

Regulatory Amendment to the Pacific Coast Groundfish Fishery Management Plan to Implement an Electronic Monitoring Program

Final Environmental Assessment

Including a Biological Evaluation

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Lead Agency:	National Marine Fisheries Service, West Coast Region National Oceanic and Atmospheric Administration
Responsible Official:	Barry Thom, Regional Administrator National Marine Fisheries Service

For further information contact: Melissa Hooper, Branch Chief, Permits & Monitoring
National Marine Fisheries Service, West Coast Region
7600 Sandpoint Way Northeast, Seattle, WA 98115
(206) 526-4357

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ACRONYMS

APA	Administrative Procedure Act
CCE	California current ecosystem
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CPS	coastal pelagic species
CPUE	catch per unit effort
CZMA	Coastal Zone Management Act
DPS	distinct population segment
EA	environmental assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
EFHRC	Essential Fish Habitat Review Committee
EFP	exempted fishing permit
EIS	environmental impact statement
EM	electronic monitoring
ENSO	El Nino Southern Oscillation
ESA	Endangered Species Act
ESU	evolutionary significant unit
fm	fathom
FMP	fishery management plan
FONSI	Finding of No Significant Impact
FR	Federal Register
FWS	U.S. Fish and Wildlife Service
GIS	global information system
GMT	Groundfish Management Team
NPGO	North Pacific Gyre Oscillation
HAPC	habitat area of particular concern
HMS	highly migratory species
IFQ	individual fishing quota
IQA	Information Quality Act
ITS	incidental take statement
lb	pound
MHHW	mean higher high water level
MMPA	Marine Mammal Protected Act
MSA	Magnuson-Stevens Fishery Conservation and Management Reauthorization Act
mt	metric ton
NEPA	National Environmental Policy Act
nm	nautical mile
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuaries Act
NOAA	National Oceanic and Atmospheric Administration
NorPac	North Pacific Database Program
NRC	National Research Council

NWFSC	Northwest Fisheries Science Center
OY	optimum yield
PacFIN	Pacific Fisheries Information Network
PDO	Pacific Decadal Oscillation
PFMC	Pacific Fishery Management Council
POP	pacific ocean perch
PRA	Paperwork Reduction Act
PSMFC	Pacific States Marine Fisheries Commission
QSM	Quota Species Monitoring Database
RCA	rockfish conservation areas
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
SAFE	stock assessment and fishery evaluation
STAR	Stock Assessment Review
STAT	Stock Assessment Review Team
TAC	total allowable catch
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
VEC	valued ecosystem component
VMP	vessel monitoring plan
WCGOP	West Coast Groundfish Observer Program

1.0 INTRODUCTION

This action considers changes to the monitoring requirements in the Pacific Coast groundfish trawl fishery to reduce costs and increase operational flexibility for groundfish vessels without adversely affecting conservation. The Pacific Coast groundfish fishery occurs off the west coast of the United States and includes a range of vessels that use midwater trawl gear, bottom trawl gear, fish pots, and hook and line to target demersal and pelagic species managed under the Pacific Coast Groundfish Fishery Management Plan (FMP). This action pertains to the limited entry trawl portion of the groundfish fishery, which is managed under a catch share program called the Trawl Rationalization Program. The catch share program currently requires all vessels participating in the program to have 100-percent at-sea and dockside observer coverage to monitor fishing activities at sea and all offloads. This action considers allowing some vessels in the trawl fishery, specifically midwater trawl vessels and fixed gear (pot and hook and line) vessels, to use electronic monitoring (video cameras and associated sensors) in place of human observers to meet at-sea monitoring requirements.

This document is an Environmental Assessment (EA), which provides an assessment of the environmental impacts of an action and its reasonable alternatives compared to the No Action alternative to address the statutory requirements of the National Environmental Policy Act (NEPA). This EA is an integrated document that also addresses the statutory requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and other applicable laws. Section 6.03d of NOAA's Administrative Order 216-6 recommends that NEPA documents to be combined with other analyses to support fishery management actions to produce one combined document (NOAA, 1999). The EA also includes a Biological Evaluation used for Endangered Species Act purposes. A detailed table of contents identifies required sections of the NEPA document. The analysis in this EA tiers off the broader information and analysis contained in the Environmental Impact Statement (EIS) for Amendment 20 to the Pacific Coast Groundfish FMP and the 2019-2020 Harvest Specifications EA. Amendment 20 created the management regime under which the proposed action is being taken and the EIS analyzed fishery-wide measures to achieve mortality targets, target healthy stocks, and mitigate the economic impacts of the measures. The 2017-2018 Harvest Specifications EA analyzed current catch and effort levels and the impacts of those measures. This document draws from the Electronic Monitoring Regulatory Amendment and draft analysis prepared by the Council. Copies of the Amendment 20 FEIS and the Council's regulatory amendment are available on the Council's website: <http://www.pcouncil.org/groundfish/background/>. This draft EA was published with the proposed rule (Sep. 6, 2016; 81 FR 61161) for public comment and no public comments on the EA were received.

Minor updates to the final EA include:

- Updated stock status and information from the Biological Opinions for salmonids, seabirds, and eulachon in the affected environment section
- Updated EM data tables and figures in the impacts analysis based on additional data from the EFPs

1.1 The Pacific Coast Groundfish Fishery

The Pacific Coast groundfish fishery occurs off the west coast of the United States in federal waters from 3-200 miles offshore. The fishery is managed by the Pacific Fishery Management Council under the Pacific Coast Groundfish FMP and includes over 90 species of rockfish, roundfish, sharks, skates, and other species. The fishery is composed of multiple sectors, including a limited entry trawl fishery, a limited entry fixed gear fishery, an open access fishery, a recreational fishery, and a tribal sector. The limited entry trawl fishery is responsible for the majority of the groundfish catch and is managed under a catch share program. The catch share program organizes the fishery into a catcher/processor sector composed of a cooperative of large vessels that both catch and process Pacific whiting at sea; a mothership sector composed of a cooperative of catcher vessels that target whiting and the mothership vessels that process their catch at sea; and the shorebased sector composed of individual midwater trawl, bottom trawl, and fixed gear vessels that target whiting and other groundfish species under individual fishing quotas (IFQs). The mothership sector and shorebased sector of the limited entry trawl fishery are the subject of this action.

A comprehensive history of groundfish fishery management and the development of the current management regime is contained in Chapter 2 of the Pacific Coast Groundfish FMP, available on the Council's website: http://www.pcouncil.org/wp-content/uploads/2016/03/GF_FMP_FINAL_Mar2016_Mar282016.pdf.

1.2 The Development of this Action

In 2010, the Council implemented the Pacific Coast Groundfish Trawl Rationalization Program through Amendments 20 and 21 to the FMP, which established a catch share program in the limited entry trawl fishery. Mothership vessels and their catcher vessels were allowed to form cooperatives to catch and manage a shared allocation of whiting. The mothership cooperative also receives allocations of other non-target species that limit bycatch of these species (called "set-asides"). Vessels in the shorebased IFQ sector each receive 30 individual allocations of species and species groups that they pursue with bottom trawl, midwater trawl, or fixed gear. As part of the catch share program, Amendment 20 also implemented requirements for 100-percent observer coverage at sea and dockside to ensure full accountability for catch of allocated species and a level playing field for all participants. Beginning in 2011, catcher vessels were required to obtain observers for 100 percent of trips in the shorebased and mothership fisheries, and mothership vessels were required to obtain 200 percent coverage for each trip (2 observers per trip). Buyers of IFQ species, called "first receivers," were also required to obtain catch monitors to monitor the offload and weighing of all IFQ species.

NMFS initially subsidized 100-percent of the costs of observers for industry, but this subsidy declined over time and finally ended in September 2015 when industry took on the full costs of monitoring. Since implementation of the program, industry has been concerned about its ability to bear the full costs of monitoring and interested in electronic monitoring (EM) as a potential alternative. In response to industry's concerns, the Council initiated development of a regulatory amendment in November, 2012, to consider implementing an EM program for catcher vessels in the mothership and shorebased sectors. Prior to Amendment 20, the Council had been developing an EM program for the whiting fishery in Amendment 10 to the Pacific Coast Groundfish FMP. The Council ultimately set this action aside to focus on the development of the catch share program, but did include some components of an EM program in Amendment 20. Amendment 20 allowed for catcher vessels to use EM in place of observers and implemented maximized retention requirements for the whiting fishery, which allows whiting vessels to put all catch directly into the hold with minimal discards (as opposed to sorting and discarding bycatch species at sea). However, the requirements of the EM program were not sufficiently developed to be implemented with the rest of the catch share program in 2011.

What is Electronic Monitoring (EM)?

Electronic monitoring uses video cameras and integrated sensors (e.g., GPS, motion sensor, hydraulic pressure sensor) to passively monitor fishing activity at sea. The video and sensor data can be reviewed after the trip by an analyst onshore to collect information about location and amount of catch and fishing effort. EM has the potential to reduce monitoring costs because it does not require deploying a person on the vessel and the logistical and travel expenses that generates.

The regulatory amendment that is the subject of this EA would specify the detailed requirements necessary to implement an EM program for two components of the trawl fishery—catcher vessels using midwater trawl gear to target whiting in the mothership and shorebased sectors and trawl-permitted vessels using fixed gear to target other species in the shorebased sector. The regulatory amendment originally considered measures for all gear types, but the Council postponed final action on EM for bottom trawl and midwater trawl used to target rockfish to a later year to allow more time for development and analysis.

The Council initiated the regulatory amendment in 2012 and developed the alternatives for the program over the course of 2013–15. A list of the meetings at which the Council discussed this action and other opportunities for public comment are contained in Section 8.4.2. The Council selected preliminary preferred alternatives at its September 2014 meeting, but decided that additional research was needed before taking final action. The Council instead solicited exempted fishing permit (EFP) proposals to test the use of EM in the groundfish fishery and to develop the detailed requirements that would be necessary to complete the regulations and implement the program. The Council reviewed the EFP proposals at its April and June 2014 meetings, and NMFS approved and implemented the EFPs in May 2015.

NMFS issued a total of 37 EFPs in 2015, 46 EFPs in 2016, 45 EFPs in 2017, and 50 EFPs in 2018 to vessels to test EM and worked with the Pacific States Marine Fisheries Commission (PSMFC) to implement and administer the project. The EFPs were designed to test the

Council's preliminary preferred alternatives and provide data to inform the Council's final decision. NMFS and PSMFC collected logbook and EM data and other information to assist the Council and NMFS in evaluating the performance of EM as a tool for meeting the objectives of the catch share program. NMFS presented the results from the 2015 EFPs at Council meetings September 2015-April 2016. The EFPs provided sufficient information for the Council to take final action on measures for whiting vessels (November 2015) and fixed gear vessels (April 2016). But the 2015 EFPs had low participation by bottom trawl and non-whiting midwater trawl vessels, so the Council postponed final action for these gear types to 2017 to allow NMFS to collect more information from the 2016 EFPs.

The Council submitted the proposed regulations for NMFS's review in August 2016. Under the MSA the Secretary must review and may approve, disapprove, or partially approve the Council's preferred alternative. This document summarizes the Council's preferred alternative and other alternatives for an EM program for the whiting and fixed gear vessels in the mothership and shorebased sectors of the limited entry trawl fishery, and analyzes the impacts of those alternatives. This document is accompanied by a regulatory impact review and final regulatory flexibility analysis as required by Executive Order 12866 and the Regulatory Flexibility Act (RFA), respectively. These documents are available on the West Coast Region's website.

2.0 PURPOSE AND NEED FOR THE ACTION

The purpose of this action is to expand the range of monitoring tools for vessel operators to meet the 100 percent monitoring requirements of the Trawl Program. This action is needed to achieve the following objectives:

1. Reduce total fleet monitoring costs to levels sustainable for the fleet and NMFS;
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.

This action seeks to fulfill the purpose and need while continuing to meet the goals and objectives set forth by the Council in the Pacific Coast Groundfish FMP.

3.0 DESCRIPTION OF ALTERNATIVES

This section summarizes the preferred alternative and alternatives for changes to the requirement for catcher vessels in the Shorebased IFQ and Mothership sectors of the Pacific whiting fishery, and fixed gear vessels in the Shorebased IFQ fishery, to have 100 percent at-sea observer coverage.

3.1. Alternative 1 – No Action

Under this alternative, groundfish monitoring requirements would remain as defined in Amendment 20 and subsequent rulemakings. Catcher vessels in the Pacific whiting fishery and fixed gear vessels in the Shorebased IFQ fishery would be required to obtain 100 percent at-sea observer coverage for all trips. Vessels would continue to use observers to satisfy the 100 percent at-sea observer coverage requirement and would not be able to use electronic monitoring as an alternative to observers. Vessels sorting at sea would be able to discard IFQ and non-IFQ species provided it has been documented by an observer.

3.2 Alternative 2 – Electronic Monitoring (*Council and NMFS Preferred*)

Under this alternative, catcher vessels in the Pacific whiting fishery and fixed gear vessels in the Shorebased IFQ fishery would have the option to use electronic monitoring in place of human observers to meet the requirements of Amendment 20 for 100 percent at-sea observer coverage. Vessel owners would be able to submit an application to NMFS for an authorization to use EM in place of observers. Vessel owners authorized to use EM would be required to obtain, install, and maintain an EM system from an approved service provider, as well as services to review the video data to generate discard estimates and to submit reports to NMFS. Vessel operators would also be required to fill out a logbook to document and report discards to NMFS. Copies of the discard logbook and state logbook would be required to be submitted to NMFS within 24 hours of landing. Under this alternative, the EM service provider would review the EM data after the trip and calculate estimated discards by species/species group to report to NMFS to debit from IFQ and IBQ. There are two ways that EM data could be used under this alternative.

