

**AN ELECTRONIC MONITORING  
PROGRAM FOR THE LIMITED ENTRY  
MIDWATER TRAWL WHITING FISHERY**

**DRAFT ANALYTICAL DOCUMENT FOR A  
REGULATORY AMENDMENT  
TO THE PACIFIC COAST GROUND FISH  
FISHERY MANAGEMENT PLAN**

**PREPARED BY  
THE PACIFIC FISHERY MANAGEMENT COUNCIL  
7700 NE AMBASSADOR PLACE, SUITE 101  
PORTLAND, OR 97220  
503-820-2280  
[WWW.PCOUNCIL.ORG](http://WWW.PCOUNCIL.ORG)**

**AND THE**

**NATIONAL MARINE FISHERIES SERVICE  
7600 SAND POINT WAY NE, BIN C15700  
SEATTLE, WA 98115-0070  
206-526-6150**

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**Abstract:** This document provides background information about, and analyses for, regulatory changes affecting the whiting trawlers that deliver whiting to shorebased plants or to mothership processors. In addition to addressing MSA mandates, this document serves as a draft environmental assessment (EA) covering the impacts of the action alternatives relative to the No Action Alternative, pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended.

This draft analytical document, including National Environmental Policy Act (NEPA) alternatives, analyzes the effects of establishing an EM program for catcher vessels in the whiting fishery. The proposed EM program would be established to monitor vessels for compliance with IFQ and individual bycatch quotas (IBQ) assigned to quota share (QS) permit holders under the catch share program, and assist in monitoring groundfish allocations provided to the shoreside and mothership fishing sectors. The main purpose of EM is to monitor discard of catch using video cameras and logbooks, and includes speciation and weight estimations of discards. The proposed action would implement an EM program for the mothership and shorebased IFQ sectors of the Pacific whiting fishery. Catcher vessels would have the option to obtain an exemption from the requirement to have 100 percent human observer coverage, provided that they carry an EM system (cameras and associated sensors) and comply with catch handling/species retention requirements, reporting requirements, and other conditions. Logbooks and EM data would be used to account for IFQ catch at sea in lieu of human observers and for accounting for mothership catch against the mothership sector quotas.

The limited entry trawl fishery consists of three sectors: 1) shorebased individual fishing quotas (IFQ), 2) catcher/processor, and 3) mothership. Catcher vessels that target Pacific whiting with midwater trawl gear deliver to shoreside processors (shorebased IFQ sector) and to mothership processing vessels at sea (mothership sector). These vessels are subject to obtaining human observer coverage for all trips and will be responsible for the full cost of human observer coverage in the near future, \$500 to \$600 per day. In addition, vessels must provide 72 hour notice to secure an observer prior to departure on a fishing trip. The fishing industry believes that EM may provide more flexibility in the decision making process of when to go fishing. Therefore, electronic monitoring (EM) (i.e., video monitoring) is being considered as a flexible and economical substitute for human observers on catcher vessels. EM is not being considered for use on whiting catcher/processor vessels or the mothership processing vessels.

The program would be voluntary and includes eligibility requirements to use EM and a process for vessels to declare their intention to use EM prior to fishing. Other components would include but are not limited to individual vessel monitoring plans, equipment and installation requirements for a video monitoring system, video data processing protocols, and compliance measures. Under the proposed EM program, the regulatory requirement of 100 percent human observer coverage on all fishing trips would be maintained; however, if a vessel qualifies for and chooses to fish using an EM system on a trip, the vessel would be exempt from the requirement for a human observer on the trip for compliance monitoring. The proposed EM program is not intended to meet the needs for collecting biological data or monitoring for other scientific information. Human observers would still be necessary to collect this information at an appropriate level to support scientific

needs; therefore, on EM trips, the vessel could be randomly selected by National Marine Fisheries Service (NMFS) to carry an observer for the purpose of collecting scientific information. Vessel operators would continue to make arrangements with third party observer providers to hire a human observer if required to do so.

This document analyzes the effects an EM program would have on the socioeconomic, biological, and physical environments. The alternatives considered are intended to maintain the full accountability of IFQs, IBQs, and groundfish allocations managed under the Shorebased catch share program and Mothership Coop Program. The proposed program is largely a new administrative program to collect, verify, and document discard data. No additional allocations of fish resources would be required, and fishing operations (area fished, effort, or gear used) are not expected to change under the proposed program. Impacts to the biological and physical environment are not expected to change and would likely be similar to those realized under the current catch share program. It's expected that the EM program would provide positive socioeconomic benefits for the industry; however, administrative costs to administer the new program may increase for NMFS.

## Document Guide

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Overview of purpose and needs, objectives, and summary of EM alternatives and options with some notable considerations.
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Summary of proposed action, decision to be made, and groundfish fisheries management.
- Detailed Description EM Alternatives and Options** ..... CHAPTER 2, page XX  
This section describes the alternatives and options that are available to the Council to create an EM program. It provides detailed description of all components of the proposed program.
- Description of the Affected Environment** .....Error! Reference source not found., page XX  
Description of the physical, biological, and socioeconomic environment, including description of fisheries, target and non-target species.
- Impact Analysis and the Analytical Scenarios** .... Error! Reference source not found., page 102  
Analytical scenarios were developed to help the reader understand the impact of choosing an alternative with certain options. The scenarios are meant to illustrate the range of choices available for management and the effect those choices have on the physical, biological and social environment.
- Applicable Laws** .....Error! Reference source not found., page, XX  
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# An Electronic Monitoring Program for the Limited Entry Midwater Trawl Whiting Fishery

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## GLOSSARY

***Electronic Technology(ies)*** – Any electronic tool used to support catch monitoring efforts both on shore and at sea, including electronic reporting (e.g., e-logbooks, tablets, and other input devices) and

electronic monitoring (Vessel Monitoring Systems, electronic cameras, and sensors on-board fishing vessels).

**Electronic Monitoring (EM)** – The use of technologies – such as vessel monitoring systems or video cameras – to passively monitor fishing operations through observing or tracking. Video monitoring is often referred to as EM.

**Electronic Reporting (ER)** – The use of technologies – such as smart phones, computers and tablets – to record, transmit, receive, and store fishery data.

**Fishery-dependent Data Collection Program** - Data collected in association with commercial, recreational or subsistence/customary fish harvesting or subsequent processing activities or operations, as opposed to data collected via means independent of fishing operations, such as from research vessel survey cruises or remote sensing devices.

**Full Retention** – A type of fishery where total catch is retained and brought to shore, without discards. This is a generic definition, used in the Policy Directive for illustrative purposes only. There are multiple stages in the fishing process where intentional and unintentional discards can occur. Such variations (e.g., maximum retention, operational discards, prohibited species catch, etc.) require specific definition in each fishery for regulatory compliance and/or enforcement purposes.

**Maximized Retention** – A type of fishery where total catch is retained and brought to shore, except for minor operational amounts of catch lost by a catcher vessel. A vessel is generally required to retain all catch share species, non-catch share groundfish species, non-groundfish species, non-FMP and prohibited species.

**Total catch for trawl** – Total catch is defined as the sum, or estimated weight, of all organic and inorganic material caught by the gear, to include any organic or inorganic material confined within a trawl net as the net is being landed, lost gear, as well as any visually discernible catch lost during the retrieval process that can be reasonably attributed to the vessel.

**Discard for fixed and trawl gear** – Discard is any portion of the total catch that is not delivered to a buyer. Fish caught for bait or onboard consumption are considered discard. For gear that is lost, or sets and hauls that are unobserved, discard rates will be applied based on similar sets and hauls.

**Retained catch for fixed gear and trawl** – Retained catch is any portion of the total catch that is delivered to a buyer or processor.

## Acronyms

DOC .....	Department of Commerce
EFH .....	essential fish habitat
ESA .....	Endangered Species Act
FMP .....	fishery management plan
MMPA .....	Marine Mammal Protection Act
MSA .....	Magnuson-Stevens Fishery Conservation and Management Act
NEPA .....	National Environmental Policy Act

NOAA ..... National Oceanic and Atmospheric Administration  
NOAA Fisheries or NMFS ..... National Marine Fisheries Service  
NWFS ..... Northwest Fisheries Science Center  
PFMC ..... Pacific Fishery Management Council  
PSMFC ..... Pacific States Marine Fisheries Commission  
SWFSC ..... Southwest Fisheries Science Center  
WCR ..... West Coast Region

# CHAPTER 1 INTRODUCTION

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## 1.1 Council's Pacific Coast Groundfish Fishery Management Plan

The west coast groundfish trawl fishery is jointly managed by state and Federal authorities under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), which was passed in 1976 to "Americanize" U.S. fisheries. In addition to establishing eight regional fishery management councils, the MSA extended U.S. fishery management authority in territorial waters from 12 miles out to 200 miles from the shore. This created the exclusive economic zone (EEZ), which, including U.S. Federal territorial waters, extends from 3 to 200 miles off shore. For the west coast (California, Oregon, and Washington), the Pacific Fishery Management Council (the Council) coordinates Federal management of fisheries in the Federal EEZ with state management of fisheries occurring in state waters (i.e., between the shoreline and 3 miles offshore). The groundfish trawl fishery is subject to a Federal license limitation program (referred to as LE), implemented in 1994; currently there are 178 groundfish LE trawl permits.

The Council's Pacific Coast Groundfish Fishery Management Plan (FMP) includes a LE midwater trawl and an LE bottom trawl fishery (Figure 1-1). Catcher vessels in LE midwater trawl fishery mainly target Pacific whiting and operate in both shorebased and mothership (MS) fishery sectors. Midwater whiting trawl catcher vessels deliver their catch to shore-based processors (shorebased whiting fishery) or to processors at sea. There are two distinct cooperative fishery programs that target and process whiting at-sea: 1) the MS with catcher vessels sector; and 2) catcher-processor sector (CP). The MS fishery uses midwater trawl vessels to catch whiting and deliver unsorted catch to a mothership; the catch is sorted and processed aboard the mothership. Catcher-processor vessels do both; they catch and process the whiting at-sea on the same vessel. The shorebased, MS, and CP sectors are annually provided with separate sector allocations for whiting and bycatch of other species. This analysis concerns 26 shorebased vessels, 30 mothership catcher vessels, for a total of 30 whiting vessels. All of the vessels that participate in the shorebased fishery also fish in the mothership fishery.

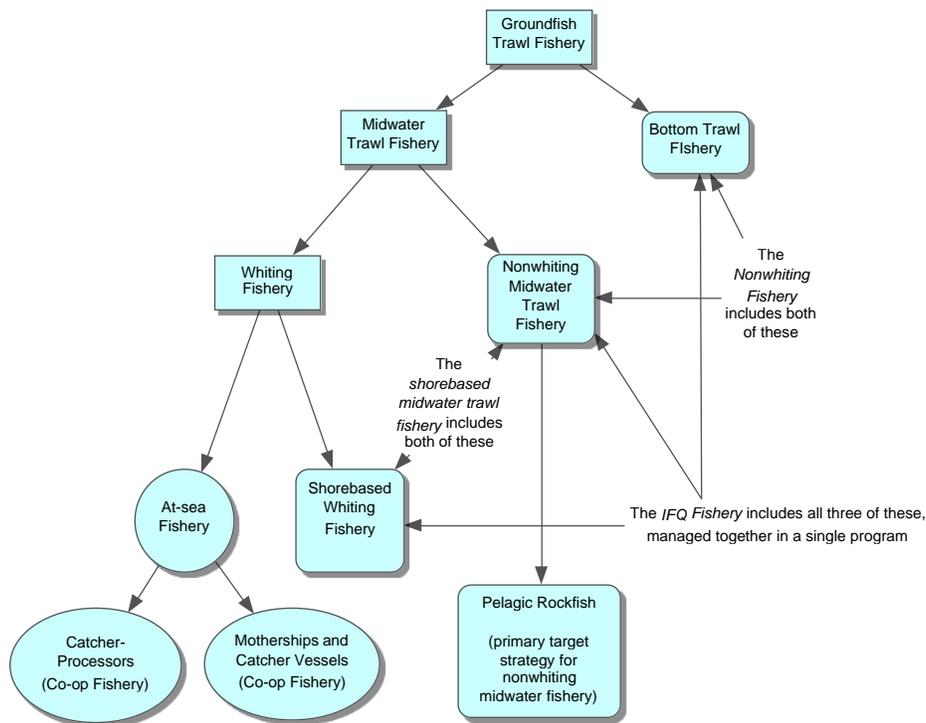


Figure 1-1. Schematic of groundfish trawl fishery sectors.

In 2011, National Marine Fisheries Service (NMFS) implemented the trawl catch share program for the West Coast limited entry groundfish trawl fishery (See Appendix E of the Pacific Coast Groundfish FMP for a description of program and allocations, PFMC 2015). The program applies to vessels that hold limited entry trawl permits and have declared into the trawl catch share fishery. These vessels may use midwater trawl and bottom trawl gear to target groundfish. The program also allows catch share vessels to use non-trawl gear such as longline and fish pots. The catch share program requires that each catcher vessel that deliver to shoreside plants have in their vessel accounts sufficient quota for the IFQ species that they land or that vessels that participate in the Mothership program, participate in a co-op that has sufficient allocations from endorsed vessels to cover their whiting landings.

