool in the Observer Program. The discussion paper includes draft language for the analysis’ purpose and need statement and alternatives (Section 2 and 3), as well as a preliminary description of the components of an EM program that will be evaluated (Section 4), and the proposed timeline for this amendment (Section 5). The paper also describes the Workgroup’s initial direction for developing a 2017 pre-implementation program (Section 6).

This discussion paper was developed and refined through a Council committee, the fixed gear EM Workgroup (EMWG). In 2014, the Council appointed the EMWG to develop and refine an EM program for integration into the Council’s Observer Program. The EM Workgroup provides a forum for all stakeholders, including the commercial fishing industry, agencies, and EM service providers, to cooperatively and collaboratively design, test, and develop EM systems, and to identify key decision points related to operationalizing and integrating EM systems into the Observer Program in a strategic manner.

2 Draft Purpose and Need

The EM Workgroup recommends the following as a draft purpose and need statement for this action.

To carry out their responsibilities for conserving and managing groundfish resources, the Council and NMFS must have high quality, timely, and cost-effective data to support management and scientific information needs. In part, this information is collected through a comprehensive fishery monitoring program for the groundfish and halibut fisheries off Alaska, with the goals of verifying catch composition and quantity, including of those species discarded at sea, and collecting biological information on marine resources. While a large component of this monitoring program relies on the use of human observers, the Council and NMFS have been on the path of integrating technology into

our fisheries monitoring systems for many years, with electronic reporting systems in place, and operational EM in a compliance capacity in some fisheries. More recently, research and development has focused on being able to use EM as a direct catch estimation tool in fixed gear fisheries.

The fixed gear fisheries are diverse in their fishing practices and vessel and operational characteristics, and they operate over a large and frequently remote geographical distribution. The Council recognizes the benefit of having access to an assorted set of monitoring tools in order to be able to balance the need for high-quality data with the costs of monitoring and the ability of fishery participants, particularly those on small vessels, to accommodate human observers onboard. EM technology has the potential to allow discard estimation of fish, including halibut PSC and mortality of seabirds, onboard vessels that have difficulty carrying an observer or where deploying an observer is impracticable. EM technology may also reduce economic, operational and/or social costs associated with deploying human observers throughout coastal Alaska. Through the use of EM, it may be possible to affordably obtain at-sea data from a broader cross-section of the fixed gear groundfish and halibut fleet.

The integration of EM into the Council's fishery research plan is not intended to supplant the need for human observers. There is a continuing need for human observers as part of the monitoring suite, and there will continue to be human observer coverage at some level in the fixed gear fisheries, to provide data that cannot be collected via EM (e.g., biological samples).

The Council and NMFS have considerable annual flexibility to provide observer coverage to respond to the scientific and management needs of the fisheries. By integrating EM as a tool in the fisheries monitoring suite, the Council seeks to preserve and increase this flexibility. Regulatory change is needed to specify vessel operator responsibilities for using EM technologies, after which the Council and NMFS will be able to deploy human observer and EM monitoring tools tailored to the needs of different fishery sectors through the Annual Deployment Plan.

3 Draft Alternatives

The EM Workgroup recommends that the following alternatives be analyzed as part of the Council's EM Integration analysis. The Council may select different alternatives for different sections of the fixed gear fleet (e.g., for longline vs pot gear, or by vessel size class), or may choose multiple alternatives for regulatory implementation, but specify annually in the ADP which vessels will be using which EM program.

Alternative 1: Status quo - EM is not a tool in the Council's Research Plan

Alternative 2: Allow use of EM for catch estimation on vessels in the EM selection pool

Option: Require full retention of key species with associated dockside monitoring

Alternative 3: Allow use of EM for compliance monitoring of vessel operator logbooks used for catch estimation

The EM Workgroup also recommends that the Council consider a trailing amendment to this analysis, to evaluate the feasibility and potential cost savings associated with EM cooperatives, where a particular group of vessels would contract specifically with an EM provider to meet their monitoring needs over the course of a year. The EMWG considers that this concept shows a lot of promise for meeting the goals of the program with respect to providing cost savings, while maintaining a high level of data quality. The complexity of the Federal contracting system, however, is such that fully specifying and analyzing this alternative as part of the initial Council EM Integration analysis will likely

delay initial review on that package, and consequently delay the possibility of 2018 implementation. As a result, the Workgroup recommends that this concept be evaluated as a trailing amendment.