Sub-Option A1: EM data is used as the primary data source to debit discards from vessel accounts.

Rationale: This option would have less of a paperwork burden on vessel operators because it would negate their having to fill out a logbook.

Sub-Option A2: Logbook data is used as the primary data source to debit vessel accounts and EM data is used to audit the validity of the logbook data. (*Council/NMFS Preferred*)

Rationale: This option would employ logbooks to allow a subsample of video to be reviewed in an audit model. Logbooks would also provide a secondary data source for comparison to the EM data.

In addition, there are two sub-options for the amount of video that would be reviewed to develop the discard estimates from the video data.

Sub-Option B1: 100 percent of the video is reviewed to generate discard estimates.

Rationale: Reviewing 100 percent of the video from a trip would provide a census of discards and reduce the uncertainty of using discard estimates expanded from a subsample.

Sub-Option B2: Less than 100 percent of the video is reviewed. The level would initially be 100 percent, but NMFS would have the ability to modify the percentage based on performance in consultation with the Council. (*Council/NMFS Preferred*)

Rationale: Reviewing a subsample of the video to extrapolate a discard estimate for a trip would be less costly than reviewing 100 percent of the video from the trip.

Whiting catcher vessels would be required to practice maximized retention and would no longer be allowed to sort catch at sea, with limited exceptions, while using EM. Because the type of catch handling that would be required to identify discards to species would not be practical at the large volumes on whiting trips, maximized retention would be required to ensure that catch can be documented by the shoreside catch monitors or mothership observers before being disposed of or processed. Fixed gear vessels would be required to sort and discard catch in a manner that enables the EM system to record it. Because some species can be difficult to differentiate on camera, the Council considered different sub-options for retention requirements for fixed gear vessels.

Sub-Option C1: Vessel operators would be required to retain all catch until landing, with a few exceptions for prohibited and protected species and discards for safety reasons. *(Council/NMFS Preferred for Whiting)*

Rationale: Requiring the majority of catch to be retained would simplify the video review and potentially reduce review costs, and would allow more complete data collection on most catch by a shoreside catch monitor.

Sub-Option C2: Vessel operators would be able to discard those species that can be differentiated on camera. The list of species that may be discarded may be modified through a routine action as defined in the Pacific Coast Groundfish FMP. *(Council/NMFS Preferred for Fixed Gear)*

Rationale: Allowing vessel operators to discard those species that can be differentiated on camera would reduce the burden of having to store and dispose of unmarketable or otherwise undesirable fish.

Halibut that are discarded would be debited from vessel accounts using an assumed mortality rate. This is in contrast to the status-quo for fixed gear trips where a viability assessment is conducted on a subsample of discarded halibut by the observer and vessel accounts are not charged for fish that are likely to survive. The Council considered different sub-options for accounting of other discards from EM trips.

Sub-Option D1: All discards would be debited from IFQ and cooperative allocations. *(Council/NMFS Preferred)*

Rationale: Debiting discards from individual and cooperative allocations would be consistent with status quo accounting methods using observer data and would create the strongest incentive for minimizing discards. Because the video review time for whiting trips is so rapid, quantifying all discards would not substantially increase program costs. Debiting discards from individual and cooperative allocations would be consistent with status quo accounting methods using observer data and would create the strongest incentive for minimizing discards.

Sub-Option D2: Discards dumped off the deck or for safety reasons (e.g., pull zipper on net), and from unobserved sets/hauls would be debited from IFQ. Other discards from net bleeding, lost gear, and consumed or used as bait would be deducted preseason from the sector allocation or the ACL using historical data.

Rationale: The Council considered debiting small amounts of discards or unintentional discards from sector allocations preseason to simplify and reduce the cost of video review.

Sub-Option D3: Discards from Shorebased catcher vessels would be debited from IFQ. Discards from mothership catcher vessels would be deducted from the mothership cooperative allocation preseason using historical data.

Rationale: The Council considered debiting mothership catcher vessel discards preseason to simplify and reduce the cost of video review.

Video, sensor, and other data from the EM system is recorded onto a hard drive on the vessel. The Council considered different sub-options for who would be responsible for retrieving the hard drive from the vessel and delivering it to the third party service provider for review and analysis.

Sub-Option E1: A representative of the vessel (vessel operator or crew) would be responsible for delivering the hard drive to the EM service provider. (*Council/NMFS Preferred*)

Rationale: Making the vessel representative solely responsible for delivering the hard drive ensures accountability and a clear chain of custody, while still allowing flexibility for the vessel operator to delegate the responsibility to a third party. This option is also cheaper than the other sub-options.

Sub-Option E2: The EM service provider would be responsible for retrieving the hard drive from the vessel and delivering it for analysis.

Rationale: Having an independent third party retrieve the hard drive would ensure a clear chain of custody and may reduce the likelihood of tampering.

Sub-Option E3: The catch monitor or other third party would be responsible for delivering the hard drive to the EM service provider for analysis.

Rationale: Allowing the catch monitor, processor, or other third party to retrieve the hard drive would offer flexibility to vessel operators and may reduce program costs by using existing resources.

NMFS would establish standards and minimum requirements for vessels and EM service providers participating in the EM program, including eligibility criteria, equipment standards, application requirements, catch handling instructions, and reporting and recordkeeping. NMFS would establish a permitting process for EM service providers to apply to and be approved to provide EM services to the fishery. In addition, vessel owners would be able to use a “self-enforcing agreement,” a voluntary, private contractual arrangement between a group of vessel owners to jointly manage the EM operations of their group of vessels and self-enforce their compliance with the EM regulations. NMFS would specify the requirements and components of self-enforcing agreements in the regulations and review and approve proposed agreements.

Vessel owners would be required to submit for review by NMFS an individual Vessel Monitoring Plan (VMP) that would document the installation of the EM system on the vessel and the vessel’s specific plans and procedures for operations, catch handling, and maintenance. The Council considered two sub-options for the frequency that VMPs would expire and need to be renewed with NMFS.

Sub-Option F1: Vessel monitoring plans would be effective until revised
(*Council/NMFS Preferred*)

Rationale: This sub-option would reduce the administrative burden on vessel owners of having to resubmit an application and vessel monitoring plan each year.

Sub-Option F2: Vessel monitoring plans would expire and must be renewed annually.

Rationale: This option would have a greater administrative burden for vessel owners, but would ensure that vessel monitoring plans remain up to date.

Vessels operators would be required to declare their intent to use EM with the Office of Law Enforcement. Some vessels may desire to switch between using EM on some trips and observers on others for efficiency, cost, or other reasons. The Council considered different sub-options for the extent to which they would limit this activity to reduce potential complications for the Observer Program and observer service providers in planning the observer workforce and deployments.

Sub-Option G1: No limit on switching between EM and observers. (*Council/NMFS Preferred for Fixed Gear*)

Rationale: This option would provide vessel operators the most flexibility to use whatever monitoring option works best for their operations at a given time. Impacts to the Observer Program could be mitigated through communication between the vessel operators and NMFS.

Sub-Option G2: There would be some limit on switching, to be determined by NMFS, with the exception that an observer could be used in the event of an EM system failure. (*Council/NMFS Preferred for Whiting*)

Rationale: This option would provide vessel operators some flexibility, but limit the impact of switching on Observer Program operations.

Sub-Option G3: The vessel operator would be required to log a plan with NMFS indicating when they plan to use EM and observers that could not be changed, with exceptions for EM system failures.

Rationale: This option would also limit the impact of switching on Observer Program operations, but allow the vessel operator the flexibility to choose their own limits on switching depending on their individual operations.

Sub-Option G4: No switching between observers and EM would be allowed, except for instances of EM system failure.

Rationale: This option would minimize the impacts of switching on Observer Program operations, but would provide the least flexibility for vessel operators.

Vessels that do not apply to or are not authorized to use EM would continue to use observers to meet the requirements for 100 percent observer coverage. In addition, the West Coast Groundfish Observer Program would maintain some level of observer coverage for biological sampling and protected species data collection similar to levels prior to implementation of the Trawl Program (approximately 20-25 percent of landings).

3.3 ALTERNATIVES CONSIDERED AND REJECTED

3.3.1 Alternative 3 – Mandatory use of EM

This alternative would have required all shorebased vessels (whiting and fixed gear) to use EM in place of observers. No vessels would have been able to use observers for at-sea monitoring. Making EM mandatory was considered during public scoping for the regulatory amendment, but was not pursued because some fishery participants did not want to use EM. Some fishery participants were concerned about EM system malfunctions forcing a vessel to miss valuable fishing time while waiting for repairs. The Council instead opted to make EM a voluntary program, to allow fishery participants to weigh the trade-offs between EM and at-sea observers.

3.3.2 Sub-Option C3 – Full retention of all catch

Under this option, vessel operators would have been required to retain all catch and no discarding would have been allowed. This option was rejected because it raised several practicality and safety issues. Full retention would require that vessels retain species protected under the ESA and MMPA, which may not be allowable without a specific permit. Retaining large organisms or large amounts of catch can be unsafe for vessel personnel, such as if the catch exceeds the vessel's hold capacity. In addition, some discards occur outside the vessel operator's control, such as fish spilling out of the gear during retrieval.

3.3.3 Sub-Option C4 – Allow whiting vessels to sort and discard at sea

This option would have allowed whiting vessels to sort and discard catch at sea to enable discarding of prohibited and protected species. This option was rejected because all whiting vessels currently practice maximized retention to get the catch into the hold quickly to ensure the quality of the product. Sorting at sea would have required a change to their operations, and would not be practical at the large volumes on whiting trips. In addition, using EM to identify and estimate weight of individual species would be a challenge at the high volumes on whiting trips.

3.3.4 Sub-Option C5 – No limit on discards, vessels may discard all IFQ and non-IFQ species

This option would have allowed fixed gear vessels to discard fish at will, consistent with existing regulations. This option was rejected because the Council was concerned about the ability of EM to identify species that are difficult to differentiate on camera. The Council believed some controls were needed to ensure the quality of data for catch accounting. The Council rejected this sub-option, but retained an option that would allow discards based on a species list that could be modified over time as technology and methods improve (**Sub-Option C2**).

3.3.5 Sub-Option D4 – Some discards not debited

Under this option, discards dumped off the deck or for safety reasons (e.g., pull zipper on net), and from unobserved sets/hauls would be debited from IFQ. Other discards from net bleeding,

lost gear, and consumed or used as bait would not be counted at all. This option was rejected because it did not meet legal requirements of the MSA to account for all mortality and to minimize bycatch to the extent practicable.

3.3.6 Sub-Option G5 – No declaration of EM use

This option would have allowed vessel operators to use EM in a given year without first notifying NMFS. This option was rejected, because declarations are needed by NMFS, EM providers, and other entities for planning purposes.

4.0 AFFECTED ENVIRONMENT

4.1 Potentially Impacted Valued Ecosystem Components (VECs)

This analysis considers impacts to five VECs, which are the important environmental facets used to evaluate impacts in this EA:

Physical Environment/Habitat/EFH: For the purpose of this analysis the physical environment VEC consists of EFH in the California Current Ecosystem (CCE) including the continental shelf, slope, and abyssal plain sub-regions. The Sustainable Fisheries Act defines EFH as “[t]hose waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Section 4.2 describes the conditions of the physical environment.

Target species: For the purpose of this analysis, the target species VEC includes those species targeted by catcher vessels participating in the mothership sector and shorebased IFQ sector using midwater trawl or fixed gear. Target stocks include Pacific whiting and sablefish. Section 4.3 describes the current condition of each stock.

Non-target species and bycatch: Non-target species are species that whiting and fixed gear vessels may not target but may catch and land. Non-target species can include a broad range of species. The term “bycatch,” as defined by the MSA, means fish that are harvested in a fishery but that are not sold or kept for personal use. Bycatch includes the discard of whole fish at sea or elsewhere, including economic and regulatory discards, and fishing mortality due to an encounter with fishing gear that does not result in capture of fish (i.e., unobserved fishing mortality). Bycatch does not include fish released alive under a recreational catch-and-release fishery management program. For purposes of this assessment, non-target and bycatch species most likely to be affected include: widow rockfish, yellowtail rockfish, Pacific ocean perch, darkblotched rockfish, cowcod, Bocaccio rockfish, dogfish, and non-groundfish species. Section 4.4 describes the current condition of these stocks.

Protected resources: This VEC includes species under NMFS’s and the U.S. Fish and Wildlife Service’s (USFWS) jurisdiction that are afforded protection under the ESA (i.e., for those designated as threatened or endangered) and/or the MMPA. Table 3 lists the 23 marine mammal, sea turtle, and fish species that are classified as endangered or threatened under the ESA. The remaining species in Table 3 are protected by the MMPA and are known to interact

with the Pacific Coast groundfish fishery. Section 4.5 describes the current condition of these protected resources.

Human communities: This VEC includes impacts to people’s way of life, traditions, and communities. These social and economic impacts may be driven by changes in fishery flexibility, opportunity, stability, certainty, safety, and other factors. Impacts would most likely be experienced across communities, gear cohorts, and vessel size classes. Section 4.6 describes the current conditions in the potentially impacted communities.

