Abstract: Participants with a Pacific Coast groundfish limited entry trawl permit that have a quota share (QS) permit and operate using individual fishing quota under the catch share program (Shorebased IFQ program) are subject to 100 percent observer coverage. Some participants have experienced difficulties in securing observers in a timely or consistent manner. In addition, program participants will be responsible for the full cost of observer coverage in the near future. Therefore, Electronic Monitoring (EM) (i.e., video monitoring) is being explored as a flexible and economical substitute for human observers.

This draft decision document analyzes the effects of establishing an EM program for catcher vessels using bottom trawl, midwater trawl, and fixed gear (i.e., longline and pots) in the Shorebased IFQ program. The proposed EM program would be established to monitor vessels for compliance with individual fishing quotas (IFQ), individual bycatch quotas (IBQ), or groundfish allocations assigned to QS permit holders. The program would be voluntary and includes eligibility requirements to use EM, individual vessel monitoring plans, equipment and installation requirements of a video monitoring system, video data processing protocols, and compliance measures. Under the proposed action, the regulatory requirement of 100 percent human observer coverage on all IFQ fishing trips would be maintained. The proposed EM program is not intended to meet the needs for biological data or monitoring of other scientific information; however, human observers would continue to collect this information at an appropriate level to support scientific needs. Therefore, on EM trip, the vessel could be randomly chosen by NMFS to carry an observer for the purpose of collecting scientific information. However, if a vessel qualifies and chooses to fish using an EM system on an IFQ trip, the vessel would be exempted from the requirement for a human observer on the trip form compliance monitoring but would still be subject to random observer placement for scientific data collection.

The alternatives considered would maintain the full accountability of IFQs, IBQs, and groundfish allocations managed under the Shorebased IFQ program. This document analyzes the effects that an EM program would have on the socioeconomic, biological, and physical environments. 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 action. Impacts to the biological and physical environment are expected to be similar to those realized under the current Shorebased IFQ program.
2.4 Definitions for Total Catch Accounting - Total Catch, Discard, Retained ................................................................. 53

2.5 Discard Requirements ............................................................................................................................................................................. 53
2.5.1 Option A: Maximize Retention .................................................................................................................................................. 54
2.5.2 Option B: Optimize Retention Retain Catch Share Species with Limited Discard Options ................................................. 55
2.5.3 Option C: Discard At Will (Status Quo) .................................................................................................................................. 56

2.6 Halibut Retention/Discard with Fishery Specific Options ........................................................................................................... 59

2.7 Discard Species List Adjustments .......................................................................................................................................................... 61

2.8 Vessel Operation Provisions ................................................................................................................................................................. 61
2.8.1 Observer Exemption Process .................................................................................................................................................. 61
2.8.2 Eligibility for Camera Use .................................................................................................................................................. 62
2.8.2.1 Initial eligibility criteria: ............................................................................................................................................... 62
2.8.2.2 Continued eligibility: ................................................................................................................................................ 62
2.8.2.3 Self-Governing Plan Elements ........................................................................................................................................ 62
2.8.3 Application Approval and Required Information ............................................................................................................... 63
2.8.4 EM Vessel Operational Plan - Individual Vessel Monitoring Plans (IVMP) ........................................................................ 64
2.8.4.1 IVMP requirements ................................................................................................................................................ 64
2.8.5 EM Vessel Operational Plan - IVMP Expiration ........................................................................................................... 65
2.8.6 Declaration of EM Use ................................................................................................................................................ 65

2.9 Equipment and Protocol Provisions .................................................................................................................................................... 66
2.9.1 EM Equipment Requirements .................................................................................................................................................. 66
2.9.1.1 Data formats:.................................................................................................................................................. 66
2.9.1.2 Video Hardware:.............................................................................................................................................. 67
2.9.1.3 Logbook Data Source: ........................................................................................................................................ 67
2.9.1.4 On Vessel Data Storage: .................................................................................................................................... 67
2.9.1.5 Onboard operations: ........................................................................................................................................ 67
2.9.2 Data Transfer Process ................................................................................................................................................ 67
2.9.3 Data Confidentiality/Accessibility/Ownership ..................................................................................................................... 68
2.9.4 Video and Data Processing and Analysis .................................................................................................................. 68
2.9.4.1 Video Review Process ........................................................................................................................................ 68
2.9.4.2 Video reviewers ............................................................................................................................................. 69

2.10 WCGOP Scientific Observations ..................................................................................................................................................... 69
2.10.2 Payment for Scientific data collection/observations ........................................................................................................... 72

2.11 NMFS Processes ...................................................................................................................................................................................... 72

2.12 Spatial Variation for High Bycatch Areas ........................................................................................................................................... 73

2.13 Adaptive or Phased Implementation .................................................................................................................................................. 73

2.14 Alternatives Considered but Eliminated from the Detailed Analysis .................................................................................................. 74
2.14.1 Mandatory Use of an EM program ....................................................................................................................................... 74
2.14.2 Full retention of All Catch .................................................................................................................................................. 74
2.14.3 No declaration of EM use ................................................................................................................................................ 75
CHAPTER 3  AFFECTED ENVIRONMENT ................................................................. 75

3.1  Action Area and Physical Characteristics of the Affected Environment ......................................................... 75

3.2  Biological Characteristics of the Affected Environment ..................................................................................... 77

3.3  Socio-Economic Characteristics of the Affected Environment ............................................................................ 77
   3.3.1  Landings, Revenue, and Participation ........................................................................................................ 77

CHAPTER 4  IMPACT ANALYSIS OF THE ALTERNATIVES ...................................................... 81

4.1  Effects on the Physical Environment ................................................................................................................. 81

4.2  Effects on the Biological Environment .............................................................................................................. 82
   4.2.1  Overview of Effects ........................................................................................................................................ 82
   4.2.1.1  Overfished Species and Affect on Rebuilding Plans .................................................................................. 84
   4.2.1.2  Bycatch Limits ......................................................................................................................................... 85
   4.2.1.3  Tracking and Monitoring Under the Proposed Action ....................................................................... 85
   4.2.1.4  Indirect Biological Effects ..................................................................................................................... 87
   4.2.2  Effects on prohibited species and protected species .................................................................................. 87

4.3  Effects on the Socioeconomic Environment ....................................................................................................... 88
   4.3.1  Analysis of Program Costs for Compliance and Biological Monitoring .................................................. 88
   4.3.1.1  Assumptions ........................................................................................................................................... 89
   4.3.1.2  Cost Categories ................................................................................................................................. 90
   4.3.2  Trawl IFQ Program Fishing Operations (Harvesters) ............................................................................ 119
   4.3.2.1  No Action Alternative ....................................................................................................................... 120
   4.3.2.2  Action Alternative ............................................................................................................................. 120
   4.3.3  Federal permits and endorsements .......................................................................................................... 121
   4.3.4  Quota Share Owners ............................................................................................................................... 121
   4.3.5  Vessel Owners ........................................................................................................................................ 122
   4.3.6  Crew Members ....................................................................................................................................... 122
   4.3.7  Other Fisheries ..................................................................................................................................... 122
   4.3.8  Processors .......................................................................................................................................... 123
   4.3.9  Video Reviewers .................................................................................................................................... 123
   4.3.10 Observer Providers ................................................................................................................................ 124
   4.3.11 Communities ...................................................................................................................................... 124
   4.3.12 Government ..................................................................................................................................... 124
      4.3.12.1  Federal ............................................................................................................................................ 124
      4.3.12.2  States ............................................................................................................................................ 124
      4.3.12.3  Pacific States Marine Fisheries Commission .............................................................................. 125

4.4.  Cumulative effects ................................................................................................................................................. 125

CHAPTER 5  LIST OF PREPARERS ......................................................................................... 126

CHAPTER 6  REFERENCES ........................................................................................................ 126
Trawl Rationalization Goals and Objectives (Amendment 20) .......................................................... 127
Pacific Groundfish FMP Goals and Objectives .................................................................................. 128
General FMP ....................................................................................................................................... 128

APPENDIX A. ANALYSIS OF EM PROGRAM PROVISIONS ............................................................ 131

1.1. Retention options ......................................................................................................................... 131

List of Tables

Table 2-1. Summary of EM Program Components and Alternatives with Options. NOTE: Section references in the table coincide with descriptions following the table. ........................................... 23
Table 2-2. Decision table for alternatives and options specific to midwater trawl whiting. NOTE: Section references in the table coincide with section descriptions in document. ............................. 35
Table 2-3. Decision table for alternatives and options specific to fixed gear (longline and pot). NOTE: Section references in the table coincide with section descriptions in document. ............................ 39
Table 2-4. Decision table for alternatives and options specific to bottom and non-whiting midwater trawl. NOTE: Section references in the table coincide with section descriptions in document. .......... 44
Table 2-5. IFQ program and Non-IFQ groundfish species groups that are noted in section 2.5 as potential discards. Source regulations are noted in each list .......................................................... 57
Table 2-6. Co-op program groundfish species lists noted section 2.5 as potential discards. ................... 58
Table 2-7. ESA-listed species that may be found in the area of operation for groundfish fisheries. ........... 58
Table 2-8. Data collected from Pacific halibut caught on IFQ vessels using different types of gear. Viability is assessed at the point of fish release when returned to sea. ............................................. 59
Table 3-1. Exvessel revenue and total pounds landed in 2012 by month and fishery sector. ....................... 77
Table 4-1. Rebuilding parameters estimated in the most recent rebuilding analyses and specified in rebuilding plans for overfished groundfish stocks at the start of the 2013-2014 management cycle. .................................................... 85
Table 4-2. Preliminary working assumptions on rates of vessel participation in the EM program. ............... 89
Table 4-3. Cost estimation template .................................................................................................... 91
Table 4-4. Potential changes to logbooks or additional logbooks for each fishery under Alternative 3 ...... 94
Table 4-5. Current provider fees for catch monitoring services .............................................................. 96
Table 4-6. Key to port abbreviations .................................................................................................... 98
Table 4-7. PREIMINARY assessment of challenges with providing catch monitoring in each port based on seasonal landing patterns (summary of data in Figure 4-4 through Figure 4-19). .......... 118
Table 6-1. National Standards from the Section 301 of the MSA ............................................................. 127
Table 6-2. Trawl Rationalization goals and objectives from Amendment 20 ........................................... 127
Table 6-3. Pacific Groundfish FMP Goals and Objectives .................................................................... 128

List of Figures

Figure 2-1. General depiction of total catch accounting in the Shorebased IFQ program. ....................... 51
Figure 3-1. Fishery management lines on the U.S. west coast. Source: PFMC 2014, SAFE. ...................... 76
Figure 3-2. Share of groundfish landings (top) and inflation adjusted ex-vessel revenue (bottom) by fishery sector, 2003-2012. Source: *2011-2012 non-whiting trawl includes IFQ non-trawl landings. SAFE Tables 12a-b and 14a-b. ................................................................. 79

Electronic Monitoring Analysis .......................... 5 June 2014
Figure 3-3. Ex-vessel revenue trends (inflation adjusted, 2012, from groundfish only) for groundfish fishery sectors, 2003-2013; 2003=100. *Nonwhiting trawl includes non-trawl IFQ in 2011-2012. Value outside figure scale (>300%): 2008 at-sea CP whiting 408%, 2011 shoreside whiting 342%. Source: SAFE Tables 12b and 14b.

Figure 4-1. Number of nonwhiting trawl, whiting trawl, and nontrawl IFQ landings by port for 2011, 2012, and 2013 (see Table 4-6 for key to port names) – there are no first receives in Bodega Bay (BDG) or Berkeley (B) therefore the landings reported for these ports are likely miscodings.

Figure 4-2 Number of nonwhiting trawl, whiting trawl, and nontrawl IFQ vessels by port for 2011, 2012, and 2013 (vessels participating in more than one IFQ gear sector or landing in more than one port are counted more than once, see Table 4-6 for key to port names) – there are no first receives in Bodega Bay (BDG) or Berkeley (B) therefore the landings reported for these ports are likely miscodings.

Figure 4-3 Number of nonwhiting trawl, whiting trawl, and nontrawl IFQ first receivers by port for 2011, 2012, and 2013 (first receivers receiving from more than one gear group are counted more than once, see Table 4-6 for key to port names) – there are no first receives in Bodega Bay (BDG) or Berkeley (B) therefore the landings reported for these ports are likely miscodings.

Figure 4-4 Bellingham, Washington, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings – no whiting landings were made to this port)

Figure 4-5 Westport, Washington, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting and whiting landings)

Figure 4-6 Ilwaco, Washington, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting and whiting landings)

Figure 4-7 Astoria, Oregon, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting and whiting landings)

Figure 4-8 Newport, Oregon, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting and whiting landings)

Figure 4-9 Coos Bay, Oregon, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting and whiting landings – there were whiting landings only in 2011)

Figure 4-10 Brookings, Oregon, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting and whiting landings)

Figure 4-11 Crescent City, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port)

Figure 4-12 Eureka, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port)

Figure 4-13 Fort Bragg, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port)

Figure 4-14 San Francisco, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port)

Figure 4-15 Half Moon Bay, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port)
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 not prohibited species).

Electronic Monitoring Analysis 7 June 2014
*Optimized Retention* - A vessel is generally required to retain all catch share species and may be allowed to discard certain species.
CHAPTER 1 INTRODUCTION

The groundfish fishery in the Exclusive Economic Zone (EEZ), offshore waters between 3 and 200 nautical miles (nm), off the coasts of Washington, Oregon, and California (WOC) is managed under the Pacific Coast Groundfish Fishery Management Plan (FMP), while the nearshore areas are managed by the states and tribes. The Pacific Coast Groundfish FMP was prepared by the Pacific Fishery Management Council (Council) under the authority of the Magnuson Fishery Conservation and Management Act (subsequently amended and renamed the Magnuson-Stevens Fishery Conservation and Management Act). The FMP has been in effect since 1982.

Actions taken to amend FMPs or to implement regulations to govern the groundfish fishery must meet the requirements of several Federal laws, regulations, and executive orders. In addition to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), these Federal laws, regulations, and executive orders include: National Environmental Policy Act (NEPA), Regulatory Flexibility Act (RFA), Endangered Species Act (ESA), Marine Mammal Protection Act (MMPA), Coastal Zone Management Act (CZMA), Paperwork Reduction Act (PRA), Executive Orders (E.O.) 12866, 12898, 13132, and 13175, and the Migratory Bird Treaty Act.

NEPA regulations require that NEPA analysis documents be combined with other agency documents to reduce duplication and paperwork (40 CFR §§ 1506.4). Therefore, this EA will ultimately become a combined regulatory document to be used for compliance with not only NEPA, but also E.O. 12866, RFA, and other applicable laws. NEPA, E.O. 12866, and the RFA require a description of the purpose and need for the proposed action as well as a description of alternative actions that may address the problem.

➢ Chapter One describes the purpose and need of the proposed action.
➢ Chapter Two describes a reasonable range of alternative management actions that may be taken to meet the proposed need.
➢ Chapter Three contains a description of the socioeconomic, biological, and physical characteristics of the affected environment.
➢ Chapter Four examines changes in the socioeconomic, biological, and physical environments resulting from the alternative management actions.
➢ Chapter Five addresses consistency with the FMP and other applicable laws.
➢ Chapter Six is the regulatory impact review and regulatory flexibility analysis.
➢ Chapter Seven is a list of individuals who help prepare this document.
➢ Chapter Eight provides a list of references for this document.
1.1 Summary of the Proposed Action

The proposed action is to create the regulatory framework for an electronic monitoring program, to monitor the fisheries for compliance with IFQ and groundfish allocations under the Shorebased IFQ program (See Appendix E of the Pacific Coast Groundfish FMP). The EM program would include a video monitoring system for catch accounting that is adequate to maintain the integrity of the IFQ program and ensure that resource management objectives are being met. The proposed EM program would monitor vessels for compliance with individual fishing quotas (IFQ), individual bycatch quotas (IBQ), or groundfish allocations assigned to QS permit holders. The program would be voluntary and includes eligibility requirements to use EM, individual vessel monitoring plans, equipment and installation requirements of a video monitoring system, video data processing protocols, and compliance measures. The requirement for 100 percent observation of trips would be maintained; therefore, vessels will be required to have either a human observer or an EM system to operate in the Shorebased IFQ program.

This action is intended to implement a voluntary program that would allow participants under the IFQ program to use EM rather than human observers via long-term Federal regulations. If approved, the action is intended to be implemented in 2016.

1.2 Purpose and Need for the Proposed Action

There is a need to adequately monitor the IFQ program for compliance in an economical and flexible manner yet meet 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 electronic monitoring (EM) may be a viable option to monitor IFQ fisheries for compliance.

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.
1.3 Decision to be Made

From the information in this document, the Council may refine alternatives, assign focused analysis, and select any preliminary preferred alternatives that may be appropriate for the different fishery sectors. The Council is currently scheduled for final decision making on a regulatory program recommendation to the NMFS at the September, 2014 Council meeting. At that time, the Council may make final decisions on individual fishery sectors, as opposed to needing to make a final decision for all sectors simultaneously.

1.4 Management of the Pacific Coast Groundfish Fishery and the Trawl Rationalization Program

1.4.1 History of Management

The west coast groundfish trawl fishery is jointly managed by state and Federal authorities under the 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 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 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 fishery as a whole comprises several different sectors, defined by fishing gear, species targeted, and regulatory context. The list of current trawl target species includes flatfish, roundfish, thornyheads, and a few species of rockfish. Primary flatfish target species include petrale sole and Dover sole. Roundfish target species include Pacific whiting, Pacific cod, and sablefish. Some rockfish species, especially Pacific ocean perch and widow rockfish, were important trawl targets until the mid 1990s. However, seven rockfish species are currently declared overfished pursuant to the MSA. The need to rebuild these stocks to a healthy size has led to a variety of harvest constraints on groundfish fisheries, and rockfish are generally no longer a target of these fisheries.

The groundfish trawl fishery is subject to a Federal license limitation program (referred to as LE), implemented in 1992; currently there are 178 extant groundfish LE trawl permits. For purposes of analysis in this document, the LE trawl fishery is divided into the shoreside and at-sea midwater trawl fishery (catcher vessels only and does not include at-sea motherships or catcher/processors), mid-water non-whiting trawl fishery, fixed gear fishery (includes longline with hook-and-lines and longline with pots), and bottom trawl.

At its November 2008 meeting, the Council recommended trawl rationalization through an IFQ program for the shoreside fishery and co-ops for the whiting mothership and catcher-processor sectors (hereafter referred to as Shoreside IFQ program). Following the November 2008 meeting, the Council worked on critical trailing actions needed to complete Amendment 20. These actions covered topics such as eligibility to own IFQs, accumulation limits, a set-aside for adaptive management, and miscellaneous clarifications. The Council completed the critical trailing actions at its June 2009 meeting and adopted the related FMP amendment language.
initial allocation of canary quota shares was modified at the November 2009 Council meeting. The Council’s final recommendations on Amendments 20 and 21 were submitted to the Secretary of Commerce for approval on May 7, 2010. On August 9, 2010, NMFS issued a letter approving the bulk of both Amendments 20 and 21. The final regulations to initiate implementation of Amendments 20 and 21 were published in the Federal Register on October 1, 2010 (the initial allocation rule). A proposed rule for a separate set of regulations required for implementation (the components rule) was published on August 31, 2010. The components rule was finalized December 2010 and implemented January 11, 2011. Since implementation, the Council has recommended a number of adjustments to the trawl catch share program (see Trailing Amendments and Actions on Trawl Rationalization [Catch Shares]).

The Shoreside IFQ program for the limited entry bottom trawl fleet and two distinct cooperative programs for the at-sea hake mothership and catcher-processor trawl fleets. The bottom trawl fleets traditionally operates from the U.S./Canadian border to Morro Bay, California. The at-sea hake fleet operates off the coasts of Oregon and Washington. Observer data is used to account for any IFQ discarded catch, including the mandatory discarding of Pacific halibut. Observer data, in combination with landings data, enable fishermen to track their individual fishing quotas and allow managers to monitor the progress of the fishery. The program requires that each vessel acquire quota pounds (QP) to cover its catch (including discards) of nearly all groundfish species.1 Proper functioning of the program requires some form of at-sea monitoring to ensure that discards are enumerated for each vessel. The catch share program specified that this monitoring function be achieved through 100% at-sea observer coverage (compliance monitoring).

1.4.2 Applicable Federal Permits, Licenses, or Authorizations Needed in Conjunction with Implementing this Proposal

The Shorebased IFQ Program applies to qualified participants in the Pacific Coast Groundfish limited entry fishery and includes a system of transferable quota shares (QS) for most groundfish species or species groups, individual bycatch quota (IBQ) for Pacific halibut, and trip limits or set-asides for the remaining groundfish species or species groups. A QS permit would be required to participate in the proposed EM program. NMFS will issue a QS permit to eligible participants and will establish a QS account for each QS permit owner to track the amount of QS or IBQ and quota pounds (QP) or IBQ pounds owned by that owner. NMFS will establish a vessel account for each eligible vessel owner participating in the Shorebased IFQ Program, which is independent of the QS permit and QS account. In order to use QP or IBQ pounds, a QS permit owner must transfer the QP or IBQ pounds from the QS account into the vessel account for the vessel to which the QP or IBQ pounds is to be assigned. Harvests of IFQ species may only be delivered to an IFQ first receiver with a first receiver site license. A Pacific Coast groundfish limited entry permit is required to establish a vessel account and, amongst other requirements, a limited entry permit would be required to participate in the EM program.

1 Exceptions were made for some species rarely caught in the trawl groundfish fishery.
1.4.3 Background on Decisions to Consider EM

1.4.3.1 Why is 100% Monitoring Needed for this Fishery?

Prior to the trawl rationalization program, the West Coast groundfish observer program monitored approximately 20 percent of the trips taken on groundfish trawl vessels. The trawl rationalization program relies on the monitoring of all trips. 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.

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. Alternative regulations would have to be developed for unmonitored trips, adding to regulatory complexity. Those regulations would have to assume high bycatch rates for constraining species in order to ensure that the trawl allocations not be exceeded. The assumption of such high bycatch rates would increase vessel operation costs (require the vessel to use more quota) and diminish quota potentially available for the remainder of the fleet. To provide more opportunity, different bycatch rates could be created for different harvest areas. However, this would increase regulatory complexity with a greater number of management lines and assumed bycatch rates, make the calculation of trip catch more complex and time consuming, and potentially burden enforcement with determination of whether any tows on the trip crossed into the high bycatch area. This example assumes that area of catch is the only parameter affecting high bycatch rates of constraining species. Other parameters such as the sonar signal on which fishermen set their gear and the configuration and manner in which the gear is fished may also affect bycatch rates. For example, halibut excluders might be disabled on unmonitored trips in order to increase CPUE.

Finally, the Council is in the process of considering how to more fully achieve the potential benefits of the individual incentives provided by the trawl rationalization program by liberalizing a number of regulations governing trawl vessels (e.g. gear regulations). If some vessels were unmonitored, two sets of regulations might need to be maintained, one for monitored vessels the other for unmonitored vessels, further increasing regulatory complexity. For these reasons, 100 percent monitoring is required for effective function of the program.

1.4.3.2 Why Monitor With Observers?

Currently 100% monitoring is achieved through the use of observers on the vessels. The Council’s final action 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. At the time the Council took final action, the program had already been in development for over five years and consideration of camera monitoring may have further delayed implementation. The trawl
The circumstances, under which electronic monitoring was originally rejected, have changed. Fishery managers have now had two years of experience under the 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 becoming available on the performance of electronic monitoring and there is time to more carefully consider the utility of electronic monitoring relative to human observers. There are a number of needs that an alternative to monitoring with observers may address. First, for vessels, the need to pay for vessel observers is one of the most expensive compliance costs associated with participation in the trawl rationalization program. For the first years of the program, NMFS has subsidized observer costs to help the fleet through the period of adjusting to the new management system. Overall fleet profits, and consequently the price of quota, will be below what they might otherwise be if less expensive monitoring is available. Second, small vessels may be disproportionately affected by observer costs. Vessels are billed for observers on a per day basis, and because smaller vessels may have a lower total revenue per day at sea, observer costs reduce vessel net revenue disproportionately more than for larger vessels. On this basis, over time it might be expected that quota will migrate to larger vessels and there will be fewer smaller vessels in the fleet—assuming small vessels do not have other countervailing advantages. Third, because of the overhead involved with maintaining observer availability in small, somewhat isolated ports with relatively low demand for observers, at least one observer company has indicated that it may pull out of at least one of the small ports on the West Coast. In addition, some observer companies may not be willing to provide observers for safety reasons. Thus, over time, smaller ports may be disadvantaged by the observer requirement, relative to larger ports. Fourth, if overall monitoring costs can be reduced (those borne by both private parties and the public), national net economic benefits may be increased. And finally, the observer fee system puts pressure on vessels to fish in unsafe conditions. Because vessels are billed on per day both for at-sea and for standby time, vessels may incur higher costs for standing down due to marginal weather conditions.
1.5 ESA Opinions and Thresholds for the Pacific Coast Groundfish Fishery

Six marine mammal species are known to have interacted with groundfish trawl gear: California sea lion, harbor seal, harbor porpoise, pacific white-sided dolphin, northern elephant seal, and Stellar sea lion (unidentified sea lions are also recorded, which could be either California or Stellar). Various seabird species have been observed taken in the groundfish trawl fishery; none is ESA-listed.