The catch share program also includes a requirement for human observers on all fishing trips (100% observer coverage) for compliance monitoring and the collection of scientific information. Prior implementation of the catch share program, the West Coast groundfish observer program monitored approximately 20 percent of the trips taken on groundfish trawl vessels. One hundred percent monitoring is required to provide for the individual accountability on which the program relies, to fully achieve the potential program benefits, and to prevent the complexity and challenging enforcement circumstances which would arise if some vessels were monitored and others were not. Under the catch share program, the midwater trawl whiting fishery uses observers to estimate and document all bycatch that is discarded prior to delivery to ensure that all fish are accounted for in individual vessel accounts. Each sector (shorebased, MS, and CP) are monitored for total whiting catch and NMFS may close the fishery due to attainment of that sectors allocation. In addition, NMFS may close the MS or CP sector if a sector allocation is attained. Observer data, in combination with landings data, enable shoreside fishermen to track their individual fishing quotas and provide managers with near real-time data to monitor the progress of both shoreside and MS fishery sector allocations. We refer to the monitoring of the quotas and sector allocations as “compliance monitoring”.

From 2004 to 2010, electronic monitoring (EM) was tested on catcher vessels operating in the shorebased sector to monitor vessels for compliance with maximized retention regulations; generally no discards were allowed prior to delivery and EM was used to account for the discards that occurred. In 2010, EM was proposed to be permanently implemented in the shorebased and MS sectors; however, in 2011 NMFS implemented the catch share program with 100% observer monitoring. Therefore, the proposed EM program was not implemented.

When the catch share program was implemented, NMFS subsidized for the observer coverage with the understanding that at some point in the near future the industry would be responsible for full payment of the observer coverage. The average daily cost for an observer in 2015 ranges from \$450 to \$600 per day; and the 2015 the Federal government subsidy to offset the cost for an observer per day of fishing activity is \$108 per day. In the near future, the industry will be will be responsible for the full cost of human observer coverage and it's estimated that the average annual ex-vessel cost for observer coverage for catcher vessels that deliver to shoreside and MS processors is roughly \$XXX,XXX and \$XXX,XXX, respectively. Participants in the catch share program have indicated that the rising cost for observer coverage and other operating costs are hindering participation in groundfish fisheries and lowering profitability. In addition, vessels must provide 72 hour notice to secure an observer. Some operators would like more flexibility to decide when to go fishing.

### 1.1.1 What is Electronic monitoring?

Electronic monitoring is the use of technologies – such as vessel monitoring systems or video cameras – to passively monitor fishing operations through tracking location and speed or observing gear and deck activity. Video monitoring is often referred to as EM. Figure 1-2 provides an example of a closed video system with cameras, sensors, GPS receiver, and a control center. A computer hard drive stores the video images, location data, and the sensor information for review at a later date at a mainland facility. The hard drive can be removed and a new one loaded to continue storing data while at sea or in port by a fisherman or technical staff. The sensor data provides an accurate account of vessel activity that could be used to develop a distinctive digital “signature” of vessel activities including transit, gear setting, net towing, net retrieval, and catch stowage (McElderry et, al. 2014). The video images record all fishing activities from several angles (up to four cameras) to capture the handling of fish and any discard activity.

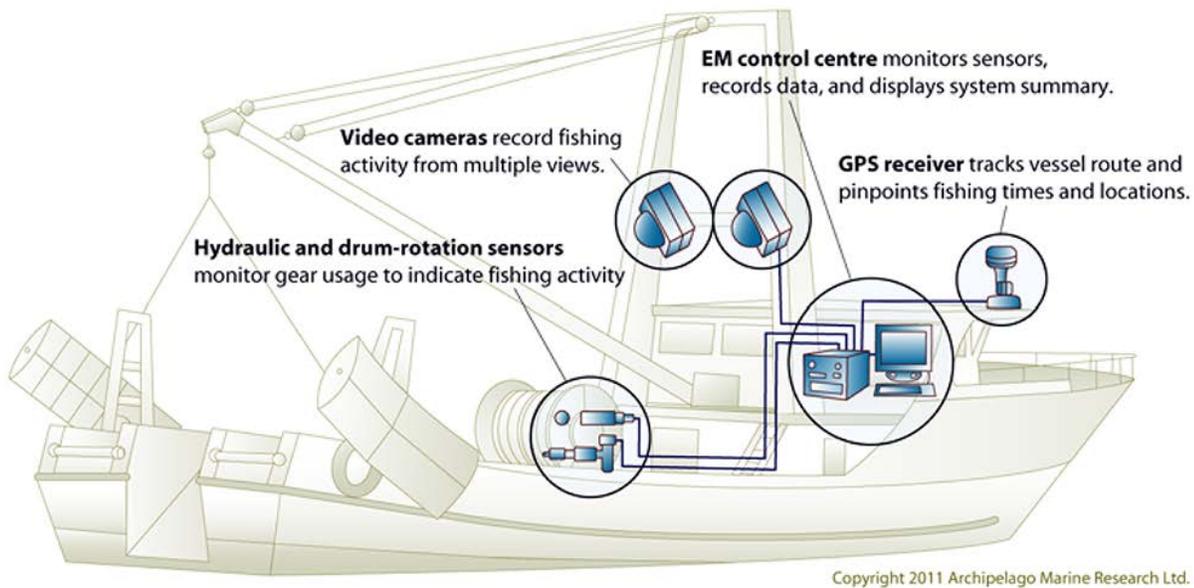


Figure 1-2. General EM system schematic for a trawl vessel.

## 1.2 Proposed Action

The proposed action would implement an EM program for the mothership and shorebased IFQ sectors of the Pacific whiting fishery. Catcher vessels would have the option to obtain an exemption from the requirement to have 100 percent human observer coverage, provided that they carry an EM system (cameras and associated sensors) and comply with catch handling/species retention/discard requirements, reporting requirements, and other conditions. Logbooks and EM data would be used to account for IFQ and mothership catcher vessel catch at sea in lieu of human observers estimates.

## 1.3 Purpose and Need for the Proposed Action

There is a need to adequately monitor the catch share program for compliance in an economical and flexible manner while meeting the goals and objectives of national policies and standards, the Pacific Coast Groundfish FMP, the trawl rationalization program, and all applicable laws and acts including the Magnuson-Stevens Act (MSA) and Endangered Species Act (ESA). NMFS and the Council identified that EM may be a viable option to monitor the catch share program for compliance with IFQs and individual and mothership coop sector allocations. The purpose of the proposed action is to meet the following regulatory objectives:

1. Reduce total fleet monitoring costs to levels sustainable for the fleet and agency;
2. Reduce observer costs for vessels that have a relatively lower total revenue;
3. Maintain monitoring capabilities in small ports;
4. Increase national net economic value generated by the fishery;
5. Decrease incentives for fishing in unsafe conditions;
6. Use the technology most suitable and cost effective for any particular function in the monitoring system; and
7. Reduce the physical intrusiveness of the monitoring system by reducing observer presence.

## 1.4 Scoping Process for EM use in the Catch Shares Program

### 1.4.1 How the Council Reached the Decision to Consider EM

Based on rising costs for observer coverage and the potential opportunity to increase flexibility in planning fishing activity, the industry requested that the Council consider the use of EM in monitoring catch share program for compliance with IFQs and sector allocations. In 2012, the Council began the public scoping process to analyze EM use for the midwater trawl and bottom trawl fisheries, including those vessels that use longline and pots (see Sections 1.4.2.1, 1.4 and **Error! Reference source not found.** for further discussion). However, in September 2014 the Council chose to move forward with the intent to implement EM for use in the whiting fishery first, and consider implementation of EM for other catch share fisheries in the near future.

On May 3, 2013, NMFS released its Policy on Electronic Technologies and Fishery Dependent Data Collection to “adoption of electronic technology solutions in fishery-dependent data collection programs” (NMFS, 2013). A complete copy of this policy has been posted on the EM page of the Council web site (<http://www.pcouncil.org/groundfish/trawl-catch-share-program-em/>). The objective for this policy is stated as follows:

It is the policy of the National Oceanic & Atmospheric Administration’s (NOAA’s) National Marine Fisheries Service (NOAA Fisheries) to encourage the consideration of electronic technologies to complement and/or improve existing fishery-dependent data collection programs to achieve the most cost-effective and sustainable approach that ensures alignment of management goals, data needs, funding sources and regulations.

Therefore, NMFS Policy Directive supports the Council’s decision to consider EM for the catch share program.

### 1.4.2 Development of the Current Proposal

Development of an EM program for the catch share program initially included the limited entry fisheries under the program: midwater trawl (whiting and non-whiting), bottom trawl, and fixed gear (longline and pot). The following information documents the timeline whereby the Council considered the use of EM for all catch share fisheries, including whiting.

In November 2012, the Council directed that an EM workshop be held to begin developing a policy context and identify necessary elements for a thorough Magnuson-Stevens Act (MSA) process to use EM in the West Coast groundfish catch share program. The workshop was held in February 2013 and identified several goals and objectives (See Section 1.4.2.1).

The Council decided at the April, 2013 Council meeting to move forward with consideration of the possible use of EM for the catch share program. At that time, the Council decided that the primary focus of integrating EM into the trawl catch share program would be to achieve the compliance monitoring required for individual accountability of catch and bycatch, as opposed to using EM to meet needs for biological data or other scientific information monitoring. A set of regulatory objectives and calendar from the February EM workshop report were adopted. Also, at the April meeting a set of recommendations on the 2013 EM field study was approved for forwarding to Pacific States Marine Fisheries Commission. A similar field study was conducted in 2012. Both studies focus on comparison of video and observer data.

At the June 2013 Council meeting, the Council established two EM committees to focus on the development of options for EM use in the trawl catch share program. In August 2013 both the Groundfish Electronic Monitoring (GEM) Policy Advisory Committee (GEMPAC) and the GEM Technical Advisory Committee met to further the Council scoping process. The GEMPAC report for their August meeting provides a draft set of EM program alternatives for Council consideration and were presented at the September 2013 Council meeting. The Council provided guidance to the GEMPAC for continued development of EM program alternatives.

The GEM Committees met again in October, 2013 to discuss the guidance provided by the Council. The GEMPAC refined the draft alternatives and developed a GEMPAC report with recommendations for Council consideration at their November, 2013 meeting. The Council decided to revise the alternatives with the modifications recommended in the Enforcement Consultants report and to move forward with an impact analysis of the draft alternatives.

On May 7 and 8, 2014 the GEM Committees met to discuss initial EM program alternatives and options adopted by the Council for analysis. The GEMPAC revised and added some options for further analysis. The GEMPAC recommendations were then added to the draft analysis for further Council consideration.

In [June 2014, the Council](#) reviewed the draft analysis of the alternatives and decided to modify some of the regulatory options. Also at the June meeting, the Council received four revised [EFPs](#) and recommended that NMFS implement them for the whiting midwater trawl, non-whiting midwater trawl, fixed gear, and bottom trawl fisheries in 2015 and 2016. Specifically, the Council recommended the EM EFPs be issued to test EM in the fisheries on in limited capacity with [some additional permit conditions](#).

In [September 2014 the Council](#) reviewed the draft analysis for regulatory development of the EM Program. It included the new options added by the Council during the June meeting. The Council also reviewed the [GEMPAC Report](#) and other [Advisory Body Reports](#). The Council picked its [final preferred alternatives](#) for an EM program for all groundfish fisheries operating under the trawl catch shares program, contingent on scheduled review opportunities prior to the final rule implementation.

The Council provided guidance to NMFS regarding preservation of the IFQ Program goals and the development of performance standards when considering regulations to implement an EM Program. In order to preserve the conservation and accountability aspects of the IFQ Program, the EM Program must accurately capture discard events (i.e., whether discard has occurred), amount of discard (i.e., volume in weight and size of individual fish), disposition of discard (i.e., consider providing survivability credit for released fish, such as halibut), and rare events (e.g., catch and discard of rebuilding rockfish, by species).

In developing performance standards and accountability measures, the Council recommended NMFS consider the economic incentives to misreport or underreport catches and mortalities of overfished rockfish and Pacific halibut. Individual accountability in the fisheries will hold only so far as monitoring programs are able to counteract these incentives. As such, having adequate enforcement to ensure compliance with the EM Program with strong consequences in place for violations are keys to success.

Performance standards *examples* suggested by the Council for NMFS consideration include:

1. Require recording of discards in logbooks with estimated weights given for each species for each haul or set;
2. Require a minimum of 30% video review during times of gear retrieval and 30% of video review of the remainder of the trip; compare to logbook entries for logbook certification;
3. Logbook certification is achieved if video review determines that logbook amounts are within 20% accuracy of video review, by species;
4. If logbook amounts do not meet 20% accuracy standard, then a 100% video review is triggered at vessel account holder expense and vessel cannot commence another fishing trip until video has been reviewed and vessel account has been debited;
5. If the 100% video review is triggered more than twice within a six-month time period, then 100% video review is in effect for all fishing trips for the six months following the commencement of fishing activity, again at the vessel account holder's expense.

#### 1.4.2.1 Trawl Catch Share Program Electronic Monitoring (EM) Workshop Report

The Pacific Fishery Management Council held a workshop on the potential use of electronic monitoring (EM) in the trawl fishery catch share program, February 25-27, 2013. The full report is available at: [http://www.pcouncil.org/wp-content/uploads/D7b\\_EM\\_WKSHOP\\_RPT\\_APR2013BB.pdf](http://www.pcouncil.org/wp-content/uploads/D7b_EM_WKSHOP_RPT_APR2013BB.pdf)

During the EM workshop there was a discussion of the potential regulatory requirements for an EM system and the need for regulatory flexibility, both with respect to technologies employed and processes. The needed flexibility would allow private industry to develop efficient and effective monitoring system and to continue to innovate as new technologies become available over time. It was suggested that rather than being prescriptive, regulations should specify performance standards which must be met. This recommendation is in line with Executive Order 12899, which requires that each agency “identify and assess alternative forms of regulation and shall, to the extent feasible, specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt.”