Trailing amendment: Allow use of EM for catch estimation for fishery participants organized into EM cooperatives

Option 1: EM providers as cooperative entity

Option 2: Vessels as cooperative entity

3.1 Alternative 1 – Status quo

Under the status quo, at-sea fisheries monitoring in the partial coverage category is accomplished with a human observer pool, with a flexible deployment plan that allows the Council and NMFS to make annual policy choices on which vessels qualify for different selection pools, and the selection rates assigned to each pool.

3.2 Alternative 2 – Allow EM for catch estimation on vessels in the EM selection pool

Alternative 2 would integrate EM into the Observer Program as a tool for catch estimation. Vessel operators would be required to comply with a predetermined set of operator responsibilities, and the program would be loosely modeled in the 2016 Pre-implementation Plan for longline vessels 40 to 57.5 feet length overall, although some provisions will differ.

3.3 Alternative 3 – Allow EM for compliance monitoring of operator logbooks used for catch estimation

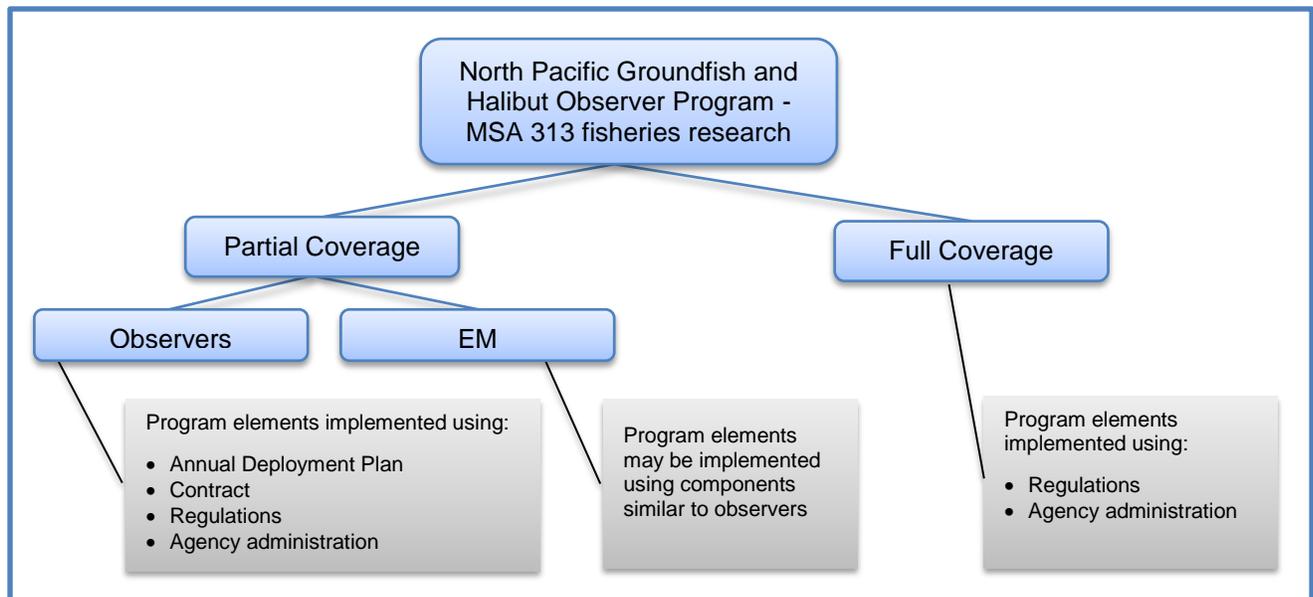
Under Alternative 3, participants in the EM pool would be required to complete operator logbooks for key species, which would be used as the basis for catch estimation. To verify the accuracy of the logbooks, a review of the footage from EM cameras would be used to audit the operator logbooks.

4 Components of an EM program to be considered in the EM analysis

The Council's EM integration analysis will consider broadly the costs and benefits of a functioning EM pool as part of the Council's fishery monitoring program. Integrating EM is a complex project with many components, however, and not all of the components will necessarily be implemented in regulation. Section 4.1 provides some background on how the current partial coverage human Observer Program is implemented, and Section 4.2 describes the various components of an EM program that will be considered in the analysis.