On December 7, 2012, NMFS issued a Biological Opinion (Opinion) under the ESA on the continuing operation of the Pacific Coast groundfish fishery. NMFS concluded that the fishery is not likely to jeopardize the continued existence of green sturgeon (Acipenser medirostris), eulachon (Thaleichthys pacificus), humpback whales (Megaptera novaeangliae), Steller sea lions (Eumetopias jubatus), and leatherback sea turtles (Dermochelys coriacea). We also conclude that the proposed action is not likely to destroy or adversely modify designated critical habitat of green sturgeon or leatherback sea turtles. Furthermore, NMFS concluded that the proposed action may affect, but is not likely to adversely affect the following species and designated critical habitat:

Sei whales (Balaenoptera borealis),
North Pacific Right whales (Eubalaena japonica),
Blue whales (Balaenoptera musculus),
Fin whales (Balaenoptera physalus),
Sperm whales (Physeter macrocephalus),
Southern Resident killer whales (Orcinus orca),
Guadalupe fur seals (Arctocephalus townsendi),
Green sea turtles (Chelonia mydas),
Olive ridley sea turtles (Lepidochelys olivacea),
Loggerhead sea turtles (Carretta carretta),
Critical habitat of Southern Resident killer whales, and Critical habitat of Steller sea lions

On November 21, 2012, the US Fish and Wildlife Service (USFWS) issued an Opinion under the ESA on the continuing operation of the Pacific Coast groundfish fishery. USFWS concluded the fishery would not jeopardize the continued existence of short-tailed albatross (Phoebastria albatrus), and concurred that the fishery is not likely to adversely affect the marbled murrelet (Brachyramphus marmoratus), California least tern (Sterna antillarum browni), southern sea otter (Enhydra lutris nereis), and the federally threatened bull trout (Salvelinus confluentus) and its designated critical habitat. The USFWS anticipates a yearly average of one short-tailed albatross could be taken as a result of the fishery. The incidental take is expected to be in the form of short-tailed albatross killed from longline hooks or trawl cables.

The most recent Biological Opinion covering the incidental take of ESA-listed salmon in groundfish fisheries was published in 2006 (NMFS 2006c). That document includes a detailed history of section 7 consultations on the groundfish fishery.
Salmon are caught incidentally in both the at-sea and shore-based segments of the whiting fishery and bottom trawl. This bycatch is closely monitored through an at-sea observer program and dockside sorting of shore deliveries. A salmon bycatch reduction plan has also been implemented in this fishery. NMFS issued a Supplemental Biological Opinion on March 11, 2006 concluding that neither the higher observed bycatch of Chinook in the 2005 whiting fishery nor new data regarding salmon bycatch in the groundfish bottom trawl fishery required a reconsideration of its prior “no jeopardy” conclusion. NMFS also reaffirmed its prior determination that implementation of the Groundfish PCGFMP is not likely to jeopardize the continued existence of any of the affected ESUs. The 1999 biological opinion concluded that the bycatch of salmonids in the Pacific whiting fishery were almost entirely Chinook salmon, with little or no bycatch of coho, chum, sockeye, and steelhead.

NMFS will continue to monitor and collect data to analyze take levels for all protected species.

1.6 Environmental Review Process and Public Scoping

The purpose of the environmental review process is to determine the range of issues that the NEPA document needs to address. The environmental review process is intended to ensure that problems are identified early and properly reviewed; issues of little significance do not consume time and effort; and that the draft NEPA document is thorough and balanced. The environmental review process should: identify the public and agency concerns; clearly define the environmental issues and alternatives to be examined in the NEPA document; eliminate non-significant issues; identify related issues; and identify state and local agency requirements that must be addressed. The following public review and scoping presented in this document is in reference to the development of an EM program for the Shoreside IFQ program.

In 2011, NMFS implemented a Council developed catch share program for the West Coast limited entry groundfish trawl fishery. The program requires that each vessel acquire quota pounds (QP) to cover its catch (including discards) of nearly all groundfish species. Proper functioning of the program requires some form of at-sea monitoring to ensure that discards are enumerated for each vessel. The catch share program specified that this monitoring function be achieved through 100% at-sea observer coverage. Electronic monitoring (EM) is being explored as a potential technically and economically viable substitute for the use of human observers in the function of compliance monitoring for the catch share program.

At the November 2012 Council meeting, the Council directed that an EM workshop be held. The workshop was held February, 2013. The purpose of the workshop was to begin developing the policy context and identify necessary elements for a thorough Magnuson-Stevens Act (MSA) process to use EM in the West Coast groundfish trawl catch share program.

The Council decided at the April, 2013 Council meeting to move forward with consideration of the possible use of EM for the trawl catch share program. At that time, the Council decided that

2 Exceptions were made for some species rarely caught in the trawl groundfish fishery.
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. The 
Council is scheduled to hear an update on the analysis in April, 2014 and in June will review 
the full analysis to pick preliminary preferred alternatives. The Council is scheduled to pick its 
final preferred alternatives for an EM program at its September 2014, meeting with the 
expectation of implementing an EM program by January 2016.

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.pcfci.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.”
1.6.1 **Trawl Catch Share Program Electronic Monitoring (EM) Workshop Report**


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.”

1.6.2 **NMFS Policy Directive**

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/](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.

Appendix A contains NMFS policy directive, and the goals and objectives of the MSA, the trawl rationalization program, and the Pacific Coast Groundfish FMP.

1.6.3 **Issues and Concerns Raised Through Scoping**

In addition to the goals and objectives of the Pacific Coast Groundfish FMP and trawl rationalization program, several objectives were adopted by the Council at the June 2013 meeting during the public scoping process to develop an EM program for trawl catch share program compliance monitoring:

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;
   while,
8. maintaining current individual accountability for catch and preserving equitable distribution of monitoring coverage among members of the fleet,
9. supporting the collection of biological information necessary for managing the fishery, for stock assessments, and to meet other needs for scientific data, with no degradation relative to pre-trawl catch share program standards
10. taking into account agency budgets and abilities to support any new policy,
11. maintaining capabilities for ACL management (e.g. for non-quota species), and
12. following an implementation path most optimal for the fishery.

The first seven items in the above list are direct regulatory objectives, i.e. reasons for considering EM. Items eight through twelve in this list are considerations, i.e. the Council would not be undertaking this action in order to achieve items eight through twelve but rather in pursuing the first seven objectives will be bounded by items eight through twelve.
CHAPTER 2 ALTERNATIVES

2.1 Introduction

This chapter describes the alternative management actions that could be taken to establish an EM program.

Several approaches to monitoring participants for compliance in the shoreside IFQ program are defined and analyzed in this document. Components and options are listed in summary Table 2-1 and described in detail in this chapter. Table 2-1 provides the most current set of alternatives and options developed by the Council with revisions and additional options developed by the GEMPAC in May 2014. Preliminary preferred alternatives identified by some representatives of the GEMPAC are identified in the “Component” categories in the left-hand column. In addition, fishery specific options are listed in Table 2-2 through Table 2-4.

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. The alternatives were developed to examine potential components and options for an EM program and are compared to the no-action alternative.

The EM program would need to account for discard events at sea, and provide sufficient information to identify fish species and enumerate the weight of fish discarded so that IFQ accounts and catch allocations can be debited. Under the proposed options for an EM program, vessels would need to apply for an exemption to use EM rather than a human observer and qualify for the exemption. 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 4.3, under subsections on costs and impacts to different segments of the fishery and communities. Even if an exemption from required observer coverage is provided by NMFS for vessels that choose to use EM, observers would still need to be randomly deployed to collect scientific information such as biological data, bycatch estimates, and protected species interactions.

An EM program could be developed that is specific to each fishery that operates in the Shorebased IFQ program. Currently these fisheries are identified as shoreside and at-sea midwater trawl fishery (catcher vessels only and does not include at-sea motherships or catcher/processors), mid-water non-whiting trawl fishery, fixed gear fishery (includes longline with hook-and-lines and longline with pots), and bottom trawl.

Two major decision points must be made prior to selecting each component of an EM program: 1) what is the data source for the discard information - logbooks or video; and 2) which species may be discarded that would preserve the integrity of individual accounting in the IFQ system.
The choice may vary based on fishery, vessel operations, and the ability to accurately account for catch.

For example, it may be optimal to require the midwater trawl whiting fishery to continue fishing under a maximize retention regulatory environment, use logbooks as documentation for discards, then review a fixed percentage of the video to verify the discard documented in the logbooks (i.e., maximized retention with self-reporting and audit). For fixed gear (i.e., longline and pot), it may be optimal to allow discard of certain species because each fish is handled by the crew and video cameras could be used to document the species, length, and weight before it is discarded. Then, a review of all video images could be conducted to enumerate discards (i.e., optimized retention with video census). For bottom trawl, discard may be limited to certain species that can be identified on video, then audit the logbooks to verify events recorded in the logbooks are accurate and complete (i.e., optimized retention with self-reporting and audit). These potential combinations are described in more detail in Section 4.3, under subsections on costs and impacts to different segments of the fishery and communities.
Table 2-1. Summary of EM program components and alternatives with options for all fisheries. NOTE: Section references in the table coincide with descriptions following the table. Key: Yellow highlights are new components with new options; Red, bold italicized text are original components with some new text or options.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2</td>
<td>Compliance Monitoring Basic Provisions</td>
<td>Observers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2.1</td>
<td>Discard Documentation Technology</td>
<td>Observers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2.1</td>
<td>Documentation Coverage</td>
<td>100%</td>
<td>100% of all IFQ trips must either have observer or cameras</td>
<td></td>
</tr>
<tr>
<td>2.2.2</td>
<td>Video Reading Protocols</td>
<td>None</td>
<td>Option A: 100% (census), Option B: Subsample Video (% to review must be developed)</td>
<td>Audit logbook (intensity varies based on vessel's compliance history)</td>
</tr>
</tbody>
</table>

GEMPAC recommended preliminary Preferred Alts:
MDWT whiting representatives like Alternative 3, audit logbook at 10% review level but would like to see analysis for Alternative 2, Option B before final recommendation.

GEMPAC recommended preliminary Preferred Alts:
Fixed gear representatives like Alternative 3, logbook audit.
<table>
<thead>
<tr>
<th></th>
<th>Discard Accounting - Individual or Fleet-wide</th>
<th>Observers/IFQ</th>
<th>Accounting of discards are either accounted against IFQ, accounted against sector-wide, annual catch limit (ACL), or not accounted. Estimation of discard may be done through EM, WCGOP observer program, or not estimated.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option A: One discard category and all discards are estimated using EM and counted against IFQ:</td>
<td>Dumped off deck (e.g., shoveled, picked out of net)</td>
<td>Dumped/washed out of net for safety reasons (bleeding, pull zipper, etc.).</td>
<td>Dumped off gear</td>
</tr>
<tr>
<td></td>
<td>Dropped off gear</td>
<td>Floating fish</td>
<td>Lost gear (not captured by EM, estimate using WCGOP protocol)</td>
</tr>
<tr>
<td></td>
<td>Consumed/used as bait (not captured by EM)</td>
<td>Unobserved sets/hauls (not captured by EM, maybe apply discard rate using EM estimates from previous sets/hauls)</td>
<td></td>
</tr>
<tr>
<td>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:</td>
<td>Dumped off deck (e.g., shoveled, picked out of net)</td>
<td>Dumped/washed out of net for safety reasons (bleeding, pull zipper, etc.).</td>
<td>Dumped off gear</td>
</tr>
<tr>
<td></td>
<td>Unobserved sets/hauls (not captured by EM, apply discard rate using WCGOP)</td>
<td>Floating fish</td>
<td>Used WCGOP estimates</td>
</tr>
<tr>
<td></td>
<td>Dropped off gear (use WCGOP estimates)</td>
<td>Floating fish (use WCGOP estimates)</td>
<td>Estimated from lost gear (estimate using WCGOP protocol)</td>
</tr>
<tr>
<td></td>
<td>Consumed/used as bait (not captured by EM, use WCGOP estimates)</td>
<td>Consumed/used as bait</td>
<td></td>
</tr>
<tr>
<td>Option C: Split into two discard categories; Category 1 count against IFQ, no accounting for discard 2 category:</td>
<td>Dumped off deck (e.g., shoveled, picked out of net)</td>
<td>Dumped/washed out of net for safety reasons (bleeding, pull zipper, etc.).</td>
<td>Dumped off gear</td>
</tr>
<tr>
<td></td>
<td>Unobserved sets/hauls (not captured by EM, apply discard rate using WCGOP)</td>
<td>Floating fish</td>
<td>Lost gear</td>
</tr>
<tr>
<td></td>
<td>Consumed/used as bait</td>
<td>Consumed/used as bait</td>
<td></td>
</tr>
</tbody>
</table>
Table 2-1. Summary of EM program components and alternatives with options for all fisheries. NOTE: Section references in the table coincide with descriptions following the table. Key: Yellow highlights are new components with new options; Red, bold italicized text are original components with some new text or options.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4</td>
<td>Definitions for Total Catch Accounting - Total Catch, Discard, Retained</td>
<td>Use WCGOP definitions</td>
<td>NOTE: Under the IFQ and catch allocation system all catch must be accounted for to debit individual QS accounts and fishery allocations, regardless if it categorized as retained catch or discard.</td>
<td></td>
</tr>
</tbody>
</table>

**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.

**Total catch for fixed gear:** Total catch is defined as the sum, or estimated weight, of all organic and inorganic material caught by the gear to include any fish hooked or in a pot as the gear 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.
## 2.5 Discard Requirements

<table>
<thead>
<tr>
<th>Discard Requirements</th>
<th>Option A: Maximized Retention</th>
<th>Option B: Optimize Retention of Catch Share Species with Limited Discards</th>
<th>Option C: Discard At Will (Status Quo)</th>
</tr>
</thead>
</table>
| Discard at will unless required to retain.  
• May discard any species unless regulations require you to retain them.  
• May discard catch share species, non-catch share species.  
• May discard non-groundfish  
• Allow discard of trash, mud coral, etc.  
• Require discards of prohibited species.  
• Require discards of ESA and MMPA species (protected species). | A vessel is generally required to retain all catch share species, non-catch share groundfish species, non-groundfish species (Non-FMP and not prohibited species)  
• No selective discard for catch share species, non-catch share groundfish species  
• No selective discard for non-groundfish species  
• Allow selective discard of trash, mud coral, etc.  
• Require selective discards of prohibited species (except whiting trips);  
• Require selective discards of ESA and MMPA species (i.e., protected species).  
• Non-selective discard for e.g., safety, "bleeding net", zipper accidentally opened, fish came off hook, gilled in net. | A vessel is generally required to retain all catch share species.  
• Allow selective discard of trash, mud coral, etc.  
• Require selective discards of prohibited species (except whiting trips);  
• Require selective discards of ESA and MMPA species (i.e., protected species).  
• Non-selective discard for e.g., safety, "bleeding net", zipper accidentally opened, fish came off hook, gilled in net. | May discard any species unless regulations require you to retain them  
• May discard catch share species, non-catch share species  
• May discard non-groundfish  
• Allow selective discard of trash, mud coral, etc.  
• Require selective discards of prohibited species (except whiting trips);  
• Require discards of ESA and MMPA species (i.e., protected species).  |

### Potential Gear Specific Sub-options under Optimized Retention (Must be Verifiable under EM):

Allowable Discards Midwater trawl non-whiting trips, bottomtrawl, and fixed gear trips may discard the following species if verifiable under the EM program:

a) For catch share species
   - Option a – Allow discard of flatfish
   - Option b – Allow discard of lingcod and sablefish
   - Option c – Allow discard of all non-rockfish groundfish (full retention of rockfish only)
   - Option d – Allow discard of species that are verifiable with EM

b) For non-catch share groundfish species
   - Option a – Allow discard of all non-rockfish groundfish (full retention of rockfish only)
   - Option b – Allow discard of species that are verifiable with EM
   - Option c – For non-groundfish (Non-FMP and not prohibited species)
   - Option d – Allow discard of species that are verifiable with EM

### Option C - Discard At Will (Status Quo)

- May discard any species unless regulations require you to retain them
- May discard catch share species, non-catch share species
- May discard non-groundfish
- Allow selective discard of trash, mud coral, etc.
- Require selective discards of prohibited species (except whiting trips);
- Require discards of ESA and MMPA species (i.e., protected species).

### GEMPAC Recommended Preliminary Preferred Alts:

- Fixed gear and bottom trawl representatives prefer Optimized retention (Option B)
- Midwater trawl whiting representatives prefer Maximize retention (Option A)
Table 2-1. Summary of EM program components and alternatives with options for all fisheries. NOTE: Section references in the table coincide with descriptions following the table. Key: Yellow highlights are new components with new options; Red, bold italicized text are original components with some new text or options.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.6</td>
<td>Halibut Retention/Discard with Fishery Specific Options</td>
<td>Use WCGOP and IPHC protocols</td>
<td>Option A: Apply IPHC mortality rate for specific gear type: MDWT Whiting 100% mortality; MDWT non-whiting and BTW 90% mortality if discarded; Fixed gear longline 16% mortality if discarded; Fixed gear pot 18% mortality if discarded.</td>
<td>Option C: IPHC exemption to allow full retention (need to examine the feasibility of this option for fisheries other than MDWT whiting)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Option D: Captain and crew provide assessment (training would be required)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Option E: Use EM viability assessment (currently conducting study, need IPHC approval)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Option F: Use vessel specific mortality rate (update rates periodically)</td>
</tr>
<tr>
<td>2.7</td>
<td>Discard Species List Adjustments</td>
<td>None</td>
<td>Options for a process to expand or change the species lists:</td>
<td>Option 1: NMFS to make determination and provide list to fishers through the NMFS EM Observer Exemption Process.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Option 2: Use Council process for changing species list using routine management measures if initial list is fully analyzed for environmental impacts (e.g., use groundfish specification process, or some other routine management measure).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Option 3: Set initial lists in regulation and change at some future point through Council process with proposed/final rule making.</td>
</tr>
<tr>
<td>2.8</td>
<td>Vessel Operation Provisions</td>
<td>None</td>
<td>NMFS to Develop Application and Approval Process</td>
<td></td>
</tr>
<tr>
<td>2.8.1</td>
<td>Observer Exemption Process</td>
<td>None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DETAILED COMPONENTS FOR ALL FISHERIES

Electronic Monitoring Analysis 27 June 2014
Table 2-1. Summary of EM program components and alternatives with options for all fisheries. NOTE: Section references in the table coincide with descriptions following the table. Key: Yellow highlights are new components with new options; Red, bold italicized text are original components with some new text or options.

**DETAILED COMPONENTS FOR ALL FISHERIES**

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.8.2</td>
<td>Eligibility For Camera Use</td>
<td>N/A</td>
<td>Vessel in good standing and has approved equipment and operational plan certifications.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Initial eligibility criteria:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Limited entry groundfish trawl permit</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Quota share permit</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. No IFQ deficits</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. No civil penalties related to fishing activity exceeding a certain amount <strong>and timeframe</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Schematic and Description of NMFS approved Individual Vessel Monitoring Plan (IVMP)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>a. IVMP unique for each vessel</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Multiple IVMPs included if submitted by group of vessels</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6. Self-Governing Plan (if applicable, not required)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>a. Data Delivery and Analysis (DDA) specifications</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. submitted by either a group of vessels or an individual vessel</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Continued eligibility:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Participants must be in compliance with their IVMP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Demonstrate proper documentation of the discards in logbooks or on video</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. No civil penalties related to fishing activity exceeding a certain amount within the time period of EM use</td>
<td></td>
</tr>
</tbody>
</table>
| 2.8.3 | Application Approval and Required Information | N/A | Requires application to NMFS to use EM, could include:

1. Operational Informational 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 |
Table 2-1. Summary of EM program components and alternatives with options for all fisheries. NOTE: Section references in the table coincide with descriptions following the table. Key: Yellow highlights are new components with new options; Red, bold italicized text are original components with some new text or options.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.8.4</td>
<td>EM Vessel Operational Plan - Individual Vessel Monitoring Plans (IVMP)</td>
<td>No plan required</td>
<td>EM Operational Plan Required</td>
<td>Potential categories of information in an IVMP:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a) Type of system</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>b) Hardware</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>c) Software</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>d) Emergency protocols</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>e) Back-up equipment use protocols</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>f) Catch handling protocols</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>g) Layout of vessel</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>h) Screen shots of all camera views</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>i) Number of cameras needed with placement specifications</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>j) Care and maintenance of the EM system</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>k) Types of sensors and data for sensors to capture</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>l) Download/maintenance schedule</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>m) Logbook format (electronic or paper)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>n) Tamper Resistant/Taper Evident</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>o) Lighting Locations (Stern, Deck, Discard Shoot, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>p) Bridge Mounted Computer Interface/Monitors</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>q) GPS Receiver</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>r) Winch Sensors</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>s) Hydraulic Pressure Transducers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>t) Power Supply / Backup</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>u) Wire Runs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>v) Geo Fencing (NMFS supplied)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>w) System’s Check Certification</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x) Data logger</td>
</tr>
</tbody>
</table>

Electronic Monitoring Analysis 30 June 2014
Table 2-1. Summary of EM program components and alternatives with options for all fisheries. NOTE: Section references in the table coincide with descriptions following the table. Key: Yellow highlights are new components with new options; Red, bold italicized text are original components with some new text or options.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.8.5</td>
<td>EM Vessel Operational Plan - IVMP Expiration</td>
<td>No plan required</td>
<td>Option A – No Expiration unless modifications are made</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Approval of plans by NMFS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Plan modification provisions: (NMFS to decide how this is done)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. EM Provider and vessel operator provisions – changes that do not need re-approval by NMFS (e.g. camera position changes)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. NMFS provisions - changes that trigger the need for re-approval by NMFS (e.g. operator will use a different vessel)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Option B – Annual Expiration or if modifications are made</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Same as Option A but with annual expiration</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Option C - Indefinite (example 2 or 3 year duration)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Same as Option A but with Indefinite expiration</td>
<td></td>
</tr>
<tr>
<td>2.8.6</td>
<td>Declaration of EM Use</td>
<td>No declaration except for current VMS requirements</td>
<td>Option A - Annual Declaration</td>
<td>Use EM all year</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Option B - Declaration for Intermittent Use</td>
<td>For the coming year, participants must indicate in which months, if any, it will use EM and in which months, if any, it will use an observer. (e.g. quarterly)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Option C - Trip by Trip Basis</td>
<td>Vessel and the observer provider would need to work out when observers may be available on a per trip basis.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Exception for Emergency Situation for Option A and B</td>
<td>For example, camera broke so need an observer tomorrow, vice versa</td>
</tr>
</tbody>
</table>
Table 2-1. Summary of EM program components and alternatives with options for all fisheries. NOTE: Section references in the table coincide with descriptions following the table. Key: Yellow highlights are new components with new options; Red, bold italicized text are original components with some new text or options.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.9</td>
<td>Equipment and Protocol Provisions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9.1</td>
<td>EM Equipment Requirements</td>
<td>N/A</td>
<td>Options for specification of technology hardware, data formats, etc. including consideration for changes through time. <em>Both Open Source or Proprietary should be allowed if they meet the performance criteria.</em></td>
<td></td>
</tr>
</tbody>
</table>
| 2.9.2             | Data Transfer Process                          | Completed by observers                       | Video data transfer, electronic/paper logbook, and data logger information will be developed during implementation of the program. Some of this information would be disclosed in an IVMP. Includes secure transfer for data and chain of custody requirements. Options (not mutually exclusive)  
• *Vessel operator*  
• Crew  
• Shoreside catch monitor  
• PSMFC  
• EM Provider  
• Enforcement  
• *Contractor (hired by processor, port, or fisher)* |
| 2.9.3             | Data Confidentiality/Accessibility/Ownership (all data collected in the EM system) | Status quo                                   | Only data according to Magnuson-Stevens Act is confidential. Describe confidentiality standards for fishery participants. Status quo protocols will be used for access, ownership, and public dissemination. |
Table 2-1. Summary of EM program components and alternatives with options for all fisheries. NOTE: Section references in the table coincide with descriptions following the table. Key: Yellow highlights are new components with new options; Red, bold italicized text are original components with some new text or options.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
</table>
| 2.9.4             | Video and Data Processing and Analysis | N/A                                        | Video reviewers (not mutually exclusive): | Option A - NMFS  
|                   |           |                                            | Option B - PSMFC  
|                   |           |                                            | Option C - EM Provider  
|                   |           |                                            | *Option D - Third Party*                             |
| 2.10              | WCGOP Scientific Observations |                                            |                                            |                                                        |
| 2.10.1            | Payment for Scientific data collection/observations | Status quo however in near future industry will need to pay for all observer costs | **Option A**: Government funded, same as pre IFQ  
|                   |           |                                            | **Option B**: Industry Funded  
|                   |           |                                            | **Option C**: Combination of both Government and Industry [Need to discuss allocating costs]  
|                   |           |                                            | GEMPAC Recommended Preliminary Preferred Alts:  
|                   |           |                                            | Most industry representatives would like Option A |
| 2.11              | NMFS Processes | N/A                                        | Identify items for NMFS to work out and then conduct a formal deeming process with the Council (i.e., Observer Exemption Application, Application and Approval Process, EM Equipment Type-Approval, IVMP Review) |                                                        |
| 2.12              | Spatial Variation for High Bycatch Areas | Status quo for current area restrictions (e.g., Rockfish Conservation Areas) | **Option A** - No special provisions  
|                   |           |                                            | **Option B** - fishing activity in areas that are likely to have lower bycatch could be monitored with EM rather than using observers; no EM in high bycatch areas  
|                   |           |                                            | **Option C** - Under this option, if you chose to fish in a high bycatch area, a higher level of EM review may be required |
Table 2-1. Summary of EM program components and alternatives with options for all fisheries. NOTE: Section references in the table coincide with descriptions following the table. Key: Yellow highlights are new components with new options; Red, bold italicized text are original components with some new text or options.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.13</td>
<td>Adaptive or Phased Implementation</td>
<td>N/A</td>
<td>Option A. None, implement all fisheries at one time through regulatory implementation</td>
<td>Option B. Use EFPs to test final Council policy, prior to full regulatory implementation. Option C. Phase in by sector/gear. Option D. Phase in retention options over time. Options B-D are not mutually exclusive.</td>
</tr>
</tbody>
</table>
**Fishery Specific Alternatives and Options**

Several components in Table 2-1 are applicable to all fisheries and do not have options; therefore they are not presented in the fishery specific Tables 2-2 through 2-4. Fishery specific decision Tables 2-2 through 2-4 provide the alternatives and options that are germane to each fishery. Only components of the EM program that contain options are provide in the tables. These are the decision points for the Council for each fishery.