The following is a summary of the main topics examined at the workshop:

##### **Why is 100% Monitoring Needed for this Fishery?**

The trawl fishery is a multispecies fishery in which the allowable harvest levels for some stocks (potentially including overfished species) constrain total harvest. If a vessel were not monitored on a particular trip, the elimination of individual accountability would generate an incentive to alter fishing behavior and target stocks that are more difficult to catch without encountering high levels of constraining species. The trawl rationalization program has helped the fleet make tremendous gains in bycatch avoidance. During an unmonitored trip the incentive to avoid bycatch would be minimal.

##### **Why Monitor With Observers?**

Currently 100% monitoring is achieved through the use of observers on the vessels. The Council's final action in 2010 on trawl rationalization included a provision allowing vessel observes to be supplemented with cameras (one of the most common forms of electronic monitoring), but not allowing the use of cameras to completely fulfill the monitoring function.

The trawl rationalization program entailed a major change to the fishery and, while the change was expected to be positive, there was concern about the potential for unexpected consequences. Even though cameras had been successfully used to monitor the whiting fleet on an experimental basis, the

incentives provided by individual accountability also create an incentive to avoid detection, which was not present during the development of the camera monitoring program for the whiting fishery. Prior to trawl rationalization, the West Coast Groundfish Observer Program was successfully monitoring about 20 percent of the trips and, thus providing a familiar tool. While the incentives to avoid detection could also lead to behaviors frustrating the observer's role, a human observer has more ability than a camera system to detect and respond to contingencies and collect information useful to modifying the monitoring program. Thus, the decision to not include cameras as an alternative to observes was made in the context of uncertainties about the performance of the overall program and cameras.

For further information regarding the Council's public scoping timeline to consider EM and the rational for the preferred alternative and options see Section **Error! Reference source not found.**

### **Why Monitor With EM?**

The circumstances, under which electronic monitoring was originally rejected, have changed. Fishery managers have now had three years of experience under the trawl rationalization program, which has provided a better understanding of how the fishery performs and how fishermen operate under the program. This has reduced some of the uncertainty about potential unintended consequences. Now, increasing information is available on the performance of electronic monitoring in the whiting fishery (from 2004 to 2010 by Archipelago Marine Research Ltd, McElderry et al. 2014) and additional field studies by the Pacific States Marine Fisheries Commission in 2012 and 2013 (Al-Humaidhi et al. 2013 and 2014). There is time to more carefully consider the utility of electronic monitoring relative to human observers.

# CHAPTER 2 ALTERNATIVES

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Under the National Environmental Policy Act, a reasonable range of alternatives must be identified for a federal action, and includes the “no-action” alternative or status quo.

## Overview of Council’s Preferred Alternative and Options

At the September 2014 Council meeting in Spokane, WA, the Council preferred the following Alternative and Options (Table 2-1 **Error! Reference source not found.**).

- **Alternative 2** - Camera Recordings Used to Estimate Discard. *Footnote by Council: Alternative 2 is preferred unless audited logbooks, Alternative 3, produces reliable estimates more efficiently and at reduced cost.*
- **Video Review Option A:** 100% - census all video footage and estimate discard, includes a mandatory logbook requirement to document discard. Logbook requirement as a back-up data source. *Footnote by Council: Video Review Option A with 100% video review unless Alternative 3 meets the most cost effective standard above in which case the percent review to be the minimum level determined to be necessary to ensure compliance (no less than 10%) with an escalation clause for non-compliance.*
- **Discard Accounting Option A (Shoreside Sector):** Estimate Discard with EM and Count against IFQ
- **Discard Accounting Option D (Mothership Sector):** Deduct unintentional discards of whiting pre-season from the MS Coop allocation.
- **Retention Requirements Option A:** Maximize *(Council staff removed this discussion and option; No longer in document for analysis, already a regulatory requirement)*
- **Halibut Retention/ Discard Option D:** Discard Exemption, 100% retained, 100% mortality *(Council staff removed this discussion and option; No longer in document for analysis, already a regulatory requirement)*
- **Discard Species List Adjustment Option B** Routine Process *(Council staff removed this discussion and option; No longer in document for analysis, maximize retention does not point to the need for this process)*
- **EM Vessel Operational Plan - IVMP Expiration Option B:** Annual Expiration or if modifications are made
- **Declaration of EM Use Option C:** Declare until changed with some limit on frequency
- **Data Transfer Process Option C:** Data Transfer by Shoreside catch monitor
- **Data Transfer Process Option D:** Data Transfer by Vessel operator/Crew
- **Video and Data Processing and Analysis Option D:** Third party conducts video review
- **Payment for Scientific data collection/observations Option A:** Government funded scientific observations, same as pre IFQ
- **Implementation Option B:** Use EFPs to Test Policy *(Council staff removed this discussion and option; No longer relevant)*

Table 2-1. Council preferred alternatives as adopted by Council in September, 2014.

Alternatives/Option Choices for Shoreside and Mothership Whiting Fishery				
<b>Step 1. Choose Overall Alternative (this will be the primary data source for discard estimates)</b>				
Alternative 1: No Action – Human Observers Estimate Discards				
Alternative 2. Camera Recordings Use to Estimate Discards <b>a/</b>				
Alternative 3. Logbooks used to Estimate Discard with Logbook Audits				
<b>Step 2. For Alternative 2 or 3, Choose an Option from Each of the Following Rows</b>				
EM Component	Options for Each EM Component Category			
Video Reading Protocol (% review)	A. 100% (Alt 2 only) with logbook requirement <b>b/</b>	B. X% (Alt 2 Only)	C. X% (Alt 2 Only) plus logbook requirement	Logbook Audit (Alt 3 Only)
Discard Accounting - Individual or Fleetwide	A. For Shoreside, One Discard Category, Full Accounting for All Discards <b>c/</b>	B. For Shoreside Fishery, Two Discard Categories, Sector or ACL Deduction for Category 2 Discards	C. Two Discard Categories, No Accounting for Category 2 Discards	D. For Mothership Whiting, Deduct "unintentional minor" Discards Preseason <b>d/</b>
Retention Requirements	A. Maximize			
Halibut Retention/ Discard with Fishery Specific Options	D. Discard Exemption (100% retained, 100% mortality)			
Discard Species List Adjustment	A. NMFS Rulemaking Process	B. Routine Process	C. Full Council Rulemaking Process	
Eligibility for Camera Use	A. Initial and Continued Eligibility Requirements			
EM Vessel Operation Plan - IVMP Expiration	A. No Expiration	B. Annual		
Declaration of EM Use	A. Annual - choose for entire year	B. Annual - project for year (monthly/quarterly)	C. Declare Until Changed (some limit on frequency of change)	D. Declare Until Changed (no limit on frequency)
Data Transfer Process (Not Mutually Exclusive)	A. PSMFC Staff	B. EM provider	C. SS Catch Monitor	D. Vessel Operator (crew) E. 3rd Party
Video Review	A. NMFS <b>e/</b>	B. PSMFC	C. EM Provider	D. 3rd Party <b>e/</b>
Payment for Scientific Data Collection/Observers	A. Government	B. Industry	C. Combination	
Implementation	A. None	B. Use EFPs to Test Policy	C. Phase in By Sector - Whiting; BTW/Mid-nonwhiting, Fixed Gear	D. Loosen Species Retention Over Time E. Use EFPs to Develop Policy

The Council added some caveats to their choices. The following footnotes are for Table 2-1:

a/ Camera Recordings will be used (Alternative 2A with a logbook requirement added) unless audited logbooks produces reliable estimates more efficiently and at reduced cost (Alternative 3).

b/ Video Review: 100% unless Alternative 3 meets the most cost effective standard above in which case the percent review to be the minimum level determined to be necessary to ensure compliance (no less than 10%) with an escalation clause for non-compliance.

c/ For Shoreside fishery only Option A Full Accounting of discards

d/ For Mothership fishery only deduct the aggregate accumulated unintentional minor discards (spillage), estimated to be less than 0.5 percent of the mothership allocation. Species composition would be calculated using status quo methods.

e/ Certified Third party (Option D) once a certification process has been established, until then, Government (Option A) – NMFS or their agent (e.g. PSMFC)

## Overview of Alternatives and Options

The remainder of this chapter describes alternative management actions that could be implemented to establish an EM program for the catcher vessels operating in the shorebased and MS sectors of the whiting fishery. Chapter 4 provides an impact analysis for selecting an alternative. The impacts section analyzes each alternative and only one EM option (Discard Accounting – Individual or Fleetwide).

The two action alternatives take different approaches to ensure regulatory compliance of the participants with the goal of more flexibility and less cost than the current requirement for 100 percent coverage by human observers. The alternatives described here were developed to examine potential components and options for an EM program and includes the no-action alternative. These alternatives would apply only to catcher vessels that operate in the shorebased and MS fishery. EM is not being considered for use on whiting catcher/processor vessels or the mothership processing vessels.

There are three alternatives:

**Alternative 1: No Action** – Do not implement an EM program for the midwater trawl whiting fishery. All catcher vessels would continue to be monitored for compliance using human observers on all trips (100% observer coverage).

### **Alternative 2: Use Camera Recordings to Estimate Discard**

Implement a voluntary EM program for the midwater trawl whiting fishery. Qualified participants could choose to use EM or an observer to monitor their compliance with IFQ and sector allocations in lieu of a human observers. The video data would be the primary source for discard monitoring and accounting. Those that choose not to use EM would continue fishing under the regulations associated with Alternative 1-No Action.

### **Alternative 3: Use Logbooks to Estimate Discard, (Audit Logbooks with Camera)**

Implement a voluntary EM program for the midwater trawl whiting fishery. Qualified participants could choose to use EM or an observer to monitor their compliance with IFQ and sector allocations in lieu of a human observers. Logbook data would be the primary source for discard monitoring and accounting. Logbook data would be audited using video data to ensure compliance with the catch share program.

Those that choose not to use EM would continue fishing under the regulations associated with Alternative 1-No Action.

EM Components were added as part of each alternative. Some of the components contain options for the Council to choose from to develop the EM program policy for the midwater trawl whiting fishery. Only one component is unique to Alternative 2, Video Reading Protocol; all other EM Components listed here are applicable under both Alternative 2 and Alternative 3.

List of all EM components for development of an EM program are:

- Video Reading Protocol (**Unique to Alternative 2**)
- Discard Accounting – Individual or Fleetwide
- EM Individual Vessel Monitoring Plan – Expiration
- Declaration of EM Use
- Data Transfer Process
- Video and Data Processing and Analysis
- Payment for Scientific data collection/observations
- Observer Exemption Process
  - Application and Approval Process (including an application for fishermen)
  - Eligibility Criteria (Initial and continued eligibility criteria)
  - IVMP and Approval Process (including a form for submission to NMFS for review)
  - Declaration Process to Use EM (possibly including port hail in/out process, PRA)
- EM Vessel Operational Plan - Individual Vessel Monitoring Plans (IVMP)
- EM Equipment and Protocol Provisions
  - EM Equipment Requirements (e.g., data format, video hardware products, logbook data source, on-vessel data storage, onboard operational standards and practices)
  - NMFS Type-Approval Process for EM Equipment (including a list of specifications for EM providers)
  - Approved EM Provider List (including a list of specific criteria for providers to demonstrate their capability and standards)
- Data Confidentiality/Accessibility/Ownership

These main components create the infrastructure of the EM Program. Table 2-2 contains a detailed list of all EM Program Components with cross references to section descriptions. The EM Components are described in detail only under Alternative 2, they are not repeated under Alternative 3. However, summary tables are provided under each alternative that show all EM components and options under the alternative with cross references to each section. We incorporated the Council's preferred alternatives into both Alternative 2 and Alternative 3 for analysis. Three EM component options were removed from the analysis. Maximized retention and halibut retention options were removed since they are already a regulatory requirement and there are no other options to choose from regarding retention. The Discard Species List Adjustment Option B Routine Process was removed because the current maximized retention rule does not point to the need for a discard species list or a process to adjust the list.

## **2.1 Alternative 1 - No Action**

The No Action Alternative or status quo (Alternative 1) defines the default management structure if no Federal action was taken. Here the status quo would maintain the existing LE permit and licensing requirements, the catch share program requirements, and the current observer program requirements.

Under Alternative 1:

- All catch share program regulatory requirements would remain in place (See Section 50 of the Code of Federal Regulations Part 660 Subpart A, C and D);
- Maintain current mandatory 100% human observer coverage to monitor fishery participants for compliance with IFQs, IBQs, and allocated groundfish;
- Maintain requirements for vessels to secure and pay for compliance observers for each trip;
- Third party providers would continue to supply compliance observers and shorebased catch monitors to the industry;
- NMFS would continue to train third party compliance observers for data collection and biological sampling;
- Vessels would still be required to use a vessel monitoring system (VMS);
- Maintain requirement to document catch in logbooks; and
- Maintain current maximized retention requirements.

Under the Alternative 1, all midwater trawl whiting trips would continue to be monitored with a catch share program observer to provide the necessary data to debit QP accounts and sector catch allocations. Catch that is landed would continue to be monitored shoreside with catch monitors that are employed as a third-party observer. Catch that is landed onto motherships are monitored by observers that estimate catch and bycatch totals. Currently, all at-sea discards from whiting trips must be monitored by a human observer in order to monitor the fisheries for compliance with the catch share program and estimate total discard.

The Northwest Fisheries Science Center trains, certifies, and equips IFQ program observers, ensures data quality, and stores, maintains, and analyzes data collected by observers. It's expected that third-party observer providers would continue to provide human at-sea and shoreside monitoring for vessels in the whiting fishery.