4.1 Background - how the current North Pacific Groundfish and Halibut Observer Program is implemented

As EM is integrated into the Observer Program, the different components of the program may be implemented through regulation, the annual deployment plan, contracts, or administration by NMFS. To facilitate the discussion about how to integrate the different elements of EM into the partial coverage program, the following sections describe how elements of the current partial coverage observer category are implemented.



Annual Deployment Plan (ADP)

The ADP documents how NMFS intends to assign at-sea and shoreside observers to vessels and processing plants engaged in groundfish and halibut fishing in the North Pacific. The ADP addresses the changing needs of fisheries management and stock assessment by providing a flexible design that may be adjusted annually.

Elements include:

- Defining pool of vessels and shoreside processors eligible to be selected for coverage
- Defining strata based on factors that are known prior to vessel departure (e.g. gear type, vessel size). The strata definitions can change on an annual basis.
- Describing the selection rate for the strata based on estimated effort and budget
- May include policy decisions regarding observer development to address scientific and management needs (for example, the Bering Sea Aleutian Islands Pacific cod fleet voluntarily selecting full observer coverage).

Contract

The observer provider contract supplies qualified observers to vessels in a timely fashion and provides logistical and operational support including travel to deployment locations, safety and communications.

Elements include:

- Defining the qualification requirements for observers to be hired by the contractor
- Defining observer duties and data collection requirements
- Identifying the contractor roll in the ODDS call center
- Describing the contractors responsibilities regarding logistic and operational support for observer deployment
- Requiring contractor to describe how the quality and timeliness of observer data will be ensured.
- Describing performance standards contractor must meet to be considered successful and receive a positive past performance rating.

Regulations

The Observer Program regulations describes vessel owner or operator responsibilities.

Elements include:

- Logging fishing trips
- Paying fees
- Making vessel available and carrying observers when selected for coverage
- Ensuring observers have a safe environment and are able to collect required data when aboard.

Agency Administration

Agency administration of the Observer Program ensures that observers collect high quality data, and that observer data are integrated into catch accounting system in a timely manner so data can be used for management.

Elements include:

- Training observers prior to deployment
- Providing inseason support during deployment
- Debriefing observers at the end of deployment
- Managing and disseminating data collected by observers
- Maintaining and evaluating methods to integrate observer data into catch accounting

4.2 EM components

The EM Workgroup has identified a general list of the different components that will be considered in the Council's EM integration analysis. The EM Workgroup has begun developing the elements of each of these components for Alternative 2, recognizing that while the components themselves will generally be parallel across the action alternatives, specific elements may differ. More work will be done on developing the elements for Alternative 3 as the analysis proceeds.

EM Deployment Design

Goal: Use best available information to design the EM deployment methods, including the EM selection pool, that meet policy and data collection goals.

Elements could include:

- Use the **ADP** process to define the
 - EM deployment methods and coverage rates
 - EM selection pool (the universe of vessels that can participate in EM based on, for example, vessels size, gear type, area, and/or port)
 - EM data collection goals and methods (types of data collected by EM vessels, seabird handling, depredation)
- Use the **Annual Report** for performance review and analysis of EM coverage and data
 - Representative deployment
 - Data quality
 - Achieved coverage rate and monitoring rate

Participation/eligibility

Goal: A pool of EM participants that are capable and committed to making EM work on their boats.

Elements could include:

- Opt-in process - NMFS to notify the universe of vessels defined by the selection pool, provide the opportunity for eligible vessels to opt-in, and select vessel that meet eligibility criteria (use ODDS?).
- Eligibility to participate contingent on
 - compliance with the *vessel monitoring plan* (VMP)
 - *option*: performance standard (low compliance rate with VMP over time or repeat problems with EM system reliability or video quality)
 - process for reviewing eligibility decisions
- Selection of vessels to carry EM during selection periods (selection can be by vessel or trip)

Equipment (wiring/sensors, cameras, monitors, hard drives) and Installation

Goal: Appropriate EM equipment gets properly installed on each vessel, at the right port, and in a timely fashion with the least interruption to the fishing plan.