Table 2-2. Decision table for alternatives and options specific to midwater trawl whiting. NOTE: Section references in the table coincide with section descriptions in document.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Component</td>
<td>Status Quo: Human Observers Estimate Discard</td>
<td>Camera Recordings Used to Estimate Discard</td>
<td>Logbooks Used to Estimate Discard, with Camera Audits</td>
</tr>
<tr>
<td>2.2.2</td>
<td>Video Reading Protocols</td>
<td>None</td>
<td>Option A: 100% (census). Option B: Subsample Video (must develop) GEMPAC recommended preliminary Preferred Alts: MDWT whiting representatives like Alternative 3, audit logbook at 10% review level but would like to see analysis for Alternative 2, Option B.</td>
<td>Audit logbook (intensity varies based on vessel's compliance history) GEMPAC recommended preliminary Preferred Alts: Fixed gear representatives like Alternative 3, logbook audit.</td>
</tr>
<tr>
<td>2.3</td>
<td>Discard Accounting - Individual or Fleet-wide</td>
<td>Observers/IFQ</td>
<td>Accounting of discards are either accounted against IFQ, accounted against sector-wide, annual catch limit (ACL), or not accounted. Estimation of discard may be done through EM, WCGOP observer program, or not estimated. (See Table 2-1, Section 2.3 for option details)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Option A: One discard category and all discards are estimated using EM and counted against IFQ. 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: Option C: Split into two discard categories; Category 1 count against IFQ, no accounting for discard 2 category. Council staff note: In order for option 3 to be valid it would have to comply with MSA national standards. All catch and discard must be accounted to estimate total mortality estimates and ensure annual catch limits are not exceeded.</td>
<td></td>
</tr>
</tbody>
</table>
Table 2-2. Decision table for alternatives and options specific to midwater trawl whiting. NOTE: Section references in the table coincide with section descriptions in document.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>1 Status Quo: Human Observers Estimate Discard</th>
<th>2 Camera Recordings Used to Estimate Discard</th>
<th>3 Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4</td>
<td>Definitions for Total Catch Accounting - Total Catch, Discard, Retained</td>
<td>Use WCGOP definitions</td>
<td>NOTE: Under the IFQ and catch allocation system all catch must be accounted for to debit individual QS accounts and fishery allocations, regardless if it categorized as retained catch or discard.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Retained catch for fixed gear and trawl: Retained catch is any portion of the total catch that is delivered to a buyer or processor.</td>
<td></td>
</tr>
<tr>
<td>2.5</td>
<td>Discard Requirements</td>
<td>Maximized Retention</td>
<td>Option A: Maximized Retention - A vessel is generally required to retain all catch share species, non-catch share groundfish species, non-groundfish species (Non-FMP and not prohibited species). Sorting whiting at-sea requires discard of prohibited and protected species however this is generally not practiced.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GEMPAC Recommended Preliminary Preferred Alts:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Midwater trawl whiting representatives prefer Maximize retention (Option A)</td>
<td></td>
</tr>
<tr>
<td>2.6</td>
<td>Halibut Retention/Discard</td>
<td>Observers/100% mortality</td>
<td>Option A: Apply mortality rate for specific gear type: MDWT Whiting 100% mortality</td>
<td></td>
</tr>
</tbody>
</table>
Table 2-2. Decision table for alternatives and options specific to midwater trawl whiting. NOTE: Section references in the table coincide with section descriptions in document.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>1 Status Quo: Human Observers Estimate Discard</th>
<th>2 Camera Recordings Used to Estimate Discard</th>
<th>3 Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.7</td>
<td>Discard Species List Adjustments</td>
<td>Use current regulatory requirements for discard</td>
<td>Options for a process to expand or change the species lists:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Option A</strong>: NMFS to make determination and provide list to fishers through the NMFS EM Observer Exemption Process.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Option B</strong>: Use Council process for changing species list using routine management measures if initial list is fully analyzed for environmental impacts (e.g., use groundfish specification process, or some other routine management measure).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Option C</strong>: Set initial lists in regulation and change at some future point through Council process with proposed/final rule making.</td>
<td></td>
</tr>
<tr>
<td>2.8.5</td>
<td>EM Vessel Operational Plan - IVMP Expiration</td>
<td>No plan required</td>
<td><strong>Option A</strong> – No Expiration unless modifications are made</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Option B</strong> – Annual Expiration or if modifications are made</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Option C</strong> - Indefinite (example 2 or 3 year duration)</td>
<td></td>
</tr>
<tr>
<td>2.8.6</td>
<td>Declaration of EM Use</td>
<td>No declaration except for VMS requirements</td>
<td><strong>Option A</strong> - Annual Declaration</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Use EM all year</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Option B</strong> - Declaration for Intermittent Use</td>
<td>For the coming year, participants must indicate in which months, if any, it will use EM and in which months, if any, it will use an observer. (e.g. quarterly)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Option C</strong> -Trip by Trip Basis</td>
<td>Vessel and the observer provider would need to work out when observers may be available on a per trip basis.</td>
</tr>
</tbody>
</table>
Table 2-2. Decision table for alternatives and options specific to midwater trawl whiting. NOTE: Section references in the table coincide with section descriptions in document.

**MIDWATER TRAWL WHITING ALTERNATIVES**

<table>
<thead>
<tr>
<th>Component</th>
<th>Section Reference</th>
<th>1 Status Quo: Human Observers Estimate Discard</th>
<th>2 Camera Recordings Used to Estimate Discard</th>
<th>3 Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Transfer Process</td>
<td>2.9.2</td>
<td>Completed by observers</td>
<td>Video data transfer, electronic/paper logbook, and data logger information will be developed during implementation of the program. Some of this information would be disclosed in an IVMP.</td>
<td>Includes secure transfer for data and chain of custody requirements. Options (not mutually exclusive) • Vessel operator • Crew • Shoreside catch monitor • PSMFC • EM Provider • Enforcement • Contractor (hired by processor, port, or fisher)</td>
</tr>
<tr>
<td>Video and Data Processing and Analysis</td>
<td>2.9.4</td>
<td>N/A</td>
<td>Video reviewers (not mutually exclusive): Option A - NMFS Option B - PSMFC Option C - EM Provider Option D - Third Party</td>
<td></td>
</tr>
<tr>
<td>Payment for Scientific data collection/observations</td>
<td>2.10.1</td>
<td>Status quo however in near future industry will need to pay for all observer costs</td>
<td>Option A: Government funded, same as pre IFQ Option B: Industry Funded Option C: Combination of both Government and Industry [Need to discuss allocating costs]</td>
<td>GEMPAC Recommended Preliminary Preferred Alts: Most industry representatives would like Option A</td>
</tr>
<tr>
<td>Spatial Variation for High Bycatch Areas</td>
<td>2.12</td>
<td>Status quo for current are restrictions (e.g., Rockfish Conservation Areas)</td>
<td>Option A - No special provisions Option B - fishing activity in areas that are likely to have lower bycatch could be monitored with EM rather than using observers; no EM in high bycatch areas Option C - Under this option, if you chose to fish in a high bycatch area, a higher level of EM review may be required</td>
<td></td>
</tr>
<tr>
<td>Adaptive or Phased Implementation</td>
<td>2.13</td>
<td>N/A</td>
<td>Option A. None, implement all fisheries at one time through regulatory implementation Option B. Use EFPs to test final Council policy, prior to full regulatory implementation. Option C. Phase in by sector/gear. Option D. Phase in retention options over time. Options B-D are not mutually exclusive.</td>
<td></td>
</tr>
</tbody>
</table>
Table 2-3. Decision table for alternatives and options specific to fixed gear (longline and pot). NOTE: Section references in the table coincide with section descriptions in document.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2.2</td>
<td>Video Reading Protocols</td>
<td>None</td>
<td>Option A: 100% (census). Option B: Subsample Video (% to review must be developed)</td>
<td>Audit logbook (intensity varies based on vessel's compliance history)</td>
</tr>
<tr>
<td>2.3</td>
<td>Discard Accounting - Individual or Fleet-wide</td>
<td>Observers/IFQ</td>
<td>Accounting of discards are either accounted against IFQ, accounted against sector-wide, annual catch limit (ACL), or not accounted. Estimation of discard may be done through EM, WCGOP observer program, or not estimated. (See Table 1, Section 2.3 for option details) Option A: One discard category and all discards are estimated using EM and counted against IFQ. 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: Option C: Split into two discard categories; Category 1 count against IFQ, no accounting for discard 2 category.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Counsil staff note: In order for option 3 to be valid it would have to comply with MSA national standards. All catch and discard must be accounted to estimate total mortality estimates and ensure annual catch limits are not exceeded.</td>
<td></td>
</tr>
</tbody>
</table>
Table 2-3. Decision table for alternatives and options specific to fixed gear (longline and pot). NOTE: Section references in the table coincide with section descriptions in document.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIXED GEAR ALTERNATIVES (LONGLINE AND POT)</strong></td>
<td><strong>Status Quo: Human Observers Estimate Discard</strong></td>
<td><strong>Camera Recordings Used to Estimate Discard</strong></td>
<td><strong>Logbooks Used to Estimate Discard, with Camera Audits</strong></td>
<td></td>
</tr>
<tr>
<td>2.4</td>
<td>Definitions for Total Catch Accounting - Total Catch, Discord, Retained</td>
<td>Use WCGOP definitions</td>
<td>NOTE: Under the IFQ and catch allocation system all catch must be accounted for to debit individual QS accounts and fishery allocations, regardless if it categorized as retained catch or discard.</td>
<td></td>
</tr>
<tr>
<td>2.5</td>
<td>Discard Requirements</td>
<td>Discard at will unless required to retain.</td>
<td><strong>Option A: Maximized Retention</strong> - A vessel is generally required to retain all catch share species, non-catch share groundfish species, non-groundfish species (Non-FMP and not prohibited species)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Option B: Optimize Retention of Catch Share Species with Limited discards</strong> - A vessel is generally required to retain all catch share species. Potential Gear Specific Sub-options under Optimized Retention (must be verifiable under EM)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Option C - Discard At Will (Status Quo)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>GEMPAC Recommended Preliminary Preferred Alts:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Fixed gear and bottom trawl representatives prefer Optimized retention (option B)</td>
<td></td>
</tr>
</tbody>
</table>

Electronic Monitoring Analysis 40 June 2014
Table 2-3. Decision table for alternatives and options specific to fixed gear (longline and pot). NOTE: Section references in the table coincide with section descriptions in document.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
</table>
| 2.6               | Halibut Retention/Discard with Fishery Specific Options | Use Observers and IPHC protocols for applying mortality | Option A: Fixed gear longline 16% mortality if discarded; Fixed gear pot 18% mortality if discarded.  
Option B: WCGOP scientific observations (assumed 20-30% coverage) is applied to fleet  
Option C: IPHC exemption to allow full retention (need to examine the feasibility of this option for fisheries other than MDWT whiting)  
Option D: Captain and crew provide assessment (training would be required)  
Option E: Use EM viability assessment (currently conducting study, need IPHC approval)  
Option F: Use vessel specific mortality rate (update rates periodically) | |
| 2.7               | Discard Species List Adjustments | Use current regulatory requirements for discard | Options for a process to expand or change the species lists:  
Option A: NMFS to make determination and provide list to fishers through the NMFS EM Observer Exemption Process.  
Option B: Use Council process for changing species list using routine management measures if initial list is fully analyzed for environmental impacts (e.g., use groundfish specification process, or some other routine management measure).  
Option C: Set initial lists in regulation and change at some future point through Council process with proposed/final rule making. | |
| 2.8.5             | EM Vessel Operational Plan - IVMP Expiration | No plan required | Option A – No Expiration unless modifications are made  
Option B – Annual Expiration or if modifications are made  
Option C - Indefinite (example 2 or 3 year duration) | |

Electronic Monitoring Analysis 41 June 2014
Table 2-3. Decision table for alternatives and options specific to fixed gear (longline and pot). NOTE: Section references in the table coincide with section descriptions in document.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.8.6</td>
<td>Declaration of EM Use</td>
<td>No declaration</td>
<td>Option A - Annual Declaration</td>
<td>CAMERA RECORDINGS USED TO ESTIMATE DISCARD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Use EM all year</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Option B</strong> - Declaration for Intermittent Use</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>For the coming year, participants must indicate in which months, if any, it will use EM and in which months, if any, it will use an observer. (e.g. quarterly)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Option C</strong> - Trip by Trip Basis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vessel and the observer provider would need to work out when observers may be available on a per trip basis.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Exception for Emergency Situation for Option A and B</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>For example, camera broke so need an observer tomorrow, vice versa</td>
<td></td>
</tr>
<tr>
<td>2.9.2</td>
<td>Data Transfer Process</td>
<td>Completed by observers</td>
<td>Video data transfer, electronic/paper logbook, and data logger information will be developed during implementation of the program. Some of this information would be disclosed in an IVMP.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Includes secure transfer for data and chain of custody requirements.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Options (not mutually exclusive)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Vessel operator • Crew</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Shoreside catch monitor</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• PSMFC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• EM Provider</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Enforcement</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Contractor (hired by processor, port, or fisher)</td>
<td></td>
</tr>
<tr>
<td>2.9.4</td>
<td>Video and Data Processing and Analysis</td>
<td>N/A</td>
<td>Video reviewers (not mutually exclusive): Option A - NMFS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Option B - PSMFC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Option C - EM Provider</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Option D - Third Party</td>
<td></td>
</tr>
</tbody>
</table>

Electronic Monitoring Analysis  42  June 2014
Table 2-3. Decision table for alternatives and options specific to fixed gear (longline and pot). NOTE: Section references in the table coincide with section descriptions in document.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIXED GEAR ALTERNATIVES (LONGLINE AND POT)</strong></td>
<td><strong>Status Quo: Human Observers Estimate Discard</strong></td>
<td><strong>Camera Recordings Used to Estimate Discard</strong></td>
<td><strong>Logbooks Used to Estimate Discard, with Camera Audits</strong></td>
<td></td>
</tr>
<tr>
<td>2.10.1</td>
<td>Payment for Scientific data collection/observations</td>
<td>Status quo however in near future industry will need to pay for all observer costs</td>
<td>Option A: Government funded, same as pre IFQ&lt;br&gt;Option B: Industry Funded&lt;br&gt;Option C: Combination of both Government and Industry [Need to discuss allocating costs]&lt;br&gt;GEMPAC Recommended Preliminary Preferred Alts: Most industry representatives would like Option A</td>
<td></td>
</tr>
<tr>
<td>2.12</td>
<td>Spatial Variation for High Bycatch Areas</td>
<td>Status quo for current area restrictions (e.g., Rockfish Conservation Areas)</td>
<td>Option A - No special provisions&lt;br&gt;Option B - fishing activity in areas that are likely to have lower bycatch could be monitored with EM rather than using observers; no EM in high bycatch areas&lt;br&gt;Option C - Under this option, if you chose to fish in a high bycatch area, a higher level of EM review may be required</td>
<td></td>
</tr>
<tr>
<td>2.13</td>
<td>Adaptive or Phased Implementation</td>
<td>N/A</td>
<td>Option A. None, implement all fisheries at one time through regulatory implementation&lt;br&gt;Option B. Use EFPs to test final Council policy, prior to full regulatory implementation.&lt;br&gt;Option C. Phase in by sector/gear.&lt;br&gt;Option D. Phase in retention options over time. Options B-D are not mutually exclusive.</td>
<td></td>
</tr>
</tbody>
</table>

Electronic Monitoring Analysis 43 June 2014
Table 2-4. Decision table for alternatives and options specific to bottom and non-whiting midwater trawl. NOTE: Section references in the table coincide with section descriptions in document.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2.2</td>
<td>Video Reading Protocols</td>
<td>None</td>
<td>Option A: 100% (census). Option B: Subsample Video (% to review must be developed)</td>
<td>Audit logbook (intensity varies based on vessel's compliance history)</td>
</tr>
<tr>
<td>2.3</td>
<td>Discard Accounting - Individual or Fleet-wide</td>
<td>Observers/IFQ</td>
<td>Accounting of discards are either accounted against IFQ, accounted against sector-wide, annual catch limit (ACL), or not accounted. Estimation of discard may be done through EM, WCGOP observer program, or not estimated. (See Table 1, Section 2.3 for option details)</td>
<td></td>
</tr>
</tbody>
</table>

**Option A:** One discard category and all discards are estimated using EM and counted against IFQ.

**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.

**Option C:** Split into two discard categories; Category 1 count against IFQ, no accounting for discard 2 category.

Council staff note: In order for option 3 to be valid it would have to comply with MSA national standards. All catch and discard must be accounted to estimate total mortality estimates and ensure annual catch limits are not exceeded.
Table 2-4. Decision table for alternatives and options specific to bottom and non-whiting midwater trawl. NOTE: Section references in the table coincide with section descriptions in document.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4</td>
<td>Definitions for Total Catch Accounting - Total Catch, Discard, Retained</td>
<td>Use WCGOP definitions</td>
<td>NOTE: Under the IFQ and catch allocation system all catch must be accounted for to debit individual QS accounts and fishery allocations, regardless if it categorized as retained catch or discard.</td>
<td></td>
</tr>
</tbody>
</table>

**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.
Table 2-4. Decision table for alternatives and options specific to bottom and non-whiting midwater trawl. NOTE: Section references in the table coincide with section descriptions in document.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>Discard Requirements</td>
<td>Discard at will unless required to retain.</td>
<td>Option A: Maximized Retention - A vessel is generally required to retain all catch share species, non-catch share groundfish species, non-groundfish species (Non-FMP and not prohibited species)</td>
<td>Option B: Optimize Retention of Catch Share Species with Limited discards - A vessel is generally required to retain all catch share species. Potential Gear Specific Sub-options under Optimized Retention (must be verifiable under EM) Option C - Discard At Will (Status Quo) GEMPAC Recommended Preliminary Preferred Alts: • Bottom trawl representatives prefer Optimized retention (option B)</td>
</tr>
<tr>
<td>2.6</td>
<td>Halibut Retention/Discard with Fishery Specific Options</td>
<td>Use Observers and IPHC protocols for applying mortality</td>
<td>Option A: MDWT non-whiting and BTW 90% mortality if discarded Option B: WCGOP scientific observations (assumed 20-30% coverage) is applied to fleet Option C: IPHC exemption to allow full retention (need to examine the feasibility of this option for fisheries other than MDWT whiting) Option D: Captain and crew provide assessment (training would be required) Option E: Use EM viability assessment (currently conducting study, need IPHC approval) Option F: Use vessel specific mortality rate (update rates periodically)</td>
<td></td>
</tr>
<tr>
<td>2.7</td>
<td>Discard Species List Adjustments</td>
<td>Use current regulatory requirements for discard</td>
<td>Options for a process to expand or change the species lists: Option A: NMFS to make determination and provide list to fishers through the NMFS EM Observer Exemption Process. Option B: Use Council process for changing species list using routine management measures if initial list is fully analyzed for environmental impacts (e.g., use groundfish specification process, or some other routine management measure). Option C: Set initial lists in regulation and change at some future point through Council process with proposed/final rule making.</td>
<td></td>
</tr>
</tbody>
</table>
Table 2-4. Decision table for alternatives and options specific to bottom and non-whiting midwater trawl. NOTE: Section references in the table coincide with section descriptions in document.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.8.5</td>
<td>EM Vessel Operational Plan - IVMP Expiration</td>
<td>No plan required</td>
<td>Option A – No Expiration unless modifications are made</td>
<td>Option A – No Expiration unless modifications are made Option B – Annual Expiration or if modifications are made Option C - Indefinite (example 2 or 3 year duration)</td>
</tr>
<tr>
<td>2.8.6</td>
<td>Declaration of EM Use</td>
<td>No declaration</td>
<td>Option A - Annual Declaration</td>
<td>Use EM all year</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Option B - Declaration for Intermittent Use</td>
<td>For the coming year, participants must indicate in which months, if any, it will use EM and in which months, if any, it will use an observer. (e.g. quarterly)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Option C - Trip by Trip Basis</td>
<td>Vessel and the observer provider would need to work out when observers may be available on a per trip basis.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Exception for Emergency Situation for Option A and B</td>
<td>For example, camera broke so need an observer tomorrow, vice versa</td>
</tr>
<tr>
<td>2.9.2</td>
<td>Data Transfer Process</td>
<td>Completed by observers</td>
<td>Video data transfer, electronic/paper logbook, and data logger information will be developed during implementation of the program. Some of this information would be disclosed in an IVMP.</td>
<td>Includes secure transfer for data and chain of custody requirements. Options (not mutually exclusive) • Vessel operator • Crew • Shoreside catch monitor • PSMFC • EM Provider • Enforcement • Contractor (hired by processor, port, or fisher)</td>
</tr>
</tbody>
</table>
Table 2-4. Decision table for alternatives and options specific to bottom and non-whiting midwater trawl. NOTE: Section references in the table coincide with section descriptions in document.

