

Final 2016 Electronic Monitoring Pre-Implementation Plan

1. Introduction

The North Pacific Fishery Management Council (Council) has established an intention to integrate electronic monitoring (EM) tools into the Observer Program for the fixed gear small-boat groundfish and halibut fisheries. The Council's intent is to develop EM to collect data to be used in catch estimation for this fleet. The Council has set an interim goal of pre-implementation in the small boat (40-57.5 feet length overall) longline fleet in 2016, focusing on vessels that have trouble carrying an observer. This document describes the EM pre-implementation plan for 2016, and also notes other EM research and development that will take place in 2016.

This pre-implementation plan was developed and refined through a Council committee, the fixed gear EM Workgroup (EMWG). The EMWG 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, consistent with the Council goal to integrate EM into the Observer Program.

The overall goal of this pre-implementation plan and the cooperative research is to assess the efficacy of using EM, in combination with other tools, for catch accounting of retained and discarded catch, and to identify key decision points related to operationalizing and integrating EM systems into the Observer Program for fixed gear vessels in a strategic manner. The experience and results from the data collected during this pre-implementation and research phase will inform decisions and future Council alternatives for integrating electronic monitoring into the Observer Program. As such, it should be noted that the eventual components of the regulated EM program may have different provisions than those that are proposed in 2016.

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 and stereo camera 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-Jul – EM stereo camera field research on 3-5 longline vessels. Field research on 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		

2. Management Objective

The EM management objective identified by the Council is to estimate at-sea discards. Retained catch will be assessed through landings reports. The intent for EM is to identify discard species to the lowest taxonomic level possible, or at a minimum to the species level needed for management and stock assessment purposes, while acknowledging that for some species, grouping will still occur.

A secondary objective has been established for seabird monitoring in 2016, namely to determine whether seabird mitigation measures are present or absent during setting of longline gear on EM-observed trips.

3. The EM Selection Pool

The EM selection pool in 2016 includes the vessels that meet the Council's criteria for EM, and who opt into the EM pool. Not all vessels in the EM selection pool will carry cameras for all of their fishing activity (see Section 4).

Qualifying Criteria & Process:

- **Criteria:** The 2016 EM selection pool will focus as a first priority on vessels 40-57.5 feet length overall where carrying a human observer is problematic, due to bunk space or life raft limitations¹.
- **Process:** NMFS sent a letter to all hook and line vessels from 40-57.5 feet length overall, and requested that vessels indicate their interest in being in the EM pool by July 27, 2015 (see Attachment 1). Following discussion of the EM Pre-implementation Plan at the October Council meeting, a final letter was sent to vessels that have expressed interest, detailing the specific rules governing EM deployment for 2016 (Attachment 2). At that time, after reviewing final EM pool requirements, vessels that had already expressed interest were given a final deadline of November 20, 2015 to continue with EM program participation, or return to the human observer pool. Vessels agreeing to the EM program rules, and accepted by NMFS, will be placed in the EM selection pool for the duration of the 2016 season, with no probability of carrying an observer on any trips for the 2016 fishing season.
- **EM Pool Size:** As of December 4, 2015, 58 vessels opted in to the EM selection pool. A maximum of 60 boats is recommended for the EM selection pool size. This number was targeted to accommodate a few adjustments both into and out of the pool, as participants are made aware of the specific rules governing EM deployment. Additions to the EM pool from vessels not meeting the July 27, 2015 deadline were considered on a case-by-case basis relative to the qualifying criteria.

4. EM Deployment Model

Past experience has shown that deployment of EM systems on vessels for a single trip yields lower quality results and higher costs per unit of effort, as compared with EM deployments on vessels for an extended duration. This is because of the cost of EM system installation and removal and the time needed to 'burn in' operational procedures such as EM system care and on-board catch handling that improve with time. Therefore, unlike the trip selection model used for observer deployments in 2016, vessels selected for EM-based monitoring will carry EM systems for a pre-determined time period.

¹ 170 unique vessels were identified that 1) were granted TEs or conditional release for life raft or bunk space in 2013 or 2014; 2) were granted a TE for life raft in 2015 (5 vessels); or 3) were eligible to receive temporary exemptions (TEs) for limited life raft capacity in 2015.