Under Alternative 1, the cost for observer coverage in the near future will no longer be federally subsidized. It's expected that in 2016 the industry will pay the full amount for compliance monitoring by human observers. In 2015, Federal government subsidy to offset the cost for an observer per day of fishing activity is \$108 per day.

Currently, under the trawl rationalization program the catcher vessels in the shorebased and MS sectors are required to retain all species caught, with limited exceptions.

The following requirements would continue to apply:

- Mid-water trawl IFQ trips for whiting that deliver to shoreside processors and motherships must retain prohibited species (halibut, salmon, and Dungeness crab), and protected species unless sorting at sea.
- Current regulation at 660.140(g)(2): (2) *Whiting maximized retention vessels*. Maximized retention vessels participating in the Pacific whiting IFQ fishery may discard minor operational amounts of catch at sea if the observer has accounted for the discard (i.e., a maximized retention fishery).
- Current regulation at 660.150(i): (i) *Retention requirements*. Catcher vessels participating in the MS Coop Program may discard minor operational amounts of catch at sea if the observer has accounted for the discard (i.e., a maximized retention fishery).

During fishing operations, vessels may intentionally or unintentionally discard fish for various reasons. For example, when retrieving a midwater trawl net, fish may “bleed” out of the net as it surfaces because it is too full or part of the net is open. In addition, some vessels may dump fish for safety reasons (i.e., rough seas or remove fish from deck when the hold is full). These events would still need to be documented in logbooks by vessel operators.

Vessels are allowed to retain prohibited species (i.e. salmon, halibut, and Dungeness crab) if the vessel does not sort their fish at sea. Although the option to sort at sea currently exists in regulation, vessels that target whiting for delivery to shoreside processors do not sort their fish.

Since midwater trawl gear is a prohibited gear to catch Pacific halibut, an exemption to retain and land halibut is needed from the International Pacific Halibut Commission’s (IPHC). Under Alternative 1, NMFS would maintain the status quo to implement an IPHC exemption to allow retention of halibut caught in midwater gear and continue to apply a 100% mortality rate for all halibut caught, regardless if it is discarded at sea unintentionally.

## **2.2 Alternative 2 - Camera Recordings Used to Estimate Discard**

Table 2-2 is a summary of components that would be implemented as part of the EM program under Alternative 2. The Council adopted these components as necessary elements to create the framework of an EM program. The summary table provides the Council preferred options and then lists other options that were considered when the Council selected the preferred option(s).

Table 2-2. Summary of Alternative 2 and EM Program Components. NOTE: Section references in the table coincide with descriptions in the document.

Section Reference	Component	Alternative 2 - Camera Recordings Used to Estimate Discard (Council Preferred)	Other Available Options
<u>2.2.1.2</u>	Video Reading Protocol	<p><b>The following video reading protocol options are unique to Alternative 2:</b>  <b>Option A: (Council Preferred)</b> 100% with a mandatory logbook (census all video footage and estimate discard).</p>	<p><b>Option B:</b> Subsample Video and expand discard estimate to whole trip (% review must be developed)  <b>Option C:</b> Subsample Video with a mandatory logbook requirement to document discard (% to review must be developed)</p>
<u>2.2.1.3</u>	Discard Accounting – Individual or Fleetwide	<p><b>Estimation of discard may be done through EM, WCGOP observer program, or other data sources.</b></p> <p><b>Option A – (Council Preferred for Shoreside Sector)</b> Estimate Discard with EM and Count against IFQ  Under this option all discard events would be estimated with EM and total discard would be debited from IFQ accounts or sector allocations.</p> <p style="padding-left: 40px;">One discard category and all discards are estimated using EM and counted against IFQ:  Dumped off deck (e.g., shoveled, picked out of net)  Dumped for safety reasons (e.g., pull zipper)  Floating fish (bleeding net/washed out of net)  Lost gear (not captured by EM, estimate using WCGOP protocol)  Consumed/used as bait (not captured by EM)  Unobserved sets/hauls (not captured by EM, maybe apply discard rate using EM estimates from previous sets/hauls)</p> <p><b>Option D – (Council Preferred for Mothership Sector)</b> Deduct unintentional discards of whiting pre-season from the MS Coop allocation.  No category is used and only unintentional minor discards of whiting would be deducted pre-season from the MS co-op allocation of whiting. All other events would be estimated using EM and deducted from IFQ accounts and sector allocations in-season. A proxy of the average percentage of discard from 2011, 2012, 2013, 2014, and any additional averaging from future years would be used for the deduction. Discard of bycatch species would be determined by pro-rating the observer data from the MS processor.</p>	<p><b>Option B</b> – Split into two discard categories; discard Category 1 events count against IFQ, discard Category 2 events count against sector or ACL; for some types of discard events the estimate is based on trips with observer coverage (events in each category described below).</p> <p><b>Option C</b> – Split into two discard categories; discard Category 1 events count against IFQ, no accounting for discard Category 2:</p> <p><i>Discard 1:</i></p> <ul style="list-style-type: none"> <li>• Dumped off deck (e.g., shoveled, picked out of net)</li> <li>• Dumped for safety reasons (e.g., pull zipper)</li> <li>• Unobserved sets/hauls (not captured by EM, apply discard rate using WCGOP protocol)</li> </ul> <p><i>Discard 2:</i></p> <ul style="list-style-type: none"> <li>• Floating fish (bleeding net/washed out of net)</li> <li>• Lost gear (not captured by EM, estimate using WCGOP protocol)</li> <li>• Consumed/used as bait (not captured by EM)</li> </ul>

Table 2-2. Summary of Alternative 2 and EM Program Components. NOTE: Section references in the table coincide with descriptions in the document.

Section Reference	Component	Alternative 2 - Camera Recordings Used to Estimate Discard (Council Preferred)	Other Available Options
<u>2.2.1.4</u>	EM Individual Vessel Monitoring Plan – Expiration	<b>Option B – (Council Preferred)</b> Annual Expiration or if modifications are made Same as Option A but with annual expiration	<b>Option A</b> – No Expiration unless modifications are made • Approval of plans by NMFS • Plan modification provisions: (NMFS to decide how this is done) 1. EM Provider and vessel operator provisions – changes that do not need re-approval by NMFS (e.g. camera position changes) 2. NMFS provisions - changes that trigger the need for re-approval by NMFS (e.g. operator will use a different vessel)
<u>2.2.1.5</u>	Declaration of EM Use	<b>Option C – (Council Preferred)</b> Declare Until Changed with Some Limit on Frequency For the coming year participants must notify NMFS, EM provider, and observer provider when it will use EM and when it will use an observer however a limit would be imposed on the number of times a vessel could switch from using EM to using an observer and then back to using EM.  <b>Exception for Emergency Situation</b> For example, camera broke so need an observer tomorrow, vice versa	<b>Option A</b> - Annual Declaration Use EM all year; no observer coverage needed unless EM fails  <b>Option B</b> – Annual Declaration with Intermittent Use For the coming year participants must notify NMFS, EM provider, and observer provider when it will use EM and when it will use an observer (e.g. monthly or quarterly).  <b>Option D – Declare until Changed with No Limit on Frequency</b> Same as Option C but with no limit on the number of times a vessel could switch back and for the between using EM and an observer.
<u>2.2.1.6</u>	Data Transfer Process	Includes secure transfer for data and chain of custody requirements. <b>Options</b> (not mutually exclusive): <b>C. (Council Preferred) Shoreside catch monitor</b> <b>D. (Council Preferred) Vessel operator/Crew</b>	<b>Options</b> (not mutually exclusive): <b>A. PSMFC</b> <b>B. EM Provider</b> <b>E. Third Party (hired by processor, port, or fisher)</b>
<u>2.2.1.7</u>	Video and Data Processing and Analysis	Potential video reviewers <b>Option D - (Council Preferred) Third Party</b>	<b>Options</b> (not mutually exclusive): <b>Option A</b> -NMFS <b>Option B</b> -PSMFC <b>Option C</b> - EM Provider
<u>2.2.1.8</u>	Payment for Scientific data collection/observations	<b>Option A:</b> Government funded, same as pre IFQ ( <i>Council Preferred</i> )	<b>Option B:</b> Industry Funded <b>Option C:</b> Combination of both Government and Industry

Table 2-2. Summary of Alternative 2 and EM Program Components. NOTE: Section references in the table coincide with descriptions in the document.

<b>EM Components under Alternative 2</b> <b>These components do not have options to choose from but would be implemented as part of an EM Program</b>		
<p><b>2.2.1.9</b></p>	<p>Observer Exemption Process - Application Approval and Required Information</p>	<p><b><u>Requires application to NMFS to use EM; the application could include the following information:</u></b></p> <ol style="list-style-type: none"> <li>1. Operational information.                             <ol style="list-style-type: none"> <li>a. Installation by certified EMS Provider</li> <li>b. EMS service provider responsibilities</li> <li>c. Data Confidentiality Standards</li> <li>d. Data Storage and Delivery Standards</li> <li>e. EMS Coverage Requirements</li> <li>f. Monitoring Requirements</li> <li>g. Vessel Responsibilities</li> </ol> </li> <li>2. Data Sources                             <ol style="list-style-type: none"> <li>a. Digital Camera(s)</li> <li>b. Winch Sensors</li> <li>c. Hydraulic Sensors</li> <li>d. Log Book</li> <li>e. VMS</li> <li>f. GPS</li> </ol> </li> </ol>
<p><b>2.2.1.9</b></p>	<p>Observer Exemption Process - Eligibility Requirements</p>	<p>A vessel must be in good standing and has approved equipment and operational plan certifications.</p> <p><b><u>Eligibility Requirements</u></b>  <b><u>Initial eligibility criteria:</u></b></p> <ol style="list-style-type: none"> <li>1. Limited entry groundfish trawl permit</li> <li>2. Quota share permit</li> <li>3. No IFQ deficits</li> <li>4. No civil or criminal penalties related to fishing activity exceeding a certain amount and timeframe</li> <li>5. Schematic and Description of NMFS approved Individual Vessel Monitoring Plan (IVMP)                             <ol style="list-style-type: none"> <li>a. IVMP unique for each vessel</li> <li>b. Multiple IVMPs included if submitted by group of vessels</li> </ol> </li> <li>6. Self-Governing Plan (if applicable, not required)                             <ol style="list-style-type: none"> <li>a. Data Delivery and Analysis (DDA) specifications</li> <li>b. submitted by either a group of vessels or an individual vessel</li> </ol> </li> </ol> <p><b><u>Continued eligibility for all fisheries:</u></b></p> <ol style="list-style-type: none"> <li>1. Participants must be in compliance with their IVMP</li> <li>2. Demonstrate proper documentation of the discards in logbooks or on video</li> <li>3. No civil penalties related to fishing activity exceeding a certain amount within the time period of EM use</li> </ol>

Table 2-2. Summary of Alternative 2 and EM Program Components. NOTE: Section references in the table coincide with descriptions in the document.

<b>EM Components under Alternative 2</b> <b>These components do not have options to choose from but would be implemented as part of an EM Program</b>		
<u>2.2.1.10</u>	EM Vessel Operational Plan - Individual Vessel Monitoring Plans (IVMP)	<p><b>Required EM IVMP Plan</b></p> <p>Potential categories of information in an IVMP:</p> <ul style="list-style-type: none"> <li>a) Type of system</li> <li>b) Hardware</li> <li>c) Software</li> <li>d) Emergency protocols</li> <li>e) Back-up equipment use protocols</li> <li>f) Catch handling protocols</li> <li>g) Layout of vessel</li> <li>h) Screen shots of all camera views</li> <li>i) Number of cameras needed with placement specifications</li> <li>j) Care and maintenance of the EM system</li> <li>k) Types of sensors and data for sensors to capture</li> </ul> <ul style="list-style-type: none"> <li>l) Download/maintenance schedule</li> <li>m) Logbook format (electronic or paper)</li> <li>n) Tamper Resistant/Taper Evident</li> <li>o) Lighting Locations (Stern, Deck, Discard Shoot, etc.)</li> <li>p) Bridge Mounted Computer Interface/Monitors</li> <li>q) GPS Receiver</li> <li>r) Winch Sensors</li> <li>s) Hydraulic Pressure Transducers</li> <li>t) Power Supply / Backup</li> <li>u) Wire Runs</li> <li>v) Geo Fencing (NMFS supplied)</li> <li>w) System's Check Certification</li> <li>x) Data logger</li> </ul>
<u>2.2.1.11</u>	EM Equipment and Protocol Provisions	Type-Approval Process, EM Equipment Requirements (Data formats, Video Hardware, Logbook Data Source, On-Vessel Data Storage, Onboard operations)
<u>2.2.1.12</u>	Data Confidentiality /Accessibility/ Ownership	All data collected under the EM program (e.g., video, logbooks, and applications) would be considered confidential. Current confidentiality rules may need to be clarified to include this information.

## 2.2.1 Description of Alternative 2 and EM Components

Alternative 2 is the Council's preferred Alternative. Alternative 2 is described in detail in Section 2.2.1.1., then all EM Program Components under Alternative 2 are discussed in remaining sections. Table 2-2 contains a detailed list of all EM Program Components with cross references to the section descriptions.

Each component is described in detail with discussion and rationale for development of the component. Only components 2.2.1.2 through 2.2.1.8 have options for the Council to choose from to develop the policy for that EM component.