Elements could include:

- Option 1: NMFS contracts with service provider to provide and install equipment on each vessel (partial coverage model)
 - Specifications/performance standards for equipment would be in the contract (few, if any, regulations would be needed to specify equipment)
 - Contractor works with a vessel operator to write a VMP, which can be amended between trips working with the contractor.
 - Equipment/installation would be paid for using observer fees or other funding as available
 - Maintenance/replacement of equipment
 - Vessel operator's responsibilities to ensure contractor has all needed access and assistance (similar to 2016 pre-implementation plan) prior to and during installation.
 - Compliance monitoring and recourse if installation is not successful
- Option 2: Vessel owner contracts with service provider to provide and install equipment on the vessel (full coverage model)
 - Specifications/performance standards for equipment would be in regulations
 - Contractor works with a vessel operator to write a VMP, which can be amended between trips working with the contractor.
 - How would equipment/installation be paid for?
 - Maintenance/replacement of equipment
 - Vessel operator's responsibilities to ensure contractor has all needed access and assistance (similar to 2016 pre-implementation plan) prior to and during installation.
 - Compliance monitoring and recourse if installation is not successful
- VMP Process – need for a process for submitting a VMP to NMFS, NMFS approval of the VMP, and process for amending VMP inseason?

Operation

Goal: Each vessel operator maintains a functioning EM system throughout the fishing trip and there is a good process for maintaining quality control and addressing equipment failures.

Elements could include:

- Vessel operator's responsibilities in the operational plan, part of the VMP
- Types of responsibilities include stable power supply, function tests, breakdown, hard drive capacity, video quality, catch handling, effort logbook – all from 2016 EM pre-implementation plan, others depending on information gathered during pre-implementation.
- Flexibility to address non-critical equipment malfunctions while at-sea
- Critical EM system malfunction, vessel must remain in port for up to 48 hours for repairs, vessel released if repairs can't be fixed within 48 hours. Malfunction must be fixed prior to departing on subsequent trips
- First trip quality control and electronic record - recommended
- Dockside observer to verify EM data or collect data that cannot be obtained from EM

Data/Equipment Retrieval

Goal: EM equipment with data returned to NMFS timely and in good condition.

Elements could include:

- Transmit hard drives/data to NMFS/contractor
- Un-install equipment
- Coordination with contractors (schedules, ports, etc.)

Retrieval of EM data/ Catch Accounting

Goal: Extract data from EM system and integrate data into the catch accounting system in a timely manner so that data can be used in management.

Elements could include:

- Methods for video review
- Method for integrating EM data into catch accounting
- Methods for certifying video review entities
- Methods for other types of data (seabird handling, depredation)

EM data retention and storage

Goal: Retain data from EM systems in an appropriate format.

Elements could include:

- Retrieval for compliance
- Do Federal record requirements apply?

Feedback Mechanisms

Goal: All participants have the opportunity to provide feedback to address problems and improve the EM Program.

Elements could include:

- Feedback from vessel operators on performance of providers
 - exit survey
- Feedback on performance of vessel operators (equipment maintenance, data quality)
 - score card
- Feedback on NMFS management of EM Program
- Feedback from OLE and GCEL on compliance/enforcement actions

Fees/Funding/Costs

Goal: Use Observer Program fees or other sources of funding to pay for the EM equipment, installation, and maintenance.

Elements could include:

- Alternative mechanisms to fund EM equipment purchase
- Alternative mechanisms to fund EM equipment installation and maintenance
- How fees are used?
- How to achieve efficiencies and cost savings?
- Costs include equipment purchase, ongoing installation/maintenance, equipment replacement, NMFS management/infrastructure

5 Timeline for EM Integration analysis

Under the current best-case scenario timeline, the Council is scheduled for initial review of an analysis to integrate EM in October 2016, with final action following in December. Under this timeline, regulations would be prepared in 2017, and the integrated program would be implemented for the 2018 fishing year.