EM Equipment Deployment Periods:

- **4 Deployment Time Periods:** In 2016, EM equipment will be deployed in 4 time periods during the calendar year: Jan-Feb, March-June, July-Oct, and Nov-Dec (a 2-4-4-2 month quarterly deployment pattern). This time distribution fits well with the fishing patterns of the small boat fixed gear fleet. The February/March break avoids bisecting the early part of the IFQ fishery, and June/July is a natural break when IFQ vessels switch to State fisheries. Positioning the EM deployment period breaks in this way will hopefully avoid chokepoints and fishing disruptions for moving cameras between vessels.
- **Pre-registration requirement:** Vessels need to register in advance for the upcoming selection period to indicate if they are going to fish, and their fishing plans for the upcoming time period.
 - Once they are pre-registered for a deployment time period, vessels would NOT be required to log each of their trips into ODDS.
 - If a vessel has not pre-registered activity during a deployment time period, but unexpected circumstances result in the vessel wanting to fish during that period, the vessel should notify NMFS and the EM service provider as soon as possible prior to fishing, and be willing to take an EM system if one is available.
 - If a vessel that pre-registers for a deployment time period is selected to take an EM system but subsequently chooses not to fish in that period, NMFS may select a replacement vessel for that time period.
- **Target Coverage Level:** In each deployment time period, 30% of vessels that are pre-registered would be selected and required to carry EM.
 - If equipment is available, vessels could be asked to carry EM for longer (i.e., the program would allow for higher coverage on an ad hoc basis to further test an aspect of EM).
 - A midyear budget review is planned and, if necessary, the coverage level may be adjusted downward for the final two deployment periods dependent on remaining funds.
- **Selection for deployment:** Vessels will be chosen using a random selection with replacement method, from the group of vessels that are in the EM selection pool and are pre-registered for that deployment period. Anticipated numbers of vessels selected for each time period are listed in Table 1.

Table 1 Number of vessels anticipated to pre-register in each time period in 2016, based on the fishing history of the 56 vessels that have opted-in to the EM selection pool; and approximate number of vessels that would be selected to carry EM at 30% coverage.

Deployment time period	Anticipated number of vessels that will register	Number of vessels selected at 30% coverage
January – February	3	1
March – June	38	12
July – October	36	11
November - December	2	1

Note, the number of vessels selected may be greater or less than identified, based on random selection probabilities, the total number of vessels registered for the EM pool, and actual fishing patterns.

5. Service Ports

In 2013, the 40' to 57.5' LOA fleet made landings in 19 ports across Alaska, with the top four ports of Homer, Juneau, Sitka, and Kodiak accounting for 65% of all landings. The top 6 ports for vessels that have trouble accommodating an observer were: Kodiak, Sitka, Seward, Homer, Dutch, King Cove.

- **Service Port Locations:** There will be two service ports in 2016, Sitka and Homer.
- Other ports where vessels in the EM Selection Pool are either home-ported or do deliveries include: Seward, Kodiak, Juneau, Petersburg, and Sand Point. Locally-based EM services in these ports will be limited, and technicians from Sitka and Homer will provide fly-in or remote services, as required.

6. EM Hardware

In 2016, vessels participating in the EM pre-implementation program will use EM equipment designed and supplied by the Archipelago Marine Research, Ltd. (AMR). The EM system consists of a control center to manage the data collection, connected to an array of peripheral components including digital IP cameras (generally 2 or 3, depending on the deck configuration), GPS receiver, and gear sensors (hydraulic pressure transducer, drum rotation sensor if appropriate). An additional camera will also be installed to determine if a seabird streamer line was used during setting.

7. Operator Responsibilities on Vessels Carrying EM Systems

Vessel operators are expected to adhere to the following responsibilities when randomly selected from the EM pool to carry cameras while participating in the 2016 pre-implementation program. The EM Workgroup will use the experience from 2016 to consider how to structure the regulations with respect to these and other responsibilities; a regulated program may have different provisions.

- **EM system installation:** Vessels selected from the EM Pool must have an installed, functioning EM system for the specified monitoring period. During the EM system installation, it will be the vessel owner's responsibility to assist with planning the best wiring routes and installing the hydraulic oil pressure and engine oil pressure sensors with the assistance of the EM technician.
- **EM system operation.**
 - **Onboard Power:** The EM systems that will be used in 2016 can accommodate DC power from 12-32 volts, or use AC power from an inverter or gen set. It will be the vessel owner's responsibility to work with the EM technician to identify a stable power supply and maintain power to the EM system at all times when underway. To avoid battery drain, the EM systems will be allowed to power down to sleep mode when the engine is off.
 - **Function Test:** Prior to leaving port, the vessel operator must turn the system on and conduct a system functionality test following the instructions in the VMP. If the functionality test identifies a malfunction, the vessel operator must contact the EM service provider immediately to resolve the issue. The EM service provider will determine if the malfunction is critical or non-critical. A critical malfunction is one that prevents the data collection objectives from being achieved.
 - **Non-Critical EM System Malfunction:** If the malfunction cannot be fixed in a timely fashion, the vessel operator may depart on the scheduled trip, but must follow the service provider's instructions to trigger video recording manually. The vessel operator may not depart on a second trip without a functioning EM system unless approved by the EM service provider.
 - **Critical EM System Malfunction:** If the malfunction is a camera defined as "critical" in the vessel must remain in port for up to 48 hours to allow the EM service provider time to effect repairs. If the problem cannot be fixed within the