The main EM components that contain options for policy development are:

- 2.2.1.2 - Video Reading Protocol (**Unique to Alternative 2**)
- 2.2.1.3 - Discard Accounting – Individual or Fleetwide
- 2.2.1.4 - EM Individual Vessel Monitoring Plan – Expiration
- 2.2.1.5 - Declaration of EM Use
- 2.2.1.6 - Data Transfer Process
- 2.2.1.7 - Video and Data Processing and Analysis
- 2.2.1.8 - Payment for Scientific data collection/observations

EM components 2.2.1.9 through 2.2.1.12 do not have options but were adopted by the Council as necessary components for an EM program and expect NMFS to develop and implement these components as appropriate. The following list provides an overview of the EM components that would be implemented by NMFS upon approval of the proposed action. These components do not have options to choose from but contain topics of information that could be used to develop processes or protocols.

EM components that do not have options to choose from include:

- 2.2.1.9 - Observer Exemption Process (Possible PRA Approval)
  - Application and Approval Process (including an application for fishermen)
  - Eligibility Criteria (Initial and continued eligibility criteria)
- 2.2.1.10 - EM Vessel Operational Plan - Individual Vessel Monitoring Plans (IVMP)(including a form for submission to NMFS for review)
- 2.2.1.11 - EM Equipment and Protocol Provisions
  - EM Equipment Requirements (e.g., data format, video hardware products, logbook data source, on-vessel data storage, onboard operational standards and practices)
  - NMFS Type-Approval Process for EM Equipment (including a list of specifications for EM providers and submission process to receive type-approval) - Possible PRA Approval
  - Approved EM Provider List (including a list of specific criteria for providers to demonstrate their capability and standards) - Possible PRA Approval
- 2.2.1.12 - Data Confidentiality/Accessibility/Ownership

***Discussion and Rationale for Development of EM Components without Options:*** While working through the development of the alternatives and options for Alternative 2 and 3, certain components of the EM program were identified as basic elements that would be necessary for an EM program to run efficiently and to conduct an orderly fishery. However, there are no options to choose from under this section. The Council developed the EM policy to include these components but would delegate

implementation of them to NMFS. For example, NMFS would need to set up a process for applicants to submit an “Observer Exemption Application” to NMFS requesting use of EM in lieu of an observer. NMFS would develop regulations to specify the requirements for fishermen, EM providers, and observer providers (e.g., fill out applications, to create individual vessel monitoring plans, or for compliance with program rules). The development of these processes and associated regulations would likely involve a Council deeming process whereby the Council would review the draft regulations before they go into the proposed rule stage.

#### 2.2.1.1 Alternative 2 - Camera Recordings Used to Estimate Discard (*Council Preferred Alternative*)

***Council adopted language:*** “Under Alternative 2, the video images are the primary data source for estimating discards. The video is reviewed for fish discarded by fishermen, the species are identified, assign an estimated weight, and the QP account is debited.”

Under Alternative 2, a voluntary EM program for the midwater trawl whiting catcher vessels would be implemented. Qualified participants could choose to use EM or an observer to monitor their compliance with IFQ and sector allocations. Under Alternative 2, the requirement for 100% at-sea observation of all whiting trips would continue.

***Discussion and Rationale:*** Under Alternative 2 discard events at sea would be monitored with video cameras to provide sufficient information to enumerate the weight of fish discarded at sea so that IFQ accounts and sector allocations could be debited. The primary data source for this information, in lieu of an observer, would be video data. The video data would be reviewed at a shoreside facility to estimate total discard by the vessel for each trip. Since the whiting fishery is a large volume fishery, it’s likely that bycatch rates for retained and landed fish would be applied to discarded weight estimates to account for fish species that are not identified and enumerated on an individual basis. This option was developed to rely on video as the data source. Since this fishery was monitored with EM under EFPs from 2004 to 2010 and it provided accurate estimates of discards, managers are confident in using video data to manage the fishery.

#### 2.2.1.2 Video Reading Protocol (Unique to Alternative 2)

Since Alternative 2 uses video as the data a source, a method for reading the video and creating discard estimates must be chosen (Video Reading Protocol). There are three separate ways to use the video for discard estimation. These options are unique to Alternative 2.

**Option A: 100% - census all video footage and estimate discard, includes a mandatory logbook requirement to document discard. (*Council Preferred Alternative*)**

Option A is to conduct a census of all video images and estimate the total discard for each set or haul that occurred in a trip. The discarded species would need to be accurately identified, assigned a weight, and debit the QP account in a timely manner. Option A includes a mandatory logbook requirement. Although midwater trawl vessels are currently required to submit a trawl logbook, additional information regarding species discards (for each species if known) would be required.

***Discussion and Rationale for Option A:*** A full census of the video images would provide the most data for discard estimates and reduce the risk of missing discard events. Compared to Option B and

C, this option would provide the most accurate estimate for debiting IFQ accounts and sector allocations.

***Rationale for Preferred Alternative and Options***

The Council chose 100% video review for discard events would capture the most information and therefore would have the least amount of risk for missing discarded fish and the most confidence in estimating total discard during the video review. Since all video would be reviewed, the risk that video reviewers would miss discard events is low, especially those that are greater than 10,000 pounds. In addition, making the EM program voluntary rather than mandatory provides the industry a flexible and economical opportunity to monitor their compliance with IFQs, IBQs, and sector allocations. Through choice of EM or human observer, fishermen will pick the program that makes most sense to their operations.

**Option B: Subsample Video and expand discard estimate to whole trip; percent subsample for the review must be developed.**

Option B is to subsample the video images at some predetermined percent of video review (e.g., 10%, 25% and 50%), speciate the discard, estimate the weight of the discard, then expand the discard rate to the entire trip to provide a total estimated discard for the trip.

***Discussion and Rationale for Option B:*** Cross comparison of full census and subsampling would be needed to determine if it is sufficiently accurate for catch accounting purposes.

Rather than review all video (Option A), under Option B the total discard would be estimated by random sampling of the video data, which would then be expanded to estimate discards for the whole trip. The sampling rate necessary to accurately estimate total discard would need to be determined prior to implementation. There are several problems with this method that will need to be resolved before implementation. First, if discards are rare events, the sample rate may need to be quite high or the expanded estimate of discard may be greater than or less than the actual discard.

The Council was not provided options for the level of random sampling that may be suitable when it chose its final preferred alternative. It may be more appropriate for data managers to determine the optimum sample rate, balancing cost and accuracy for accounting purposes. If this option is chosen, the Council expects NMFS to develop and implement the appropriate level of review necessary for accurate and cost effective catch accounting.

**Option C: Same as Alternative B but includes a mandatory logbook requirement to document discard.**

Option C is the same as Option B, however additional logbook information would be required to document discard. Option B is to subsample the video images at some predetermined percent of video review (e.g., 10%, 25% and 50%), speciate the discard, estimate the weight of the discard, then expand the discard rate to the entire trip to provide a total estimated discard for the trip

***Discussion and Rationale for Option C*** Option C is the same as Option B, however a logbook would be required to document discard data. Logbook information provides a back-up data source to verify discard if an EM system fails to capture the necessary data because of equipment failure or environmental conditions. Logbooks depend on accurate self-reporting of discard events and there is an incentive to underreport.

### 2.2.1.3 Discard Accounting – Individual or Fleetwide

Discard events occur in a several ways. These events need to be captured by EM in order to account for them. Discard is any portion of the total catch that is not delivered to a buyer. Fish caught for bait or onboard consumption are considered discard. For gear that is lost or sets and hauls that are unobserved, discard rates will be applied based on similar sets and hauls.

The discard accounting options were developed in the following way:

- 1) Discard events were grouped into discard categories 1 and 2 (type of discard events);
- 2) Accountability was established (i.e., IFQ, Fleetwide, or not accounted); and
- 3) Data sources were identified as either EM or the WCGOP.

#### **Option A: Estimate Discard with EM and Count against IFQ (*Council Preferred for Shoreside Sector*)**

Under this option all discard events would be estimated with EM and total discard would be debited from IFQ accounts or sector allocations.

One discard category and all discards are estimated using EM and counted against IFQ:

- Dumped off deck (e.g., shoveled, picked out of net)
- Dumped for safety reasons (e.g., pull zipper)
- Floating fish (bleeding net/washed out of net)
- Lost gear (not captured by EM, estimate using WCGOP protocol)
- Consumed/used as bait (not captured by EM)
- Unobserved sets/hauls (not captured by EM, maybe apply discard rate using EM estimates from previous sets/hauls)

#### **Option B: Split into two discard categories; Category 1 count against IFQ, Category 2 count against sector or ACL; for some discard the estimate is based on trips with observer coverage**

Under Option B, two discard categories would be created. Category 1 events would be debited from IFQ accounts and sector allocations. Category 2 events would be estimated annually and debited from the fishery sector allocation preseason or from the annual catch limit (ACL).

*Discard 1 IFQ Accounting:*

- Dumped off deck (e.g., shoveled, picked out of net)
- Dumped for safety reasons (e.g., pull zipper)
- Unobserved sets/hauls (not captured by EM, apply discard rate using WCGOP protocol)

*Discard 2 Sector or ACL accounting:*

- Floating fish (bleeding net/washed out of net)
- Lost gear (not captured by EM, estimate using WCGOP protocol)
- Consumed/used as bait (not captured by EM)

#### **Option C: Split into two discard categories; no accounting for discard 2 category:**

Under Option C, two discard categories would be created and each category. Category 1 events would be debited from IFQ accounts and sector allocations. Category 2 events would not be estimated or debited from sector allocations or the ACL. Council staff note that in order for Option C to be valid it would have to comply with MSA national standards. National Standard 9 requires accounting for all catch and discard to estimate total mortality estimates and ensure annual catch limits are not exceeded. Option C would not comport with the MSA National Standard 9.

*Discard 1 IFQ Accounting:*

- Dumped off deck (e.g., shoveled, picked out of net)
- Dumped for safety reasons (e.g., pull zipper)
- Unobserved sets/hauls (not captured by EM, apply discard rate using WCGOP protocol)

*Discard 2 No accounting:*

- Floating fish (bleeding net/washed out of net)
- Lost gear (not captured by EM, estimate using WCGOP protocol)
- Consumed/used as bait (not captured by EM)

**Option D: Deduct unintentional discards of whiting preseason from the MS\Coop allocation.  
(Council Preferred for Mothership Sector)**

Under Option D, no discard category is used and only unintentional minor discards of whiting would be deducted preseason from the MS co-op allocation of whiting. All other events would be estimated using EM and deducted from IFQ accounts and sector allocations in-season.

***Discussion and Rationale for Option D:*** The Council developed this option for the mothership fishery only. The intent was to deduct the aggregate accumulated unintentional minor discards (spillage estimated to be less than 0.5 percent of the mothership allocation) from the mothership allocation preseason and species composition would be calculated using status quo methods. Unintentional discards of whiting are estimated to be between 200 and 500 mt annually. A proxy of the average percentage of discard from 2011, 2012, 2013, 2014, and any additional averaging from future years could be used for the deduction. Discard of bycatch species would be determined by pro-rating the observer data from the MS processor. The Council would defer to NMFS to implement the most appropriate way to annually estimate the discard and deduct the amount preseason during the biennial specifications process for groundfish.

***Discussion and Rationale for development of all options:*** Under the catch shares program, total catch must be accounted for to debit individual quota share accounts and fishery allocations. Retained and discarded catch is combined to get total catch. Shoreside monitors are used to verify retained catch when it is landed on motherships or shoreside processors and the West Coast Groundfish Observer Program (WCGOP) uses at-sea IFQ observer data to estimate and report discards by species.

Total catch accounting in the shoreside and the MS fishery sectors is simplified in Figure 2-1. There are several ways that discard can occur and be documented in both sectors.