<table>
<thead>
<tr>
<th>Section Reference</th>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.9.4</td>
<td>Video and Data Processing and Analysis</td>
<td>N/A</td>
<td>Video reviewers (not mutually exclusive): Option A - NMFS</td>
<td>Option B - PSMFC Option C - EM Provider Option D - Third Party</td>
</tr>
<tr>
<td>2.10.1</td>
<td>Payment for Scientific data collection/observations</td>
<td>Status quo however in near future industry will need to pay for all observer costs</td>
<td>Option A: Government funded, same as pre IFQ Option B: Industry Funded Option C: Combination of both Government and Industry [Need to discuss allocating costs] GEMPAC Recommended Preliminary Preferred Alts: Most industry representatives would like Option A</td>
<td></td>
</tr>
<tr>
<td>2.12</td>
<td>Spatial Variation for High Bycatch Areas</td>
<td>Status quo for current area restrictions (e.g., Rockfish Conservation Areas)</td>
<td>Option A - No special provisions Option B - fishing activity in areas that are likely to have lower bycatch could be monitored with EM rather than using observers; no EM in high bycatch areas Option C - Under this option, if you chose to fish in a high bycatch area, a higher level of EM review may be required</td>
<td></td>
</tr>
<tr>
<td>2.13</td>
<td>Adaptive or Phased Implementation</td>
<td>N/A</td>
<td>Option A. None, implement all fisheries at one time through regulatory implementation Option B. Use EFPs to test final Council policy, prior to full regulatory implementation. Option C. Phase in by sector/gear. Option D. Phase in retention options over time. Options B-D are not mutually exclusive.</td>
<td></td>
</tr>
</tbody>
</table>
2.2 Compliance Monitoring - Overview

All IFQ trips must be monitored in an adequate manner to provide the necessary data to debit QP accounts. In order to monitor the fisheries for compliance with the IFQ program, discard must either be monitored by a human observer or be captured on video for a video reviewer to verify the discard events.

2.2.1 Discard Documentation Technology and Documentation Coverage

Currently, all discard on IFQ trips must be monitored by a human observer in order to monitor the fisheries for compliance with the IFQ program. Observers participating in the IFQ program are referred to as IFQ program observers and are employed by private third-party companies. Vessels make arrangements with the third-party observer provider to secure an observer for a trip and pay the provider directly. The Northwest Fisheries Science Center trains, certifies, and equips IFQ program observers; ensures data quality; and stores, maintains, and analyzes data collected by observers. Under all alternatives, vessels would continue to have the option to use human observers for compliance monitoring and it’s expected that “third-party” observer providers would continue to provide this service to the vessels in the IFQ program.

Under the proposed action, discard must either be monitored by a human observer (Alternative 1) or be captured on video for a video reviewer to verify the discard events. A voluntary EM program provides the industry an opportunity to choose either a human observer or EM to monitor their compliance with IFQs, IBQs, and catch allocations. Both catch and discard is debited from the QP or catch allocation. Catch that is landed would continue to be monitored shoreside with catch monitors that are employed as a “third-party” observer. At sea, discarded catch would be monitored by either a human observer or EM. The EM program would need to account for discard events and provide sufficient information to identify fish species and enumerate the weight of fish discarded so that QP accounts and catch allocations can be debited in a timely manner. Under these alternatives, and in support of the current requirement of the IFQ program, 100% observations of all IFQ trips must be observed through either EM or human observers.

2.2.2 Video Reading Protocols

A discard monitoring method that would adequately account for discard in each fishery is necessary and likely the most critical component of an EM program. The data source to accurately account for discard is either a human observer, logbook, or video data.
2.2.2.1 Alternative 1 - No Action

The No Action Alternative or status quo (Alternative 1) defines the default management structure if no Federal action was taken. Under Alternative 1, the current mandatory 100% human observer coverage would continue in order to monitor fishery participants for compliance with IFQs, IBQs, and allocated groundfish. Existing requirements and regulations to participate in the Shorebased IFQ program would be maintained. This information is described in subparts C through E of Part 50 of the Code of Federal Regulations (CFR). These subparts include, but are not limited to, requirements for a limited entry and QS permit, use of a vessel monitoring system (VMS), at sea observer requirements, human catch monitors at shoreside first receiver locations, and reporting requirements (i.e., logbook, fish ticket, economic data collection program, and prohibitions). Under Alternative 1, the cost for observer coverage in the near future will no longer be federally subsidized. It’s expected that the industry will pay the full amount for compliance monitoring by human observers. The 2014 subsidy rate by the Federal government is 48% of the cost for an observer per day of fishing activity.

2.2.2.2 Alternative 2 - Camera Recordings Used to Estimate Discard

Under Alternative 2, the video images are the sole data source for estimating discards. The video is review for fish discarded by fishermen, the species are identified, assign an estimated weight, and the QS account is debited. Two options are identified under Alternative 2 to conduct the review and estimate the catch:

**Option A:** 100% (census)
**Option B:** Subsample Video

Option A is to conduct a census of all video images i.e., review all video segments and estimate the total discard for each set or haul that occurred in a trip. Option B is to subsample the video images at some predetermined percent of video review (e.g., 25%), speciate the discard, estimate the weight of the discard, then expand the discard rate to the entire set, haul, or trip to provide a total estimated discard for the trip.

2.2.2.3 Alternative 3 - Logbooks Use to Estimate Discard, with Camera Audits

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. The video images of documented discard events would be reviewed at some predetermined level (e.g., 25%) to verify the discard. In addition, all video segments would be subject to random review, at some predetermined level, (e.g., 10%) to look for undocumented discard events. This would ensure the vessel is in compliance with the EM program and documentation of all discard events.
2.3 Discard Accounting – Individual or Fleetwide

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 monitors to estimate and report discards by species.

![Figure 2-1. General depiction of total catch accounting in the Shorebased IFQ program.](image)

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 and scenarios noted in Figure 2-1 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 need to be used to account for the discard activity. In addition, some events may be captured by EM but are difficult to quantify or are rare, such as floating fish on the surface of the water or a fish dropped from the gear.

If these events cannot be estimated using EM, then they could be estimated either annually by the WCGOP or not at all. The discard could be estimated using historical observations by the WCGOP for the time period of 2010 to 2014 to get an average number per year or through the annual observations made by WCGOP that are on vessels that do not use EM in combination with vessels that are randomly selected to have a scientific observer while the vessel uses EM.

In addition, rather than accounting for this discard 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 or not at all. Assuming that the total mortality estimated at the sector level from this activity is minor amounts and would not affect individual vessels quota share accounts or other fishery participants, 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.

Potential changes were developed in the flowing way:
1) Discard events were grouped into discard categories 1 and 2;
2) Accountability was established (i.e., IFQ, Fleetwide, or not accounted);
3) Data source were identified as either EM or the WCGOP.

Three possible options were developed for discard accounting:

**Option A: Estimate Discard with EM and Count against IFQ**
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/washed out of net for safety reasons (bleeding, pull zipper, etc.).
- Dropped off gear
- Floating fish
- 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**

**Discard 1 IFQ Accounting:**
- Dumped off deck (e.g., shoveled, picked out of net)
- Dumped/washed out of net for safety reasons (bleeding, pull zipper, etc.).
- Unobserved sets/hauls (not captured by EM, apply discard rate using WCGOP

**Discard 2 Sector or ACL accounting:**
- Dropped off gear (use WCGOP estimates)
- Floating fish (use WCGOP estimates)
- Estimated from lost gear (estimate using WCGOP protocol)
- Consumed/used as bait (not captured by EM, use WCGOP estimates)

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

**Discard 1 IFQ Accounting:**
- Dumped off deck (e.g., shoveled, picked out of net)
- Dumped/washed out of net for safety reasons (bleeding, pull zipper, etc.).
- Unobserved sets/hauls (not captured by EM, apply discard rate using WCGOP

**Discard 2 No accounting:**
• Dropped off gear
• Floating fish
• Lost gear
• Consumed/used as bait

Council staff note: In order for option 3 to be valid it would have to comply with MSA national standards. All catch and discard must be accounted to estimate total mortality estimates and ensure annual catch limits are not exceeded.

2.4 Definitions for Total Catch Accounting - Total Catch, Discard, Retained

For analysis purpose the GEMPAC has developed draft definitions for the total, retained, discarded catch under an EM program. WCGOP provided the GEMPAC draft definitions of total catch and discard that are specific to trawl and fixed gear. The GEMPAC consolidate the individual gear definitions for total catch and discard into the following draft definitions:

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.

Total catch for fixed gear: Total catch is defined as the sum, or estimated weight, of all organic and inorganic material caught by the gear to include any fish hooked or in a pot as the gear 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.

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

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.

2.5 Discard Requirements

Currently, under the trawl rationalization program each fishery may discard, or is required to discard, certain species. Under an EM program, discard events will be documented with video; however, it may be difficult to identify some species or differentiate between species on video. Therefore, each fishery is examined for potential discard options and retention requirements under an EM program (see Section 4.3.). For example, when longline fishing, video cameras may be able to capture each individual species as it is hauled above the surface of the water and boarded. However, it still may be difficult to see which species of fish incidentally fell off the hook or was discarded prior to being boarded. In addition, when retrieving a midwater trawl net, fish may “bleed” out of the net as it surfaces so it may be difficult to capture the weight and identification of species when they are unintentionally discarded as a mixed group.
Some statutory management measures such as the Endangered Species Act (ESA) or the Marine Mammal Protection Act (MMPA) may restrict the consideration of some retention rules. Currently, there is an exception for the midwater trawl fishery that targets whiting which allows retention of salmon and halibut if the fish are not sorted at sea. Therefore, exceptions are provided as part of the description of alternatives.

There are three Options identified that allow for discard (Table 2-1, Section 2.5) maximized retention (minimal discard allowed), B) optimized retention (some allowable discard of IFQ species), and C) discard at will (discard any species). The retention and discard requirements are described under each alternative. Exceptions for allowable discard are also described and includes the species groups that may potentially be discarded under each alternative. The discard species are grouped by catch share groundfish species, non-catch share groundfish species, non-groundfish species, prohibited species (halibut, salmon and Dungeness crab), and ESA/MMPA protected species (turtles, marine mammals, seabirds, etc.). Table 2-5, Table 2-6 and Table 2-7 contain species lists.

For analysis purpose the GEMPAC has developed draft definitions for the retention of species under an EM program. The draft definitions were developed based on existing descriptions for maximized and optimized retention options developed in previous GEMPAC reports and adopted by the Council in November 2013. Both definitions contain the same existing regulatory requirements and discard exceptions.

### 2.5.1 Option A: Maximize Retention

**Definition:** A vessel is generally required to retain all catch share species, non-catch share groundfish species, non-groundfish species (Non-FMP and not prohibited species).

- No selective discard for catch share species, non-catch share groundfish species
- No selective discard for non-groundfish species
- Allow selective discard of trash, mud coral, etc.
- Require selective discards of prohibited species (except whiting trips);
- Require selective discards of ESA and MMPA species (i.e., protected species).
- Non-selective discard for e.g., safety, "bleeding net", zipper accidentally opened, fish came off hook, gilled in net

The following regulatory requirements or discard exceptions apply:

**Existing Regulatory Requirements**

Vessels must discard prohibited, ESA-listed, and marine mammal species unless otherwise allowed to retain them by regulation or under federal exemption for scientific purposes. The following regulatory requirements apply:

- Mid-water trawl IFQ trips for whiting that deliver to shoreside processors must retain prohibited species (halibut, salmon, and Dungeness crab) unless sorting at sea.
- Mid-water trawl catcher vessels delivering to motherships must retain prohibited species
(halibut, salmon, and Dungeness crab).

- Midwater trawl whiting trips that are unsorted may discard minor amounts of catch not delivered to shoreside or mothership processors. (current regulation: “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).”)
- For LE fixed gear 22 or 24 inch lingcod must be discarded or if the vessel exceeds their non-IFQ trip limit; i.e Regulatory discards. (The minimum size limit for lingcod is 22 inches (56 cm) total length North of 42° N. lat. and 24 inches (61 cm) total length South of 42° N. lat.) This information would need to be verifiable under an EM system.

Discard exceptions when fishing under maximized retention - All discards must be enumerated and reported
- The vessel may discard for safety reasons.
- The trawl net is ripped or zipper accidentally opened, or fish fell off hook.
- Fish washed out of the trawl net or is overflowing.
- Vessels may discard mud, sponges, coral, inverts, and inorganic material not generally retained for sale or use.

2.5.2 Option B: Optimize Retention Retain Catch Share Species with Limited Discard Options

The GEMPAC discussed fishery specific discard options under an optimized retention regulatory environment. The definition for optimized retention contains some fishery specific discard options, however it is difficult for the GEMPAC to select which species are appropriate for allowable discard since species identification issues while using EM limit the options. PSMFC has begun to identify species that may be identifiable for discard and further analysis of these options will need be conducted to assist the Council in choosing an initial species list that is specific to each fishery.

Definition: A vessel is generally required to retain all catch share species but may be allowed fishery specific selective discard options of some catch share, non-catch share, and groundfish species if verifiable with EM.

The following regulatory requirements and discard exceptions:

Existing Regulatory Requirements (Same as Maximzied Retention)
Vessels must discard prohibited, ESA-listed, and marine mammal species unless otherwise allowed by regulation or under federal exemption for scientific purposes. The following regulatory requirements apply:
- Mid-water trawl IFQ trips for whiting that deliver to shoreside processors must retain prohibited species (halibut, salmon, and Dungeness crab) unless sorting at sea.
- Mid-water trawl catcher vessels delivering to motherships must retain prohibited species (halibut, salmon, and Dungeness crab).
- Midwater trawl whiting trips that are unsorted may discard minor amounts (define?) of
catch not delivered to shoreside processors.

- For LE fixed gear 22 or 24 inch lingcod must be discarded or if the vessel exceeds their non-IFQ trip limit, i.e Regulatory discards. (The minimum size limit for lingcod is 22 inches (56 cm) total length North of 42° N. lat. and 24 inches (61 cm) total length South of 42° N. lat.)

This information would need to be verifiable under an EM system.

**Discard exceptions when fishing under maximized retention - All discards must be enumerated and reported (Same as Maximized Retention)**

- The vessel may discard for safety reasons (define?)
- The trawl net is ripped or zipper accidentally opened, or fish fell off hook.
- Fish washed out of the trawl net or is overflowing
- Vessels may discard mud, sponges, coral, inverts, and inorganic material not generally retained for sale or use.

**Potential Gear Specific Sub-options under Optimized Retention:**
This information would need to be verifiable under an EM system. Options here are not mutually exclusive; however, there must be adequate images for species identification and weight estimates of catch share species discards.

Midwater trawl non-whiting trips, bottomtrawl, and fixed gear trips may discard the following species if verifiable under the EM program and approved by NMFS:

a) For catch share species
   - Option a – Allow discard of flatfish
   - Option b – Allow discard of lingcod and sablefish
   - Option c – Allow discard of all non-rockfish groundfish (full retention of rockfish only)
   - Option d – Allow discard if species that are verifiable with EM

b) For non-catch share groundfish species
   - Option c – Allow discard of all non-rockfish groundfish (full retention of rockfish only)
   - Option d – Allow discard if species that are verifiable with EM

c) For non-groundfish (Non-FMP and not prohibited species)
   - Option e – Allow discard of all non-groundfish species
   - Option d – Allow discard if species that are verifiable with EM

2.5.3 **Option C: Discard At Will (Status Quo)**

Vessels would be allowed to fish in the same manner as they currently do and may discard any species or be required to retain species according to current regulations.

- May discard any species unless regulations require you to retain them
- May discard catch share species, non-catch share species
- May discard non-groundfish
- Allow selective discard of trash, mud coral, etc.
- Require selective discards of prohibited species (except whiting trips);
- Require discards of ESA and MMPA species (i.e., protected species).
Table 2-5. IFQ program and Non-IFQ groundfish species groups that are noted in section 2.5 as potential discards. Source regulations are noted in each list.

<table>
<thead>
<tr>
<th>Catch share species (IFQ program groundfish species, From: 660.140(c)(1))</th>
<th>Non-catch share species (Non-IFQ Groundfish Species From: Table 1 and 2 to Part 660, Subpart D – Limited Entry Trawl Rockfish Conservation Areas and Landing Allowances for non-IFQ Species and Pacific Whiting North and South of 40°10' N. Lat.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ROUNDFISH</strong></td>
<td>Minor nearshore rockfish &amp; Black rockfish</td>
</tr>
<tr>
<td>Lingcod N. of 40°10’ N. lat.</td>
<td>Cabezon</td>
</tr>
<tr>
<td>Lingcod S. of 40°10’ N. lat.</td>
<td>Shortbelly</td>
</tr>
<tr>
<td>Pacific cod</td>
<td>Spiny dogfish</td>
</tr>
<tr>
<td>Pacific whiting</td>
<td>Longnose skate</td>
</tr>
<tr>
<td>Sablefish N. of 36° N. lat.</td>
<td>Longspine thornyhead South of 34°27’ N. lat.</td>
</tr>
<tr>
<td>Sablefish S. of 36° N. lat.</td>
<td>Minor nearshore rockfish &amp; Black rockfish</td>
</tr>
<tr>
<td><strong>FLATFISH</strong></td>
<td>California scorpionfish</td>
</tr>
<tr>
<td>Arrowtooth flounder</td>
<td>Longnose skate</td>
</tr>
<tr>
<td>Dover sole</td>
<td>Other Fish (sharks (except spiny dogfish), skates (except longnose skate), ratfish, morids, grenadiers, and kelp greenling).</td>
</tr>
<tr>
<td>English sole</td>
<td></td>
</tr>
<tr>
<td>Other flatfish stock complex</td>
<td></td>
</tr>
<tr>
<td>Petrale sole</td>
<td></td>
</tr>
<tr>
<td>Starry flounder</td>
<td></td>
</tr>
<tr>
<td>Pacific halibut (IBQ) N. of 40°10’ N. lat.</td>
<td></td>
</tr>
<tr>
<td><strong>ROCKFISH</strong></td>
<td></td>
</tr>
<tr>
<td>Bocaccio S. of 40°10’ N. lat.</td>
<td></td>
</tr>
<tr>
<td>Canary rockfish</td>
<td></td>
</tr>
<tr>
<td>Chilipepper S. of 40°10’ N. lat.</td>
<td></td>
</tr>
<tr>
<td>Cowcod S. of 40°10’ N. lat.</td>
<td></td>
</tr>
<tr>
<td>Darkblotched rockfish</td>
<td></td>
</tr>
<tr>
<td>Longspine thornyhead N. of 34°27’ N. lat.</td>
<td></td>
</tr>
<tr>
<td>Minor shelf rockfish complex N. of 40°10’ N. lat.</td>
<td></td>
</tr>
<tr>
<td>Minor shelf rockfish complex S. of 40°10’ N. lat.</td>
<td></td>
</tr>
<tr>
<td>Minor slope rockfish complex N. of 40°10’ N. lat.</td>
<td></td>
</tr>
<tr>
<td>Minor slope rockfish complex S. of 40°10’ N. lat.</td>
<td></td>
</tr>
<tr>
<td>Pacific ocean perch N. of 40°10’ N. lat.</td>
<td></td>
</tr>
<tr>
<td>Shortspine thornyhead N. of 34°27’ N. lat.</td>
<td></td>
</tr>
<tr>
<td>Shortspine thornyhead S. of 34°27’ N. lat.</td>
<td></td>
</tr>
<tr>
<td>Splitnose rockfish S. of 40°10’ N. lat.</td>
<td></td>
</tr>
<tr>
<td>Widow rockfish</td>
<td></td>
</tr>
<tr>
<td>Yelloweye rockfish</td>
<td></td>
</tr>
<tr>
<td>Yellowtail rockfish N. of 40°10’ N. lat.</td>
<td></td>
</tr>
</tbody>
</table>
Table 2-6. Co-op program groundfish species lists noted section 2.5 as potential discards.

<table>
<thead>
<tr>
<th>Catch share species (Co-op groundfish species formally allocated, From: MS Co-op program species, 660.150(c)(1)(i))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pacific whiting</td>
</tr>
<tr>
<td>Canary rockfish</td>
</tr>
<tr>
<td>Darkblotched rockfish</td>
</tr>
<tr>
<td>Pacific Ocean perch</td>
</tr>
<tr>
<td>Widow rockfish</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-catch share species (At-Sea Whiting Fishery Annual Set-Asides, 2013, From Table 1d. To Part 660, Subpart C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrowtooth Flounder</td>
</tr>
<tr>
<td>BOCACCIO, S. of 40°10 N. lat.</td>
</tr>
<tr>
<td>Chilinepper, S. of 40°10 N. lat.</td>
</tr>
<tr>
<td>COWCOD, S. of 40°10 N. lat.</td>
</tr>
<tr>
<td>Dover Sole, Coastwide</td>
</tr>
<tr>
<td>English Sole, Coastwide</td>
</tr>
<tr>
<td>Lingcod, N. of 40°10 N. lat. 15</td>
</tr>
<tr>
<td>Lingcod, S. of 40°10 N. lat.</td>
</tr>
<tr>
<td>Longnose Skate, Coastwide</td>
</tr>
<tr>
<td>Longspine Thornyhead, N. of 34°27 N. lat.</td>
</tr>
<tr>
<td>Longspine Thornyhead, S. of 34°27 N. lat.</td>
</tr>
<tr>
<td>Minor Nearshore Rockfish, N. of 40°10 N. lat.</td>
</tr>
<tr>
<td>Minor Nearshore Rockfish, S. of 40°10 N. lat.</td>
</tr>
<tr>
<td>Minor Shelf Rockfish, N. of 40°10 N. lat.</td>
</tr>
<tr>
<td>Minor Shelf Rockfish, S. of 40°10 N. lat.</td>
</tr>
<tr>
<td>Minor Nearshore Rockfish, S. of 40°10 N. lat.</td>
</tr>
<tr>
<td>Minor Shelf Rockfish, S. of 40°10 N. lat.</td>
</tr>
<tr>
<td>Minor Slope Rockfish, N. of 40°10 N. lat.</td>
</tr>
<tr>
<td>Minor Slope Rockfish, S. of 40°10 N. lat.</td>
</tr>
<tr>
<td>Other Fish, Coastwide</td>
</tr>
<tr>
<td>Other Flatfish, Coastwide</td>
</tr>
<tr>
<td>Pacific Cod, Coastwide</td>
</tr>
<tr>
<td>Pacific Halibut, Coastwide</td>
</tr>
<tr>
<td>Petrale Sole, Coastwide</td>
</tr>
<tr>
<td>Sablefish, N. of 36° N. lat.</td>
</tr>
<tr>
<td>Sablefish, S. of 36° N. lat.</td>
</tr>
<tr>
<td>Shortspine Thornyhead, N. of 34°27 N. lat.</td>
</tr>
<tr>
<td>Shortspine Thornyhead, S. of 34°27 N. lat.</td>
</tr>
<tr>
<td>Starry Flounder, Coastwide</td>
</tr>
<tr>
<td>YELLOWEYE, Coastwide</td>
</tr>
<tr>
<td>Yellowtail, N. of 40°10 N. lat.</td>
</tr>
</tbody>
</table>

Table 2-7. ESA-listed species that may be found in the area of operation for groundfish fisheries.

<table>
<thead>
<tr>
<th>ESA Species</th>
<th>Southern Resident killer whales (<em>Orcinus orca</em>)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green sturgeon (<em>Acipenser medirostris</em>)</td>
<td>Guadalupe fur seals (<em>Arctocephalus townsendi</em>)</td>
</tr>
<tr>
<td>Eulachon (<em>Thaleichthys pacificus</em>)</td>
<td>Green sea turtles (<em>Chelonia mydas</em>)</td>
</tr>
<tr>
<td>Humpback whales (<em>Megaptera novaeangliae</em>)</td>
<td>Olive ridley sea turtles (<em>Lepidochelys olivacea</em>)</td>
</tr>
<tr>
<td>Steller sea lions (<em>Eumetopias jubatus</em>)</td>
<td>Loggerhead sea turtles (<em>Carretta carretta</em>)</td>
</tr>
<tr>
<td>Leatherback sea turtles (<em>Dermochelys coriacea</em>)</td>
<td>Short-tailed albatross (<em>Phoebastria albatrns</em>)</td>
</tr>
<tr>
<td>Sei whales (<em>Balaenoptera borealis</em>)</td>
<td></td>
</tr>
</tbody>
</table>

Electronic Monitoring Analysis 58 June 2014
North Pacific Right whales  
(*Eubalaenajaponica*)  
Marbled murrelet (*Brachyramphus marmoratus*)

Blue whales (*Balaenoptera musculus*)  
Southern sea otter (*Enhydra lutris nereis*)

Fin whales (*Balaenoptera physalus*)  
California least tern (*Sterna antil/arum browni*)

Sperm whales (*Physter macrocephalus*)

2.6  **Halibut Retention/Discard with Fishery Specific Options**

*Pacific Halibut Data Collection in the Shore-delivery IFQ Fishery*

The WCGOP designed sampling methodologies that help ensure P. halibut mortality can be estimated, regardless of the limitations imposed by the vessel, catch composition, or catch quantity. Three pieces of information are necessary to estimate Pacific halibut mortality (also see Table 2-1, Section 2.6):

1. A count of individual P. halibut in the haul or sample  
2. Actual or visual length measurements (cm)  
3. A viability obtained by physical assessment of individual P. halibut using IPHC designed dichotomous keys that relate the physical condition of the fish to a viability code (NWFSC 2013). A unique key is used for each gear type (trawl, longline, pot).