Year	Fieldwork / Pre-implementation (Pre-imp)	Council process, regulations	Observer Program/ Annual Deployment Plan (ADP)
2014	<i>Fieldwork</i>	<i>EMWG develops 2015 Cooperative Research Plan (CRP), discusses alternatives for analysis</i>	<i>Oct – 2015 ADP places 10 vessels that are participating in EM research into the no selection pool</i>
2015	<i>Feb – SSC reviews CRP Jan-Jul – operational longline, stereo camera, pot cod field research</i>	<i>Feb – SSC, Council review CRP Oct – propose a 2016 Pre-Implementation plan to Council</i>	<i>Oct – 2016 ADP proposes all EM Pre-Imp vessels in no selection pool</i>
2016	<i>Jan-Dec – Pre-implementation on 58 longline vessels 40-57.5'. Jan-Apr – pot cod field work Jan-Jul – Stereo camera research on 3-5 longline vessels, and pot vessels</i>	<i>Oct – initial review for EM analysis to integrate EM into obs program. Dec – final action on EM analysis</i>	<i>Oct – 2017 ADP proposes all EM Pre-Imp vessels in no selection pool</i>
2017	<i>Jan-Dec – Second pre-implementation year for longline vessels >40', and proposed pre-implementation for pot vessels. Potential research on other technology.</i>	<i>Jan-Aug – Develop proposed and final regulations for integrating EM, hold MSA-required hearings in AK, WA, OR</i>	<i>June – Annual Report provides prelim analysis on allocating observer fee between observer and EM deployment Oct – 2018 ADP allocates funding to observers and EM deployment</i>
2018	Integrated observer/EM monitoring program		

6 2017 Pre-implementation Proposals

The EM Workgroup recommends that it will develop a proposal for two separate pre-implementation pools for 2017, for longline and pot vessels. Initial proposals were discussed at the EM Workgroup meeting in January 2016, and will be further refined over the course of the year to result in a formal Pre-Implementation Plan for the Council to consider at the October Council meeting, in conjunction with review of the 2017 Annual Deployment Plan. If the Council concurs with this direction, then the Workgroup and NMFS will also proceed to identify funding needs and potential funding sources to support this level of pre-implementation in 2017. In general, the Workgroup envisions that the working

provisions of the 2017 pre-implementation program would be similar to the 2016 program. For deployment of EM in both pot and longline pools, however, the EM Workgroup is exploring the concept of using EM monitoring on a trip selection basis in 2017, whereby all vessels in the EM pool would be wired for EM, but the system would only be activated on those trips for which the vessel is randomly selected for coverage through ODDS.

Over 40 ft longline vessels

Pending the constraints of the budget, the EM Workgroup proposes to expand the longline pre-implementation pool in 2017 to 90 vessels, and to remove the constraint that vessels must be less than 57.5 ft LOA. However, first priority in the pool would continue to be given to small longline vessels (40 to 57.5 ft LOA) that have liferaft or bunk space limitations with carrying a human observer. Management objectives for 2017 would be the same as 2016, to estimate at-sea discards and secondarily, to determine whether seabird mitigation measures are present or absent during setting of longline gear on EM-observed trips. Goals of the pre-implementation program for 2017 would be to evaluate the feasibility and cost of a trip selection approach to EM in this fleet, to identify the group of longline vessels for which EM may be a more cost effective or compatible monitoring tool, and to continue to test equipment reliability across diverse vessel operating parameters.

Pot vessels

The EM Workgroup also recommends that a pre-implementation pool for 30 pot vessels (of any length) be established for 2017, again subject to the constraints of the budget. The EM Workgroup considers that there may be efficiency in deploying EM rather than human observers for monitoring in the pot fishery, where vessels generally make high numbers of short trips, operating frequently in and out of remote ports. As with the longline fleet, the primary management objective would be to estimate at-sea discards, and different approaches could be tested to collect only piece counts of retained and discarded species, or also to collect lengths of at-sea discards. Goals of the pre-implementation program for 2017 would be to begin to socialize a larger contingent of the pot fleet to EM and increase EM support capacity in the pot fleet, test equipment reliability across diverse vessel operating parameters, and improve understanding of data precision associated with EM video review and discard lengths in the pot fishery.

Under 40 ft longline vessels

The EM Workgroup continues to be interested in expanding EM into the under 40 foot longline fleet, but recognizes that there are challenges. In order to start developing a research approach for this fleet, **the EM Workgroup recommends that a demographic study of the under 40' fleet occur in 2017**, to evaluate effort both by the number of trips and vessel length, in order to identify priorities for phase in of coverage. **The intention would be for this study to lead to the development of a plan for specific field research in the under 40 ft fleet in 2018.**

7 Council action

The EM Workgroup is requesting the Council review the draft purpose and need statement and alternatives, to ensure they are consistent with the Council's intent with developing the EM Integration analysis. The Workgroup would also appreciate any feedback from the Council about the Workgroup's intentions for developing a 2017 pre-implementation proposal to include pools for both longline and pot vessels, as the Workgroup and NMFS will begin to explore funding sources for the 2017 work in the coming months.