This EA incorporates by reference the description of the affected environment from the Amendment 20 EIS and the 2019-2020 harvest specifications and management measures EA, and provides updated information where appropriate.

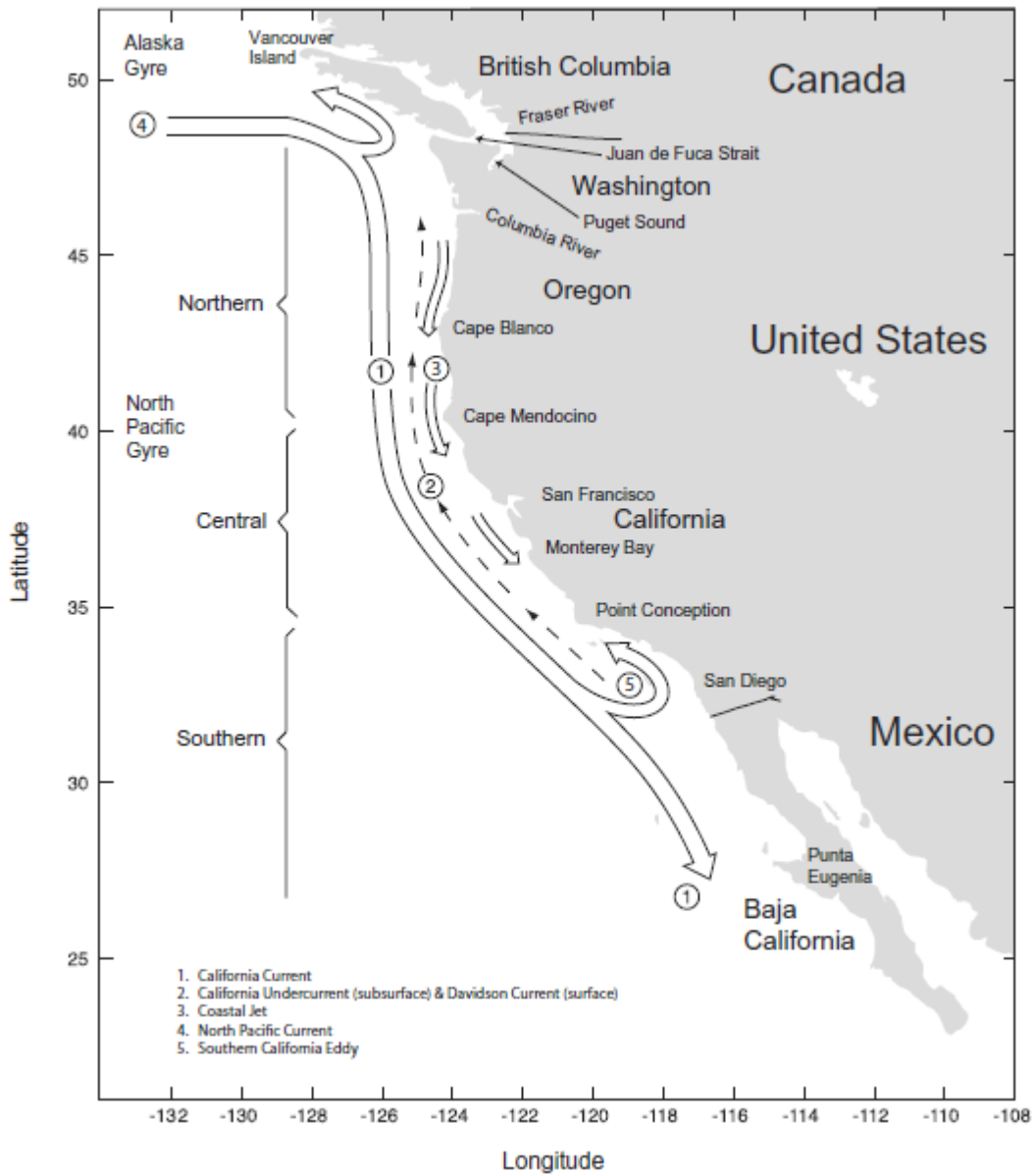
4.2 Physical Environment/Habitat/EFH

This EA incorporates by reference the description of the affected physical environment, habitat, and EFH from the Amendment 20 EIS and 2019-2020 harvest specifications and management measures EA. Information on the physical environment is summarized below; refer to the EIS for more detailed information on the physical environment, habitat, and EFH.

4.2.1 Description of the Physical Environment

The U.S. West Coast Exclusive Economic Zone (EEZ) resides within the California Current Large Marine Ecosystem. The Council has designated the entire West Coast EEZ, the U.S. portion of this Large Marine Ecosystem, as the California Current Ecosystem and the subject of its Pacific Coast Fishery Ecosystem Plan. The CCE essentially begins where the west wind drift (or the North Pacific Current) reaches the North American continent. The North Pacific Current typically encounters land along the northern end of Vancouver Island, although this location varies latitudinally from year to year. This current then splits into the southward-flowing California Current heading south (see Figure 1) and the northward-flowing Alaska Current. The “current” in the California Current is a massive southward flow of water ranging from 50 to 500 kilometers offshore (Mann and Lazier, 1996).

Figure 1: Dominant current systems off the U.S. West Coast



Major offshore physiographic features of Washington and Oregon include the continental shelf, slope, and Cascadia Basin. Low benches and hills characterize the upper slope. The lower slope intersects the deep sea floor of the Cascadia Basin at 2200 m depth off the north coast, and at about 3,000 m off the central and southern Oregon coast. The continental slope is characterized by a number of geological features that create bathymetric complexity and perform a variety of ecological functions. These features include: submarine canyons and fans, seamounts, ridges, banks, islands, rocky reefs, and pinnacles. Rocky habitat may be composed of bedrock, boulders, or smaller rocks, such as cobble and gravel. Hard substrates are one of the least abundant benthic habitats, yet they are among the most important habitats for groundfish. Pinnacles can be important bathymetric features that attract fish and invertebrates.

Coastal upwelling results in well-mixed nearshore waters during spring-summer at depth up to 50-75m extending 5-20km offshore. These well-mixed waters are characterized by cold, oxygen-saturated, nutrient-rich water that is the basis for high productivity of the coastal portions of the CCE. The major phytoplankton classes within the CCE include diatoms, dinoflagellates, small (often termed “pico”-) eukaryotes, and cyanobacteria.

Vegetation forms two major classes of large-scale habitats: large macro-algal attached benthic beds, and microalgal blooms. Along the Pacific coast, there are two major canopy-forming species of kelp, the giant kelp (*Macrocystis pyrifera*) and the bull kelp (*Nereocystis leutkeana*). These species can form kelp forests which provide habitat for a diverse mix of species including fishes, invertebrates, marine mammals, and sea birds. Kelp forests provide cover or nursery grounds for many adult, young of the year, or juvenile nearshore and shelf rocky reef fishes, such as bocaccio, lingcod, flatfish, other groundfish, and state-managed species including kelp bass (*Paralabrax clathratus*), white seabass, and Pacific bonito (*Sarda chiliensis lineolata*). Kelp is considered EFH for groundfish.

The CCE is also home to a range of benthic invertebrates that may form habitat for groundfish species. The delineation of benthic structure-forming invertebrates, in particular corals and sponges, is under more thorough discussion within the Groundfish EFH Review Committee for updates to Groundfish EFH designation (EFHRC 2012). Whitmire and Clarke (2007) listed 101 species of corals identified in the U.S. West Coast EEZ, within which four species were classified as having adequate individual or colony size and morphological complexity to be considered of high structural importance: *Lophelia pertusa*, *Antipathes dedrochristos*, *Paragorgia arborea*, and *Primnoa pacifica*. Several additional classes and individual species of coral were identified as being of medium structural importance: *Dendrophyllia oldroydae*, *Bathypathes* sp., *Isidella* sp., and *Keratoisis* sp. Corals of the West Coast EEZ are distributed over a variety of bottom habitats, with higher concentrations on hard-bottom (not sand) and medium-to-high relief rocky habitat. With their morphologically complex forms, corals can enhance the relief and complexity of physical habitat (Whitmire and Clarke 2007), although the literature remains divided on whether West Coast deep sea corals serve to aggregate fish (Etnoyer and Morgan 2005, Auster 2005, Tissot et al. 2006). Marliave and co-authors (2009) found quillback rockfish (*S. maliger*) using colonies of cloud sponges (*Aphrocallistes vastus*) as

nursery habitat in southern British Columbia's coastal waters, which are within the northern extent of the CCE.

More detail on the CCE is contained in the Council's FEP, where the Council conducted an extensive review and description of the characteristics of the California Current large marine ecosystem and on the types of impacts fisheries and other anthropogenic activities and climate change have on ecosystem dynamics and marine habitat: <http://www.pcouncil.org/ecosystem-based-management/fep>. The FEP is incorporated by reference. The NMFS Northwest and Southwest Fisheries Science Centers also provides yearly updates on the state of the California Current Ecosystem. The 2018 update is available at: https://www.pcouncil.org/wp-content/uploads/2018/02/F1a_NMFS_Rpt1_2018_IEA_SoCC_FINAL_main_Mar2018BB.pdf

4.2.2 Essential Fish Habitat (EFH)

Habitats provide living things with the basic life requirements of nourishment and shelter. This ultimately provides for both individual and population growth. The quantity and quality of available habitat influences the fishery resources of a region. Depth, temperature, substrate, circulation, salinity, light, dissolved oxygen, and nutrient supply are important parameters of a given habitat. These parameters determine the type and level of resource population that the habitat supports. The Sustainable Fisheries Act defines EFH as “[t]hose waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” The Preferred Alternative could potentially affect EFH for species that are managed under the Pacific Coast groundfish, Coastal Pelagic Species, Salmon, and Highly Migratory Species FMPs. EFH for the species managed under these FMPs includes a wide variety of benthic habitats and the water column in state and Federal waters throughout the California Current Ecosystem. Full descriptions and maps of EFH for each species and life stages are available in their respective FMPs:

- Chapter 7 in the Pacific Coast Groundfish FMP describes groundfish EFH (Section 7.2) and HAPCs (Section 7.3): <http://www.pcouncil.org/groundfish/fishery-management-plan/>. Amendment 19 to the FMP designated and described these EFH and HAPCs and implemented measures to mitigate the adverse effects of fishing on EFH: <http://www.pcouncil.org/groundfish/fishery-management-plan/fmp-amendment-19/>.
- Appendix D to the Coastal Pelagic Species FMP describes EFH for coastal pelagic species like anchovy, squid, and sardines: <http://www.pcouncil.org/coastal-pelagic-species/fishery-management-plan-and-amendments/>.
- Amendment 18 to the Salmon FMP revised the description of EFH and designated HAPCs for salmon species: <http://www.pcouncil.org/salmon/fishery-management-plan/adoptedapproved-amendments/>.
- Chapter 7 of the Highly Migratory Species FMP describes EFH and HAPCs for highly migratory species including sharks, tuna, and marlin: <http://www.pcouncil.org/salmon/fishery-management-plan/adoptedapproved-amendments/>.

Figure 3 shows the current extent of designated groundfish EFH. In general, Groundfish EFH is described in the FMP as:

- Depths less than or equal to 3,500 m (1,914 fm) to mean higher high water level (MHHW) or the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean-derived salts measure less than 0.5 ppt during the period of average annual low flow.
- Seamounts in depths greater than 3,500 m as mapped in the EFH assessment geographic information system (GIS).
- Areas designated as Habitat Areas of Particular Concern (HAPC) not already identified by the above criteria.

Figure 4 shows current areas designated as HAPCs for groundfish. The regulatory guidelines also establish authority for Councils to designate HAPC, based on the vulnerability and ecological value of specific habitat types. The Groundfish FMP identifies these HAPCs:

- Estuaries
- Canopy kelp
- Seagrass
- Rocky reefs
- Specified “areas of interest,” which are discrete areas that are of special interest due to their unique geological and ecological characteristics, and include:
 - All waters and sea bottom in state waters off of Washington from the three nautical mile boundary of the territorial sea shoreward to MHHW;
 - Daisy Bank/Nelson Island, Thompson Seamount, President Jackson Seamount off of Oregon; and,
 - All seamounts, including Gumdrop Seamount, Pioneer Seamount, Guide Seamount, Taney Seamount, Davidson Seamount, and San Juan Seamount; Mendocino Ridge; Cordell Bank; Monterey Canyon; specific areas in the Federal waters of the Channel Islands National Marine Sanctuary; and, specific areas of the Cowcod Conservation Area, off of California.

In 2011, the Council began a 5-year review of the groundfish EFH and HAPC descriptions and designations and information on fishing and non-fishing impacts. The Council completed Phase I and II of this review in 2013 with the compilation of updated ecological, habitat, and fishing effort data to support the Council’s decision-making on revisions to EFH. The completed Phase II report is available at: http://www.pcouncil.org/wp-content/uploads/D2b_EFHRC_RPT_PHASE2_MAR2014BB.pdf. During Phase III of the review, now underway, the Council is considering potential modifications to EFH conservation areas, which were implemented as part of Amendment 19. The Council took final action on these modifications at its April 2018 meeting and NMFS is currently reviewing the Council’s recommendations.