Observers could sample all or a subset of P. halibut caught in a haul/set. The proportion of P. halibut sampled is based on the number of P. halibut caught in the haul/set, the level of assistance provided by the crew, as well as other variables (e.g., physical space, time of day, weather). Sampling and assessment of P. halibut is dependent on crew assistance and cooperation. Regulations prohibit vessel crew from discarding any P. halibut without first notifying the observer. The vessel crew must comply with any and all requests by the observer to ensure proper P. halibut sampling, including but not limited to: modifying P. halibut sorting procedures, assisting the observer by delivering the P. halibut to the observer, and modifying operations to ensure P. halibut sampling is completed. Table 2-8 describes the P. halibut data obtained on IFQ-permitted vessels fishing different gear types.

Table 2-8. Data collected from Pacific halibut caught on IFQ vessels using different types of gear. Viability is assessed at the point of fish release when returned to sea.

<table>
<thead>
<tr>
<th>Gear</th>
<th>Count</th>
<th>Length Measurement</th>
<th>Viability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom trawl</td>
<td>all in the haul</td>
<td>actual, all or subset</td>
<td>yes</td>
</tr>
<tr>
<td>Midwater trawl</td>
<td>all in the haul</td>
<td>actual, all or subset</td>
<td>yes</td>
</tr>
<tr>
<td>Pot</td>
<td>all in sampled portion</td>
<td>actual, all or subset</td>
<td>yes</td>
</tr>
<tr>
<td>Hook -and- line</td>
<td>all in sampled portion</td>
<td>visual, all or subset</td>
<td>no</td>
</tr>
</tbody>
</table>

Electronic Monitoring Analysis 59 June 2014
The Council had specific questions regarding the options for the retention or discard of halibut in each fishery. The GEMPAC developed fishery specific options and took into account the existing regulatory requirements, the current process for viability assessments that are normally conducted by observers, and discard mortality estimations that are applied to each type of gear. IPHC provides the mortality "keys" by fishing gear type that observers use to determine mortality of pacific halibut. The IPHC also determines what mortality rates apply to the different viabilities (Excellent, Poor, Dead for trawl and pot or Minor, Moderate, Severe, Dead for hook and line). The IPHC also has sector specific average mortality rates (i.e., longline and pot). Vessel or sector specific mortality rates based on data from the catch share program could be developed by the WCGOP.

The following gear specific options need to be examined for feasibility and IPHC may need to approve certain options. Council staff and NMFS will work with the IPHC to examine potential changes to halibut mortality assessment methods and the use of sector or vessel specific mortality rates.

For midwater trawl whiting:
Since the fishery is already a maximized retention fishery and all catch is allowed to be retained and landed, all halibut would be considered dead (100% mortality). Current regulations allow fishermen to sort whiting at sea, and if a fishermen chose to do so, would be required to discard halibut. The GEMPAC and GEMTAC believe that sorting at-sea does not occur so only one option was developed for the EM program. If the impact analysis reveals that another option is needed, Council staff will consult the GEMPAC.

For bottom trawl and non-whiting midwater trawl gear:
Option A: Use IPHC mortality rate for specific gear type: 90% mortality if discarded.
Option B: WCGOP scientific observations (assumed 20-30% coverage) is applied to fleet
Option C: IPHC exemption to allow full retention (need to examine the feasibility of this option)
Option D: Captain and crew provide assessment (training would be required)
Option E: Use an appropriate EM viability assessment (currently conducting study, need IPHC approval)
Option F: Use vessel specific mortality rate (update rates periodically)

For Fixed gear:
Option A: Use WCGOP mortality rate for specific gear type: 16% mortality if discarded from longline; 18% mortality rate if discarded from pots.
Option B - Option F: same as bottom trawl and non-whiting midwater trawl gear
2.7 Discard Species List Adjustments

In the future, it’s expected that recognition software programs may assist in further refinement or expansion of a species discard list under an optimized retention regulatory environment. During the GEMPAC discussions the group identified that a process to update the species discard list to accommodate advances in fish identification technology or an increase in the ability to identify more species using video review. The development of a species discard list for each fishery is a difficult task and changing technology may allow expansion of these lists after their initial creation. Each fishery will likely have a specific species discard lists. In the future, recognition software may be further developed or regulatory actions could provide the option to expand or change the species lists, therefore; a process that is efficient and flexible to change the list should be developed. Therefore a new component was added to the EM program options.

The GEMPAC identified three options to account for technological changes and to streamline the revision of species discard lists for an EM program:

**Option 1**: NMFS to make determination and provide list to fishers through the NMFS EM Observer Exemption Process.

**Option 2**: Use Council process for changing species list using routine management measures if initial list is fully analyzed for environmental impacts (e.g., use groundfish specification process, or some other routine management measure).

**Option 3**: Set initial lists in regulation and change at some future point through Council process with proposed/final rule making.

2.8 Vessel Operation Provisions

The following sections discuss provisions that relate to vessel operations and include approval and application processes, and EM system requirements.

2.8.1 Observer Exemption Process

Since observer coverage is mandatory under the IFQ program, participants would need to initially apply for an exemption from NMFS to use EM and then demonstrate they are complying with the standards and practices of its use to continue using EM. Therefore, both initial eligibility criteria and continued eligibility criteria are needed. 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, 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 specific or performance based for the proposed criteria.
2.8.2 Eligibility for Camera Use

Under the proposed EM program, participants would need to be eligible to use EM. Participants would need to apply for an exemption from the existing observer requirement for all IFQ trips. 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 2.8.3).

2.8.2.1 Initial eligibility criteria:

1. Limited entry groundfish trawl permit
2. Quota share permit
3. No IFQ deficits
4. No civil 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
   a. Data Delivery and Analysis (DDA) specifications
   b. submitted by either a group of vessels or an individual vessel

2.8.2.2 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

2.8.2.3 Self-Governing Plan Elements

If applicable, the following information would also be necessary.

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

### 2.8.3 Application Approval and Required Information

Applicants would need to follow specific regulations and provide adequate information for NMFS to evaluate the Observer Exemption application. 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. This process is identified as a NMFS process; therefore, the standards would likely involve a Council deeming process (see Section 2.11).

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

2.8.4 EM Vessel Operational Plan - Individual Vessel Monitoring Plans (IVMP)

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 plan for discard documentation, installation and maintenance of an EM system, protocols for data storage and transfer, among other things.

2.8.4.1 IVMP requirements

Each vessel operator/owner would be responsible for developing an IVMP for the vessel and acquiring the needed approval from NMFS. An IVMP that is approved by NMFS would be part of the Observer Exemption Criteria. 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 (see Section 2.11). A general list of categories of information that would be included in the IVMP is provided here.

Potential categories of information in an IVMP:
   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
EM Vessel Operational Plan - IVMP Expiration

The duration of the IVMP effectiveness must be determined; however, modifications may be necessary. For example, to accommodate changes in fishing practices, changes in fish handling protocols to obtain better information, or protocols for data handling. If modifications to the IVMP are necessary, changes must be made in agreement between the vessel representative and the EM provider. Such changes may require re-approval by NMFS; therefore, criteria that trigger re-approval will need to be developed.

Three options have been identified:

**Option A – 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)

**Option B – Annual Expiration or if modifications are made**
Same as Option A but with annual expiration

**Option C – Indefinite or if modifications are made (example 2 or 3 year duration)**
Same as Option A but with indefinite expiration

### Declaration of EM Use

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.
Option A - Annual Declaration of Intent to Use EM (year around).

Option B - For the coming year, participants must indicate in which months, if any, it will use EM and in which months, if any, it will use an observer (e.g. quarterly). 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.

Option C - Trip by trip basis. 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.

Exception for Emergency situations (e.g., camera broke so need an observer tomorrow, vice versa)

2.9 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. EM equipment that provides the necessary data for efficient processing and accurate review is critical. A type approval process will need to be developed by NMFS with the aid of current experience and technology. However, technology will change in the future so a process that incorporates the ability to change the standards for equipment use, data formats, and protocols for data transfer will need to be flexible.

2.9.1 EM Equipment Requirements

Although NMFS policy requests the use of open source software so that common platforms can use the data generated or multiple users can access data, the GEMPAC suggest allowing both open source and proprietary equipment and software be allowed if they meet the performance criteria. The following topics would need to be worked out with technical advisors and input from the industry.

2.9.1.1 Data formats:

Create a standardized data output 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 will need to be specified in the future with the advice of PSMFC, States, NMFS, and other technical advisors such as EM providers.
2.9.1.2 Video Hardware:

Image quality must be sufficient to allow clear identification of species or species categories being discarded. Performance standards need to be developed during implementation between NMFS, PSMFC, states, and contractors.

2.9.1.3 Logbook Data Source:

Allow either paper or electronic logbooks; however, electronic logbooks may increase efficiencies in the EM analysis.

2.9.1.4 On Vessel Data Storage:

Integrated and in a secure format (video hardware, sensor data, vessel location data, logbook data)

2.9.1.5 Onboard operations:

Topic examples:

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 contractors.

2.9.2 Data Transfer Process

Protocols need to be established for data transfer. 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 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 may vary by fishing sector. 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.
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 hardrives 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.

Several personnel options have been identified to provide the transfer data from the vessels to the reviewer.

(1) Vessel Operator
(2) Crew
(3) Shoreside catch monitor
(4) PSMFC
(5) EM Provider
(6) Contractor (hired by processor, port, or fisher)

### 2.9.3 Data Confidentiality/Accessiblity/Ownership

All data collected in the EM system (e.g., video, logbooks, and applications) would be considered confidential according to the Magnus-Stevens Fishery Conservation and Management Act, NMFS internal confidentiality rules, and any new or revised rules that are proposed at this time (NMFS confidentiality Final Rule will be released in 2014). This includes access, ownership, and public dissemination of the information.

### 2.9.4 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.

#### 2.9.4.1 Video Review Process

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 NMFS, PSMFC, and contractors.
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. This information currently flows through PSMFC then to NMFS for final accounting. Since PSFMC 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.

The amount of video to review depends on the method chosen to monitor discards. For example, if a census of all video for a fishery is chosen then all video of discard events would be captured. If logbooks with audit is chosen, then a determination must be made as to how much video should be reviewed that would reduce the risk of missing discard activity to a level that is appropriate for IFQ accounting. What level of sampling is appropriate if sub-sampling the video for discard events and expanding the rate to the entire trip is used?

An analysis of this information can be found in Section 4, Impact Analysis of the Alternatives (analysis needs further development).

2.9.4.2 Video reviewers

Potential reviewers for discard events (not mutually exclusive):

- Option A: NMFS
- Option B: Pacific States Marine Fisheries Commission
- Option C: EM Provider
- Option D: Third Party

2.10 WCGOP Scientific Observations

The NMFS Northwest Fishery Science Center Fisheries Observation Science Program collects and analyzes critical fisheries data from U.S. West Coast fishing vessels. Independent field biologists known as observers are deployed aboard working fishing boats to collect this scientific data. While at sea, observers collect a variety of data on fishing operations, catch composition, and protected resources. They also collect biological samples from the catch. Staff provide logistical and scientific support, ensure data quality, and train observers. Our scientists also produce a variety of data products and reports to support fisheries management and the NOAA mission. Fishery scientists and managers depend on observer data and analysis for stock assessments, management decisions, in-season quota tracking, and scientific research.

2.10.1 Observer Programs

There are currently two Federal observer programs being operated by the NMFS Northwest Fishery Science Center in the Pacific coast groundfish fishery: Shorebased IFQ Program and the WCGOP.

These two programs are very different from each other particularly in how they are funded, the type of sampling and fishery data that are used to derive total catch, and availability of data for
inseason management. Two types of funding mechanisms are currently used to fund observers: federally funded observers and third-party or “pay-as-you-go” observers. The WCGOP is federally funded and currently provides observer coverage in the LE and open access non-whiting fisheries. Federal funds are used to run the program infrastructure (training, debriefing, and data management) and to hire, equip, insure, and transport observers. Third party providers are used to observe fishing activity under the Shorebased IFQ program and are funded by the fishery participant directly to the third party provider.

2.10.1.1 West Coast Groundfish Observer Program

The WCGOP is a year-round program that provides observers for all of the commercial groundfish fisheries. Because monitoring of the Pacific whiting shoreside sector has been carried out under EFPs, WCGOP observers have not been used to provide coverage for that sector. All WCGOP sampling protocols and coverage strategies are defined by NMFS. Because there are few observers relative to the number of vessels in the groundfish fishery, observer sampling coverage has focused on obtaining bycatch data at sea that can be combined with state fish ticket data to derive bycatch ratios for different fishing areas and target fishing strategies. Vessel logbook data are used to estimate fleetwide fishing effort. Using observer, fish ticket, and logbook data, the fishery is modeled to derive an estimate of total catch by species. Due to the delayed availability of fish ticket and logbook data, and the time needed to process observer data, the final analysis of estimated total catch by species is typically not finalized until well over one year after the fishing year has ended.

Observer coverage goals for the WCGOP are detailed in a coverage plan (NMFS 2006a). Observers initially covered about 10 percent of the west coast LE trawl fleet effort, selected via a stratified random sample. Trawl fleet coverage has since increased to about 25 percent and has also been expanded to include the LE fixed-gear and open access vessels.

2.10.1.2 IFQ Fisheries Observer Program

Third party providers are used to secure observers for IFQ fishing trips. These observers are trained in the same manner as those observers in the WCOP. The NMFS-permitted observer providers collect the fees directly from the vessels, recruit qualified individuals, provide insurance and benefits to the observers, deploy the observers, and ensure that the observer data are delivered to NMFS.

The IFQ Program requires 100% at-sea observer coverage, as all catch of IFQ species/species groups must be accounted for. The observer data is used to account for any IFQ discard, including the mandatory discarding of Pacific halibut. The observer data, in combination with landings data, will enable the fishermen to track their individual quotas and allow managers to monitor the progress of the fishery. Because both the discarded and the retained weights are estimates; the observed estimates of total catch contain some uncertainty.

Vessels that require observer coverage are:

- All whiting and non-whiting groundfish trawl and non-trawl vessels.
• All motherships participating in the at-sea whiting fishery.
• All mothership catcher-vessels participating in the at-sea whiting fishery.
• All catcher processors participating in the at-sea whiting fishery.

Under the IFQ program both observers (at sea) and catch monitors (at shoreside facilities) are used to monitor total catch. Observers are highly trained biologists that work independently aboard vessels to quantify total catch. They estimate bycatch, collect biological samples, and monitor for fishery interactions with marine mammals, sea turtles, and seabirds. A catch monitor is someone who is land-based at first receiver facilities and confirms that total landings are accurately sorted, weighed, and recorded on fish tickets (landing receipts).

Observers focus on scientific data collection at sea, while catch monitors ensure compliance with IFQ landed fish sorting requirements, and together they give NMFS a very accurate and complete picture of the fishing mortality in the IFQ program. First receivers must use an approved electronic fish ticket reporting software to and submit the data to Pacific States Marine Fisheries Commission.

Observers collect the following information:
• Fishing activity, including areas and depths fished, gear set, and retrieval times.
• Catch, such as how much of each species was discarded.
• Individual fish, including length, weight, and sex.
• Bycatch of protected species like marine mammals.

All IFQ catch is delivered to licensed first receivers. This can be a person or company that receives, purchases, or takes custody, control, or possession of catch onshore from a vessel that harvested fish under the IFQ Program (e.g., fish buyer station or processing plants). All buyers must hold a first receiver site license for each physical landing site. Site licenses are effective for one year from the date of issuance. First receivers currently holding a site license, must register prior to the ending date to continue to receive landings from the IFQ program. New first receivers must contact the Pacific States Marine Fisheries Commission to install electronic fish ticket software.

Each first receiver taking delivery of IFQ species is required to have a certified catch monitor present for the entire duration of the landing. Catch monitors are certified by NMFS and must meet responsibilities specified in the regulations at § 660.17. Once verified, catch monitors independently report catch data to the Pacific States Marine Fisheries Commission and NOAA Fisheries catch accounting databases. Catch monitors are available from approved observer providers. Catch monitors perform more of a compliance role than that of a biologist and are required to report any observations of suspected violations of regulations.

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. 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.

2.10.2 Payment for Scientific data collection/observations

Previous to the IFQ program NMFS provided scientific data collection on roughly 20 percent of
the limited entry trawl fleet. This cost was covered by the Government. Under an EM program
scientific data collection will be needed from vessels without an observer. 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.

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: Government funded, same as pre IFQ
Option B: Industry Funded
Option C: Combination of both Government and Industry

2.11 NMFS Processes

While working through the development of the alternatives and options certain
components or portions of the EM program were identified for NMFS to develop. For
example, NMFS will need to set up an internal process to conduct a “type-approval”
process that authorizes vessels to use certain EM equipment on a vessel, and set up a
process for applicants to submit an “Observer Exemption Application” to request use of
EM in lieu of an observer.

A list of processes are identified here; however it’s expected that some of the development will be
done in consultation with the GEMPAC or other technical advisors. In addition, regulations will
need to be developed to provide specific guidance to fishermen and EM providers, or observer
providers (e.g., fill out applications, make changes to 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 for the Council to review the draft regulations
before they go into the proposed rule stage. Approval from the Office of Management and Budget
for the collection of information under the Paperwork Reduction Act (PRA) will be needed when
appropriate and are preliminarily identified in the list below. The list may be updated as the
decision document is developed and the impact analysis expanded.

- Observer Exemption Process (including an application for fishermen, PRA)
- Individual Vessel Monitoring Plan Approval (including a form for submission to NMFS for
  review, PRA)
- Equipment Type Approval (including a list of specifications for EM providers to
  accommodate, PRA)
• Approved EM Provider List (including a list of specific criteria for providers to demonstrate their capability and standards, PRA)
• Eligibility Criteria (Initial and Continued)
• Declaration Process to Use EM (possibly including port haul in/out process, PRA)
• Confidentiality Rules (if different from status quo)
• WCGOP Scientific Observation Sampling Scheme

2.12 Spatial Variation for High Bycatch Areas

This option could be applied to allow the use of EM based on ocean areas that are known for high or low bycatch. Under these options, the areas need to be identified and designed for explicit use of EM or would use preexisting areas such as the Rockfish Conservation Area or Essential Fish Habitats.

**Option A** - No special provisions

**Option B** - Under this option, fishing activity in areas that are likely to have lower bycatch could be monitored with EM rather than using observers. Vessels would declare their fishing area prior to departure and be required to follow the appropriate fishing protocols for that area.

**Option C** - Under this option, if you chose to fish in a high bycatch area, a higher level of EM review may be required. The level of review would need to be determined.

The GEMPAC understand the possible utility of this type of management, however; this type of spatial management may add too much complexity to the management of the IFQ fishery and would require identifying additional management areas which in turn may be difficult and costly to manage.

**Therefore, the GEMPAC recommends removal of Option B and C for spatial management options.**

2.13 Adaptive or Phased Implementation

Implementation of an EM program could be done for all fisheries at one time through regulation (Option 1). However, there may be other options. Implementation of an EM program could be done through a pilot program using an Exempted Fishing Permit (ESP.) (Option 2). For example, an EM program may be developed for a fishery, and then implemented on a temporary basis through an EFP to identify issues and improve the program before it is implemented full scale for a particular fishery or all fisheries. It could also be done through a “phased-in” approach. For example, if development of an EM monitoring program (i.e., regulations, camera system, EM providers, review process, accounting protocols, enforcement, etc.) is ready for use in the mid-water trawl fishery then NMFS could implement the program by regulation before other EM programs are fully developed for use in other fisheries such as the bottom trawl (Option 3).
Another approach would be to implement an EM program based on retention rules (Option 4), starting with any gear types that are willing to fish under a maximized retention type fishery (See Alternative 2 in Section 2.5 for a description of a maximize retention fishery). For example, bottom trawl and non-whiting mid-water trawl vessels that are willing to retain and land all fish (excluding prohibited species and ESA/MMPA species) would be allowed to use EM. Then, as EM capabilities improve to provide verifiable species identification (for example distinguishing aurora rockfish from rough eye rockfish), the EM program could be expanded to include other discard options. A list of species that are shown to be verifiable with EM would need to be developed over time.

Implementation could be organized in a number of ways.

**Option A.** None, implement all fisheries at one time through regulatory implementation

**Option B.** Use EFPs to test final Council policy, prior to full regulatory implementation.

**Option C.** Phase in by sector/gear.

**Option D.** Phase in retention options over time, start with maximize retention fisheries and move to other retention rules as reliable technologies for speciation are developed.

**Options B-D are not mutually exclusive.**

### 2.14 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 not analyzed in this document. An explanation is provided under each topic.

#### 2.14.1 Mandatory Use of an EM program

Under this option, all participants in the Shoreside IFQ program would be required to use EM. No human observers would be used to monitor for compliance with IFQs, IBQs, or catch 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 vessel would not be able to fish until the system is working. This could delay fishing activity until a technician can repair the system. This limits vessels options and can monetarily impact a vessel significantly depending on the amount of time the vessel is tied up, the target species, and the price of fish.

#### 2.14.2 Full retention of All Catch

Under this option, vessels would be required to retain all retain all catch share species and non-catch share groundfish species for the IFQ and co-op fisheries (see Table 2-5 and Table 2-6, respectively), non-groundfish species, prohibited species; ESA species (Table 2-7); 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 capture fish they may have accidentally been released would be impractical and by not allowing vessels to discard fish for safety reasons could endanger vessel crew.

2.14.3 No declaration of EM use

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

CHAPTER 3 AFFECTED ENVIRONMENT

This chapter describes the Pacific Coast groundfish fishery and the resources that would be affected by the alternative action. Physical resources are discussed in Chapter 3.2, biological resources are described in Chapter 3.3, and socio-economic resources are described in Chapter 3.3. Rather than repeat information detailed in the other NEPA documents, the information has been summarized in this document and the reader is referred to the appropriate sections in the other NEPA documents for further detail.

3.1 Action Area and Physical Characteristics of the Affected Environment

The action area is the state and federal waters of the U.S. and includes the shoreline out to the 200 nautical mile line of the U.S. Exclusive Economic Zone. The area of operation of the Pacific Coast groundfish fishery is within this area (Figure 3-1).
Figure 3-1. Fishery management lines on the U.S. west coast. Source: PFMC 2014, SAFE.
3.2 Biological Characteristics of the Affected Environment

3.3 Socio-Economic Characteristics of the Affected Environment

3.3.1 Landings, Revenue, and Participation

Section 3.2 in the 2015-16 Groundfish Harvest Specifications FEIS (as well as EISs for earlier biennial periods) describes commercial fisheries targeting groundfish and characterizes west coast fishing communities with respect to groundfish fisheries. Section 3.2.1 of the FEIS describes revenue trends for commercially important groundfish. That information is incorporated by reference here. The 2014 Groundfish SAFE document contains a series of tables summarizing landings and ex-vessel revenue in groundfish fisheries, landings and revenue by port, and indicators of fishery participation. These data may be summarized here to highlight current fishery trends. Both long-term historical landings, revenue, and price data (the full PacFIN database time series) and a recent a 10-year baseline period of 2003-2012 are used to characterize fisheries and communities.

Table 3-1 shows the share of landings and inflation-adjusted ex-vessel revenue by groundfish fishery sector (IFQ, whiting catcher processor, and whiting mothership) for the 2012 baseline period.