48 hour window, the vessel may receive a release and depart on the scheduled trip. The malfunction must be fixed prior to departing on subsequent trips.

- **Equipment breakdown at sea:** If the system passes the function check prior to leaving port, and remains continuously powered during the trip, the operator would NOT be required to return to port in the event of a breakdown. However the malfunction must be fixed prior to departing on subsequent trips. If a vessel has repeat problems with EM system reliability or video quality, that vessel may be removed from the EM pool for a period of time and placed in the human observer pool.
- **Hard Drive Capacity:** The vessel operator must ensure that the system has adequate memory to record the entire trip before departing port. The vessel operator must carry one or more spare hard drives, sufficient to record the entire trip, as a back-up.
- **Video quality:** The vessel operator will be required to check the monitor before each haul and to wipe water and slime off the camera lenses to maintain video quality. Video quality for each set will be recorded on the vessel score card.
- **First Trip Quality Control Review:** Operators of vessels selected for EM coverage will be strongly encouraged to make their first landing at an EM service port to allow for a quality control visit.
- **Catch handling:**
 - **Discard control points.** The vessel operator will be responsible for ensuring all catch is handled within view of the cameras as described in the VMP. A deck camera will be used to ensure that all discards are done in view of the rail cameras.
 - **Seabirds:** An additional camera will be installed to determine if a seabird streamer line was used during setting. Vessel operators will be required to hold incidentally caught seabirds up to the camera for 2-3 seconds and ensure that certain key parts of the animal, such as the beak, are captured by the cameras. Goals of 2016 would be: 1) determining presence/absence of mitigation measures; 2) test different triggers associated with the setting of gear to turn the seabird cameras on (instead of just having them on all the time); 3) if birds are caught and there are images of birds, have a seabird expert look at those images to see if they can identify the species & verify if the presentation times are acceptable.
- **Effort logbooks:** Vessel operators will be required to keep a simple logbook and write down their hook size, spacing, skate length, and the number of skates on each set. They will not be required to record catch information, other than what is already required in IPHC or other logbooks. The effort log is shown in Figure 1.
- **Vessel Monitoring Plan:** the EM service provider will work with each participating vessel to develop a vessel monitoring plan (VMP) which will identify the specific practices required for each vessel's unique configuration. The VMPs will include a cover letter that includes program details, such as the EM system details, operator responsibilities, operator checklist, and troubleshooting protocols. The VMPs will also include an installation summary defining vessel-specific installations details, system settings, camera locations and views. Additionally, a description of how to conduct a hard drive swap and typical troubleshooting strategies, and contact information for key program resources and participants will be provided. Vessel operators will sign the VMP in acknowledgment of the operator responsibilities and system setup requirements.
- **Feedback:** Vessel operators will have the opportunity to provide feedback on 1) the "user experience"; 2) vessel costs or impacts; 3) how much time it takes to have EM on the boat (installation, cleaning lens, changes to fishing practices, etc).

Figure 1: Sample effort log for the EM pre-implementation plan.

2016 EM Program Effort Logbook

Vessel Name:		Start Port:	
ADF&G Number:	Trip Start Date (mm/dd):	Offload Port:	
Operator Name:	Offload Date (mm/dd):	Did you haul at night?	Y N

Did the EM system function normally the entire trip? Y N If no, please describe any problems:	Gear ID	Gear Type	Length of Skate (feet)	Hook Size	Hook Spacing (ft)	No. Hooks Per Skate
	A					
	B					
	C					
	D					

Set		Haulback		Seabirds Caught?	Did you discard legal-sized halibut?	Gear ID	No. Skates Set	No. Skates Lost
Date (mm/dd)	Start Time	Date (mm/dd)	Start Time					
				Y N	Y N			
				Y N	Y N			
				Y N	Y N			
				Y N	Y N			
				Y N	Y N			
				Y N	Y N			
				Y N	Y N			

Shaded areas are not required if you are completing and sharing your IPHC logbook with EM program staff.