Figure 2: Designated groundfish EFH

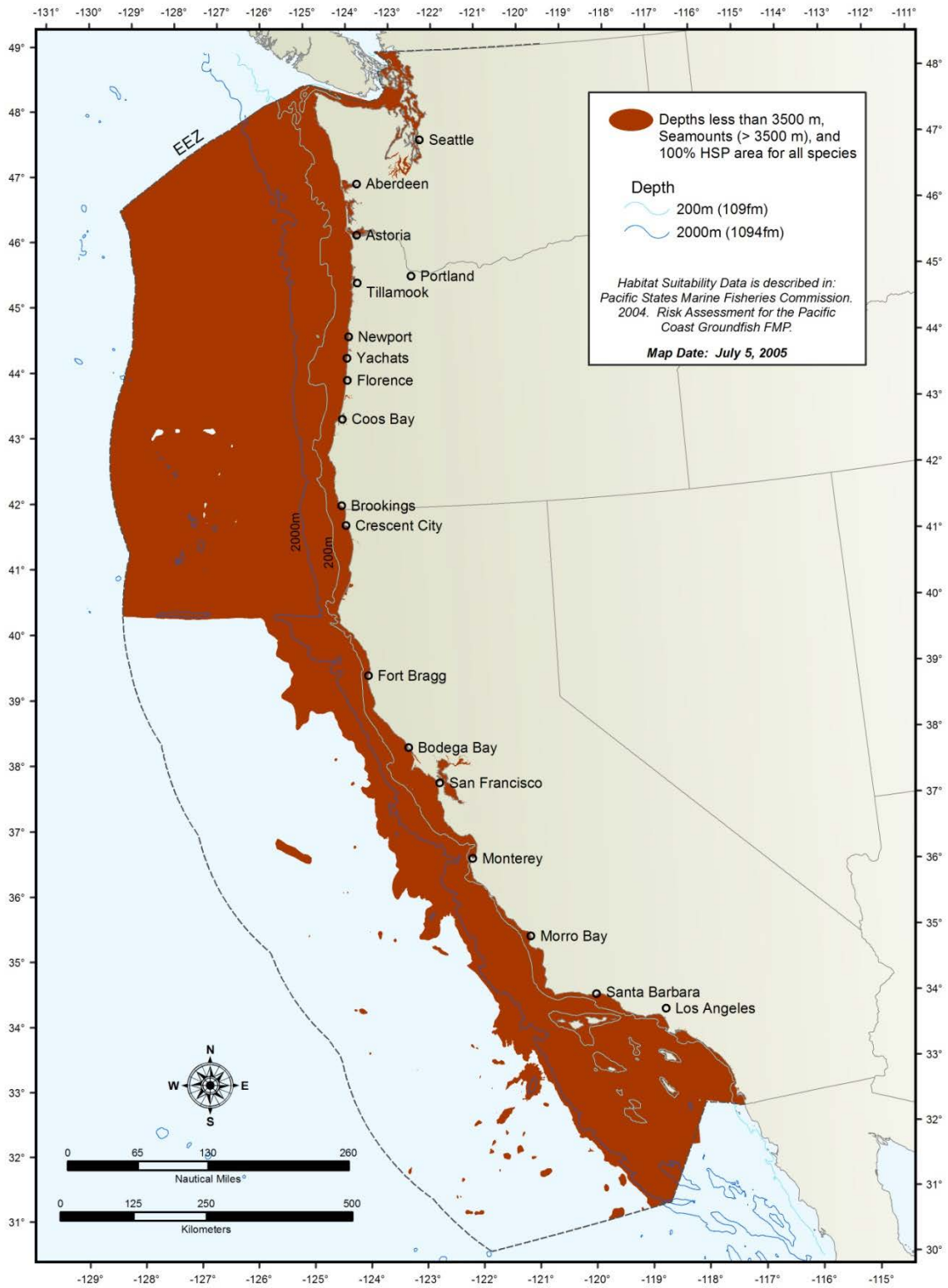
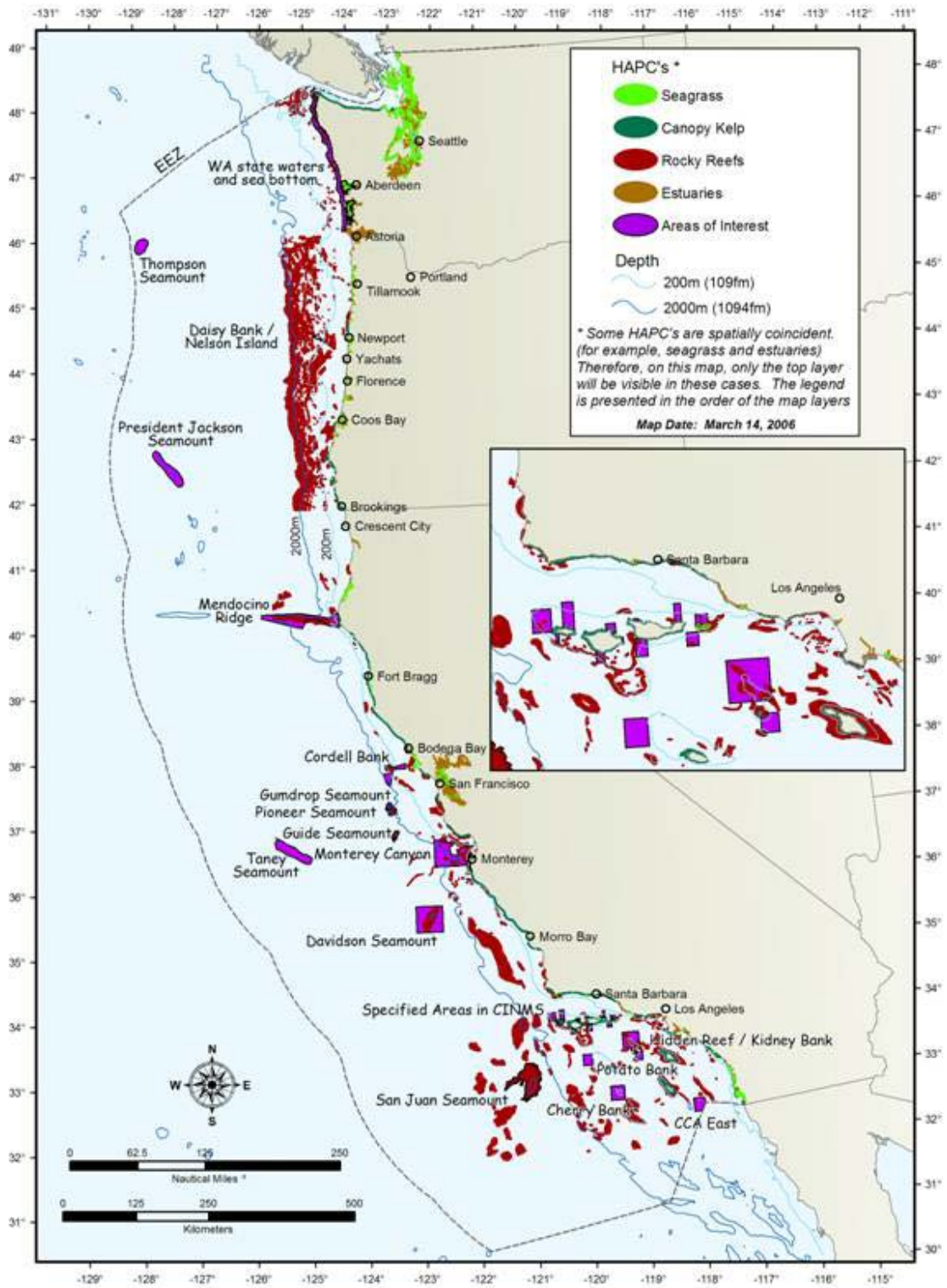


Figure 3: Groundfish HAPCs and major geological structures



4.2.3 Gear Types and Interactions with Habitat

Vessels participating in the groundfish fishery fish for target species with a number of gear types: trawl (including midwater and bottom), fish pot/trap, and hook and line gear (including jigs and demersal longlines). An in-depth analysis of gear types and their interactions with habitats is available in Amendment 19 to the Pacific Coast Groundfish FMP:

http://www.westcoast.fisheries.noaa.gov/publications/nepa/groundfish/final_groundfish_eis.html. The FEIS for the 2015-2016 Specifications and Management Measures and Amendment 24 and the EA for the 2019-2020 Specifications and Management Measures and management measures contained analysis of the impacts of the current operations of the groundfish fishery on habitat and is available at:

<https://www.westcoast.fisheries.noaa.gov/fisheries/groundfish/index.html>.

In general, the seafloor is the location of habitat types most susceptible to gear disturbances, so adverse effects to the physical habitat from different gear types are assessed by whether and how much the gear or harvesting technique contacts the bottom (Stevenson et al. 2004). Mobile gear types, such as dredges and trawls, generally have greater impacts on habitat than fixed gear types, like longlines and fish pots, due to the amount of the gear that contacts the bottom and how it interacts with the bottom. Bottom otter trawls are considered to have high degree impacts to habitat, because they have doors, ground cables, bridles, and sweeps that are dragged across the bottom during fishing. Some possible effects of bottom otter trawls on benthic habitats include reduction of habitat complexity, changes in benthic communities, and reduction of productivity of benthic habitat (NRC 2002). Impacts from trawling are greater in gravel/rock habitats with attached epifauna, due to its greater vulnerability and lower frequency of disturbance.

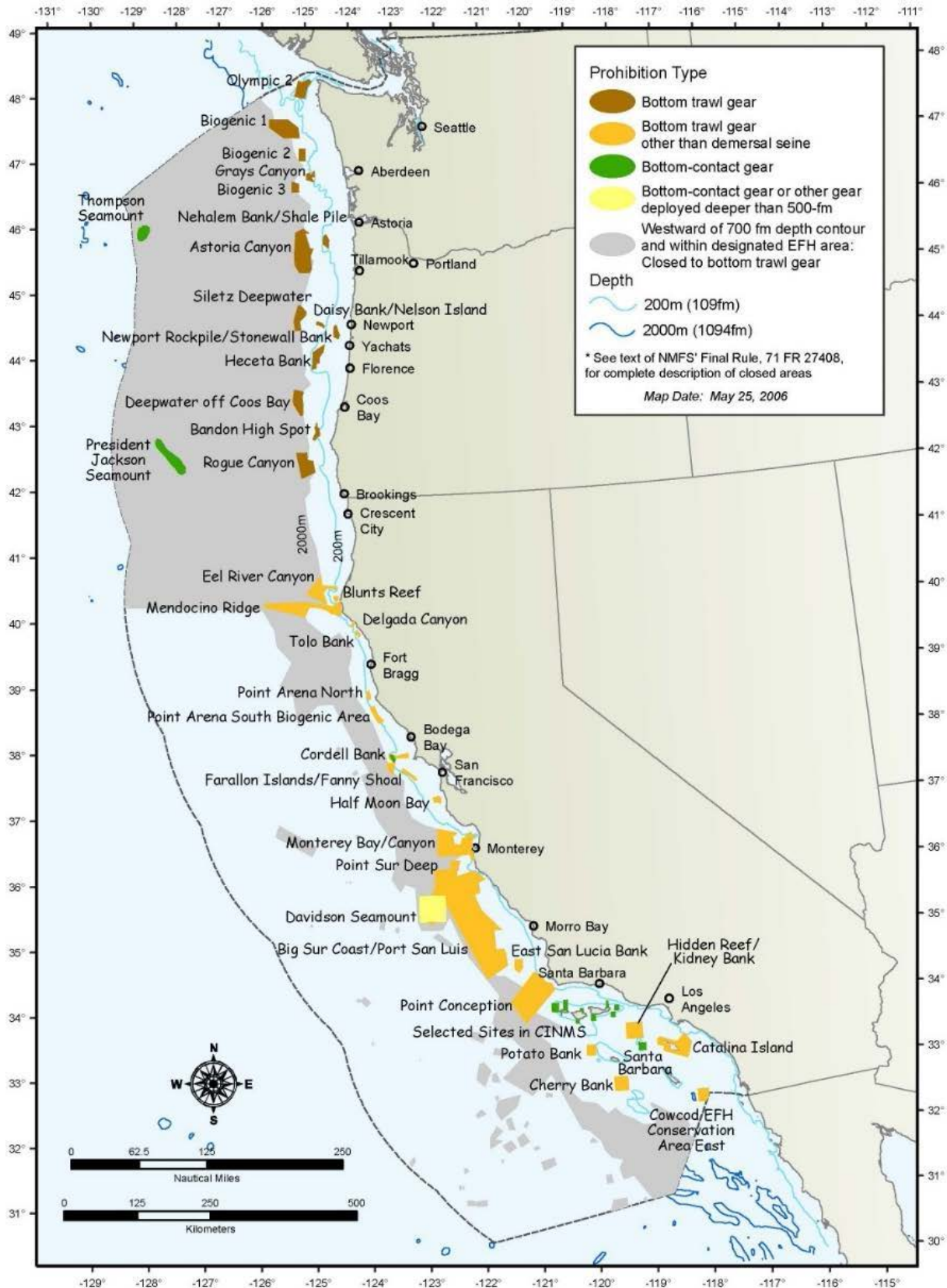
The Preferred Alternative would not revise regulations for bottom trawl vessels, only vessels using midwater trawl gear, fish pots, and bottom longlines. Impacts to habitat from fish pots and bottom longlines are considered low because less of the gear comes into contact with the bottom (anchors, lead lines) and the gear remains fixed during fishing. Midwater trawls also have low or no impacts, because they are fished in the water column to catch pelagic species and have minimal contact with the bottom. Contact with the bottom may occasionally occur, but most likely on soft, mud bottom because fishermen generally avoid bottom contact in more complex, rocky habitats to avoid causing costly damage to the gear. The Amendment 19 analysis showed that most midwater trawl fishing effort (77 percent) occurs on soft substrate on the upper slope (shallower than 700 fm). Fixed gear effort is more evenly distributed across habitat types, with 55 percent of fixed gear effort occurring on the upper, soft substrate slope. Because fixed gear comes in contact with the bottom, it may have some adverse impacts on biogenic habitats, such as corals and sponges, when the pot lands or is dragged across the sea floor. However, the Amendment 19 analysis indicated that recovery time for such habitat is short, less than 1 year. More detailed analysis of the vulnerability of different habitats to different gear types is available in the Amendment 19 FEIS and updated information is contained in the Council's Phase II report, which can be viewed on the Council's website:

<http://www.pcouncil.org/groundfish/groundfish-essential-fish-habitat/>.