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>IFQ lbs.</th>
<th>IFQ rev.</th>
<th>CP lbs.</th>
<th>CP value</th>
<th>MS lbs.</th>
<th>MS value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>Jan</td>
<td>1,491,862</td>
<td>1,141,585</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2012</td>
<td>Feb</td>
<td>2,395,897</td>
<td>1,639,885</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2012</td>
<td>Mar</td>
<td>3,329,906</td>
<td>2,110,348</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2012</td>
<td>Apr</td>
<td>4,954,879</td>
<td>2,844,151</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2012</td>
<td>May</td>
<td>4,265,175</td>
<td>2,236,024</td>
<td>44,844,730</td>
<td>6,329,660</td>
<td>9,390,741</td>
<td>1,325,467</td>
</tr>
<tr>
<td>2012</td>
<td>Jun</td>
<td>13,934,687</td>
<td>3,411,107</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2012</td>
<td>Jul</td>
<td>26,469,461</td>
<td>5,863,888</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2012</td>
<td>Aug</td>
<td>36,519,674</td>
<td>7,520,641</td>
<td>8,223,969</td>
<td>1,251,804</td>
<td>4,642,409</td>
<td>744,548</td>
</tr>
<tr>
<td>2012</td>
<td>Sep</td>
<td>26,705,062</td>
<td>6,256,446</td>
<td>35,760,005</td>
<td>4,935,301</td>
<td>12,818,454</td>
<td>1,721,627</td>
</tr>
<tr>
<td>2012</td>
<td>Oct</td>
<td>35,277,242</td>
<td>7,111,834</td>
<td>32,687,073</td>
<td>4,246,301</td>
<td>47,645,273</td>
<td>6,213,841</td>
</tr>
<tr>
<td>2012</td>
<td>Nov</td>
<td>25,327,203</td>
<td>5,737,083</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2012</td>
<td>Dec</td>
<td>4,049,970</td>
<td>2,309,175</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2012 Sum</td>
<td>184,721,018</td>
<td>48,182,167</td>
<td>121,515,776</td>
<td>16,763,066</td>
<td>84,494,178</td>
<td>11,453,663</td>
<td></td>
</tr>
</tbody>
</table>

Source: Cost Recovery Annual Report, NMFS 2014

Pacific whiting fisheries dominate in terms of landings, accounting for 88% of the total. However, because whiting fetches a low price per pound, those sectors accounted for only 39% of inflation-adjusted ex-vessel revenue. Non-whiting trawl/shoreside IFQ accounts for the next largest share of...
landings and revenue, 10% and 34% respectively. Fixed gear landings fetch a relatively higher price so while those sectors accounted for only a little more than 2% of landings, they garnered a quarter of groundfish revenue, primarily in the non nearshore sector that targets sablefish.

Figure 3-2 shows revenue trends for groundfish sectors over the baseline period. Revenues have been more stable for nonwhiting sectors compared to whiting. One way of assessing variability is the coefficient of variation (the standard deviation divided by the mean). The values for the sectors (over the baseline period) shown in the figure are as follows: nonwhiting trawl (including non-trawl IFQ in 2011-2012): 0.131; shoreside whiting trawl: 0.584; non nearshore fixed gear: 0.269; nearshore fixed gear 0.074; at-sea catcher-processors: 0.503; at-sea mothership catcher vessels: 0.551.
Figure 3-2. Share of groundfish landings (top) and inflation adjusted ex-vessel revenue (bottom) by fishery sector, 2003-2012. Source: *2011-2012 non-whiting trawl includes IFQ non-trawl landings. SAFE Tables 12a-b and 14a-b
Figure 3-3. Ex-vessel revenue trends (inflation adjusted, 2012, from groundfish only) for groundfish fishery sectors, 2003-2013; 2003=100. *Nonwhiting trawl includes non-trawl IFQ in 2011-2012. Value outside figure scale (>300%): 2008 at-sea CP whiting 408%, 2011 shoreside whiting 342%. Source: SAFE Tables 12b and 14b.
CHAPTER 4 IMPACT ANALYSIS OF THE ALTERNATIVES

The terms "effect" and "impact" are used synonymously under NEPA. Impacts include effects on the environment that are ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Direct effects are caused by the action itself and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. Cumulative impacts are those impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Sections 4.1 through 4.3 of this document discuss the direct and indirect impacts on the physical, biological, and socio-economic environment that are likely to occur under each of the proposed alternatives, including the Status Quo alternative. Section 4.4 presents the reasonably foreseeable cumulative effects of the environment from the proposed alternatives.

4.1 Effects on the Physical Environment

Alternatives 2 and 3 would implement an EM program that is a general framework for each fishery. There are several options to choose from within the alternatives that can be specific for each IFQ gear sector and may be appropriate for one sector and not the other. However, each alternative and options selected with those alternatives are unlikely to have a significant direct impact on fishing activities. Although the range of options include maximized retention to discarding fish species at will, all fish (except halibut, lingcod, and sablefish) are considered dead.

Landing more fish that are undesirable by the fish processors (under maximized retention) may have an impact on processing plants financially through additional handling and trucking of fish. Additional costs to dispose of fish may be passed on to fishermen or born by the processing facility. It’s possible that fish meal may be utilized in other ways to help off-set the cost of trucking and handling the surplus of fish that are generally unmarketable.

Impacts to essential fish habitat (EFH) or marine habitats are not expected to change as a result of the proposed actions since fishing practices and areas fished are not expected to change significantly. Fishing practices (number of hooks, pots, trips, set/hauls) are not expected to
significantly change under all options using EM. Fish handling on deck may take more time under all retention options to accurately identify and estimate species weights before they are discarded. Under the option to allow EM in low bycatch areas (Spatial Management Sub-option 1) or higher review of EM video in areas with high bycatch (Spatial Management Sub-option 2) could change areas fished by the fleets if they chose to fish in areas with low bycatch or chose to avoid high bycatch areas. Generally fishermen already try to fish in low bycatch areas or avoid high bycatch areas. A significant amount of analysis would be needed to identify these management areas as well as monitoring activity within them. These sub-options could create more complexity in management. None of the remaining alternatives or options are expected to alter areas currently fished by all fisheries.

4.2 Effects on the Biological Environment

Effects on the biological environment resulting from fishery management actions primarily include changes in species mortality levels resulting from implementation of the alternatives. Implementation of an alternative that changes fish retention and discard requirements could have a direct biological effects; however, the fisheries would continue to operate under current ACLs and IFQ limits. Additional mortality of some species could be realized if maximum retention was required in all fisheries, although most of the species currently discarded under the status quo would not result in exceeding current ACLs or IFQ limits. All other options that are available to build an EM program are mostly administrative and do not affect the biological environment. Indirect effects from fishery management actions include changes in fishing practices that affect the biological environment, but are further away in time or location than those occurring as a direct impact. Indirect biological impacts could result if catch data were inaccurate or delayed such that fishery specifications (bycatch limits, species allocations, OYs, and biological opinion thresholds) could not be adequately monitored or the fishing stopped before one of the specifications were exceeded. If a fishery specification were exceeded, the magnitude of the impact would depend of the status of the stock (healthy, precautionary zone, or overfished), the proportion of allowable fishing mortality represented by fishery specification that was exceeded, and the stock’s sensitivity to changes in fishing mortality. If other fisheries could not be effectively managed to stay within the same fishery specification, cumulative indirect impacts could result.

4.2.1 Overview of Effects

Under the No Action Alternative (Alternative 1), vessel’s would still be required to have a limited entry permit with a QS permit and must have quota pounds in their account to continue fishing under the IFQ Program. Participants in the IFQ Program must continue using human observers on 100% of all IFQ trips. Observers would continue to estimate catch and discard to provide full accounting of all IFQ catch and submit this information to PSMFC, and NMFS would debit IFQ QS accounts. Catch monitors would still be required to monitor offloading and verify catch accounting by observers. Fishermen would still be allowed to discard any species, regardless if it is an IFQ or non-IFQ species, and continue to discard species they are required to discard under the current groundfish regulations. Fishermen would continue to use existing procedures regarding logbook reporting requirements for permit holders/vessel operators, to submit this information.
along with economic data, and be required to use VMS. Observer coverage is currently subsidized by NMFS; however, in the near future full payment will be required by the industry.

The one major difference between all action alternatives is how discard is documented and enumerated to debit a vessel’s QP account.

Under Alternative 2, a vessel captain “self reports” the discard by species and provides a weight in a logbook. Video documentation of those discards are then reviewed at some predetermined level (See section x.x for a discussion of review rates) to verify the discarded species and weight. The reviewer would also look for discard events that are not recorded in the logbooks. If there are no discrepancies between the two data sources then the logbook data is used to debit the QP account. Protocols for resolving discrepancies would be used.

Under Alternative 2, video documentation of the discard events would be reviewed to identify and enumerate the discard either through a census of all video (or through a sampling and expansion of the discard that is documented in the video). Under Alternative 3, the fishermen self-report the discard by recording the species and their weights in a logbook; the video is then reviewed to verify the information submitted. Discrepancies between both data sources are resolved before debiting the fishermen’s QP account.

Beyond these major differences, there are many options to choose from within each alternative to build a EM program, such as which species can be discarded, declaration process for vessels to announce when they will use EM, how fish should be handled so the video can capture adequate images of them before they are discarded, how and what data is captured on video, how will data be transferred from the vessel, how will analyze the data, and how will the program be implemented.

The most important decision is which species will be retained and which will be allowed for discard in each fishery (i.e., midwater trawl whiting, midwater trawl non-whiting, bottom trawl and longline). Allowing discard will hinge on whether video can appropriately capture the discard in a clear image so a video reviewer can identify the species and estimate the weight of the discard. Three options are provided: 1) maximize retention; 2) optimum retention (some selective discard of certain species), and 3) discard at will (currently allowed).

Overall, impacts to fish resources are not expected to change significantly under any alternative or option since most fish discarded (except halibut, lingcod and sablefish) are considered dead after release. Since the fishery is under an IFQ system, exceeding ACLs is unlikely. Most of the IFQ species are not being caught and there is room for increase. If fish are discarded and not reported or captured by EM then impacts could increase but it will be difficult to enumerate this.

Each fishery will be examined for impacts to fish resources under these three basic options (not yet analyzed). Under optimized retention, further analysis is provided regarding the impact of choosing several species or species groups for discard in each fishery. In general impacts to fish resources may be greater under Option 1 (maximize retention requirements) since vessels would be required to retain nearly all catch and bring it to shore or deliver it to motherships, as is the case with the
current midwater trawl whiting fishery. Impacts to fish resources may be less under Option 2 (optimize retention) if certain species are allowed to be selectively discarded by fishermen, assuming fish mortality rate estimates do not change. Option 3, fishermen in the non-whiting midwater trawl, whiting vessels that sort at sea, bottom trawl, and fixed gear (pot and longline) would still be allowed to discard any species unless required to retain them by regulation. Therefore Option 3 would have the least impact on fish resources and discard rates would be similar to what is estimated under the current program. However, fish identification is most difficult with EM under Option 3 and least under Option 1. At this time multiple efforts are being pursued to help identify fish through different fish handling protocols (such as with chutes, fish length boards and discard stations, and fish recognition software). At this time a specific EM species discard list for each fishery has not been developed.

Of critical importance, and yet to be analyzed, is the level of risk that managers are willing to take to capture rare events such as yelloweye rockfish discard if a fisher was allowed to discard them, log it, and then use video review to not only review the logbook discard event but also to randomly sample the video to see if discard events are not logged. Fishery managers will need to examine what level of risk is appropriate and the cost implications for trying to capture all events to balance management of overfished species and the economics of fishing activity. Cost for video review can increase dramatically for a fishermen if all video is reviewed (census) versus only 10 or 25 percent.

### 4.2.1.1 Overfished Species and Affect on Rebuilding Plans

Harvest specifications, and the science used as the basis for management decision-making are derived from the most recent assessments and/or rebuilding analyses prepared for those stocks informed by an assessment. Please see the 2015-2016 SAFE document for an explanation of the process that sets the harvest limits for the managed groundfish stocks (PFMC 2014).

There are six overfished west coast rockfish stocks (i.e., bocaccio south of 40º10’ N lat., canary rockfish, cowcod south of 40º10’ N lat., darkblotched rockfish, Pacific ocean perch, and yelloweye rockfish) and one overfished flatfish stock (i.e., petrale sole) at the start of 2013. All seven of these stocks are rebuilding and three (i.e., bocaccio south of 40º10’ N lat., darkblotched rockfish, and petrale sole) are predicted to rebuild by the start of 2015.

Rebuilding plans are in place for six overfished rockfish species, as well as petrale sole, where assessments have indicated spawning biomass has declined to below the MSST. New full and updated assessments and rebuilding analyses were done in 2013 inform the 2015 and 2016 harvest specifications for many of the overfished species. New full assessments were conducted for cowcod, darkblotched rockfish, and petrale sole in 2013; however, a new rebuilding analysis was only prepared for cowcod. The results of the new assessments for darkblotched rockfish and petrale sole indicated those stocks would be rebuilt by 2015 and 2014, respectively. The SSC did not recommend new rebuilding analyses for these two stocks given their imminent rebuilding expectation. An update assessment for bocaccio was prepared in 2013. Like darkblotched, the stock is predicted to rebuild by 2015 and the SSC therefore recommended no new rebuilding analysis be prepared. Catch reports for canary rockfish, Pacific ocean perch, and yelloweye
rockfish were prepared in 2013. These catch reports indicated total catches were within limits prescribed in these stocks’ respective rebuilding plans.

Stock rebuilding parameters estimated from the most recent rebuilding analyses and current rebuilding parameters specified at the start of 2013 are provided in Table 4-1.

Table 4-1. Rebuilding parameters estimated in the most recent rebuilding analyses and specified in rebuilding plans for overfished groundfish stocks at the start of the 2013-2014 management cycle.

<table>
<thead>
<tr>
<th>Stock</th>
<th>T_MIN</th>
<th>T_{F=0}</th>
<th>T_MAX</th>
<th>T_{TARGET}</th>
<th>Harvest Control Rule Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bocaccio</td>
<td>2018</td>
<td>2018</td>
<td>2031</td>
<td>2022</td>
<td>SPR 77.7%</td>
</tr>
<tr>
<td>Canary</td>
<td>2027</td>
<td>2028</td>
<td>2050</td>
<td>2030</td>
<td>SPR 88.7%</td>
</tr>
<tr>
<td>Cowcod</td>
<td>2059</td>
<td>2060</td>
<td>2097</td>
<td>2068</td>
<td>SPR 82.7%</td>
</tr>
<tr>
<td>Darkblotched</td>
<td>2012</td>
<td>2016</td>
<td>2037</td>
<td>2025</td>
<td>SPR 64.9%</td>
</tr>
<tr>
<td>POP</td>
<td>2040</td>
<td>2043</td>
<td>2071</td>
<td>2051</td>
<td>SPR 86.4%</td>
</tr>
<tr>
<td>Yelloweye</td>
<td>2044</td>
<td>2047</td>
<td>2089</td>
<td>2074</td>
<td>SPR 76%</td>
</tr>
</tbody>
</table>

4.2.1.2 Bycatch Limits

Under the IFQ system there are individual by catch limits for halibut. In addition, there are bycatch limits for certain groundfish species that are either pooled by groups of fishermen or traded amongst individuals. The at-sea whiting sectors are managed under bycatch limits for selected overfished species. Mandatory co-ops in the mothership sector are allocated a portion of these sector bycatch limits and are accountable for keeping catch of these species within their allocation. Bycatch limits are not expected to change under any of the proposed alternatives.

4.2.1.3 Tracking and Monitoring Under the Proposed Action

All vessels would be required to carry at-sea observers at their own expense to monitor sorting and discarding of the catch and shoreside landings. There would also have to be an electronic system to report bycatch and landings, which may be integrated with the current state fish ticket (landings reporting) system. NMFS would also continue to administer a system to track QS/QP holdings. A comprehensive EM program is expected to require minimal increases in enforcement effort. Since the EM program would be voluntary, vessels may immediately lose privileges for certain violations. In addition, it’s possible that existing coops and new coops could assist in “self-policing” to increase accountability between members and lessen the need for enforcement actions. To resolve ongoing EM monitoring issues or in response to violations, observers may be required in place of EM.
Under Alternative 1 (No Action), at-sea observers would be required on all vessels (100 percent coverage). Observers would be required to monitor the sorting, weighing, and discarding of catch.

Under Alternative 2 or 3, to assure accuracy when QPs are discarded at sea, vessels may be required to meet specified monitoring and weighing provisions, including adequate space for catch sorting, an adequate location for video monitoring, and the equipment necessary for accurately weighing and documenting QP species at sea.

Under all alternatives, biological data collected by shoreside samplers would include age structure data (lengths, otoliths, scales, snouts, etc.) and would continue to provide much needed fishery dependent length and age data use in stock assessments. Providing quality fishery dependent length and age data is expected to have a beneficial effect, as it helps stock assessment scientists better understand a stock’s population status and changes in the stock. Stock assessments are important to the management process because they are generally used as the basis for setting future harvest levels.

Under Alternative 1, catch composition data would continue to be collected by at-sea observers; however, under Alternative 2 and 3, sampling would need to be conducted on EM vessels to collect biological data and possibly verify EM data that is seen by reviewers and logged by vessel operators. The level of sampling and the cost to support these efforts has not yet been evaluated or decided upon.

A catch monitor is present during the entire delivery to ensure that all incidental catch makes it to the point of weighing. This includes monitoring the primary sorting stations and confirming the weight of the catch includes species that may have been missed in the initial sorting, and confirming that all catch is recorded accurately. Depending on a processor’s capacity and efficiency, and the size of vessel deliveries, a full offload could take a few hours to the majority of the day. Although this monitoring program would remain in regulation, it’s possible that some efficiencies may be lost since many observers depart the vessel and become the shoreside catch monitor. Under Alternative 2 and 3 a shoreside monitor will need to be present for vessels that deliver and do not have an observer aboard the vessel. Vessels and processors will need to work together to ensure a catch monitor is available.

Fish ticket data must be submitted within 24 hours of the time the catch was landed rather than daily, electronic fish ticket data for some deliveries may not be submitted until almost two days after the catch was landed and would be available to managers shortly thereafter.

One major consideration for debiting a QP account is the timeframe to get the data into the system. Under Alternative 3 (logbook audit) it’s possible to get the data from the logbook into the system within a week; however, it may take up to a month or more depending on the review software and the number of discard events to review, or corrections to be made to get the data into the system and reconcile a QP account. The physical transfer of the video data (via electronic or car) to the reviewer and the length of time it takes for the reviewer to conduct the audit are the limiting factors for the process. Review all the video (Alternative 2, Option A: census), would take the most time and be the most costly to fishermen.
4.2.1.4 Indirect Biological Effects

Valid and timely data are needed to monitor total catch of all IFQ species, IBQ species, and catch allocations. Positive indirect biological effects could occur if the quality of catch data were improved such that more timely and accurate data were available for managing the fishery inseason and keeping total catch within the fishery specifications, including: bycatch limits, species allocations, OYs, and biological opinion thresholds. Negative indirect biological effects could result if catch data used to manage the fisheries inseason were inaccurate or delayed such that fishery specifications could not be adequately monitored or the fishing stopped before one of the fishery specifications were exceeded.

If a fishery specification for precautionary zone and healthy groundfish species or species groups is exceeded, the risk to the stock is generally lower than it is for overfished species. If a fishery specification of a constraining overfished species was greatly exceeded due to unreported discarding at sea, inaccurate catch accounting, or delayed catch reporting, the risk of exceeding rebuilding-based OYs is increased. There are many variables that affect the time it takes a stock to rebuild, fishing mortality is only one of those variables. However, exceeding the rebuilding based OY could result in an extended rebuilding period for an overfished species.

4.2.2 Effects on prohibited species and protected species

Salmonids: None of the alternatives would cause additional impact to salmonids since fishing behavior is unlikely to change and fishers would be required to discard them (except shoreside and at-sea whiting catcher vessels). If other fisheries are required to retain them under Option A Maximized retention then some additional impacts may occur; however, current impacts are minimal in groundfish fisheries. The shoreside and at-sea whiting fishery operates under a limit and an EM program would not increase the limit nor cause an increase in catch rates.

Halibut: Halibut impacts are not expected to increase unless vessels are required to retain them under maximized retention, as is the current practice in the shoreside and at-sea whiting fishery. IF all catch is considered dead then impacts may reach a maximum but would not exceed current IBQs and catch allocations for each sector. If vessel continue to discard them and current IPHC halibut mortality rates are applied then impacts would likely be similar to the status quo. Several options for discard mortality and retention are identified but are not yet analyzed yet: Using WCGOP scientific observations (assumed 20-30% coverage) is applied to fleet (Option B), captain and crew provide assessment (Option D), an appropriate EM viability assessment (Option E), or vessel specific viability assessment (Option F).

Marine Mammals: The alternative actions are not likely to affect the incidental mortality levels of marine mammals over what has been considered in previous NEPA analyses.

Seabirds: The alternative actions are not likely to affect the incidental mortality levels of seabirds over what has been considered in previous NEPA analyses.
Sea Turtles: The alternative actions are not likely to affect the incidental mortality levels of sea turtles over what has been considered in previous NEPA analyses.

Endangered Species: The alternative actions are not likely to affect the incidental mortality levels of endangered species over what has been considered in previous NEPA analyses.

4.3 Effects on the Socioeconomic Environment

This section of the EA looks at direct and indirect impacts, positive and negative, on the socioeconomic environment. Basic information regarding the people and the fisheries that are projected to be affected by the management alternatives will be presented in Chapter 3. The following section differs from Chapter 3 in that it discusses what is projected to happen to the affected people and fisheries as well as what social changes are expected to occur, and, how changes are expected to affect fishing communities.

In this section, the primary impact mechanisms that will be traced through to their socioeconomic effects are:

- Increased retention of unwanted fish
- Replacement of human compliance observers with electronic monitoring, on a voluntary basis
- New onboard catch handling restrictions (e.g. ensuring adequate quality camera capture of any discards)
- Other new data collection activities (e.g. discard logbooks)
- New data processing related tasks (e.g. data retrieval and video review)
- Changes in the configuration of the shoreside monitoring task (e.g. use of catch monitors present in the port rather than relying on observers)
- New and changing distribution of responsibility for paying for various tasks (e.g. payment for at-sea biological observations, payment for video review)

One of the main impacts of the alternatives that runs through all sectors, including the government sector, is the impacts on the direct costs of the compliance and biological monitoring programs. For that reason, this section will start with an assessment of the direct compliance and biological monitoring costs of the alternatives followed by a full evaluation of the impacts to each sector.

4.3.1 Analysis of Program Costs for Compliance and Biological Monitoring

A complete assessment of costs is underway and is expected to be completed in the summer of 2014. Contributions to the cost assessment have been requested from NMFS WCR and NWFSC as well as PSMFC. There will be some significant uncertainties in that assessment including uncertainties about

1. EM program participation rates in aggregate and by port
2. Additional fleet consolidation
3. Organization of the shoreside monitoring function
4. Changes to fees charged by providers for compliance observers and shoreside catch monitors

The outcome for some of these uncertainties will depend on how fishery participants respond to the program. To deal with these some of these uncertainties, ranges of estimates will be developed and some results may be presented qualitatively, or quantitatively but with out dollar values assigned.

Others uncertainties depend on the eventual design of the program. There are also a number of decision points that will affect the cost estimates and distribution of costs. A few of the more significant ones may be

1. Who will retrieve data from vessels
2. Whether all video must be reviewed (Alternative 1) or only a percentage of it (Alternative 2).
3. What amount of discarding will be allowed (and hence the video that must be reviewed more carefully reviewed)
4. Who will carry out the video review function
5. Who will pay for the video review function

Note: The following analysis has not yet been fully reviewed by the Groundfish Electronic Monitoring Technical Advisory Committee.

4.3.1.1 Assumptions

Participation Rates

On one of the most important factors – EM participation rates – a range of working assumptions is being considered on a preliminarily basis. **Comment on this range is sought at the June Council meeting.**

Table 4-2. Preliminary working assumptions on rates of vessel participation in the EM program.