8. Dockside Monitoring

No dockside monitoring is proposed for 2016, other than quality control and maintenance visits to the vessel.

9. Data Turnaround Times

Hard drives will be collected by field support staff every second trip, or biweekly if possible, and mailed to PSMFC for review. Vessel operators not landing in a service port may be required to follow simple procedures to retrieve the hard drive, and mail it to PSMFC at the appropriate time. Instructions are provided in the Vessel Monitoring Plan.

10. Feedback Systems

In 2016, participants in the EM program will be tracked through the use of a Vessel Scorecard (see examples in Figure 2 and Figure 3). The goal for 2016 is to be able to collect feedback on the performance of the vessel with respect to the operator responsibilities, and the quality of data coming from off the vessel. This data will be used to evaluate normal thresholds for performance. The intention would also be to use the 2016 vessel scorecard to evaluate potential incentive systems, and consider how performance in given year could be used as a criterion for allowing vessels to continue to participate in the EM program in future years.

Figure 2: Sample Vessel Scorecard as completed with field technician

Data Set Details			
Vessel name:		Operator Name:	
Data Set Start:	Click here to enter a date.	ADF&G Number:	
Data Set End:	Click here to enter a date.	Current Port:	

Logbooks Completed		Requirement
EM Program Effort Logbook	Y N	Yes
Verified IPHC Logbook (photo or e-log printout)	Y N	Optional
Fish Ticket (photo)	Y N	Optional
Duty of Care		Comments
Function test run at the start of each trip?	Y N	
Sensor data complete throughout trip	Y N	
Initial image quality assessment	H M L	
Initial catch handling assessment*	1 2 3	

*Guide to catch handling assessment: 1) All catch was handled out of view; 2) Some catch was handled within view, and some out of view; 3) All catch was handled within view.

Figure 3: Sample Vessel Scorecard as completed by PSMFC reviewer

Data Set Summary			
Vessel name:		Operator Name:	
Data Set ID:		ADF&G Number:	
Trip Start Date:	Click here to enter a date.	Start Port:	
Trip End Date:	Click here to enter a date.	Landing Port:	
Number of days on hard drive:			
Trip Assessment			
Effort Logbook Submitted:	Y N	Function test run at the start of each trip?	Y N
IPHC Logbooks submitted:	Y N	Continuous power (with exception of sleep events)	Y N
Fish ticket submitted:	Y N		
Fishing Event Assessment			Comments
Seabird Mitigation Devices Used:	Y N		
Seabirds Captured:	Y N		
Extended Presentation?	Y N		
All discarding at control points?	Y N		
Comments:			
Reviewer's Average Data Confidence	H, M, L, U		
Data Confidence Reason	Catch handling – in camera view		
	Catch handling – not in camera view		
	Image quality		
Event Image Quality			Comments
Average Image Quality During Haulback	H, M, L, U		
	NA (if image quality high)		
	Obstruction		
	Dirty camera(s)		
	Night lighting		
	Water spots		
	Condensation		
	Glare		
	No video recorded, scrambling or white screen		
	Out of focus		
	Poor camera angles		

11. Data review procedures

In 2016, PSMFC will review all EM data collected to assess whether data is complete, how many trips and hauls were captured, and the video quality of those hauls. All review information will be entered on the vessel score card (Figure 3). The EM Workgroup will provide direction to PSMFC on protocols for reviewing video for species identification. All catch events that are of reasonable quality to provide reliable species ID information will be reviewed in 2016.

12. Catch Accounting

Steps & decision points needed to use EM data in catch accounting

NMFS is not yet using EM data being collected through the EM Cooperative Research Plan in catch accounting. However, the goal during pre-implementation is to make the necessary infrastructure modifications and catch estimation programming changes to incorporate EM data into the catch accounting system so that it is available for inseason management. EM data processing occurs at three locations: Pacific States Marine Fisheries Commission, Alaska Fisheries Science Center (AFSC) and the Alaska Regional Office (AKRO). Figure 4 illustrates the data processing steps that need to occur during each of these phases as well as the data transfer that will need to occur between these entities. On the right-hand side of the figure, we have noted estimation decision points (in blue) and data quality/validation decision points (in purple) that need to be taken into consideration as the data estimation process is implemented.