The Council established measures to mitigate the adverse impacts of fishing on groundfish EFH through Amendment 19, which are described in FMP Chapter 6 (PFMC, 2006). These mitigation measures extended a prohibition on the use of bottom trawl gear with footropes larger than 8 inches in diameter shoreward of a line approximating the 100-fathom depth contour (Section 6.6), to discourage trawling in areas where bycatch of overfished rockfish species is higher and resulted in ancillary benefits by reducing trawling in areas of rocky habitat, as well as prohibitions on destructive gear types like dredges and beam trawls. Amendment 19 also closed 34 areas to bottom trawl gear and 16 areas to bottom contact commercial fishing gear, which includes pots and bottom longlines. Areas deeper than 700 fm were also closed to all bottom trawl gear (Section 6.8). Figure 5 shows the different closed areas. In addition, measures to control fishing capacity may have reduced impacts to EFH by limiting fishing effort (Section 6.9). Rockfish Conservation Areas (RCAs) implemented to conserve groundfish species have also reduced or eliminated fishing effort within these areas, depending on their restrictions.

The Council is currently considering changes to these closed areas in conjunction with the 5-year review of groundfish EFH and HAPC designations. More information about the changes under consideration is available on the Council's website:
<http://www.pcouncil.org/groundfish/groundfish-essential-fish-habitat/>.

Figure 4: EFH and EFH closed areas of the West Coast



4.3 Target Species

This EA incorporates by reference the Amendment 20 EIS and 2019-2020 harvest specifications and management measures EA sections on the two target species relevant to this action. Information on the target species is summarized below; refer to the EIS for more detailed information on target species. This section describes the stock population status for Pacific whiting, the target species of midwater trawl vessels in the mothership and shorebased Pacific whiting fishery, and sablefish, the target species of fixed gear vessels in the IFQ fishery. This information is summarized from the draft 2018 SAFE Report. The SAFE Report and more detailed information about the distribution, life history, and population trends are available in stock assessments, Stock Assessment Review (STAR) Panel Reports, Stock Assessment Review Team (STAT) Reports on the Council's website: <http://www.pcouncil.org/groundfish/stock-assessments/>.

4.3.1 Pacific Whiting

Model estimates indicate that Pacific whiting stock was below the unfished equilibrium in the 1960s and 1970s, increased toward the unfished equilibrium after two or more large recruitments occurred in the early 1980s, and then declined steadily through the 1990s to a low in 2000. This long period of decline was followed by a brief peak in 2003 as the large 1999 year class matured and subsequently supported the fishery for several years. Estimated female spawning biomass declined to an all-time low of 0.497 million mt in 2009 because of low recruitment between 2000 and 2007, along with a declining 1999 year class. Spawning biomass estimates have increased since 2009 on the strength of a large 2010 cohort and an above average 2008 cohort. The most recent Pacific whiting assessment estimated female spawning biomass to be 1.357 million mt, with a depletion ratio of 66.7 percent of unfished equilibrium levels at the start of 2018 (Edwards, et al. 2018). Currently, the Pacific whiting stock is not overfished and overfishing is not occurring.

4.3.2 Sablefish

The 2011 sablefish assessment estimated spawning stock biomass to be at 33 percent of its unfished biomass at the beginning of 2011 (Stewart, et al. 2011). An update of the 2011 sablefish assessment was conducted in 2015 (Johnson, et al. 2015), which indicated spawning biomass to be 34.5 percent of its unfished level. According to the 2015 assessment, sablefish spawning biomass relative to unfished spawning biomass is estimated to have dropped below the B40% management target in 2011 and continued to decline to 2015. Poor recruitments appear to be the main cause of the declining trend, as fishing intensity has remained below relative SPR target rates since 1988, except for 2009, 2010, and 2011. All sensitivity analyses and alternative models in the 2015 updated assessment show a declining trend in biomass to 2015. The PSA vulnerability score of 1.64 indicates a relatively low concern for potential overfishing. Currently, the sablefish stock is not overfished and overfishing is not occurring.

4.4 Non-Target Species and Bycatch

This EA incorporates by reference the Amendment 20 EIS on the non-target fish species relevant to this action. Information on the non-target species and bycatch is summarized below; refer to the EIS for more detailed information on non-target species and bycatch. This section describes the life history and stock population status for the main non-target and bycatch species in the Pacific whiting and fixed gear IFQ fisheries. This information is summarized from the draft 2018 SAFE Report. The SAFE Report and more detailed information about the distribution, life history, and population trends are available in stock assessments, STAR Panel Reports, STAT Reports on the Council’s website: <http://www.pcouncil.org/groundfish/stock-assessments/>.

4.4.1 Overfished Groundfish Species

Overfished and rebuilding stocks in the groundfish fishery include Cowcod (*Sebastes levis*) South of 40°10’N and Yelloweye rockfish (*Sebastes ruberrimus*).¹ Rockfish are generally long-lived and slow-growing, which make them vulnerable to overfishing and slow to recover from depletion. Yelloweye rockfish are among the longer living rockfish, with individuals that have been aged to 118 years old. Cowcod is managed as separate stocks north and south of 40°10’N latitude. North of 40°10’ N cowcod are managed as part of an assemblage of shelf rockfish species called Minor Shelf North of 40°10’N. South of 40°10N they are managed separately. Yelloweye rockfish are managed as a single stock throughout the West Coast region. The current status of these species is summarized in Table 1.

Table 1: Status of overfished groundfish species

Stock	Overfishing?	Overfished?	Management Action Required	Rebuilding Program Progress	B/Bmsy or B/Bmsy proxy
Cowcod – South	No	No – rebuilding	Continue rebuilding	Year 18 of 19-year plan	0.85
Yelloweye rockfish	No	No – rebuilding	Continue rebuilding	Year 14 of 70-year plan	0.71

The draft EA showed stock status based on the Quarter 2 2016 report to Congress. The table has been updated to reflect the latest stock statuses based on the Quarter 3 2018 report to Congress.

4.4.2 Other Groundfish Species

Other groundfish species caught most frequently by whiting and fixed gear vessels include widow rockfish (*Sebastes entomelas*), yellowtail rockfish (*Sebastes flavidus*), and spiny dogfish (*Squalus suckleyi*). Information on the amount of bycatch of these and other species in the groundfish fishery is available in the Groundfish Total Mortality Reports prepared by the West Coast Groundfish Observer Program (WCGOP):

https://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_products/data_library.cfm

¹ Note that the status of the overfished species changed between the draft and final EA. Bocaccio rockfish, darkblotched rockfish, and Pacific ocean perch were listed as overfished and rebuilding species in the draft EA, but later declared rebuilt. Yelloweye rockfish is still rebuilding, but is no longer overfished.

Distribution, life history, and other information about these stocks and other non-target groundfish species is available in the draft 2018 SAFE report: <http://www.pcouncil.org/groundfish/safe-documents/>. The stock status of all non-overfished groundfish species is summarized in Table 2.

Table 2: Status of non-overfished groundfish species

Stock	Overfishing?	Overfished?	Management Action Required	Rebuilding Program Progress	B/Bmsy or B/Bmsy proxy
Arrowtooth flounder	No	No	N/A	N/A	3.47
Black rockfish - North	No	No	N/A	N/A	1.51
Black rockfish - South	No	No	N/A	N/A	1.76
Blackgill rockfish	Unknown	No	N/A	N/A	0.83
Blue rockfish	Unknown	No	N/A	N/A	0.93
Bocaccio – South	No	No	N/A	N/A	1.22
Brown rockfish	Unknown	No	N/A	N/A	1.06
Cabezon	No	No	N/A	N/A	1.21
California scorpionfish	No	No	N/A	N/A	1.36
Canary rockfish	No	No	N/A	N/A	1.41
Chilipepper rockfish – South	No	No	N/A	N/A	1.73
Darkblotched rockfish	No	Rebuilt	None	N/A	1.00
Dover sole	No	No	N/A	N/A	3.35
English sole	No	No	N/A	N/A	3.52
Gopher rockfish – North	Unknown	No	N/A	N/A	2.42
Greenspotted rockfish	Unknown	No	N/A	N/A	0.86
Greenstriped rockfish	Unknown	No	N/A	N/A	2.02
Kelp greenling – Oregon	Unknown	No	N/A	N/A	1.99
Lingcod	No	No	N/A	N/A	0.82
Longnose skate	No	No	N/A	N/A	1.65
Longspine thornyhead	No	No	N/A	N/A	1.88

Pacific ocean perch – North	No	No	None	N/A	1.92
Pacific sanddab	Unknown	No	N/A	N/A	>1.0
Petrale sole	No	No	N/A	N/A	1.23
Rex sole	Unknown	No	N/A	N/A	3.20
Rougheye rockfish	Unknown	No	N/A	N/A	1.18
Sablefish	No	No	N/A	N/A	0.86
Shortbelly rockfish	No	No	N/A	N/A	1.67
Shortspine thornyhead	No	No	N/A	N/A	1.85
Spiny dogfish	No	No	N/A	N/A	1.58
Splitnose rockfish	No	No	N/A	N/A	1.64
Starry flounder	No	No	N/A	N/A	1.25
Vermilion rockfish	Unknown	Unknown	N/A	N/A	Not estimated
Widow rockfish	No	No	N/A	N/A	1.88
Yellowtail rockfish	No	No	N/A	N/A	1.88

The draft EA showed stock status based on the Quarter 2 2016 report to Congress. The table has been updated to reflect the latest stock statuses based on the Quarter 3 2018 report to Congress.

4.4.3 Non-Groundfish Species

Because midwater trawling for Pacific whiting primarily occurs on dense aggregations during daylight hours only a small percentage of the catch is non-whiting and an even smaller portion is non-groundfish species. Coastal pelagic species (CPS) (mackerels, market squid, northern anchovy, Pacific sardine, and Pacific herring) made up approximately 22 percent of the non-groundfish landings from 2010-2014. CPS are schooling fish, not associated with the ocean bottom, that migrate in coastal waters. For further information on CPS, see the 2017 CPS SAFE document prepared by the Council (<https://www.pcouncil.org/coastal-pelagic-species/stock-assessment-and-fishery-evaluation-safe-documents/>) Notable landings of other non-groundfish species included brown cat shark, unidentified squids, and shad. Small amounts of sharks managed under the Highly Migratory Species (HMS) FMP were also caught. For further information on HMS see the 2017 SAFE document prepared by the Council (<https://www.pcouncil.org/highly-migratory-species/stock-assessment-and-fishery-evaluation-safe-documents/current-hms-safe-document/>).

4.5 Protected Resources

This EA incorporates by reference the Amendment 20 EIS and 2017-2018 harvest specifications and management measures EA discussions on protected resources. Information on the protected resources is summarized below; refer to the EIS for more detailed information on protected

resources. Numerous protected species inhabit the environment within the Pacific Coast Groundfish FMP management unit. Therefore, many protected species potentially occur in the operations area of the fishery. These species are under NMFS's and FWS's jurisdiction and are afforded protection under the Endangered Species Act of 1973 (ESA) and/or the Marine Mammal Protection Act of 1972 (MMPA). As listed in Table 3, 23 marine mammal, sea turtle, fish species, and invertebrate species are classified as endangered or threatened under the ESA. The remaining species in Table 3 are protected by the MMPA and are known to interact with the Pacific Coast groundfish fishery. Non ESA-listed species protected by the MMPA that utilize this environment and have no documented interaction with the Pacific Coast groundfish fishery will not be discussed in this document.

4.5.1 Species Present in the Area

Table 3 and 4 lists the species and critical habitat, protected by the ESA, the MMPA, or both, that may be found in the environment utilized by the groundfish fishery. Note that all marine mammals are protected under the MMPA. This list does not include ESA-listed species only listed in the Puget Sound, because the action area does not include Puget Sound.