<table>
<thead>
<tr>
<th>Low Rate</th>
<th>Medium Rate</th>
<th>Higher Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>50</td>
<td>80</td>
</tr>
</tbody>
</table>

Fleet Consolidation

Under the No Action Alternative, there may be further fleet consolidation as a continuation of the rationalization process started with the implementation of Amendment 20 in 2011. While there has already been some consolidation, additional consolidation might be expected with the start of QS trading and as subsidies for observer fees end. It would be expected that if the action alternatives have a substantial effect on vessel operating costs there might be an effect on fleet consolidation. The amount of consolidation expected is extremely difficult to predict and it is possible that there would be no additional consolidation under No Action. On this basis, no attempt will be made to
model additional fleet consolidation but the possibility or such consolidation will be covered in the discussion of results and discussion of the impact on fishery participants.

Other Assumptions

Other assumptions will be identified and specified as the analysis is further developed.

4.3.1.2 Cost Categories

For purposes of developing the analysis, costs have been broken out into the categories provided in Table 4-3. It may be necessary to develop cost estimates in two fashions: one for implementing a program for all sectors at one time and another for implementing the program for one or two sectors, with an assessment of the incremental costs for adding sectors at a later time. Costs may vary in important ways depending on how many sectors are covered at one time.
## Table 4-3. Cost estimation template.

<table>
<thead>
<tr>
<th>Component</th>
<th>Status Quo: Human Observers Estimate Discard</th>
<th>Camera Recordings Used to Estimate Discard</th>
<th>Logbooks Used to Estimate Discard, with Camera Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Private</td>
<td>Government</td>
<td>At-sea Whiting</td>
</tr>
<tr>
<td><strong>Electronic Monitoring</strong></td>
<td>None</td>
<td>Cameras</td>
<td>Logbooks and Cameras</td>
</tr>
<tr>
<td><strong>Individual Vessel Monitoring Plans (IVMPs)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of standards for IVMPs (1x)</td>
<td>x</td>
<td>??</td>
<td>one project for all sectors?</td>
</tr>
<tr>
<td>Development of IVMPs by vessels(1x)</td>
<td>x</td>
<td>?</td>
<td>??</td>
</tr>
<tr>
<td>Approval of IVMP by NMFS (1x)</td>
<td>x</td>
<td>?</td>
<td>??</td>
</tr>
<tr>
<td>Maintenance and revision of IVMP</td>
<td>x</td>
<td>?</td>
<td>??</td>
</tr>
<tr>
<td><strong>Vessel Equipment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of standards for equip. (1x)</td>
<td>x</td>
<td>?</td>
<td>??</td>
</tr>
<tr>
<td>Purchase cost (1x)</td>
<td>x</td>
<td>?</td>
<td>??</td>
</tr>
<tr>
<td>Installation cost (1x)</td>
<td>x</td>
<td>?</td>
<td>??</td>
</tr>
<tr>
<td>Maintenance - annual</td>
<td>x</td>
<td>?</td>
<td>??</td>
</tr>
<tr>
<td><strong>Data Transfers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of protocols and software (1x)</td>
<td>x</td>
<td>?</td>
<td>??</td>
</tr>
<tr>
<td>Retrieval/submission of data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- video</td>
<td>?</td>
<td>?</td>
<td>??</td>
</tr>
<tr>
<td>- logbook</td>
<td>?</td>
<td>?</td>
<td>??</td>
</tr>
<tr>
<td><strong>Video/Data Processing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of protocols and software (1x)</td>
<td>?</td>
<td>x</td>
<td>??</td>
</tr>
<tr>
<td>Video/logbook review</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- during gear retrieval &amp; catch sorting b/</td>
<td>?</td>
<td>?</td>
<td>$27/day</td>
</tr>
<tr>
<td>- transmission to Catch Acctng Sys</td>
<td>?</td>
<td>?</td>
<td>$372/trip</td>
</tr>
<tr>
<td>- after sorting and stowage until offload</td>
<td>?</td>
<td>?</td>
<td>??</td>
</tr>
<tr>
<td><strong>Data Storage and Maintenance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of protocols, software etc. (1x)</td>
<td>x</td>
<td>?</td>
<td>??</td>
</tr>
</tbody>
</table>

Electronic Monitoring Analysis 91 June 2014
<table>
<thead>
<tr>
<th>Component</th>
<th>Alt 1</th>
<th>Alt 2</th>
<th>Alt 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status Quo: Human Observers Estimate Discard</td>
<td>Camera Recordings Used to Estimate Discard</td>
<td>Logbooks Used to Estimate Discard, with Camera Audits</td>
<td></td>
</tr>
<tr>
<td>Private Government</td>
<td>At-sea Whiting</td>
<td>Shoreside MWT</td>
<td>Bottom Trawl</td>
</tr>
<tr>
<td>Equipment costs (1x)</td>
<td>x</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Equipment maintenance</td>
<td></td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Resp to data req.</td>
<td>x</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Compliance and Biological Observers</td>
<td>100% Cov</td>
<td>Partial Coverage (e.g. 25%)</td>
<td>Partial Coverage (e.g. 25%)</td>
</tr>
<tr>
<td>Government Costs (WCGOP)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program planning and development (1x)</td>
<td>x</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Ongoing admin costs (e.g. trip notifcns)</td>
<td>x</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Observer training admin costs</td>
<td>x</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Observer debriefing admin costs</td>
<td>x</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Data QA/QC, summary, and analysis</td>
<td>x</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Gear and equipment</td>
<td>x</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Costs – At-Sea for Biological Observers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observer provider fees</td>
<td>??</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Observer boarding costs (e.g. food)</td>
<td>x</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Costs – At-Sea for Compliance Observers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observer provider fees</td>
<td>x</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Observer boarding costs (e.g. food)</td>
<td>x</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Shoreside Catch Monitor (CM) c/</td>
<td></td>
<td>100% Cov</td>
<td>100% Coverage</td>
</tr>
<tr>
<td>First Receiver - Shoreside CM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CM training &amp; admin costs</td>
<td>x</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>CM debriefing &amp; admin costs</td>
<td>x</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Gear and equipment</td>
<td>x</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>CM provider fees</td>
<td>x</td>
<td>??</td>
<td>??</td>
</tr>
</tbody>
</table>

a/ PSMFC trains the catch monitors and processes the reports they generate. These costs are covered by a government contract.
b/ Values provided here are based on PSMFC’s study and include time identifying retained species, which may not be necessary if cameras are only being used for discard monitoring. Additionally, these cost estimates do not take into account other operational modifications that vessels may be able to make to reduce video review time.
c/ Catch monitoring costs are implicated since observers will no longer be available to move shoreside and handle catch monitoring responsibilities.
d/ The video review costs do not go down by 80% percent in moving from the 100% video review of Alternative 2 to the 20% video review of Alternative 3, because 20% is the minimum level of review permitted (1 of 5 hauls, or 2 of 10). A minimum of one haul must be reviewed from each trip. If the trip has less than 5 hauls, one haul will always be algebraically more that 20% of the trip. E.g., a trip that has a total of three hauls will always have 1 haul reviewed. 1 haul of a total of 3 is 33%, not 20%. Similarly, if a vessel fishes 12 hauls on a trip, 3 hauls will be reviewed, 3 of 12 is 25%. Additionally, a fixed cost of one half hour per trip was added to the review time to cover the time it takes to handle the drives and identify trips and hauls from the sensor data. An additional one half hour added to the time would further increase the cost from a directly proportional time per haul calculation.
Government Policy Development, Implementation and Administrative Costs (Across Categories)

Government costs have been broken out into a number of categories for purposes of completeness. However, the categories may be rolled up and a single estimate provided for the program as a whole. Under the action alternatives, program planning and administrative costs will be required for tasks such as developing criteria for and then approving individual vessel monitoring plans and electronic monitoring equipment; organizing the retrieval, transmission, and storage of data from the field; coordinating the video review function (whether carried out as a government or contractor activity); summarizing and responding to data requests; developing and implementing observer deployment and sampling plans to collect biological data given only partial at-sea coverage by compliance monitors. Depending on the amount of participation in the EM program, there may be a need to develop a new system for vessels to provide advance notification of trip. There may also be an addition to the costs for data summary and analysis as a result of the need to develop statistical estimates (there is currently a census) and to incorporate information from the EM system as a way of improving those estimates. Total observer training, debriefing, gear and equipment costs may decline with fewer observers but average costs could increase.

Under the action alternatives, government costs will likely vary depending on the sectors and gears covered by the alternative adopted. With respect to program development and planning costs, it may be that once a program is developed for one sector, the additional costs for adding other sectors will be lower. Some of the ongoing costs of administering the program are likely to vary by the number of participants, which will be a partial function of the sectors and gears covered. The government costs associated with the EM program might be considered costs associated with a LAPP in which case those costs would be recoverable through fees of up to three percent of total exvessel value (maximum on total cost recovery for the trawl rationalization program as a whole). The shorebased IFQ sector is already being charged the maximum 3 percent fee, therefore any increases in government costs will have to be covered from other sources. The mothership sector is being charged less than the three percent maximum, therefore it might be that some of the government costs associated with the program can be passed through to the industry. It should be noted that for the WCGOP there may be some administrative savings as a result of managing fewer observers. An assessment will be required to determine whether these savings are greater than the expected cost increases associated with the EM program.

Electronic Monitoring

Video Review Costs

Under the action alternatives there would be a new cost for video review that is not present under the No Action Alternative. It has not been determined who would bear the video review costs. Estimates have been developed for the cost of video review time during initial catch retrieval and sorting. These are displayed in Table 4-3. These estimates currently include time required to identify catch being retained. Time required for video review may be less than these estimates if only discard events have to be evaluated for species identification. Additionally, other innovations could be developed which speed video review time.
Vessels need to be monitored for discard events for the entire time fish are onboard the vessel until they are offloaded. This costs is not included in the current video review time estimate. It may be possible that video review between catch sorting activities and arrival in port may be assisted through programming software that identifies video segments where back deck activity is occurring, thus reducing the amount of transit video that needs to be reviewed. Other technologies such has hatch sensors may be useful in increasing the efficiency of reviewing video.

Logbooks (Alternative 2 Only) and Fish Tickets

Logbook reporting requirements would not change under Alternative 1. Under Alternative 2 fishermen would be required to report discards by species and provide an accurate estimate of the weight. This will require the creation of logbooks for certain fisheries. The current state trawl logbook for midwater and bottom trawl activity would need to be modified to include species discard categories with instructions. This would require additional fields in the Pacific Fisheries Information Network (PACFIN) reporting system and may require additional changes to state computer reporting systems. Potential changes to existing logbook system are described in the Table 4-4.

Table 4-4. Potential changes to logbooks or additional logbooks for each fishery under Alternative 3.

<table>
<thead>
<tr>
<th>Fishery/Gear</th>
<th>Additional data fields</th>
<th>Changes to state system</th>
<th>Changes to PACFIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whiting/MDTW</td>
<td>Estimated Pounds Discarded Each Tow</td>
<td>Yes if state wants/required to track</td>
<td>Yes if discard info is provided to NMFS via PSMFC, may need to apply species comp to estimated total discard to get individual species discards</td>
</tr>
<tr>
<td>Non-whiting/MDTW; BTW</td>
<td>Estimated Pounds Discarded Each Tow</td>
<td>Yes if state wants/required to track</td>
<td>Yes if discard info is provided to NMFS via PSMFC, may need to apply species comp to estimated total discard to get individual species discards</td>
</tr>
<tr>
<td>Fixed gear/LL and Pot</td>
<td>May not need changes for Oregon fixed gear logbook; California trap log – add discard field; Need to develop a logbook for Washington.</td>
<td>Yes if state wants/required to track</td>
<td>Yes if discard info is provided to NMFS via PSMFC; changes to accommodate California and Washington data.</td>
</tr>
</tbody>
</table>
Under each of the alternatives, first receivers in the states of Washington and California would continue to complete and submit the required paper fish tickets on forms as required by the state of landing. In the State of Oregon, first receivers would either complete paper fish ticket forms provided by the state, or computer generated tickets providing they contain all data fields specified in state law. State requirements for fish ticket submissions would not be changed under any of the proposed alternatives.

Additional Sections to be Developed

**Biological and Compliance Observers**

Prior to the trawl rationalization program approximately 20 to 25 percent of the trips were covered with government paid biological observers. Under the trawl rationalization program industry paid compliance observers have also filled the biological observer function. Under the No Action Alternative this would be expected to continue with no change. Under either of the Action Alternatives, biological observer coverage would be required to sample the catch and collect other data at-sea on a randomly distributed sample of trips by vessels participating in the EM program. A determination will be needed on who pays for the observers used in the new biological sampling regime under EM: Would the vessels pay or would government payment for observers resume? Depending on that determination, there may be a new government cost for the biological observers replacing the compliance observers paid for by industry or the industry might pay some costs for the biological observers, in addition to the EM costs.

In the past, biological observers for the trawl fishery were provided by largely the same companies that currently provide the compliance observers; and the training for both types of observers is quite similar. Under the action alternatives, the total demand for observers will likely be reduced; the demand for compliance observers will go down, mitigated to some degree by an increase in demand for biological observers. The reduction in overall demand is likely to result in an increase in the per-day-at-sea price for observers. There may also be a reorganization of the shoreside monitoring tasks such that it is no longer carried by observers once they reach port. Such a reorganization, by reducing the revenue an observer provider generates with an observer already in place in the field, could cause providers to have to increase prices to maintain a reasonable profit margin.

**Shoreside Catch Monitors**

It is expected that the organization and total costs associated with the shoreside catch monitoring program would change with the implementation of any of the action alternatives. Currently the catch monitoring function is generally carried out by the at-sea observers who, upon arriving in port, go to shore and fulfill the monitoring function at first receiver site. The shoreside catch monitoring task might take an hour or two or a half-day or more to complete, depending on the type of delivery. This would be expected to continue under the No Action Alternative. Under the action alternatives, to the degree that vessels opt into the EM Program, observers would not be available to fulfill this function and other arrangements will have to be made. This reorganization of the shoreside monitoring task is expected to impact provider fees for catch...
Effect on Catch Monitoring and Observer Costs

The impact on catch monitoring and observer costs will depend on the EM program participation rates, how industry decides to organize itself to fulfill this function, and how government functions are organized. Observer time fulfilling the shoreside monitoring function is paid by the first receiver, rather than the vessel. The fees providers currently charge for catch monitoring services are influenced by the efficiencies related to having an observer fulfill the shoreside catch monitoring function and might be higher if the catch monitoring function were fulfilled by shorebased personnel, particularly in ports where this is not enough demand to support a full time catch monitor.\(^3\) If some vessels are not carrying observers, a shoreside monitor will need to be in the port to cover a task which may only be a few hours in duration. Depending on the number of landings in the port or port region and the number of those landings without observers to cover the shoreside monitoring function, the task might need to be handled by a part time monitor or a monitor travelling in from another region. Anecdotally it has been reported that for remote ports with a small number of landings that the costs of servicing the ports with observers has been problematic. This challenge might be even greater when a catch monitor is needed in a port for only part of a day. Variable EM participation will create logistical challenges in organizing this task and add to the need for advance planning, particularly if there are only one or two catch monitors covering a region. First receiver cooperation in timing of offloads and sharing of catch monitors would also affect the number of monitors that need to be available and related costs. First receivers and providers might decide to organize the shoreside function by largely ignoring opportunities for utilization of the at-sea observers in this capacity and relying only on “dedicated shoreside monitors”. Unless there are a large number of landings in a particular port or port area, or catch monitors are able to fulfill some other program functions when not observing offloads, it seems likely that the average catch monitoring field costs (labor, transportation, etc.) are likely to be higher than under the current system where the at-sea observer fulfills the shoreside monitoring function. First receivers in ports in which there are a large number of landings, may gain some additional measure of advantage over first receivers in smaller more isolated ports, if their volume of landings allows them to achieve lower average catch monitoring fees. While the current practice is that first receivers pay the shoreside monitoring fees, increased fees could affect the exvessel prices first receivers are willing to pay for deliveries. Current rates that providers charge for the catch monitoring tasks are provided in Table 4-5.

Table 4-5. Current provider fees for catch monitoring services.

<table>
<thead>
<tr>
<th>Fee Type</th>
<th>Description</th>
<th>Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reorganization of the catch monitoring task could also exert an upward influences on the prices vessels pay for observers, since providers will no longer be able to cover some of the logistics

\(^3\) Analyst’s conclusion based on personal communications with Alaska Observers Inc and Saltwater Inc on May 27, 2014.
related costs of placing observers in the field with revenue from fees charged when observers fulfill the catch monitoring function.

By Port Demand for Catch Monitoring Services

Catch monitoring costs will be influenced by the demand for services in a port or port region. The by-port demand for catch monitoring services will be a function of the number of vessels in a port participating and not participating in the EM program; the number of first receivers in a port and their ability to coordinate landings with vessels and with one another; and the total number and seasonality of landings. Additionally, geographic proximity to other ports and related travel time and costs will determine the opportunity first receivers have to pool together with other ports to generate greater demand and potentially lower prices.

This section provides information on the distribution trawl IFQ program of landings, vessels, and first receivers across ports from 2011 through 2013 (Figure 4-1 through Figure 4-3 provide annual data and Figure 4-4 through Figure 4-19 provide monthly data). Annual values are also broken out by IFQ gear sector: nonwhiting trawl (may include some vessels using midwater trawl to catch whiting), whiting trawl (vessels using midwater trawl used to target whiting) and nontrawl (vessels using non-trawl gears to participate in the trawl IFQ program). Monthly figures do not provide IFQ gear sector breakouts. The reader should be aware that the scale of the axis for landing counts for Oregon ports is larger (going to a maximum of 250) than for Washington and California (going to a maximum of 50). Other than that, the same scales are maintained between graphs to facilitate comparisons between ports. In Westport, in one month the number of landings exceeded the scale provide (a total of 51 landings were made, as noted on the graph). Table 4-6 provides a key to the port abbreviations used in the annual tables.

The following summary is based on the 2011 to 2013 annual and monthly landings by port in Figure 4-1 through Figure 4-19. Bellingham is geographically isolated from other ports and has very low levels of landings spread through most of the year. Westport has high levels of landings but they are seasonal and dominated by whiting. Covering off-season landings might be problematic and it could become much more difficult to cover Westport with catch monitors if vessels in the whiting fishery were able to participate in EM but not vessels in other IFQ gear sectors. Ilwaco has a lower level of demand for catch monitors but may benefit by its proximity to the high demand port of Astoria. Astoria has the highest demand for catch monitoring along the coast and has high demand for coverage of both whiting and nonwhiting landings. Newport also has high demand for coverage of whiting landings but much lower for nonwhiting landings (comparable to Ilwaco and Brookings). Other than Astoria, Coos Bay, Eureka, and Fort Bragg have the highest annual demands for coverage of nonwhiting landings. If the 2011 to 2013 trend in Crescent City continues, it will likely fade out as an IFQ port. As mentioned above, the landings showing for Bodega Bay and Berkeley appear to be coding errors and will be removed from the next draft of this document. The other active ports from San Francisco south (San Francisco, Half Moon Bay, Monterey, Moss Landing, and Morro Bay) have generally lower numbers of nonwhiting landings than ports to the north with the exceptions of Crescent City, Westport, and Bellingham. Landings for 2011 in Half Moon Bay and 2012 in Morro Bay might be the exceptions. Avila appears to have faced out as an IFQ port.
There is some degree of seasonal variations in the landings of most every port. In six of the fifteen ports in which there were landings in 2013, there were at least some months in which there were no landings (Bellingham, Westport, Brookings, Crescent City, Half Moon Bay, and Monterey, Table 4-7). For months in which fishing occurred, there were fewer than an average of five landings a month in 2013 in Bellingham, Crescent City, San Francisco, Monterey, and Moss Landing. There was an average of between six and ten landings a month for months fished in 2013 in Ilwaco, Brookings, Eureka, Fort Bragg, Half Moon Bay and Morro Bay. There were an average of 16 per month in Westport and Coos Bay, but seasonality was much heavier in Westport than Coos Bay. The greatest averages were in Astoria (56 per month) and Newport (50 per month). Demand and seasonality in Westport and Newport are heavily influenced by the whiting fishery. Footnotes in Table 4-7 provide information on the travel time between ports.

Table 4-6. Key to port abbreviations.

<table>
<thead>
<tr>
<th>Port Abbreviation</th>
<th>Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLL</td>
<td>Bellingham, Washington</td>
</tr>
<tr>
<td>WPT</td>
<td>Westport, Washington</td>
</tr>
<tr>
<td>ILW</td>
<td>Ilwaco, Washington</td>
</tr>
<tr>
<td>AST</td>
<td>Astoria, Oregon</td>
</tr>
<tr>
<td>NWPT</td>
<td>Newport, Oregon</td>
</tr>
<tr>
<td>COS</td>
<td>Coos Bay, Oregon</td>
</tr>
<tr>
<td>BRK</td>
<td>Brookings, Oregon</td>
</tr>
<tr>
<td>CC</td>
<td>Crescent City, California</td>
</tr>
<tr>
<td>ERK</td>
<td>Eureka, California</td>
</tr>
<tr>
<td>FB</td>
<td>Fort Bragg, California</td>
</tr>
<tr>
<td>BDG</td>
<td>Bodega Bay, California</td>
</tr>
<tr>
<td>SF</td>
<td>San Francisco, California</td>
</tr>
<tr>
<td>B</td>
<td>Berkeley, California</td>
</tr>
<tr>
<td>HLF MN</td>
<td>Half Moon Bay, California</td>
</tr>
<tr>
<td>MNT</td>
<td>Monterey, California</td>
</tr>
<tr>
<td>MOS</td>
<td>Moss Landing, California</td>
</tr>
<tr>
<td>MOR</td>
<td>Morro Bay, California</td>
</tr>
<tr>
<td>AVL</td>
<td>Avila, California</td>
</tr>
</tbody>
</table>

4 Of the 16 ports in Table 4-7 only Avila had no 2013 landings.
Figure 4-1. Number of nonwhiting trawl, whiting trawl, and nontrawl IFQ landings by port for 2011, 2012, and 2013 (see Table 4-6 for key to port names) – there are no first receives in Bodega Bay (BDG) or Berkeley (B) therefore the landings reported for these ports are likely miscodings.
Figure 4-2  Number of nonwhiting trawl, whiting trawl, and nontrawl IFQ vessels by port for 2011, 2012, and 2013 (vessels participating in more than one IFQ gear sector or landing in more than one port are counted more than once, see Table 4-6 for key to port names) – there are no first receives in Bodega Bay (BDG) or Berkeley (B) therefore the landings reported for these ports are likely miscodings.
Figure 4-3 Number of nonwhiting trawl, whiting trawl, and nontrawl IFQ first receivers by port for 2011, 2012, and 2013 (first receivers receiving from more than one gear group are counted more than once, see Table 4-6 for key to port names) – there are no first receives in Bodega Bay (BDG) or Berkeley (B) therefore the landings reported for these ports are likely miscodings.
Figure 4-4  Bellingham, Washington, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings – no whiting landings were made to this port)
Figure 4-5  Westport, Washington, counts vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting and whiting landings)
Figure 4-6  Ilwaco, Washington, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting and whiting landings).
Figure 4-7  Astoria, Oregon, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting and whiting landings).
Figure 4-8  Newport, Oregon, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting and whiting landings).
Figure 4-9  Coos Bay, Oregon, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting and whiting landings – there were whiting landings only in 2011).
Figure 4-10  Brookings, Oregon, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting and whiting landings).
Figure 4-11 Crescent City, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port).
Eureka, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port).

Figure 4-12 Eureka, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port).
Fort Bragg, California counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port).

Figure 4-13 Fort Bragg, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port).
San Francisco, California

Figure 4-14  San Francisco, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port).

Electronic Monitoring Analysis  112  June 2014
Half Moon Bay, California

Figure 4-15 Half Moon Bay, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port).
Monterey, California

Figure 4-16 Monterey, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port).
Figure 4-17  Moss Landing, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port).
Figure 4-18 Morro Bay, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port).
Avila, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port).

Figure 4-19  Avila, California, counts of vessels, dealers and landings by month for 2011 through 2013 (includes nonwhiting landings only – no whiting landings were made to this port).
Government Costs for Catch Monitors

Currently, in addition to observer training with the NWFSC, most every observer goes to a separate training with PSFMC to learn how to fulfill the shoreside catch monitoring function. Catch monitors are able to use the equipment provided by the NWFSC to fulfill their shoreside monitoring tasks. The PSMFC checks data quality of the reports submitted by catch monitors on a bimonthly basis and debriefs catch monitors annually. The costs of training and debriefing are covered through a government contract. This would likely continue to be the case under the No Action Alternative.