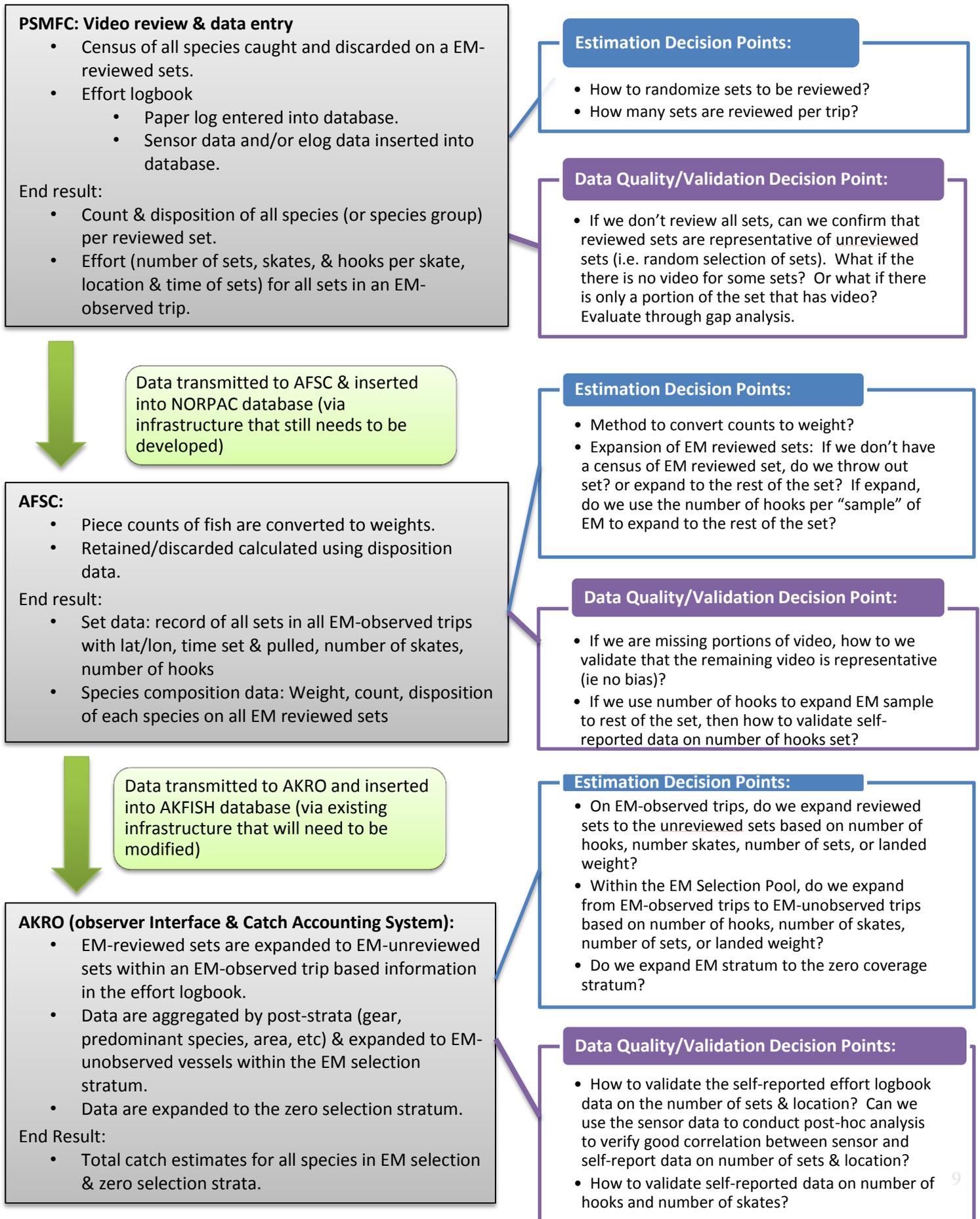
In 2016, NMFS will obtain piece counts from EM and will apply average weight by species to the piece counts using other sources of information to derive weight for catch estimation purposes. The 2016 program does not include a provision for measuring species length.

EM sampling terminology

In an attempt to use consistent terminology, we have defined the layers in the EM sampling hierarchy:

- **EM Selection Pool:** the vessels that meet the Council's criteria for EM and who opt into EM. It may be that not all vessels in the EM Selection Pool will carry cameras for all of their fishing activity.
 - **EM-unobserved vessels:** the vessels that are in the EM selection pool, but who are not selected to carry EM for a time period.
 - **EM-observed vessels:** vessels in the EM selection pool that are selected to carry EM for a time period.
 - **EM-observed trip:** the trips taken by EM-observed vessels where they are carrying EM.
 - **EM reviewed hauls:** the hauls within an EM-observed trip that are selected for EM review. The number of EM reviewed hauls could be all or some portion of the hauls within an EM-observed trip.
 - **unreviewed hauls:** the hauls within an EM-observed trips where the video is not reviewed. This could be because there was incomplete video for the trip, or due to sub-selection and sampling of the hauls within an EM-observed trip.