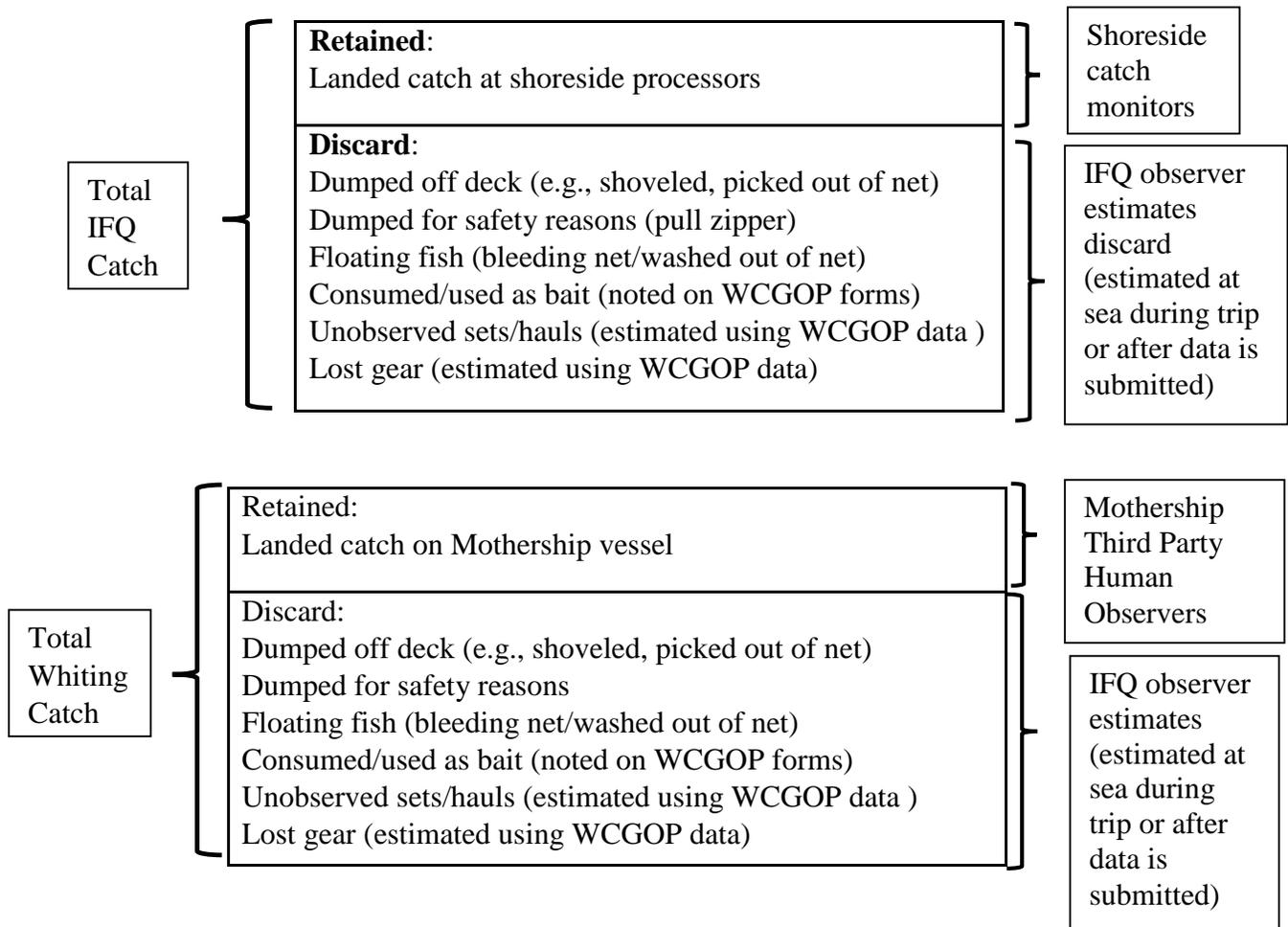


Figure 2-1. General depiction of total catch accounting in the Shorebased catch share program (upper figure) and Mothership Coop fishery (lower figure).

Under an EM program, the estimation (speciation and weight) for these discard events would be conducted using EM rather than the WCGOP. However some of the discard events may not be captured by EM, such as lost gear, crew consuming fish onboard the vessel, using fish caught as bait, and unobserved hauls/sets that had discard (i.e., EM failed to record the discard); therefore, some other source of data may be needed to account for the discard activity.

In addition, some events may be captured by EM but are difficult to quantify, such as floating fish on the surface of the water and some events may be minor amounts (less than 2,000 lbs of whiting). Rather than accounting for these discards at the individual level (IFQ), it's possible to account for it during the specification process for Annual Catch Limits (ACL), at the sector level, The estimated mortality could be deducted from the ACL prior to allocation to each sector or at the sector level to be taken "off-the-top" prior to IFQ distribution and catch allocation distributions.

#### 2.2.1.4 EM Individual Vessel Monitoring Plan – Expiration

An individual vessel monitoring plan (IVMP) would be required (see Section 2.2.1.10 for a description of the elements of an IVMP). Each vessel operator/owner would be responsible for developing an IVMP for the vessel and acquiring the needed approval from NMFS to use EM. IVMPs would play a major role as part of the EM program. These plans would help facilitate an effective program and serve as a clear, written plan for discard documentation, installation and maintenance of an EM system, protocols for data storage and transfer, among other things. However, the duration of the IVMP must be determined.

##### **Option A – No Expiration unless modifications are made**

Approval of plans by NMFS with no expiration

1. EM Provider and vessel operator provisions – changes that do not need re-approval by NMFS (e.g. camera position changes)
2. NMFS provisions - changes that trigger the need for re-approval by NMFS (e.g. operator will use a different vessel)

##### **Option B (*Council Preferred Option*) – Annual Expiration or if modifications are made**

Same as Option A but with annual expiration or if modifications are made

**Discussion and Rationale:** IVMPs will be vessel specific and provide NMFS, video reviewers and EM providers important information regarding EM performance, ensure accountability and place responsibility on vessel operators to follow the protocols of the plan. The plans must be submitted for approval and NMFS must be able to track each vessel. The plan could be left in place until modifications are needed (Option A) or an expiration could be added to allow NMFS to review each plan on an annual basis.

Program management may change with advances in technology or a change in the type-approved EM systems could trigger the need to modify plans. An IVMP may need to be modified, for example, to accommodate changes in fish handling protocols or the number of cameras needed to get more accurate information. These modifications could be initiated by the vessel operator, EM provider or the Government. If modifications to the IVMP are necessary, changes must be made in agreement between the vessel representative and the EM provider. Some changes may require re-approval by NMFS; therefore, criteria and protocols that trigger re-approval will need to be developed by NMFS upon implementation. The Council would defer to NMFS for the development of this process.

#### 2.2.1.5 Declaration of EM Use

Vessel operators would be required to declare their intended use of EM. A declaration system would be developed along with protocols for submitting information to NMFS, EM providers, and observer providers (private third-party and WCGOP). The Council would expect NMFS to implement a declaration system that is appropriate for all entities involved.

##### **Option A - Annual Declaration**

For the coming year the participant would declare that they will use EM for the next 12 months and no observer coverage is needed unless EM fails.

##### **Option B - Annual Declaration with Intermittent Use**

For the coming year, participants must indicate when they will use EM and when it will use an observer (e.g. monthly or quarterly). The IVMP would include a description of the responsibility for vessel operator to notify NMFS, EM provider, and NMFS observer program when EM will be used and when observer will be used. The time period for EM use would be adhered to unless EM fails and observer is needed.

**Option C - Declare Until Changed with Some Limit on Frequency (*Council Preferred Option*)**

Under this option, the vessel and the observer provider would need to schedule when observers are needed or available on a per trip basis. The IVMP would provide a description of the responsibility for vessel operator to notify NMFS, EM provider, and NMFS observer program when EM will be used and when observer will be used. However a limit would be imposed on the number of times a vessel could switch from using EM to using an observer and then back to using EM.

**Option D - Declare Until Changed with No Limit on Frequency**

Same as Option C but with no limit on the number of times a vessel could switch back and forth between using EM and an observer.

**An exception for Emergency situations would be provided under all options** (e.g., camera broke so need an observer tomorrow, vice versa)

**Discussion and Rationale:** Agencies and contractors (i.e., NMFS, PSMFC, EM providers, enforcement, states, and observer providers) will need to know the level of participation for EM use. This will help determine employee workload needs (e.g., how many observers, video reviewers, or catch monitors are needed month to month or annually), scheduling data transfers, EM system maintenance needs, etc. In order to process the fisheries in an orderly way, IVMP must provide a “Declaration of EM Use” and specify when an EM system will be used and when the vessel would, if at all, need an observer for a specified period of time within fishing year. For example, NMFS could require vessel operators to call into a phone declaration system or submit their intent to use EM via the IVMP. The Council would rely on NMFS to implement a limit on the frequency that vessels could change their declaration in a given year.

#### 2.2.1.6 Data Transfer Process

The video and logbook data would need to be transferred from the vessel to the video reviewer. Several options have been identified:

**Options** (not mutually exclusive):

- A. PSMFC**
- B. EM Provider**
- C. Shoreside catch monitor (*Council Preferred Option*)**
- D. Vessel operator/Crew (*Council Preferred Option*)**
- E. Third Party (hired by processor, port, or fisher)**

**Discussion and Rationale:** Protocols need to be established for the transfer of data. This is a critical component of the EM program since it involves the physical transfer of the data from the vessel to the video reviewer. The process of transferring the data could be electronically via a WiFi network or email, or physically pulling a hard drive out of a computer module and sending it in the mail or driving it from the port to the reviewer. Protocols may also vary based on the type of data being transferred (video,

electronic log, or data logger). The method of transfer would be dependent on the amount and type of data being transferred. For example, electronic logbooks can be emailed but a hard drive with a terabyte of data would likely need to be pulled out of the EM system and physically transferred to the reviewer. The method of transfer that would be allowed under the EM program will be developed by NMFS during implementation; however, some methods have been identified for use such as Wi-Fi, satellite signal, email, and thumb drives.

Data transfer protocols and frequency will vary by fishing sector (shoreside vessels vs. MS catcher vessels). For example, mothership catcher vessels may seldom return to port; this would increase the volume of data to store and affect the frequency of data transfer. If the data transfer processes are to be included in the Council recommended policy then both generic provisions that apply to all vessels or all vessels of a sector, and individual provisions may need to be specified. Again, this would be developed by NMFS during implementation.

The choice of transfer method may drive costs of the program up or down. For example, email would incur minimal costs but hiring personnel to drive port to port to pull hard drives may incur significant costs and is dependent on the frequency of this activity.

Since the data could potentially be used in enforcement actions, data transfer protocols would have to address chain of custody and ensure the integrity of the data is not compromised. Typically the video data is encrypted by the EM provider and cannot be accessed or altered.

The list of options include the trusted entities that could securely transfer the data. The Council chose Options C and D with the understanding that these may be more efficient and less costly than the others.

#### 2.2.1.7 Video and Data Processing and Analysis

EM data processing would likely involve analysis of EM sensor, video data, and logbooks. The following is an outline of some of the considerations. Video review is a critical component of the EM program; therefore, entities that can perform this function must be identified and clearly defined methods for review and validation must be developed.

Potential reviewers for discard events (not mutually exclusive):

**Option A:** NMFS

**Option B:** Pacific States Marine Fisheries Commission

**Option C:** EM Provider

**Option D (*Council Preferred*):** Third Party

***Discussion and Rationale:*** The Council preferred that a Certified Third party (Option D) conduct the video reviews. However, until a certification process has been established the Government (Option A) – NMFS or their agent (e.g. PSMFC) would conduct the video reviews.

Video review could be conducted by several entities. One obvious choice is for the EM provider to conduct the review and provide the information to NMFS. However, it's possible that NMFS, PSMFC or some other third party could conduct the reviews. The benefit of an EM provider conducting the review is that it has an acute understanding of its software and video analysis tools, such as Archipelago

Marine Research Inc. It may also be more cost effective for a fishing vessel to contract a “package” of an EM system and video review analysis from an EM provider. However, NMFS would need to conduct an audit of the EM provider or third party contractor to ensure all parties are in compliance with review protocols and IFQ accountability.

PSMFC is a trusted entity for fisheries management and support of fisheries program and conducted field studies therefore the agency has gained experience in the process. In addition, the agency is currently responsible for transferring total catch accounting data to NMFS in order to debit IFQ accounts. NMFS and PSMFC would need to develop a program to accommodate the work load.

The basic review process would include matching video segments with logbook discard events then verifying the discarded species and an estimated weight. Standard review protocols would need to be developed for each fishery and if compliance issues arise that require further review. It’s possible that the protocol would need to include defining “audit units” that match fishing logs units (i.e., fishing events, transiting time periods to and from fishing grounds). For some fisheries fishing events are not clearly defined to facilitate an audit and may need to be developed during implementation between the industry, NMFS, PSMFC, and EM providers.

Once a fishing trip is reviewed and the total discard is estimated, this information would need to be transferred to NMFS to debit a QP account or mothership catch allocation. This information currently flows through PSMFC then to NMFS for final accounting. Since PSMFC manages the Pacific Fisheries Information Network this data flow protocol is expected to remain. However there may be efficiencies to consider if data is reviewed by an EM provider or a third party and transferred to PSMFC versus directly to NMFS.

An analysis of this information can be found in Section 4, Impact Analysis of the Alternatives.

#### 2.2.1.8 Payment for Scientific data collection/observations--

There are two types of duties for observers in the IFQ fishery, compliance observations and scientific observations. Compliance observations are needed to support catch and discard monitoring in the IFQ fishery to estimate total catch by a fishermen. Scientific observations are conducted to collect data to support stock assessments and estimate protected species interactions, amongst other things.

A funding source to continue this task under an EM program must be identified to support the WCGOP efforts. Three options were developed:

**Option A (Council Preferred Option):** Government funded, same as pre catch share program

**Option B:** Industry Funded

**Option C:** Combination of both Government and Industry

**Discussion and Rationale:** If EM is used on IFQ trips and the observer is removed from the vessel without making other program adjustments, significant scientific information would be lost. A continuous need exists for at least some level of scientific observer coverage to collect biological samples and other scientific data on EM trips; therefore this portion of the sampling program would continue.

Previous to the catch share program NMFS provided scientific data collection on roughly 20 percent of the limited entry trawl fleet. This cost was covered by the Government. It’s estimated that the WCGOP

will sample roughly 20-30 percent of the EM fleet; however, these rates will need to be examined and a sampling scheme developed by NMFS in the future.

#### 2.2.1.9 Observer Exemption Process

The following discussion provides the background of what may be required and the rationale for developing these components.

Currently vessels are required to carry human observers during an IFQ trip. Under the proposed EM program, a vessel would need to apply for an exemption to this regulation. Applicants would need to follow specific regulations and provide adequate information for NMFS to evaluate the application. An applicant would need to meet certain qualification standards to be eligible for EM use in lieu of an observer. However, even if an applicant qualifies and receives the option to choose EM, the vessel will still be subject to NMFS observer coverage to collect scientific data.

**Discussion and Rationale:** Participants would need to initially apply to NMFS for an exemption to use EM in lieu of an observer and then demonstrate they are complying with the standards and practices to continue using EM. Therefore, both initial eligibility criteria and continued eligibility criteria are needed and would be specified in regulation. Since EM use would be a privilege, participants must show they are diligently and effectively using the system to monitor their activity. If vessels do not comply, then the privilege may be revoked and the vessel would be required to use a human observer to monitor their activity. The requirement to be in compliance would provide an administrative incentive for proper use of EM.