Table 3: Species present in the action area

Species	Status under ESA and/or MMPA
Marine Mammals	
Blue whale (<i>Balaenoptera musculus</i>)	Endangered
Fin whale (<i>Balaenoptera physalus</i>)	Endangered
Humpback whale (<i>Megaptera novaeangliae</i>) Mexico DPS	Threatened (Final rule published Sep 8, 2016; 81 FR 62259)
Humpback whale (<i>Megaptera novaeangliae</i>) Central North Pacific DPS and Central America DPS	Endangered (Final rule published Sep 8, 2016; 81 FR 62259)
Sei whale (<i>Balaenoptera borealis</i>)	Endangered
North Pacific right whale (<i>Eubalaena japonica</i>)	Endangered
Gray whale (<i>Eschrichtius robustus</i>) western North Pacific population	Endangered
Sperm whale (<i>Physeter macrocephalus</i>)	Endangered
Killer whales (<i>Orcinus orca</i>) southern resident distinct population segment (DPS)	Endangered
Steller sea lion (<i>Eumetopias jubatus</i>) eastern DPS*	Removed from list as of Dec 4, 2013 (78 FR 66140)
Guadalupe fur seal (<i>Arctocephalus townsendi</i>)	Threatened
Dall's porpoise (<i>Phocoenoides dalli</i>) – CA/OR/WA stock	Non-strategic stock
Harbor porpoise (<i>Phocoena phocoena</i>) - Morro Bay stock, Monterey Bay stock, San Francisco-Russian River stock, Northern CA/Southern OR stock, OR/WA stock.	Non-strategic stock
Pacific white-sided dolphin (<i>Lagenorhynchus obliquidens</i>) – CA/OR/WA stock, northern and southern stocks	Non-strategic stock
Risso's dolphin (<i>Grampus griseus</i>) – CA/OR/WA stock	Non-strategic stock
Common Bottlenose dolphin (<i>Tursiops truncatus</i>) – CA/OR/WA offshore stock, CA coastal stock	Non-strategic stock

Common dolphin, Short-beaked (<i>Delphinus delphis</i>) – CA/OR/WA stock	Non-strategic stock
Common dolphin, Long-beaked (<i>Delphinus capensis</i>) – CA stock	Non-strategic stock
Northern right whale dolphin (<i>Lissodelphis borealis</i>) – CA/OR/WA stock	Non-strategic stock
Striped dolphin (<i>Stenella coeruleoalba</i>) – CA/OR/WA stock	Non-strategic stock
Short-finned pilot whale (<i>Globicephala macrorhynchus</i>) – CA/OR/WA stock	Non-strategic stock
Sperm whale (<i>Physeter macrocephalus</i>) – CA/OR/WA stock	Strategic stock
Dwarf sperm whale (<i>Kogia sima</i>) - CA/OR/WA stock	Non-strategic stock
Pygmy sperm whale (<i>Kogia breviceps</i>) - CA/OR/WA stock	Non-strategic stock
Killer whale (<i>Orcinus orca</i>) – Eastern north Pacific offshore stock, West Coast transient stock	Non-strategic stock
Mesoplodont beaked whales (Mesoplodon spp.) - CA/OR/WA stock Hubbs' beaked whales Ginkgo-toothed whale Stejneger's beaked whales Blainville's beaked whales Pygmy beaked whale or lesser beaked whale Perrin's beaked whale <i>Due to the difficulties involved with identifying different species, as well as the rarity of these species, the SAR for these species designated all Mesoplodont beaked whales as one stock in the EEZ waters off the coasts of CA/OR/WA</i>	Non-strategic stock
Cuvier's beaked whale (<i>Ziphius cavirostris</i>) - CA/OR/WA stock	Non-strategic stock
Baird's beaked whale (<i>Berardius bairdii</i>) – CA/OR/WA stock	Non-strategic stock
Blue whale (<i>Balaenoptera musculus</i>) – Eastern North Pacific stock	Strategic stock
Fin whale (<i>Balaenoptera physalus</i>) - CA/OR/WA stock	Strategic stock
Gray whale (<i>Eschrichtius robustus</i>) - Eastern North Pacific stock and Western North Pacific stocks	Non-strategic stock (Eastern)/Strategic stock (Western)
Humpback whale (<i>Megaptera novaeangliae</i>) – CA/OR/WA stock	Strategic stock
Minke whale (<i>Balaenoptera acutorostrata</i>) - CA/OR/WA stock	Non-strategic stock
Right whale, North Pacific (<i>Eubalaena glacialis</i>) - Eastern North Pacific stock	Non-strategic stock
Sei whale (<i>Balaenoptera borealis</i>) - Eastern North Pacific stock	Strategic stock
Steller sea lions (<i>Eumetopias jubatus</i>) – Eastern U.S. stock	Non-strategic stock
California sea lion (<i>Zalophus californianus</i>) – U.S. stock	Non-strategic stock
Guadalupe fur seal (<i>Arctocephalus townsendi</i>) – Mexico to California	Strategic stock
Harbor seal (<i>Phoca vitulina richardsi</i>) – CA stock; OR/WA stock	Non-strategic stocks
Northern elephant seal (<i>Mirounga angustirostris</i>) – California breeding stock	Non-strategic stock
Northern fur seal: (<i>Callorhinus ursinus</i>) – California stock	Non-strategic stock

Sea turtles	
Leatherback turtle (<i>Dermochelys coriacea</i>)*	Endangered
Loggerhead turtle (<i>Caretta caretta</i>) North Pacific Ocean DPS	Endangered
Olive ridley (<i>Lepidochelys olivacea</i>)	Endangered/Threatened
Green turtle (<i>Chelonia mydas</i>), East Pacific DPS	Threatened
Marine invertebrates	
White abalone (<i>Haliotis sorenseni</i>)	Endangered
Black abalone (<i>Haliotis cracherodii</i>)*	Endangered
Marine and anadromous fish	
Green sturgeon (<i>Acipenser medirostris</i>) southern DPS*	Threatened
Pacific eulachon (<i>Thaleichthys pacificus</i>) southern DPS	Threatened
Chinook (<i>Oncorhynchus tshawytscha</i>) Sacramento River winter, evolutionarily significant unit (ESU)	Endangered
Chinook, Central Valley Spring ESU	Threatened
Chinook, California Coastal ESU	Threatened
Chinook, Puget Sound	Threatened
Chinook, Snake River Fall Run	Threatened
Chinook, Snake River Spring/Summer Run	Threatened
Chinook, Lower Columbia River	Threatened
Chinook, Upper Willamette River	Threatened
Chinook, Upper Columbia River Spring Run	Endangered
Coho (<i>Oncorhynchus kistuch</i>) Central California Coastal ESU	Endangered
Coho, S. Oregon/N. CA Coastal ESU	Threatened
Coho, Lower Columbia River	Threatened
Coho, Oregon Coast	Threatened
Chum, (<i>Oncorhynchus keta</i>) Columbia River ESU	Threatened
Chum, Hood Canal summer run ESU	Threatened
Steelhead, (<i>Oncorhynchus mykiss</i>), Central California Coast DPS	Threatened
Steelhead, Snake River Basin DPS	Threatened
Steelhead, Upper Columbia River DPS	Endangered
Steelhead, Southern California DPS	Endangered
Steelhead, Middle Columbia River DPS	Threatened
Steelhead, Lower Columbia River DPS	Threatened
Steelhead, Upper Willamette River DPS	Threatened
Steelhead, Northern California DPS	Threatened
Steelhead, South-Central California DPS	Threatened
Steelhead, California Central Valley DPS	Threatened
Sockeye (<i>Oncorhynchus nerka</i>), Snake River ESU	Endangered
Scalloped hammerhead (<i>Sphyrna lewini</i>) eastern Pacific DPS	Endangered

*Species with designated critical habitat within the marine waters.

Table 4: Critical habitats

Steller sea lion (58 FR 45269)	Año Nuevo Island Southeast Farrallon Island Sugarloaf Island and Cape Mendocino	Associated aquatic zones 3,000 feet seaward in State and Federally managed waters from the baseline of each rookery and the air zone 3,000 feet above each rookery measured vertically from sea level.
Southern Resident Killer Whales (71 FR 69054)	The critical habitat is made of three areas: U.S. waters south of the Washington/Canada border to the Strait of Juan de Fuca; the U.S. waters of the Strait of Juan de Fuca; Puget Sound (Hood Canal not included)	See 50 CFR 226.206 for details of critical habitat areas and specific sites not included in critical habitat designation.
Green sturgeon, southern DPS (74 FR 52300)	US coastal marine waters within 60 fathoms from Monterey Bay, CA, to Cape Flattery, WA. Numerous rivers and estuaries adjacent to marine waters are also listed. See Federal Register notice for complete list.	
Black abalone (76 FR 66806)	Rocky intertidal and subtidal habitats to the 6 meter depth bathymetry line (relative to MLLW) around specific offshore island (the Farallon Islands, Año Nuevo Island, the Channel Islands) and along the coast in specific areas between Del Mar Landing Ecological Reserve in Sonoma County and just south of Government Point in Santa Barbara County as well as along the Palos Verde Peninsula.	
Leatherback sea turtle (77 FR 4170)	Marine waters from Point Arena, CA to Point Arguello, CA from the nearshore to the 3,000 meter isobath.	
Marine and anadromous fish have designated critical habitat in rivers, streams and estuaries adjacent to marine waters. Additional information is available through NMFS and at http://www.nmfs.noaa.gov/pr/species/criticalhabitat.htm .		

Information on endangered and threatened marine species under NMFS’s jurisdiction, including species information, status and designated critical habitat, can be found at <http://www.nmfs.noaa.gov/pr/species/esa/listed.htm#fish>. Information on marine mammals protected under the MMPA can be found at: http://www.nmfs.noaa.gov/pr/sars/pdf/pacific2015_final.pdf.

4.5.2 Species Potentially Affected

The Pacific coast groundfish fishery has suspected and documented interactions with several ESA listed species that are potentially affected by this action: Chinook salmon, coho salmon, eulachon, green sturgeon, humpback whales, leatherback sea turtles, and short-tailed albatross. Chinook salmon and coho salmon are primarily caught as bycatch by midwater trawl vessels participating in the Pacific whiting fishery and also in the bottom trawl fishery. The sablefish pot/trap fishery has take of leatherback sea turtles and humpback whales due to entanglements in buoy and lead lines, although most interactions occur in the limited entry sablefish fishery which is not the subject of this action. Longline gear is responsible for interactions with short-tailed albatross in the groundfish fishery. The effects of the Pacific Coast Groundfish FMP on species listed as threatened or endangered under the ESA have been considered in two section 7 consultations. The conclusions and current status of the most recent consultations are summarized below.

Listed Salmonids

Analysis of available data for previous consultations indicates that steelhead, sockeye, and cutthroat trout are rarely, if ever, encountered in the groundfish fishery. Coho and chum are caught in relatively low numbers in the whiting fishery with average catch per year coastwide on the order of tens to a few hundred fish (NMFS 1999), and in the bottom trawl fishery on the order of tens of fish per year (NMFS 1992). NMFS concluded in the 1999 biological opinion that there is little or no effect to the steelhead, sockeye, cutthroat trout, coho, or chum salmon ESUs as a result of the groundfish FMP. Relevant information supporting this conclusion is reviewed briefly in section IV of the 1999 Biological Opinion, but is not further discussed in this assessment.

NMFS completed a biological opinion on December 11, 2017 analyzing the impacts of the Pacific Coast Groundfish FMP under section 7 of the ESA on Chinook salmon and coho salmon. This opinion considered impacts of the continued operation of the groundfish fishery on seven listed Chinook and Coho Salmon Evolutionarily Significant Units (ESUs): Puget Sound Chinook, Snake River Fall Chinook, Lower Columbia River (LCR) Chinook, Upper Willamette River (UWR) Chinook, Snake River Spring/summer Chinook, California Coastal (CC) Chinook, LCR Coho, Oregon Coast Coho, Southern Oregon/Northern California Coho, and Central California Coast (CCC) Coho Salmon (NMFS, 2017). Substantial numbers of Chinook salmon are caught in the whiting and bottom trawl fisheries and have been the subject of previous biological opinions, most recently in the 1999 biological opinion and 2006 supplemental biological opinion. As in previous opinions, the 2017 biological opinion concluded that the continued operation of the groundfish fishery is not likely to jeopardize the continued existence of listed ESUs of Chinook and coho salmon. The biological opinion established an incidental take statement (ITS) for the whiting and non-whiting fisheries, and included reasonable and prudent measures and terms and conditions. Specifically, the take statement would remain valid provided that the distribution of the fisheries did not change substantially from those assumptions made in the biological opinion, Chinook bycatch would not exceed 14,500 Chinook per year (11,000 guideline plus 3,500 reserve for unexpected bycatch events) for the whiting fishery and 9,000 Chinook per year (5,000 guideline plus 3,500 reserve) for the non-whiting

fishery, and coho bycatch would not exceed 474 coho per year for the whiting fishery and 560 coho per year for the non-whiting fishery. Reasonable and prudent measures included implementation of measures and monitoring and reporting system to ensure compliance with the guidelines and reserve limits. NMFS and the Council are currently developing measures to include in the FMP to comply with the terms of the ITS.