Figure 4. Roadmap & decision points for using EM data in catch accounting.



13. Other EM cooperative research in 2016

Within the confines of the budget, the EM Workgroup recommends continuing with other EM research projects in 2016, in addition to the EM pre-implementation program for sixty hook and line boats from 40-57.5 ft LOA. The objectives are to develop additional EM technologies, and continue progress towards expanding EM into other fixed gear sectors.

Research and development of other EM technologies for the 40-57.5 ft LOA longline fleet

1. **Stereo camera testing:** will occur on 3-5 volunteer hook and line vessels that are willing to test stereo cameras, both on vessels 40-57.5 ft LOA and over 57.5 ft LOA. The vessels will be included in the 2016 EM selection pool (no probability of carrying an observer on any trips) in addition to the approximately 60 vessels that are already part of the pre-implementation program. Research will focus on field testing the stereo camera's physical performance, programming the onboard capture of stereo camera imagery data, and programming the image processing to obtain species identification and length from stereo camera imagery data.
2. **E-logbook testing:** ALFA will work with the IPHC and NMFS Alaska Region to submit a proposed exemption to the IPHC regulations that would allow longline vessels fishing halibut to trial test e-logbooks without also being required to have a paper copy of an IPHC logbook onboard. The proposal would identify how information will be transferred from catcher vessels to IPHC port samplers. Note, this project does not require funding.
3. **Data loggers (sensor only):** volunteers from the EM selection pool could be asked to test a limited number of data loggers. The goal would be to evaluate the ability to use sensor-only data to validate the number of sets (effort) for boats which are in the EM Selection Pool, but which are not selected to carry EM equipment for a time period in which they are still fishing. Boats would fill out the EM effort log, which would be compared with the data logger information. This project is not yet ready to initiate, but could be considered for funding at the mid-year budget evaluation.

Progress towards expanding EM into other fixed gear sectors

1. **Pot cod vessels:** research will continue in 2016 through the NPFA/SWI grant. The 2016 research is focusing on methods to obtain species weights, and incorporating radio-frequency identification devices to speed up data review time. NMFS will provide data to support the evaluation of species weights for the project. NMFS has also offered to provide a chute camera for paired observations. The EMWG is interested in exploring funding mechanisms to provide direct financial support to expand the project in 2016 and 2017.
2. **Hook and line vessels <40ft LOA:** the EM Workgroup supports installing EM systems on up to 5 volunteer boats. Before any fieldwork begins, however, the Workgroup needs to think through the objectives and obstacles of extending EM to the <40 ft LOA fleet, and ensure that the fieldwork is designed to shed light on these needs. Therefore this fieldwork is tentative for 2016.
3. **Hook and line vessels >58ft LOA:** no work planned for 2016.

14. Budget for all 2016 EM deployment and research

The total available 2016 EM budget is \$2,159,051, available from the following sources:

- \$550,000 – NMFS Alaska Region
- \$700,000 – NMFS National Catch Share Program
- \$375,000 – NMFS National Observer Program
- \$78,113 – NMFS Fisheries Information System
- \$456,051 – ALFA NFWF Funds (total amount, to be spent in 2016 and 2017)

The 2016 EM funding will support work in 3 major areas:

1. Operation and deployment of EM on hook and line vessels 40-57.5 ft LOA in the EM selection pool;
2. Funding for EM infrastructure in order to integrate the data from EM into the observer program database for use in catch accounting; and
3. EM research and development projects, including work to advance remote collection of sensor data, stereo cameras, to collect size information, species identification and automation of post-processing video data.

The three areas are described in more detail below. The EM Workgroup also recommends maintaining a reserve of funding to support pre-implementation in 2017. Remaining funds in 2016 may be used to fund a request for proposals for EM work in 2017.

EM operation and deployment on hook and line vessels 40-57.5 ft LOA

Description: Operational testing of EM on fixed gear vessels according to the EM Pre-implementation plan developed by the EM workgroup. Will cover purchasing EM equipment (cameras, wiring, hard drives, etc.) field support for deployment and retrieval of the EM systems and time for Pacific States Marine Fisheries Commission (PSMFC) employees to conduct review of imagery data.