Under the action alternatives, if the shoreside catch monitoring task is reorganized to use monitors dedicated to only shoreside activities fewer shoreside monitors would be needed to fulfill this function. This could result in a reduction in the total number of shoreside monitors that need to be trained on an annual basis and possibly a reduction in debriefing time. The administrative effort for the bimonthly quality checks would be relatively unaffected, assuming that there is no change in the total number of landings. There is no reason to believe there would be substantial differences between the action and no action alternatives.

Table 4-7. PRELIMINARY assessment of challenges with providing catch monitoring in each port based on seasonal landing patterns (summary of data in Figure 4-4 through Figure 4-19).

<table>
<thead>
<tr>
<th>Port</th>
<th>Assessment of CM Needs Based on Number of Landings (averages are for months with landings – zero months excluded)</th>
<th>PRELIMINARY Assessment of Feasibility of Dedicated Shoreside Monitoring With Current Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bellingham, Washington</td>
<td>Occasional seasonal (Oct-May). In 2013, an average of 2 per month, max of 4 and minimum of 1 (3 zero months).</td>
<td></td>
</tr>
<tr>
<td>Westport, Washington</td>
<td>Regular seasonal (June through November). In 2013, an average of 16 per month, max of 39 and minimum of 2 (3 zero months). The whiting fishery is the source of the vast majority of the landings see Figure X-X.</td>
<td></td>
</tr>
<tr>
<td>Ilwaco, Washington</td>
<td>Year round part time with seasonal peaks. In 2013, an average of 8 per month, max of 16 and minimum of 1 (no zero months).</td>
<td></td>
</tr>
<tr>
<td>Astoria, Oregon</td>
<td>Year round full time (possibly), with season peaks. In 2013, an average of 56 per month, max of 136 and minimum of 19 (no zero months).</td>
<td></td>
</tr>
<tr>
<td>Newport, Oregon</td>
<td>Seasonal full time and year round part time. In 2013, an average of 50 per month, max of 153 and minimum of 4 (no zero months).</td>
<td></td>
</tr>
<tr>
<td>Coos Bay, Oregon</td>
<td>Consistent, year round part time. In 2013, an average of 16 per month, max of 27 and minimum of 3 (no zero months).</td>
<td></td>
</tr>
<tr>
<td>Brookings, Oregon</td>
<td>Consistent, year round part time – very low. In 2013, an average of 6 per month, max of 12 and minimum of 3 (1 zero months).</td>
<td></td>
</tr>
<tr>
<td>Crescent City, California</td>
<td>Very low brief seasonal. In 2013, an average of 2 per month, max of 3 and minimum of 1 (9 zero months).</td>
<td></td>
</tr>
<tr>
<td>Eureka, California</td>
<td>Consistent, year round part time with seasonal peak. In 2013, an average of 9 per month, max of 26 and minimum of 14 (no zero months).</td>
<td></td>
</tr>
</tbody>
</table>

Electronic Monitoring Analysis 118 June 2014
### Evaluation of CM Needs Based on Number of Landings

(averages are for months with landings – zero months excluded)

<table>
<thead>
<tr>
<th>Port</th>
<th>Landings Description</th>
<th>Preliminary</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Bragg, Calif.</td>
<td>Year round but very low demand in winter months. In 2013, an average of 9 per month, max of 18 and minimum of 2 (no zero months).</td>
<td></td>
<td>a</td>
</tr>
<tr>
<td>San Francisco, Calif.</td>
<td>Year round low level, small seasonal increase in the summer. In 2013, an average of 4 per month, max of 9 and minimum of 1 (no zero months).</td>
<td></td>
<td>a</td>
</tr>
<tr>
<td>Half Moon Bay, Calif.</td>
<td>Low level seasonal demand May through October. In 2013, an average of 6 per month, max of 11 and minimum of 2 (4 zero months).</td>
<td></td>
<td>a</td>
</tr>
<tr>
<td>Monterey, Calif.</td>
<td>Relatively consistent low level demand, ending June 2013. In 2013, an average of 4 per month, max of 6 and minimum of 2 (6 zero months).</td>
<td></td>
<td>a</td>
</tr>
<tr>
<td>Moss Landing, Calif.</td>
<td>Relatively consistent low level demand. In 2013, an average of 4 per month, max of 6 and minimum of 3 (no zero months).</td>
<td></td>
<td>a</td>
</tr>
<tr>
<td>Morro Bay, Calif.</td>
<td>Year round variable demand. In 2013, an average of 8 per month, max of 20 and minimum of 3 (no zero months).</td>
<td></td>
<td>a</td>
</tr>
<tr>
<td>Avila, Calif.</td>
<td>July thru Dec low level landings in 2011 and 2012. No landings in 2013.</td>
<td></td>
<td>a</td>
</tr>
</tbody>
</table>

1 Problematic because of seasonality, low demand and isolated relative to other fishing ports.
2 Some low demand in shoulder seasons, might be met with catch monitors from the Columbia River area. There might be enough demand from June through October to support a catch monitor and requirements for a second person during peak months, particularly if offloading is continuing for more than 8 to 12 hours a day.
3 Proximity to Astoria might make fulfilling the catch monitoring function more feasible.
4 During seasonal peaks there would not appear to be a problem, assuming vessels and first receivers are able to coordinate the timing of deliveries. Off season would require part time only.
5 Might be possible with a year round part time catch monitor.
6 Might be possible with a year round part time catch monitor.
7 Would require part time coverage year round. Seasonal peak might be covered with only part time coverage.
8 Very part time work in the winter.
9 Possible if same part-time catch monitor could cover other bay area ports, including Half Moon Bay.
10 Possible if same part-time catch monitor could cover other bay area ports.
11 Possibly a part time individual might cover both Monterey and Half Moon Bay – driving time 27 minutes.
12 Twenty minute driving time from Moss Landing to Monterey.
13 Two hour 20 minute driving time from Moss Landing to Morro Bay.
14 27 min driving time from Moss Landing to Avila.

### 4.3.2 Trawl IFQ Program Fishing Operations (Harvesters)

This section considers the impact of no action and the action alternatives on fishing operations/harvesting businesses. These entities are defined by their operation of a vessel, whether access to the vessel is acquired through vessel ownership or lease. Separate discussion is provided with respect to potential impacts on other types of fishery participation: quota share ownership, vessel ownership for purposes of leasing, crew and vessel operators, etc.

With respect to fishing operations, the main impacts that will be considered are as follows:

1 Change in Operating Costs
2 Change in Operational Flexibility
3 Change in Privacy

4.3.2.1 No Action Alternative

Under the no action alternative, the current Federal subsidy for observers is likely to run out in the next year or two. With the end of this subsidy, the increased financial costs may lead to an increase in consolidation within the fleet, resulting in fewer fishing vessels. Additionally, the impacts of the cost increases may be greater for vessels which have lower net revenue per day of fishing than vessels with higher net revenue per day. Observer costs which are a fixed cost for each day of fishing will erode a greater proportion of the profits of lower net revenue per day vessels than higher net revenue per day vessels. Depending on cost structures this could change the nature of the fleet. For example if smaller vessels also tend to have lower net revenue per day then the number of smaller vessels in the fleet may diminish. Or if vessels operating along a particular area of the coast have lower net revenue per day then those vessels may sell their quota to vessels operating on other regions of the coast.

4.3.2.2 Action Alternative

For both those who participate and do not participate in the EM program, costs are likely to be higher if some sectors of the fleet are covered by EM while others are not (as compared to a system where all sectors are covered at the same time). Also, the lower the participation rate in the EM program the higher the likely per fishing day costs of the program; and similarly the lower the participation rate in the at-sea compliance monitoring program, the higher the likely per day fishing costs for those carrying compliance observers.

Effects on Participants in the EM Program

- Elimination of observer costs
- New costs for electronic equipment (acquisition and maintenance)
- New costs for servicing (retrieving and transmitting/transferring data) (responsible party still to be determined)
- New costs for video review (responsible party still to be determined)
- New costs for disposal of unwanted retained fish
- Increased operational flexibility with respect to departure and duration of fishing trip
- Decreased operational flexibility with respect to discards (until camera technologies improve)
- More constraints on fish handling on the vessel, potentially reducing efficiency (to ensure good camera images, including a possible requirement for the use of discard chutes).
- More privacy with respect to potential observer presence throughout the ship and privacy related to factors other than visual images
- Less privacy with respect to constant video surveillance within camera range
- Reduction in available hold space for a maximized retention fishery
- Problematic mixing of species (e.g. retained dogfish may have adverse impact on product quality if kept in the same hold with other fish).
• Time required to fill out logbooks (Alternative 2 only)
• To the degree that discards are allowed, crew members may need to become more proficient in species identification, including juveniles and flatfish species for which species identification can be more problematic.
• There may be application fees associated with the individual vessel monitoring plans that vessels would be required to acquire.

In addition to these factors, the consistency of EM programs between fisheries (especially between the West Coast and Alaska) will have an impact on costs (e.g. if each fishery has different camera and logbook requirements then costs would be higher than they might otherwise be).

**Federal permits and endorsements**: Under all of the alternatives, vessels participating in the IFQ fishery must be registered to a limited entry permit with a trawl endorsement. In 2013, the cost to renew a limited entry permit with a trawl endorsement was $152.00. Under Alternatives 2 and 3, the costs for limited entry trawl permits with trawl endorsements are expected to remain relatively unchanged, with only minor upward adjustments being made if administrative costs increase.

**Effects on Those Not Participating in the EM Program**

• Potential increase in per day observer costs
• The current pool of funds for observer cost subsidies may last longer if there are fewer vessels drawing on it and that money is not reprogrammed to other types of reimbursements.

4.3.3 **Quota Share Owners**

Under an IFQ program, on average over the long-term, the fishing operations are expected to make zero economic profit, which is a technical way of saying that the industry is achieving normal profit levels. Under a normal profit situation, QS owners will capture any unexpected economic profits (above normal profits) which occur from changing conditions in the fishery, e.g. unexpected increases in exvessel prices would increase QS value and unexpected increases in fuel costs would decrease QS value. If the EM program reduces operational costs a portion of that reduction will be capitalized in the value of the QS, increasing the costs to subsequent entrants such that their costs are more likely to be at normal profit levels. Absent other changes in the market place, those holding the QS at the time of the change will experience increased revenue up until they sell the QS and then a higher revenue from the sale of the QS. Under the action alternatives it is expected that the fishery will operate at normal profit levels on average over the long term with higher quota share prices than would otherwise be present. Under the no action alternative, it is expected that the fishery will operate at normal profit levels on average over the long term with lower quota share prices than would occur under EM (assuming the analysis shows that EM is less than expensive than observer coverage).
4.3.4 Vessel Owners

Vessel owners will be differentially affected depending on the vessel efficiency (net profits) on a per day basis. Those who have invested in vessels only able to generate a lower net profit per day (e.g. because of hold size) may find the value of the asset diminishes as the fixed per-day at-sea compliance monitoring costs increase, and may benefit as those costs decrease. Under No Action, per day costs are expected to increase as a result of a reduction in subsidies under. Under the action alternatives, per day costs are expected to decrease for vessels participating in the EM program (analysis has yet to determine this for certain). Also, whether the decrease will be enough to compensate for the loss of subsidies is also yet to be determined. Costs for vessels continuing to use observers are likely to increase. While some smaller vessels may have been challenged in providing space to accommodate an observer, there is no reason to expect that a vessel, because of its physical configuration, would be unable to participate in the EM program if its operator so desired.

4.3.5 Crew Members

Crew members may be directly affected by

- Changes in fish handling task
- Changes in privacy and social circumstances (cameras compared to observers)
- Changes in vessel profits that could lead to changes in crew revenue (depending on the structuring of crew payments and negotiating leverage)

Crew members may also be affected by consolidation in the fleet or a geographic redistribution of job opportunities. If EM reduces per day monitoring costs it could enhance the viability of vessels which have lower revenue per day, allowing those vessels to survive longer reducing total fleet consolidation. With respect to geographic distribution, on the one hand, EM might make it more viable to achieve at-sea monitoring out of isolated low demand ports. On the other hand, the shoreside catch monitoring function may become more difficult to fulfill in those ports, as discussed in Section 4.3.1.2.

4.3.6 Other Fisheries

Inconsistency in requirements for EM monitoring among different fisheries could make it more expensive for vessels moving between fisheries. Creating a greater cost barrier for movement between fisheries could change the competition within fisheries.

If maximized retention requirements increase the mortality of non-groundfish taken in the groundfish fishery, fishing opportunities in other fisheries could be reduced (an assessment of current bycatch information is needed to evaluate this as a possible outcome).
4.3.7 Processors

The most likely direct effect on first receivers will relate to possible changes in the costs of shoreside catch monitoring services (see discussion in Section 4.3.1.2). In that regard, first receivers in high landing ports (higher number of landings) may experience either no change or a lesser increase in catch monitoring costs than first receivers in low landing ports. This could advantage processors in high landings ports. While first receivers in low landing ports could try to pass costs on by reducing exvessel prices, the expected long-term result of such a practice would be the transfer of QS out of those ports to the higher landing ports. The need to control catch monitoring costs could encourage first receivers to coordinate with one another in

How significant is the shoreside catch monitoring cost to processors? To be developed: catch monitoring costs relative to exvessel revenue for a range of typical sized landings.

Processors may also be impacted depending on how the disposal of unwanted retained catch is handled. Whiting deliveries are already made under maximum retention rules so under either action alternative there would be no expected change in retention with respect to the whiting fishery, relative to the no action alternative.

4.3.8 EM Providers

Under status quo, EM providers have been participating in research and development work. That would likely draw to a close under either of the action alternatives if all sectors are covered by EM. Under the action alternatives, new business opportunities would be created for EM providers. Depending on businesses’ strategies, the EM provider companies could be the same as the catch monitor provider companies. There are a number of different tasks that could be handled by either EM providers or Observer/Catch Monitor providers

- EM equipment, installation, and maintenance
- EM software
- Data retrieval (hard drive retrieval)
- Video review

Some of these functions, such as hard drive retrieval, might also be handled by catch monitors, state personnel, or crew members. More policy development is needed in this area.

4.3.9 Video Reviewers

The new task of reviewing video will be created. Video review might be conducted by:

- PSMFCa
- NMFS
- 3rd Party (EM Provider or Observer/Catch Monitor Provider)
Costs of review and who pays for the review may vary depending on the entity providing the services. If NMFS handles the video review task it would be difficult to create a funding mechanism by which industry would pay for the task. The maximum 3 percent of exvessel revenue fee is already being collected for the shorebased IFQ program. However, the mothership co-op program is at about 2 percent, which might leave some room for charging video for review (if the additional one percent is not taken up by other expenses related to the electronic monitoring program). If industry pays for the review there will be more private incentive for innovation to develop technologies and software to increase efficiency of the review process.

### 4.3.10 Observer Providers

A transition to EM would likely inject considerable uncertainty during the adjustment period. The demand for observer and catch monitor services will depend both on the amount of participation in the program and the at-sea biological observations contracted for by the WCGOP. The provision of shoreside catch monitoring services might present some particular logistical challenges (see Section 4.3.1.2). For ports with relatively low levels of demand for catch monitoring it may be difficult for more than one provider to service the port, affecting competition and fees. Fees for observers and catch monitors might have to increase in order to maintain a reasonable profit level.

### 4.3.11 Communities

Communities will be effected depending on the industries ability to coordinate and supply shoreside catch monitors to ports with low level and season demand. Other factors which may affect the flow of QS trading among geographic areas may impact communities. Further discussion will be developed.

Communities may also be impacted depending on how the disposal of unwanted retained catch is handled. Impacts might include odor, water usage, and truck noise. If a meal plant is installed, the retained catch may benefit the community.

### 4.3.12 Government

#### 4.3.12.1 Federal

In addition to the direct costs of the EM program and adjustments to the program for biological observers (see Section 4.3.1.2), some of the additional costs and savings to be considered include:

- Costs for increased shoreside biological sampling of retained fish (could be a state task)
- List to be developed

#### 4.3.12.2 States

States might be called on for biological sampling in the ports (to replace the retained catch sampling currently conducted by at sea observers). There is a question as to whether the states
could become providers for shoreside catch monitoring services. There may also be a need to
modify trawl logbooks to allow the recording of discards. The logbooks used in the fishery are
currently state logbooks. If the Federal requirement for recording discards is met with state
logbooks there may be some additional changes required for the computer reporting system. See
Section 4.3.1.2 for further discussion.

4.3.12.3 Pacific States Marine Fisheries Commission

PSMFC currently receives Federal money for training, debriefing and data quality checks for
shoreside catch monitors. This contract could decrease if there are fewer catch monitors in the
field. PSMFC could take on other roles in the EM system, including the role of video reviewer.

PSMFC may need to make changes to the PacFIN data system to incorporate a new discard
logbook (Alternative 3).

4.4. Cumulative effects

[Insert text after preferred alternative is selected ]
CHAPTER 5 LIST OF PREPARERS

The document was prepared by Pacific Fishery Management Council staff:

This document was prepared by (in alphabetical order, by organization):
Pacific Regional Fishery Management Council
Brett Wiedoff, Staff Officer
Jim Seger, Staff Officer

CHAPTER 6 REFERENCES
### APPENDIX A

**MSA Management Standards**

Table 6-1. National Standards from the Section 301 of the MSA.

<table>
<thead>
<tr>
<th>NS</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS-1</td>
<td>Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.</td>
</tr>
<tr>
<td>NS-2</td>
<td>Conservation and management measures shall be based upon the best scientific information available.</td>
</tr>
<tr>
<td>NS-3</td>
<td>To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.</td>
</tr>
<tr>
<td>NS-4</td>
<td>Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.</td>
</tr>
<tr>
<td>NS-5</td>
<td>Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.</td>
</tr>
<tr>
<td>NS-6</td>
<td>Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.</td>
</tr>
<tr>
<td>NS-7</td>
<td>Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.</td>
</tr>
<tr>
<td>NS-8</td>
<td>Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirements of paragraph (2), in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.</td>
</tr>
<tr>
<td>NS-9</td>
<td>Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.</td>
</tr>
<tr>
<td>NS-10</td>
<td>Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.</td>
</tr>
</tbody>
</table>

**Trawl Rationalization Goals and Objectives (Amendment 20)**

Table 6-2. Trawl Rationalization goals and objectives from Amendment 20.
Goal

Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch.

Objectives

The above goal is supported by the following objectives:

1. Provide a mechanism for total catch accounting.
2. Provide for a viable, profitable, and efficient groundfish fishery.
3. Promote practices that reduce bycatch and discard mortality and minimize ecological impacts.
4. Increase operational flexibility.
5. Minimize adverse effects from an IFQ program on fishing communities and other fisheries to the extent practical.
6. Promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.
7. Provide quality product for the consumer.
8. Increase safety in the fishery.

Constraints and Guiding Principles

The above goals and objectives should be achieved while the following occurs:

1. Take into account the biological structure of the stocks including, but not limited to, populations and genetics.
2. Take into account the need to ensure that the total OYs and allowable biological catch (ABC) are not exceeded.
3. Minimize negative impacts resulting from localized concentrations of fishing effort.
4. Account for total groundfish mortality.
5. Avoid provisions where the primary intent is a change in marketing power balance between harvesting and processing sectors.
6. Avoid excessive quota concentration.
7. Provide efficient and effective monitoring and enforcement.
8. Design a responsive mechanism for program review, evaluation, and modification.
9. Take into account the management and administrative costs of implementing and oversee the IFQ or co-op program and complementary catch monitoring programs, as well as the limited state and Federal resources available.

Pacific Groundfish FMP Goals and Objectives

General FMP

Table 6-3. Pacific Groundfish FMP Goals and Objectives
**Goal 1 - Conservation.** Prevent overfishing and rebuild overfished stocks by managing for appropriate harvest levels and prevent, to the extent practicable, any net loss of the habitat of living marine resources.

**Goal 2 - Economics.** Maximize the value of the groundfish resource as a whole.

**Goal 3 - Utilization.** Within the constraints of overfished species rebuilding requirements, achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities.

**Objectives.** To accomplish these management goals, a number of objectives will be considered and followed as closely as practicable:

### Conservation

**Objective 1.** Maintain an information flow on the status of the fishery and the fishery resource which allows for informed management decisions as the fishery occurs.

**Objective 2.** Adopt harvest specifications and management measures consistent with resource stewardship responsibilities for each groundfish species or species group. Achieve a level of harvest capacity in the fishery that is appropriate for a sustainable harvest and low discard rates, and which results in a fishery that is diverse, stable, and profitable. This reduced capacity should lead to more effective management for many other fishery problems.

**Objective 3.** For species or species groups that are overfished, develop a plan to rebuild the stock as soon as possible, taking into account the status and biology of the stock, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock within the marine ecosystem.

**Objective 4.** Where conservation problems have been identified for non-groundfish species and the best scientific information shows that the groundfish fishery has a direct impact on the ability of that species to maintain its long-term reproductive health, the Council may consider establishing management measures to control the impacts of groundfish fishing on those species. Management measures may be imposed on the groundfish fishery to reduce fishing mortality of a non-groundfish species for documented conservation reasons. The action will be designed to minimize disruption of the groundfish fishery, in so far as consistent with the goal to minimize the bycatch of non-groundfish species, and will not preclude achievement of a quota, harvest guideline, or allocation of groundfish, if any, unless such action is required by other applicable law.

**Objective 5.** Describe and identify EFH, adverse impacts on EFH, and other actions to conserve and enhance EFH, and adopt management measures that minimize, to the extent practicable, adverse impacts from fishing on EFH.

### Economics

**Objective 6.** Within the constraints of the conservation goals and objectives of the FMP, attempt to achieve the greatest possible net economic benefit to the nation from the managed fisheries.

**Objective 7.** Identify those sectors of the groundfish fishery for which it is beneficial to promote year-round marketing opportunities and establish management policies that extend those sectors fishing and marketing opportunities as long as practicable during the fishing year.

**Objective 8.** Gear restrictions to minimize the necessity for other management measures will be used whenever practicable. Encourage development of practicable gear restrictions intended to reduce regulatory and/or economic discards through gear research regulated by EFP.
### Utilization

**Objective 9.** Develop management measures and policies that foster and encourage full utilization (harvesting and processing), in accordance with conservation goals, of the Pacific Coast groundfish resources by domestic fisheries.

**Objective 10.** Recognize the multispecies nature of the fishery and establish a concept of managing by species and gear or by groups of interrelated species.

**Objective 11.** Develop management programs that reduce regulations-induced discard and/or which reduce economic incentives to discard fish. Develop management measures that minimize bycatch to the extent practicable and, to the extent that bycatch cannot be avoided, minimize the mortality of such bycatch. Promote and support monitoring programs to improve estimates of total fishing-related mortality and bycatch, as well as those to improve other information necessary to determine the extent to which it is practicable to reduce bycatch and bycatch mortality.

### Social Factors

**Objective 12.** When conservation actions are necessary to protect a stock or stock assemblage, attempt to develop management measures that will affect users equitably.

**Objective 13.** Minimize gear conflicts among resource users.

**Objective 14.** When considering alternative management measures to resolve an issue, choose the measure that best accomplishes the change with the least disruption of current domestic fishing practices, marketing procedures, and the environment.

**Objective 15.** Avoid unnecessary adverse impacts on small entities.

**Objective 16.** Consider the importance of groundfish resources to fishing communities, provide for the sustained participation of fishing communities, and minimize adverse economic impacts on fishing communities to the extent practicable.

**Objective 17.** Promote the safety of human life at sea.
APPENDIX A. ANALYSIS OF EM PROGRAM PROVISIONS

1.1. Retention options

1 Max retention - this would be status quo for midwater whiting; however for other gears there would likely be additional cost to sort, market, and distribute fish, additional costs to send to landfill. Ay flood markets if too much fish is landed across region. Optimum retention cost would be less than max retention but uncertain based on marketability of certain species. Discard of know unmarketable fish is positive benefit cus it reduces the costs of sorting, marketing and distribution of fish. May flood markets if too much fish is landed across region. Discard at will allows fishermen to meet local and regional/national demands, similar to status quo so future landings would be similar to current state of fisheries.

direct impact if changes are needed, definitions of catch/discard could affect handling protocols; max retention may be inefficient, take up hold space; installation of equipment and a change in fish handling may reduce efficiencies for vessel (reduce profit?)

direct impact-need to identify EM provider and create plan; costs to contract with EM provider and purchase system and modify vessel if necessary.