Other Species

NMFS and the U.S. Fish and Wildlife Service completed biological opinions in 2012 assessing the impacts of the Pacific Coast Groundfish FMP on eulachon, green sturgeon, Stellar sea lions, humpback whales, and leatherback sea turtles and, with USFWS short-tailed albatross. All other ESA listed species that may be affected by the groundfish fishery were evaluated and it was determined that they were not likely to be adversely affected by the fishery. The biological opinions concluded that the ongoing operation of the fishery would not be likely to jeopardize the continued existence of eulachon, green sturgeon, Stellar sea lions, humpback whale, leatherback sea turtles, or short tailed albatross and issued an incidental take statements with reasonable and prudent measure and terms and conditions to monitor and minimize mortality of incidental takes. The biological opinions also charged the Council with creating an Endangered Species Workgroup to compile information about and monitor compliance with the ITSs in the groundfish fishery. The most recent report of the Workgroup in 2017 concluded that the groundfish fishery was in compliance with its ITS for humpback whales, green sturgeon, and leatherback sea turtles.. Stellar sea lions were delisted under the ESA on December 4, 2013 (78 FR 66140).

In April 2016, NMFS reinitiated consultation on eulachon due to exceedance of the ITS (1,004 fish) in the Pacific whiting sectors of the groundfish fishery. Eulachon take exceeded the incidental take statement of 1,004 fish in 2011, 2013, and preliminarily, may have been exceeded again in 2014. In 2011 the take was 1,624 fish, of which 1,271 fish were caught in the whiting Catcher/Processor sector, and the remaining take occurring in the bottom trawl, midwater trawl, shoreside whiting, and tribal sectors. Take in 2013 was 5,115 fish, of which 4,139 fish were caught in shoreside whiting fishery, and the remaining fish caught in the bottom trawl, midwater trawl, and whiting mothership and catcher processor sectors. Take in 2014 was 3,081 fish, of which 2,751 fish were in the bottom and midwater trawl sectors of the shoreside IFQ fishery. For 2015, bycatch of eulachon totaled 699 fish, with 643 of the total caught in the shoreside bottom and non-whiting midwater trawl fisheries.

In 2016 NMFS reinitiated ESA section 7 consultation for eulachon. NMFS concluded reinitiation in 2018 (NMFS, 2018b). The take estimate level of 1,004 fish from the 2012 opinion was based on bycatch estimates from 2002–10, a time when eulachon abundance was severely depressed; abundance has subsequently increased. The 2018 opinion found it is likely that the exceedance in the take limits during the 2011 through 2014 time period was the result of variations in eulachon abundance, not changes to the groundfish fishery. Therefore, the estimated level of annual eulachon take will fluctuate based on eulachon biomass and the thresholds in the incidental take statement will be calculated annually based on prescribed methods. Additionally, eulachon bycatch/take in groundfish fisheries is small relative to other fisheries.

NMFS also reinitiated consultation on the take of short-tailed albatross in April 2016. Bycatch of short-tailed albatrosses in commercial fisheries continues to be a major conservation concern. From 1983 to 2009, eleven short-tailed albatross mortalities were documented in North Pacific groundfish fisheries. From 2010-2014, eight short-tailed albatross mortalities have been observed during commercial fishing activities, six in Alaska, one off Oregon, and one off Japan. On April 11, 2011, a short-tailed albatross mortality was documented in the limited entry sablefish fishery using fixed gear off Oregon. Because extremely low numbers of short-tailed albatross make observation data too low to use, black-footed albatross observations were used as a proxy. The 2012-2013 two-year average, using expanded annual estimates of black-footed albatross as a proxy (as required in the USFWS Biological Opinion) ranged from 1.35 to 2.0 for the lower short-tailed albatross population estimate to 1.45 to 2.15 for the higher population estimates, which exceeds the 2 per 2-year period specified in the ITS in the biological opinion. This led to the reinitiation of ESA Section 7 consultation on take of this species in the Pacific Coast Groundfish Fishery in April, 2016.

USFWS completed the biological opinion on May 2, 2017 that analyzed the ongoing operation of the groundfish fishery on the federally endangered short-tailed albatross (*Phoebastria albatrus*) and California least tern (*Sterna antillarum browni*); and the Federally threatened marbled murrelet (*Brachyramphus marn'zoratus*), southern sea otter (*Enhydra lutris nereis*), and bull trout (*Salvelinus confluentus*) and their designated critical habitat (USFWS, 2017). As described in the opinion, USFWS concluded that implementation of the activities as described within the biological assessment would not jeopardize the continued existence of short-tailed albatross. USFWS also concurred with NMFS's determination that the ongoing operation of the groundfish fishery is not likely to adversely affect the marbled murrelet, California least tern, southern sea otter, bull trout, nor bull trout critical habitat. The biological opinion established an incidental take statement of no more than one short-tailed albatross in two years or an average estimated take (calculated via the Bayesian model used in the biological opinion) of no more than five birds per two-year period. The incidental take is expected to be in the form of injury and mortality, due to bird injured or drowned as a result of encounters with hook and line groundfish gear, or taken by collision with trawl gear, including the third wire and warp cables. To account for interannual variability in actual take levels, a floating two-year period beginning on January 1, 2017, will be used to quantify the observed and estimated total reported take in each two-year period. The ITS also specified reasonable and prudent measures and terms and conditions to improvement information about and minimize takes of short-tailed albatross in the groundfish fishery, including evaluation and implementation of deterrence devices, time restrictions on use of longline gear, restrictions on offal discharge, and monitoring and reporting requirements. NMFS and the Council are working to implement these measures in the FMP.

The 2017 NMFS bycatch report provided to the ESA Workgroup (Agenda Item F.5.a, NMFS Report 2, April 2017: http://www.pcouncil.org/wp-content/uploads/2017/03/F5a_ESA_Workgroup_Rpt_3-17-2017_Apr2017BB.pdf) is incorporated by reference here, although a summary of the species status and biology is presented below. Internal citations have been omitted; for sources refer to the report. Humpback whales were listed worldwide as endangered under the ESA in 1970, and classified as a strategic stock and considered depleted under the MMPA. Based on a 2009 ESA status review, NMFS revised the listing status of the species by identifying 14 DPSs (81 FR 62259). Four DPSs occur

in the North Pacific, identified by breeding location: Hawaii, Central America, Mexico, and Western North Pacific. Humpback whales off the Oregon, Washington, and California coast are from the Central America, Mexico, and Hawaii DPSs. Only the Mexico DPS and Central America DPS are listed, as threatened and endangered, respectively. Breeding locations in the North Pacific are more geographically separated than feeding areas and include regions offshore of Hawaii, Central America; the West Coast of Mexico, and the Ogasawara and Okinawa Islands and the Philippines. Feeding areas in the North Pacific range from California, USA to Hokkaido, Japan, with most feeding occurring in coastal waters. Humpback whales in the North Pacific rarely move between these breeding regions. Strong fidelity to both feeding and breeding sites has been observed but movements are complex. Recent humpback whale abundance estimates for the entire North Pacific basin have ranged from 18,302 to 21,808 individuals; the latter estimate may still be an underestimate of actual humpback whale abundance.

Humpback whales face a variety of threats, including entrapment and entanglement in fishing gear, collisions with ships, acoustic disturbance, habitat degradation, and competition for resources with humans. Humpback whales may break through, carry away, or become entangled in fishing gear. Whales carrying gear may later die, become debilitated or seriously injured, or have normal functions impaired. Most entanglements, and subsequent mortality, is probably not recorded. Preliminary studies suggest that entanglement may be responsible for 3-4 percent of total mortality, especially among juveniles. The Hawaii DPS experiences a high rate of interaction with fishing gear (20-71 percent), with the highest rates recorded in southeast Alaska and northern British Columbia. Vessel collisions and entanglement in fishing gear pose the greatest threat to the Central America DPS. For the Mexico DPS fishery interactions are the most likely source of serious injury and mortality, followed by ship strikes. Pot and trap fisheries in general are the most commonly documented source of serious injury and mortality of humpback whales in U.S. West Coast waters.

The 2012 BiOp estimate of take for humpback whales is a five year average of one humpback whale injury or mortality per year, and up to three humpback whale injuries or mortalities in any single year. The take of humpback whales did not exceed the take estimate during the 2011–15 time period under review by the ESA Workgroup. In fisheries managed under the PCGFMP, one humpback whale was observed taken in 2014 in the limited entry sablefish fishery on a vessel fishing with pot gear. Using observer data from the groundfish sector and a Bayesian approach to estimate bycatch, the bycatch rate calculated for the 2011–15 period was 0.002 whales/year. The fleet-wide estimated 5-year annual average for 2011–15 was 0.20 whales and the total estimated mean bycatch was 1.0 whale.

Based on its review of the bycatch/take estimate for the 2011–15 period, the ESA Workgroup did not make any management recommendations. However, it did express concern about the possibility that more entanglements occurred in 2016.

Although bycatch estimates are not available for 2016 and 2017, NMFS does report observed whale entanglements (NOAA Fisheries 2017; NOAA Fisheries 2018). Figure 5 shows confirmed whale entanglements by year and species.

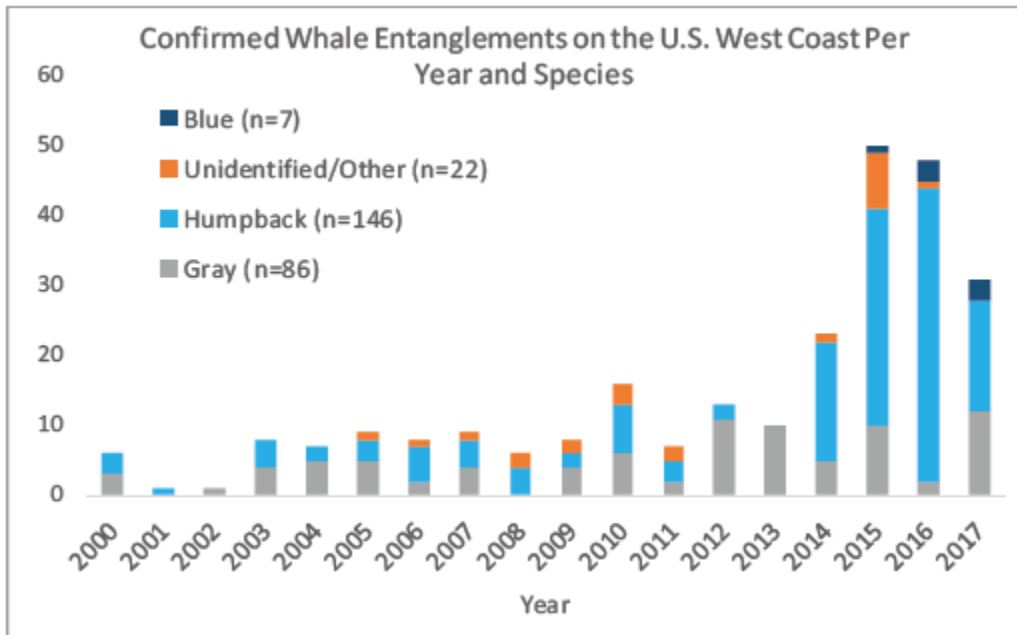
In 2016, 71 separate cases of entangled whales were reported off the coasts of Washington, Oregon, and California, as well as in neighboring countries with gear from U.S. fisheries. This is the highest annual total for the West Coast of the United States since NOAA Fisheries started keeping records in 1982. NMFS confirmed 48 of the 71 cases via the documentation submitted, follow-up sightings, and Network. The majority of these reports, 54, were of humpback whales. Of the 48 confirmed entanglement cases, 29 were identified as associated with specific fisheries or gear type. Two humpback whales were reported from the sablefish trap fishery, which is managed under the PCGFMP; all other takes were from non-groundfish fisheries. Reported entanglements were concentrated in Central California from waters off San Francisco to Monterey Bay.

In 2017, a total of 31 whales were confirmed entangled off the coasts of Washington, Oregon, and California and in Mexico with gear from U.S. fisheries. The highest concentration of these entanglements were off of California (26), however, the location where entangled animals are observed and reported does not necessarily reflect where and when an entanglement originated. Higher reporting rates in California may reflect higher sighting rates of whales off the coast of California even when the entanglement event may have originated elsewhere. The number of confirmed entanglements in 2017 was lower than the historic highs of 2015 (50) and 2016 (48), but still represents a significant increase compared to pre-2014 levels when the average was less than 10 confirmed entanglements per year. In comparison to the last several years, fewer humpback whale entanglements were reported and confirmed in 2017, but a larger number of gray whale entanglements was reported and confirmed. A total of 16 of those were confirmed to be humpback whales. In 2017, 14 of the 31 confirmed entanglement cases were identified as associated with specific fisheries or gear type. One of these was from the sablefish/coonstripe shrimp commercial trap fishery¹¹, while the rest were from non-groundfish fisheries.

On October 30, 2018, NMFS reinitiated consultation on humpback whales. The humpback whale take in the Pacific Coast Groundfish fishery has not exceeded the levels identified in the 2012 opinion, however the new species listing of humpback whales warrants reinitiation of consultation.

Information on whale entanglements is also discussed in the 2018 California Current Ecosystem Status Report (Agenda Item F.1.a, NMFS Report 1, March 2018: https://www.pcouncil.org/wp-content/uploads/2018/02/F1a_NMFS_Rpt1_2018_IEA_SoCC_FINAL_main_Mar2018BB.pdf). These whale entanglements are coincident with anomalous warming of the California Current ecosystem in 2014 to 2016. It is possible oceanographic conditions brought whales closer to shore in recent years where they fed on abundant shoals of anchovy. This brought them into an area where they would be more vulnerable to fixed gear. In addition, a major harmful algal bloom event delayed opening of the Dungeness crab pot fishery. This may have increased the deployment of pot gear during a time of the year when humpback whales are abundant in nearshore waters. In 2017–18 oceanographic conditions are trending to average conditions. Humpback whale takes were lower in 2017 than in 2016 (Figure 5).