Available Budget:

- \$380K NMFS Alaska Region
- \$400K NMFS National Catch Share Program (NCSP)
- \$456K ALFA National Fish and Wildlife Foundation Funds (NFWF)

Total: \$1,236K

Projected Spend Plan

- \$525K NMFS funds (combined NMFS Alaska Region and NCSP)
- \$112K NMFS funds (video review)
- \$199K ALFA NFWF Funds

Total: \$836K

Balance/Carryover for 2017

- \$143K NMFS funds
- \$257K ALFA NFWF Funds

Total: \$400K

Attachment 2 provides a more detailed budget specific to the fieldwork portion of the 2016 EM operation and deployment project.

As a separate document, NMFS provided a cost simulation analysis to forecast total deployment costs for the 2016 EM pre-implementation program using three approaches to characterize the uncertainty in the cost estimate. This analysis (for SSC review) is intended to promote discussion about balancing the risk of exceeding the budget with potential costs associated with varying fleet size and deployment rate. A mid-year budget review will be scheduled for May/June 2015. If the projected expenditures are excessively higher than what has been planned for, changes to the program may be instituted for the latter half of the year.

EM infrastructure and staff support

Description: Provides project management support for PSMFC employees; and costs associated with IT development of changes in NORPAC and integration of EM imagery data in the FMA database.

Available Budget:

- \$300 NMFS NCSP funds
- \$50 NMFS Alaska Region funds

Total: \$350K

EM research and development

Description: Field support for the R&D of stereo camera EM systems; Programming support for the onboard capture of stereo camera imagery data; Programming the image processing to obtain species identification and length from stereo camera imagery data; University of Washington production of on image processing; Purchasing and building the next generation of stereo cameras for field testing in late 2016 through the final year of implementation in 2017; and time for PSMFC employees to review imagery data collected during field testing. This project will also support operational testing of RFID tags, chute and stereo camera EM systems deployed onboard pot vessels and potentially Catcher Processors.

Available Budget:

- \$375K National Observer Program Funds
- \$120K Alaska Region

Total: \$495K

The AFSC also received \$78K from NMFS Fisheries Information System (FIS) for image data collection that will cover activities that are already occurring in 2015 on the IPHC surveys and staffing work.

Attachment 1 Copy of EM Pre-implementation Plan Opt-In Letter

May 18, 2015

Dear Vessel Owner,

The North Pacific Groundfish and Halibut Observer Program is seeking vessels to participate in the 2016 electronic monitoring (EM) Cooperative Research Project to collect data on board commercial fishing vessels. The goal of the research is to determine whether data collected using EM technologies can be used to estimate catch and whether this can be achieved in a cost-effective and sustainable manner. We request that you let us know of your interest to “opt-in” to the 2016 EM selection pool by July 27, 2015. Since vessels will be given a choice to opt-in for the EM pool or remain part of observer selection pool the Council may reconsider if any of the current observer exemption rules remain such as life raft capacity. Any vessel that does not opt-in by July 27 will likely not be eligible for the EM pool in 2016 and will be required to participate in the partial observer coverage pool per Federal regulations.

The National Marine Fisheries Service (NMFS) and the North Pacific Fishery Management Council (Council) have yet to determine the number of vessels that will be eligible to be in the EM selection pool. NMFS and the industry continue to seek additional funds to support the EM program and the number of vessels that will be selected to participate will depend on the amount of funding received. However, any owner that is interested in participating should let us know their preference to participate.

Priority will be given to vessels that meet the following criteria:

- A. Hook and line vessels 40 to 57.5 feet in length;
- B. Vessels granted a conditional release for insufficient life raft capacity or limited bunk space in 2013 or 2014;
- C. Vessels granted temporary exemptions for limited life raft capacity in 2015, or that might be eligible for a life raft exemption in 2015. Eligibility is based on consistent fishing history with a crew of 4 including the vessel master, and a 4-person life raft;

NMFS will select vessels that meet these criteria and have contacted FMA to opt-in to create the EM selection pool. All vessels that are participating in the 2016 EM selection pool will not be required to carry a human observer for the entire 2016 fishing year.

A 2016 EM Pre-Implementation Plan will provide comprehensive details on the EM cooperative research program for 2016. The EM Pre-Implementation Plan is expected to be completed during the summer of 2015 and presented to the Council at the October 2015 meeting. The plan will include specific criteria for vessel participation and other operational details to ensure effective deployment of EM systems in 2016. Once the EM Pre-Implementation Plan is approved by the Council, NMFS will notify owners of vessels that are selected for the EM pool with more details about the 2016 EM cooperative research in November 2015. Vessels will be given an opportunity to opt-out of the EM cooperative research prior to the start of the fishing year, but any vessels that opt-out will be subject to human observer coverage, with the exception of those granted temporary exemptions for life raft capacity, if exemptions continue to apply in 2016.