The following sections describe potential observer exemption process, eligibility for using EM, individual vessel monitoring plans (IVMP) requirements, duration of effectiveness of the IVMP, and participant's requirements to declare when a vessel will use EM. As appropriate, regulations will be prescriptive or performance based for these topics.

### **Application Approval and Required Information**

The following is a list of potential information that NMFS may require from applicants.

1. Operational Information
  - a. Installation by certified EMS Provider
  - b. EMS service provider responsibilities
  - c. Data Confidentiality Standards
  - d. Data Storage and Delivery Standards
  - e. EMS Coverage Requirements
  - f. Monitoring Requirements
  - g. Vessel Responsibilities
  
2. Data Sources
  - a. Digital Camera(s)
  - b. Winch Sensors
  - c. Hydraulic Sensors
  - d. Log Book
  - e. VMS
  - f. GPS

3. EM Data Standards
  - a. Secure Watertight Control Box Data Storage
  - b. Encrypted Data
  - c. Storage Standards
  - d. Date and Time Stamp and Counter
  - e. Digital File Format
  - f. Minimum Frame Rate
  - g. Minimum Resolution
  - h. Accepted Delivery Methods
  - i. Time Frames
  - j. Color Optics
  - k. Lighting Standards
  - l. Power Supply Standards

If NMFS deems the application incomplete, it would provide the applicant an opportunity to revise it appropriately. Specifics regarding denial of an exemption would be provided on a case by case basis but the decision would likely be based on set standards that would be developed by NMFS. This process is identified as a NMFS process; therefore, the standards would likely involve a Council deeming process.

### **Eligibility Requirements**

Participants would need to meet certain “eligibility requirements” and NMFS would review the application for approval. The application would also include a NMFS approved individual vessel monitoring plan (IVMP, See Section 0).

Initial eligibility criteria:

1. Limited entry groundfish trawl permit with trawl endorsement, and/or MS/CV endorsement (and an MS coop endorsement if fishing in an MS Coop)
2. Quota share permit
3. No IFQ deficits
4. No civil or criminal penalties related to fishing activity exceeding a certain amount and timeframe
5. Schematic and Description of NMFS approved Individual Vessel Monitoring Plan (IVMP)
  - a. IVMP unique for each vessel
  - b. Multiple IVMPs included if submitted by group of vessels
6. Self-Governing Plan (if applicable, not required)
  - a. Data Delivery and Analysis (DDA) specifications
  - b. submitted by either a group of vessels or an individual vessel

### **Continued eligibility:**

1. Participants must be in compliance with their IVMP
2. Demonstrate proper documentation of the discards in logbooks or on video
3. No civil penalties related to fishing activity exceeding a certain amount within the time period of EM use

**Discussion and Rationale:** Qualification criteria would be needed to ensure that new applicants understand the program and follow the protocols that are set forth in regulation. Since the program is intended to be a privilege, the Council would expect that vessel operators comply with the EM program to ensure its utility for accurate accounting of IFQ accounts and sector allocations. Vessels that continue

to comply would be eligible the following year. The criteria would encourage vessels to improve their efforts in order to qualify for the exemption.

### **Self-Governing Plan Elements**

If vessels choose to develop and join group or self-governing agreements, then the following information would also be required.

#### *Group Self-Governing Agreement (not inclusive of all elements)*

- a. Comply with all Federal and State Regulations
- b. Retention / Discard Requirements
- c. Time and Area Restrictions
- d. Data Collection Equipment Criteria
- e. Data Collection Requirements
- f. Data Analysis Agreement Clause
- g. Discard Assessment Protocols and Procedures
- h. Vessel / Operator Performance Standards
- i. Vessel / Operator Responsibility
- j. Compliance Criteria
  - i. By Example: escalation of consequences (to be defined by group)
  - ii. No Further use of Camera Use Alternative Criteria
- k. Escape Clause

#### *Individual Self-Governing Agreement (not inclusive of all elements)*

- a. Comply with all Federal and State Regulations
- b. Retention / Discard Requirements
- c. Time and Area Restrictions
- d. Data Collection Equipment Criteria
- e. Data Collection Requirements
- f. Data Analysis Agreement Clause
- g. Discard Assessment Protocols and Procedures
- h. Vessel / Operator Performance Standards
- i. Vessel / Operator Responsibility
- j. Compliance Criteria
  - i. By Example: fail to demonstrate compliance, vessel must use observer for rest of the year.
- k. Escape Clause

**Discussion and Rationale:** A self-governing plan was discussed as part of coop agreements to add an element of self-enforcement among members. This would provide an opportunity for vessels to work together to ensure compliance and lesson the need for enforcement actions on an individual level.

#### **2.2.1.10 EM Vessel Operational Plan - Individual Vessel Monitoring Plans (IVMP)**

NMFS would specify IVMP requirements in regulation. This process is identified as a NMFS process; therefore, the standards would likely involve a Council deeming process.

A general list of potential categories of information that would be included in the IVMP is provided:

- a) Type of system
- b) Hardware

- c) Software
- d) Emergency protocols
- e) Back-up equipment use protocols
- f) Catch handling protocols
- g) Layout of vessel
- h) Screen shots of all camera views
- i) Number of cameras needed with placement specifications
- j) Care and maintenance of the EM system
- k) Types of sensors and data for sensors to capture
- l) Download/maintenance schedule
- m) Logbook format (electronic or paper)
- n) Tamper Resistant/Taper Evident
- o) Lighting Locations (Stern, Deck, Discard Shoot, etc.)
- p) Bridge Mounted Computer Interface/Monitors
- q) GPS Receiver
- r) Winch Sensors
- s) Hydraulic Pressure Transducers
- t) Power Supply / Backup
- u) Wire Runs
- v) Geo Fencing (NMFS supplied)
- w) System's Check Certification
- x) Data logger

***Discussion and Rationale:*** Each vessel operator/owner would be responsible for developing an IVMP for the vessel and acquiring the needed approval from NMFS. IVMPs would play a major role as part of the EM program. These plans would help facilitate an effective program and serve as a clear, written plan for discard documentation, installation and maintenance of an EM system, protocols for data storage and transfer, among other things. It also serves as the main document for reference between the vessel, EM Providers, and NMFS.

An IVMP that is approved by NMFS would likely be part of the application and approval process to use EM in lieu of an observer (see Section 2.2.1.9).

#### 2.2.1.11 EM Equipment and Protocol Provisions

The success of an EM program relies on the ability to capture the data and process it in a timely manner so EM equipment that provides the necessary data for efficient processing and accurate review is critical. The following discussion provides the background of what may be required by NMFS upon implementation and the rationale for developing these components.

#### **Type-Approval Process**

NMFS may specify the use of EM equipment through a type-approval process. If so, the EM equipment would undergo an NMFS internal review process to set the standard by which all third party EM equipment providers would need to follow to get their equipment approved. Fishermen would then choose the unit that is suitable for their vessel and available through a provider. A type approval process will need to be developed by NMFS with the aid of current experience and technology.

It's expected that participants would need to secure an EM provider, purchase or lease an approved EM system, and incur the cost for its maintenance and the video review. This information is analyzed in Section 4, under subsections on costs and impacts to different segments of the fishery and communities.

**Discussion and Rationale:** NMFS has experience conducting type-approvals for vessel monitoring systems (VMS) therefore the EM equipment would likely undergo a similar approval process. Having a standard set of equipment that vessels could use would provide consistency for video data formats and review. In addition, providers of the equipment may compete with one another and keep industry cost low.

## **EM Equipment Requirements**

The following topics may need to be worked out between technical advisors from NMFS, PSMFC, EM providers and the states of CA, OR and WA.

**Discussion and Rationale:** Although the NMFS policy requests the use of open source software so that common platforms can use the data generated or multiple users can access the data, allowing both open source and proprietary equipment/software could be allowed if they meet the objectives of the type approval performance standards. Some of this information would ensure data is collected in a timely manner and that technical issues are identified quickly then communicated between vessel operators, NMFS, and EM providers.

### **Data formats**

A standardized set of data formats could be developed by NMFS so that data that can be used by multiple users such as PSMFC and NMFS to analyze data or video without a cumbersome conversion process to access the data. This would need to be specified in the future during implementation with the advice of NMFS, PSMFC, states, and other technical advisors such as EM providers.

### **Video Hardware**

Image quality must be sufficient to allow clear identification of species or species categories being discarded; therefore, performance standards of the video hardware would be developed during implementation between NMFS, PSMFC, states, and EM providers. For example, two types of video cameras are currently used by EM providers, digital and analog. Both have benefits and drawbacks. For example, if a very sharp video image is needed at a close range to identify fish and other species such as sponges then a digital camera may be necessary; however, the use of a digital format will increase the need to for more memory storage of the video files. An analog video could be used for the same purpose to capture images in the same manner and lessen the need for data storage.

### **Logbook Data Source**

The EM program could allow either paper or electronic logbooks to be used as required under Alternative 2 (Option A and C) or Alternative 3. Electronic logbooks may increase efficiencies in the EM analysis by eliminating the need to convert paper logbooks to an electronic format. It may be possible to link the electronic logbook data set to the video data set to increase efficiencies of video review. For example, random selection of the logbook discard events will be necessary under Alternative 3. After the selection is made, a list of those events could be tied to the video events so that reviewers can "jump" to the event in the video data. At this time, the Council expects NMFS to continue the requirement for vessels to submit paper logbooks however the logbooks would need to be modified to include discard information. PSMFC has developed an interim logbook that was used during field trials for EM. This information could be used to implement this component of the EM program to support

either alternative as needed. The Council defers to NMFS on efficiencies that can be gained and the most expedient way to conduct logbook analysis and implement logbook provision.

### On-Vessel Data Storage

Video hardware, sensor data, vessel location data, and logbook data/data logger would likely be integrated together in a secure format and stored on a hard drive. The hard drive would be removed and a new one replaced. Storage capacity will need to be large (1 terabyte or more). Dependent on the amount of data generated for storage, it's possible that some vessels may need to carry multiple hard drives and be trained to replace them at sea as needed or return to shore for replacement. See section 2.2.1.6 for potential data transfer processes.

### Onboard operations

Some onboard operations will need to be standardized for the all vessel under the EM program. Topic examples include:

- a) Self-check system to ensure proper functioning of EM system (“functionality test” within the EM system with a record that the test was performed)
- b) EM system is powered on during entire trip, however cameras could be triggered to turn on at first hydraulic event and remain on for the duration of the trip.
- c) Back-up-equipment-use protocols if EM unit or portions of it fail
- d) Performance standards need to be developed during implementation between NMFS, PSMFC, states, and EM providers.

#### 2.2.1.12 Data Confidentiality/Accessibility/Ownership

All data collected in the EM system (e.g., video, logbooks, and applications) would be considered confidential.

***Discussion and Rationale:*** The Magnuson-Stevens Fishery Conservation and Management Act, NMFS internal confidentiality rules, and any new or revised rules that are proposed by NMFS would guide the protection of the data that is collected under the EM program. This includes access, ownership, and public dissemination of the information. Implementation of confidentiality rules that are specific to EM data would be developed by NMFS prior to implementation.

### 2.3 Alternative 3 - Use Logbooks to Estimate Discard (Audit logbook with Camera)

***Council adopted language:*** “Alternative 3 provides the opportunity for the fishermen to speciate and estimate the total discarded weight of the fish for each set or haul and provide this information in a logbook. Then, the video images would be reviewed to verify discard events and the species/weight estimates for the trip.”

Under Alternative 3 the logbooks would be the data source while the video recordings would be used to verify the logbook data. The video images would be reviewed to verify (audit) the discard events and the species/weight estimates recorded by fishermen for the trip. Under Alternative 3, the requirement for 100% at-sea observation of all whiting trips would continue. The Council chose, as a policy, that at least

10% of the fishing events in a trip should be audited for compliance with logbook reporting requirements; however, the Council would defer to NMFS to choose an appropriate level of video.

***Discussion and Rationale:*** This method is similar to an EM program conducted in British Columbia, which is considered a success. The method relies on fishermen to accurately report their discard and places accountability on the vessel operator. A random review of the video images would be conducted at some predetermined level (e.g., 50%) to verify the discard. The audit, for example, could be to review some percentage of all fishing events for a trip (e.g., 2 out of 4 hauls), with a minimum review of one event per trip to compare the logbook discard with the discard documented for that event. The Council would rely on NMFS to choose an appropriate level of video review based on risk of error in catch accounting, especially for rare events such as large discards of overfished species.

***Summary of Alternative 3:***

Except for the Video Reading Protocol in Section 2.2.1.2, all other EM Program Components with Options and EM Program Components without Options as presented under Alternative 2 are available for implementation under Alternative 3. Please refer to these sections for complete descriptions. Table 2-3 provides a summary of Alternative 3 and the available options. The Council's preferred options were added to Alternative 3 and available options are provided as well.

Table 2-3. Summary of Alternative 3 and EM Program Components. NOTE: Section references in the table coincide with descriptions in the document.

Section Reference	Component	Alternative 3 – Use Logbooks to Estimate Discard (Audit logbook with Camera)	Other Available Options
<u>2.2.1.2</u>	Video Reading Protocol	The Council chose, as a policy, that at least 10% of the fishing events in a trip should be audited for compliance with logbook reporting requirements; however, the Council would defer to NMFS to choose and appropriate level of video.	None
<u>2.2.1.3</u>	Discard Accounting – Individual or Fleetwide	<p><b>Estimation of discard may be done through EM, WCGOP observer program, or other data sources.</b></p> <p><b>Option A – (Council Preferred for Shoreside Sector)</b> Estimate Discard with EM and Count against IFQ Under this option all discard events would be estimated with EM and total discard would be debited from IFQ accounts or sector allocations.</p> <p>One discard category and all discards are estimated using EM and counted against IFQ:                      Dumped off deck (e.g., shoveled, picked out of net)                      Dumped for safety reasons (e.g., pull zipper)                      Floating fish (bleeding net/washed out of net)                      Lost gear (not captured by EM, estimate using WCGOP protocol)                      Consumed/used as bait (not captured by EM)                      Unobserved sets/hauls (not captured by EM, maybe apply discard rate using EM estimates from previous sets/hauls)</p> <p><b>Option D – (Council Preferred for Mothership Sector)</b> Deduct unintentional discards of whiting pre-season from the MS Coop allocation. No category is used and only unintentional minor discards of whiting would be deducted pre-season from the MS co-op allocation of whiting. All other events would be estimated using EM and deducted from IFQ accounts and sector allocations in-season. A proxy of the average percentage of discard from 2011, 2012, 2013, 2014, and any additional averaging from future years would be used for the deduction. Discard of bycatch species would be determined by pro-rating the observer data from the MS processor.</p>	<p><b>Option B</b> – Split into two discard categories; discard Category 1 events count against IFQ, discard Category 2 events count against sector or ACL; for some types of discard events the estimate is based on trips with observer coverage (events in each category described below).</p> <p><b>Option C</b> – Split into two discard categories; discard Category 1 events count against IFQ, no accounting for discard Category 2:</p> <p><i>Discard 1:</i></p> <ul style="list-style-type: none"> <li>• Dumped off deck (e.g., shoveled, picked out of net)</li> <li>• Dumped for safety reasons (e.g., pull zipper)</li> <li>• Unobserved sets/hauls (not captured by EM, apply discard rate using WCGOP protocol)</li> </ul> <p><i>Discard 2:</i></p> <ul style="list-style-type: none"> <li>• Floating fish (bleeding net/washed out of net)</li> <li>• Lost gear (not captured by EM, estimate using WCGOP protocol)</li> <li>• Consumed/used as bait (not captured by EM)</li> </ul>

Table 2-3. Summary of Alternative 3 and EM Program Components. NOTE: Section references in the table coincide with descriptions in the document.

Section Reference	Component	Alternative 3 – Use Logbooks to Estimate Discard (Audit logbook with Camera)	Other Available Options
<u>2.2.1.4</u>	EM Individual Vessel Monitoring Plan – Expiration	<b>Option B – (Council Preferred)</b> Annual Expiration or if modifications are made Same as Option A but with annual expiration	<b>Option A</b> – No Expiration unless modifications are made • Approval of plans by NMFS • Plan modification provisions: (NMFS to decide how this is done) 1. EM Provider and vessel operator provisions – changes that do not need re-approval by NMFS (e.g. camera position changes) 2. NMFS provisions - changes that trigger the need for re-approval by NMFS (e.g. operator will use a different vessel)
<u>2.2.1.5</u>	Declaration of EM Use	<b>Option C – (Council Preferred)</b> Declare Until Changed with Some Limit on Frequency For the coming year participants must notify NMFS, EM provider, and observer provider when it will use EM and when it will use an observer however a limit would be imposed on the number of times a vessel could switch from using EM to using an observer and then back to using EM.  <b>Exception for Emergency Situation</b> For example, camera broke so need an observer tomorrow, vice versa	<b>Option A</b> - Annual Declaration Use EM all year; no observer coverage needed unless EM fails  <b>Option B</b> – Annual Declaration with Intermittent Use For the coming year participants must notify NMFS, EM provider, and observer provider when it will use EM and when it will use an observer (e.g. monthly or quarterly).  <b>Option D – Declare until Changed with No Limit on Frequency</b> Same as Option C but with no limit on the number of times a vessel could switch back and for the between using EM and an observer.
<u>2.2.1.6</u>	Data Transfer Process	Includes secure transfer for data and chain of custody requirements. <b>Options</b> (not mutually exclusive): <b>C. (Council Preferred)</b> Shoreside catch monitor <b>D. (Council Preferred)</b> Vessel operator/Crew	<b>Options</b> (not mutually exclusive): <b>A. PSMFC</b> <b>B. EM Provider</b> <b>E. Third Party (hired by processor, port, or fisher)</b>
<u>2.2.1.7</u>	Video and Data Processing and Analysis	Potential video reviewers <b>Option D - (Council Preferred)</b> Third Party	<b>Options</b> (not mutually exclusive): <b>Option A</b> -NMFS <b>Option B</b> -PSMFC <b>Option C</b> - EM Provider
<u>2.2.1.8</u>	Payment for Scientific data collection/observations	<b>Option A:</b> Government funded, same as pre IFQ ( <i>Council Preferred</i> )	<b>Option B:</b> Industry Funded <b>Option C:</b> Combination of both Government and Industry

Table 2-3. Summary of Alternative 3 and EM Program Components. NOTE: Section references in the table coincide with descriptions in the document.

<b>EM Components under Alternative 3</b> <b>These components do not have options to choose from but would be implemented as part of an EM Program</b>		
<p><b>2.2.1.9</b></p>	<p>Observer Exemption Process - Application Approval and Required Information</p>	<p><b><u>Requires application to NMFS to use EM; the application could include the following information:</u></b></p> <ol style="list-style-type: none"> <li>1. Operational information.                             <ol style="list-style-type: none"> <li>a. Installation by certified EMS Provider</li> <li>b. EMS service provider responsibilities</li> <li>c. Data Confidentiality Standards</li> <li>d. Data Storage and Delivery Standards</li> <li>e. EMS Coverage Requirements</li> <li>f. Monitoring Requirements</li> <li>g. Vessel Responsibilities</li> </ol> </li> <li>2. Data Sources                             <ol style="list-style-type: none"> <li>a. Digital Camera(s)</li> <li>b. Winch Sensors</li> <li>c. Hydraulic Sensors</li> <li>d. Log Book</li> <li>e. VMS</li> <li>f. GPS</li> </ol> </li> </ol>
<p><b>2.2.1.9</b></p>	<p>Observer Exemption Process - Eligibility Requirements</p>	<p>A vessel must be in good standing and has approved equipment and operational plan certifications.</p> <p><b><u>Eligibility Requirements</u></b>  <b><u>Initial eligibility criteria:</u></b></p> <ol style="list-style-type: none"> <li>1. Limited entry groundfish trawl permit</li> <li>2. Quota share permit</li> <li>3. No IFQ deficits</li> <li>4. No civil or criminal penalties related to fishing activity exceeding a certain amount and timeframe</li> <li>5. Schematic and Description of NMFS approved Individual Vessel Monitoring Plan (IVMP)                             <ol style="list-style-type: none"> <li>a. IVMP unique for each vessel</li> <li>b. Multiple IVMPs included if submitted by group of vessels</li> </ol> </li> <li>6. Self-Governing Plan (if applicable, not required)                             <ol style="list-style-type: none"> <li>a. Data Delivery and Analysis (DDA) specifications</li> <li>b. submitted by either a group of vessels or an individual vessel</li> </ol> </li> </ol> <p><b><u>Continued eligibility for all fisheries:</u></b></p> <ol style="list-style-type: none"> <li>1. Participants must be in compliance with their IVMP</li> <li>2. Demonstrate proper documentation of the discards in logbooks or on video</li> <li>3. No civil penalties related to fishing activity exceeding a certain amount within the time period of EM use</li> </ol>

Table 2-3. Summary of Alternative 3 and EM Program Components. NOTE: Section references in the table coincide with descriptions in the document.

<b>EM Components under Alternative 3</b> <b>These components do not have options to choose from but would be implemented as part of an EM Program</b>		
<u>2.2.1.10</u>	EM Vessel Operational Plan - Individual Vessel Monitoring Plans (IVMP)	<p><b>Required EM IVMP Plan</b></p> <p>Potential categories of information in an IVMP:</p> <ul style="list-style-type: none"> <li>a) Type of system</li> <li>b) Hardware</li> <li>c) Software</li> <li>d) Emergency protocols</li> <li>e) Back-up equipment use protocols</li> <li>f) Catch handling protocols</li> <li>g) Layout of vessel</li> <li>h) Screen shots of all camera views</li> <li>i) Number of cameras needed with placement specifications</li> <li>j) Care and maintenance of the EM system</li> <li>k) Types of sensors and data for sensors to capture</li> </ul> <ul style="list-style-type: none"> <li>l) Download/maintenance schedule</li> <li>m) Logbook format (electronic or paper)</li> <li>n) Tamper Resistant/Taper Evident</li> <li>o) Lighting Locations (Stern, Deck, Discard Shoot, etc.)</li> <li>p) Bridge Mounted Computer Interface/Monitors</li> <li>q) GPS Receiver</li> <li>r) Winch Sensors</li> <li>s) Hydraulic Pressure Transducers</li> <li>t) Power Supply / Backup</li> <li>u) Wire Runs</li> <li>v) Geo Fencing (NMFS supplied)</li> <li>w) System's Check Certification</li> <li>x) Data logger</li> </ul>
<u>2.2.1.11</u>	EM Equipment and Protocol Provisions	Type-Approval Process, EM Equipment Requirements (Data formats, Video Hardware, Logbook Data Source, On-Vessel Data Storage, Onboard operations)
<u>2.2.1.12</u>	Data Confidentiality /Accessibility/ Ownership	All data collected under the EM program (e.g., video, logbooks, and applications) would be considered confidential. Current confidentiality rules may need to be clarified to include this information.

## **2.4 Alternatives Considered but Eliminated from the Detailed Analysis**

The following topics were discussed during the public scoping process; however the Council eliminated them from further consideration and are not analyzed in this document. An explanation is provided under each topic.

### **2.4.1 Mandatory Use of an EM program**

Under this option, all participants in the Shorebased catch share program would be required to use EM. No human observers would be used to monitor for compliance with IFQs, IBQs, or sector allocations. Making the EM program mandatory was considered during the public scoping; however, it was not further analyzed in this EA because some participants may not want to use EM and only want a human observer. If the system breaks down vessels would not be able to fish until the system is working. This could delay fishing activity until a technician can repair the system. This measure would limit vessels options and can monetarily impact a vessel significantly depending on the amount of time the vessel is tied up.

### **2.4.2 Full retention of All Catch**

Under this option, vessels would be required to retain all catch share species and non-catch share groundfish species, non-groundfish species, prohibited species; and ESA and MMPA species. Vessels would not be allowed to discard species for safety reasons, bleeding nets or any other reason.

This option was considered impractical and potentially dangerous. Vessels would not be able to retain marine mammals or ESA listed species unless instructed to do so through a Federal exemption. Although exemptions can be made, it's typically done for special cases and research purposes. In addition, retaining large marine organisms is not possible or safe in some cases. Also, trying to recapture fish that may have been accidentally released would be impractical. In addition, by not allowing a vessel to discard fish for safety reasons could endanger vessel crew.

### **2.4.3 No declaration of EM use**

Under this option, vessels would not be required to declare their intention to use EM. This option was not further analyzed because federal and non-federal agencies, EM providers, observer providers and enforcement agencies need this information for budgetary and labor planning purposes.

In an August 31 2010 proposed rule (75 FR 53380) and a December 15, 2010 Final rule (75 FR 78344) for the catch share program, maximized retention was specifically considered for the Pacific whiting IFQ fishery. Before IFQ, most of the shorebased whiting fishery was conducted under Exempted Fishing Permits (EFPs) issued to vessels and first receivers. Under EFPs, vessels were allowed to land unsorted whiting and to retain prohibited species until landing, and first receivers were allowed to derive the weight of Pacific whiting by subtracting the weight of all other species from the weight of unsorted catch. Consistent with the Salmon FMP, the allowed disposition of prohibited species landed in the shorebased whiting fishery were specified in the vessel EFPs and the first receiver EFPs, and the states of landing had signed agreements with processing facilities. During the development of Amendment 20, maximized retention by non-whiting vessels, identified in the analysis and Final Preferred Alternative (groundfish FMP Appendix E), as those landing with less than 50 percent Pacific whiting by weight was rejected by the Council. In addition, Pacific halibut mortality considerations were specific to the targeting of whiting. During the rulemaking process, NMFS received comments that the maximized retention in the Shorebased catch share program should be consistent with the existing maximized retention fishery. NMFS agreed with the commenters.

Regulations at § 660.140(g) specify the retention requirements for maximized retention vessels participating in the Pacific whiting IFQ fishery. On a maximized retention trip, minor operational amounts of catch may be discarded at sea if the observer has accounted for the discard. Unlike pre-IFQ provisions under EFPs, the current regulations do not define what is meant by minor operational amounts<sup>1</sup> of catch. Pacific whiting vessels that sort at sea must discard Pacific halibut, and the discard mortality must be accounted for and deducted from IBQ pounds in the vessel account.

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<sup>1</sup> Operational discards. Pacific whiting removed from the deck and fishing gear during cleaning may be discarded, provided that the total operational discards must not exceed one basket from any single haul, with the maximum dimensions of the basket being 24 inches by 16 inches by 16 inches. If net cleaning results in a greater amount, all catch in excess of the one basket must be placed into the fish hold. Discarding operational discards of more than one basket of Pacific whiting per haul is prohibited. Discarding any quantity of groundfish species other than Pacific whiting is prohibited (Maximized Retention And Monitoring For Vessels Participating In The 2010 Coastwide Pacific Whiting Shoreside Fishery).