All EM equipment will be provided through the EM cooperative research program. If selected, vessels will be expected to carry and maintain EM systems on all halibut IFQ trips and all groundfish trips in Alaskan federal fisheries in 2016. Vessels will also be required to use either an electronic or a paper

logbook to record basic information such as fishing location, fishing effort (i.e. hook count) and fishing duration.

EM systems will be installed in a limited number of ports - likely Homer, Kodiak, Sand Point, and Sitka, AK. The final list of ports will be included in the 2016 EM Pre-Implementation Plan. Once a vessel's participation has ended, the EM system will be removed at one of these ports. Vessels will not be required to make all their landings in these ports while participating in this cooperative research project.

If you would like to opt-in to this EM cooperative research in Alaska, please contact Elizabeth Chilton at 206 526-4197 or via e-mail at elizabeth.chilton@noaa.gov by **July 27, 2015**. We look forward to working with you in this EM cooperative research effort.

Chris Rilling
Director
Fisheries Monitoring and Analysis Division
Alaska Fisheries Science Center
7600 Sand Point Way NE
Seattle, WA 98115

Attachment 2 Copy of 2016 EM Pre-implementation Opt-In Confirmation Letter

October 13, 2015

Dear Vessel Owner,

This letter is to notify you that your vessel has been selected to participate in the 2016 electronic monitoring (EM) Cooperative Research Program. The attached EM Pre-Implementation Plan describes the specific criteria for vessel participation and other operational details to ensure effective deployment of EM systems in 2016. There are currently 57 longline vessels in the 40-57.5 ft LOA size class that have opted-in to the EM selection pool. Now that the Council has finalized the program rules for 2016 pre-implementation of EM, you are being contacted to confirm that your vessel has been placed in the 2016 EM selection pool, or to let us know if you would prefer to return your vessel to the partial coverage human observer pool.

After reviewing the program requirements detailed in the attached plan, please let us know by **November 20, 2015** if you do **NOT** wish to participate in the EM Cooperative Research Program in 2016. This is the final opt-in, opt-out date for all vessels. Please note this date differs from the advance notification of fishing activity in 2016 discussed below. Vessels participating in the EM program will be placed in the EM selection pool for the duration of the 2016 season, with no probability of carrying a human observer on any trips for the 2016 fishing season. Vessels deciding not to participate in the EM program will be placed in the human observer pool. In 2016, vessels in the human observer pool will not be granted conditional releases or temporary exemptions for limited bunk space or life raft capacity, as the EM Pre-Implementation Plan provides a monitoring alternative.

There is also room within the Council's approved EM selection pool to accommodate a small number of additional vessels that meet the Council's priority criteria. Please note that the Council will be sending out a reminder in its October newsletter for any vessels that are still interested in participating in the 2016 EM pre-implementation program to opt-in by November 20, 2015. Because your vessel is already in the 2016 EM selection pool, you do not need to contact NMFS unless you choose to opt-out for 2016.

If you plan to participate in the EM Cooperative Research Program in 2016, you must notify NMFS **at least 30 days in advance** of each of the selection periods (Jan-Feb; Mar-Jun; July-Oct; or Nov-Dec). For example, if you plan to fish in the Jan-Feb, 2016 selection period you must notify NMFS by Dec. 1 2015 of your intent to fish. If you plan to fish in Mar-June 2016 selection period you must notify NMFS by Feb 1, 2016 of your intent to fish during that period. This advance notice is critical for NMFS to randomly select a subset of vessels from the pool of available vessels to carry EM systems during each of these four selection periods. The advance notice is also important to ensure sufficient time for the EM service provider to install the necessary EM equipment. If you do not notify NMFS of your intent to fish 30 days in advance of the selection period(s), NMFS will assume that you will not be fishing during the time period. Please note that the success of EM Cooperative Research Program in 2016 is dependent upon your cooperation and active participation in this program. As such, we ask that you carefully read this letter with attachment and understand all of the obligations, requirements, and dates required to participate in this cooperative research effort.

To notify NMFS of your intent to opt-out of the 2016 EM selection pool or to register prior to one of the 2016 selection periods and for any other questions regarding participating in the EM cooperative research please contact Liz Chilton at the Observer Program at (206) 526-4197, or by email at elizabeth.chilton@noaa.gov.

Chris Rilling
Director
Fisheries Monitoring and Analysis Division
Alaska Fisheries Science Center
7600 Sand Point Way NE
Seattle, WA 98115