Figure 5. Confirmed U.S. West Coast whale entanglements by year and whale species, 2000-2017. (Source: NOAA Fisheries 2018)



4.5.3 ESA Listed Species and Habitats Not Likely to Be Affected

The following ESA listed species occur in the action area, but NMFS has determined that the groundfish fishery is not likely to adversely affect these species or their critical habitat: Green sea turtles (*Chelonia mydas*); Olive ridley sea turtles (*Lepidochelys olivacea*); Loggerhead sea turtles (*Caretta caretta*); 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*); and critical habitat of Steller sea lions.

Section 2.2 in the 2012 biological opinion describes the status of species and critical habitat subject to the consultation. Section 2.11 describes the rationale for reaching a “not likely to adversely affect” determination for the species listed above.

4.5.4 Marine Mammals not Listed Under the Endangered Species Act

The MMPA requires all commercial fisheries to be placed in one of three categories, based on the relative frequency of incidental serious injuries and mortalities of marine mammals in the fishery:

- Category I designates fisheries with frequent serious injuries and mortalities incidental to commercial fishing.
- Category II designates fisheries with occasional serious injuries and mortalities.

- Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities.

Annually, NMFS's Office of Protected Resources publishes an updated List of Fisheries with these categorizations. NMFS published the final 2016 List of Fisheries on April 8, 2016 (81 FR 20550). The WA/OR/CA sablefish pot fishery is a Category II fishery; all other groundfish fisheries are Category III.

Potential Biological Removal (PBR) is used to assess the effects of human-caused incidental mortality under the MMPA. PBR represents the maximum level of human-caused mortality a stock can sustain and still have a high likelihood of achieving its optimum sustainable population level. PBR is reported in stock assessment reports, and the most recent estimates of PBR can be found in Carretta et al. 2016. The current stock definitions and stock status are summarized in Table 3. Observed interactions reported in Jannot et al. 2016 break down by fishery sector/gear type as follows:

- Stellar sea lion: At-sea hake, bottom trawl, hook and line, shoreside hake, California halibut trawl, non-nearshore sablefish,
- California sea lion: Shoreside groundfish trawl, California halibut trawl, non-nearshore fixed gear sablefish, nearshore fixed gear, at-sea hake.
- Harbor seal: California halibut trawl, non-nearshore fixed gear sablefish, nearshore fixed gear, at-sea hake.
- Northern elephant seal: Shoreside groundfish trawl, California halibut trawl, non-nearshore fixed gear sablefish, at-sea hake.
- Harbor porpoise: California halibut trawl, shoreside bottom trawl.
- Dall's porpoise: At-sea hake, shoreside groundfish trawl,
- Pacific white-sided dolphin: Shoreside groundfish trawl, at-sea hake.
- Risso's dolphin: Shoreside groundfish trawl.
- Common bottlenose dolphin: Non-nearshore fixed gear.
- Sperm whale: shoreside hook and line, non-nearshore fixed gear.

Animals may interact with the gear or the vessel in a variety of ways. Interactions are a function of gear type and co-occurrence of fisheries and species. Marine mammals may be hooked externally by hook gear, in the mouth region, or ingest the hook (Anderson et al. 2008). They can also become entangled in the gear. In trawl fisheries the animal is more likely to be caught by the gear and become injured or drown. Large cetaceans are less likely to incur serious injury from hooks, but gear entanglement can lead to serious injury in a variety of ways.

Large cetaceans have not been observed directly interacting with the gear in groundfish trawl fisheries. However, a 1997 paper (Fertl and Leatherwood 1997) reviewed global data and found that interactions do occur. These interactions are result of overlap between areas of high prey density for cetaceans and productive fishing areas. Furthermore, cetaceans may be attracted to trawls if fishing operations enhance prey opportunity or because of discards. Most of the interactions documented in this paper are between fishing vessels and various species of dolphins, like those listed above. Minke, humpback, and fin whales are the large cetaceans documented in the 1997 paper. Cetaceans are more often caught in midwater gear compared to bottom trawl gear, because this gear type more often targets pelagic species of interested to cetaceans, are towed at high speeds, and are large.

Saez et al. 2013 report results of a fishery large-cetacean co-occurrence model for the West Coast EEZ. The large cetaceans evaluated are blue whales, fin whales, humpback whales, and sperm whales, all listed on the ESA. The gray whales that are most abundant along the US west coast are not listed under the ESA. The endangered Western North Pacific gray whales have been documented along the US west coast, but in much smaller numbers than the Eastern North Pacific gray whales. The gray whale migration is generally very near shore, crossing through a variety of anthropogenic threats, including fixed-gear fisheries. Sablefish longline and trap occur farther offshore than migrating gray whales and subsequently post generally lower entanglement risk. However, they are considered high-risk fisheries considering all whale species, especially in central and northern California.

The 2015-2016 harvest specifications FEIS analyzed the mortality of non-ESA listed marine mammal stocks occurring in the fishery management area caused by the groundfish fishery and concluded that the operation of the fishery would not prevent these stocks from reaching their optimum sustainable population level.

4.6 Human Communities/Social-Economic Environment

This EA incorporates by reference the Amendment 20 EIS and 2019-2020 harvest specifications and management measures EA. Information on the social-economic environment is summarized below; refer to the EIS for more detailed information on the social-economic environment.

4.6.1 Description of the Fisheries

This EA considers the proposed action and alternatives and evaluates the effect they may have on people's income, employment, way of life, traditions, and community. These economic and social impacts may be driven by changes in fishery flexibility, opportunity, stability, certainty, safety, and/or other factors. While it is possible that such impacts could be solely experienced by individual fishery participants, it is more likely that impacts would be experienced across communities, gear types, and/or vessel size classes.

The remainder of this section reviews the Pacific Coast Groundfish fishery and describes the human communities potentially impacted by the Proposed Action. This includes a brief description of the fishery participants as well as their homeports. The information contained in this section provides background information and highlights some of the current industry trends. For more detailed information about the groundfish fishery see Section 3.2 in the harvest specifications and management measures for the 2015-2016 Pacific Coast Groundfish Fishery FEIS (Council 2015a), which describes commercial fisheries targeting groundfish. Associated with that description are tables summarizing landings and ex-vessel revenues in the groundfish fisheries, landings, and revenue by port, as well as indicators of fishery participation. The FEIS, associated tables, and data developed by Council staff using Pacific Fisheries Information Network (PacFIN) and North Pacific Database Program (NorPac) data are sources of information for this section. The document also provides information on tribal and recreational groundfish fisheries and fishing communities.

In January 2011, NMFS implemented a trawl rationalization program, which is a catch share program, for the Pacific coast groundfish limited entry trawl fishery. The program was implemented through Amendments 20 and 21 to the Pacific Coast FMP and the corresponding implementing regulations at 50 CFR part 660. Amendment 20 established the trawl rationalization program that consists of: an IFQ program for the shorebased trawl fleet (including whiting and nonwhiting sectors), and cooperative programs for the at-sea mothership and catcher/processor trawl fleets (whiting only). Amendment 21 set long-term allocations for the limited entry trawl sectors of certain groundfish species. In the shorebased fishery, a vessel with a limited entry trawl permit may use any legal groundfish gear to catch groundfish species. Some vessels use midwater trawl gear to target whiting, others use bottom trawl gear to target a mix of species, and some vessels use fixed gear (pots and longlines) to target sablefish. Catcher vessels using midwater trawl gear to target whiting in the shorebased and mothership sectors as well as fixed gear vessels targeting sablefish in the shorebased sector are the subject of this action. The catch share program also established licenses for processors receiving landings of IFQ species, called “first receivers” as the first point of receipt for IFQ landings.

The Proposed Action potentially affects a number of participants in the Pacific whiting and IFQ fixed gear fishery, directly or indirectly. Participants in these fisheries include the following:

- Harvesters – Vessel owners, captains, and crew that harvest and land groundfish.
- Permit Holders – The owner of a vessel and holder of a limited entry permit may not always be the same entity. Permit holders may be affected by this action indirectly through impacts to harvesters who may lease or buy their permits. Permit holders in the groundfish fishery are also called quota share holders.
- First Receivers (Processors) and Motherships – First receivers/processors are the businesses that purchase and process groundfish landed by harvesters and may be indirectly affected by the proposed action through impacts to the harvesters that deliver fish to them. Mothership vessels receive landings and process catch from catcher vessels while at sea.
- Communities – Fishing communities include the home ports of harvesters and ports in which the harvesters deliver. Fishing communities may be impacted indirectly by this action through the economic and social well-being of harvesters. Fishing communities also include secondary and tertiary businesses that may be involved in the supply chain, such as ice, transport, distribution, and other facilities and services.
- Monitoring Providers – Monitoring service providers include companies that provide monitoring services to the fishery at-sea or shoreside, which may include individual observers and catch monitors and the companies that employ them, as well as the companies deploying EM systems.

Tables 5-8 provides summaries of recent groundfish vessel participation, landings and revenue.

Table 5: Summary of whiting and fixed gear groundfish participation.

	2018
Number of trawl permits ¹	178
Number of permits with an MS/CV endorsement ¹	34
Number of shorebased whiting catcher vessels ²	26
Number of mothership vessels ¹	6
Number of trawl-permitted vessels using fixed gear ³	11
Number of licensed first receivers ¹	42

¹ From Pacific Coast Fisheries Permit System

² From Vessel Account System, the number of vessels with greater than 100,000 lbs whiting landed.

³ From Vessel Account System, the number of vessels with greater than 10,000 lbs sablefish landed.

Table 6: Shoreside Whiting: Landings of Pacific Whiting (mt) and Associated Revenue in 1000s of 2018 dollars (Source: PacFIN)

Year	Metric tons	Revenue (1000s of 2018 \$)
2011	90,352.96	\$24,416.53
2012	65,278.71	\$22,276.54
2013	96,856.15	\$28,428.91
2014	97,964.19	\$25,034.81
2015	57,900.66	\$10,187.58
2016	85,381.29	\$13,564.52
2017	144,124.5	\$24,211.34
2018	129,179.9	\$20,674.31

Table 7: Shorebased IFQ Fixed Gear: Landings of Sablefish and all other groundfish (mt) and associated revenue in 1000s of 2018 dollars(Source: PacFIN)

Year	Sablefish		Other Groundfish	
	Landings (rd. wt. mt)	Revenue (1000s of 2018 \$)	Landings (rd. wt. mt)	Revenue (1000s of 2018 \$)
2011	1,114.15	\$8,382.22	38.98	\$188.20
2012	935.22	\$5,469.89	48.59	\$95.76
2013	518.28	\$2,793.10	70.35	\$154.89
2014	760.05	\$4,686.98	38.73	\$93.84
2015	852.99	\$5,463.58	29.50	\$48.20
2016	995.17	\$6,652.68	58.69	\$112.77
2017	949.61	\$6,353.69	36.98	\$45.36
2018	838.57	\$4,139.71	22.56	\$41.73

Table 8: Mothership Sector: Retained Weight of Pacific Whiting (mt) (Source: NPAC)

Year	Retained Weight (mt)
2011	49,872.21
2012	38,325.91
2013	52,299.07
2014	61,853.99
2015	27,545.08
2016	64,614.68
2017	65,527.35
2018	65,971.97

5.0 IMPACTS OF THE ALTERNATIVES

5.1 Impact Assessment

Section 5.1 reviews the alternatives that are the subject of this evaluation, establishes criteria for evaluating the impact of each alternative on the VECs identified in Section 4.1, and discusses impacts. This section identifies impacts associated with the EM program requirements for the Pacific whiting fishery and fixed gear vessels, as well as the No Action Alternative. This document does not analyze the effects of requiring 100-percent at-sea monitoring or no monitoring, or other requirements of the Trawl Program, as those measures were analyzed in Amendment 20. The conclusions of those previous analyses may be viewed in the Amendment 20 and 21 FEISs, available on the Council’s website, and are not re-analyzed in this document.

This document focuses on determining whether the proposed action and alternatives would be expected to change the impacts of the current fishery on the biological and human environments.

5.1.1 Evaluation Criteria

This EA evaluates the potential impacts using the criteria outlined in Table 9. Impacts from all alternatives are judged relative to the baseline conditions, as described in Section 4.0, and compared to each other. None of the alternatives assessed in this action were found to have significant impacts under NEPA.

Table 9: Impact definitions and qualifiers.

Impact Definition			
VEC	Direction		
	Positive (+) (Insignificant)	Negative (-) (Insignificant)	Negligible (Negl) (Insignificant)
Allocated target species, other landed species, and protected resources	Actions that increase stock/population size	Actions that decrease stock/population size	Actions that have little or no positive or negative impacts to stocks/populations
Physical Environment/Habitat/EFH	Actions that improve the quality or reduce disturbance of habitat	Actions that degrade the quality or increase disturbance of habitat	Actions that have no positive or negative impact on habitat quality
Human Communities	Actions that increase revenue and social well-being of fishermen and/or associated businesses	Actions that decrease revenue and social well-being of fishermen and/or associated businesses	Actions that have no positive or negative impact on revenue and social well-being of fishermen and/or associated businesses
Impact Qualifiers:			
Low (L, as in low positive or low negative)	To a lesser degree, not significant		
High (H; as in high positive or high negative)	To a substantial degree, not significant		
Likely	Some degree of uncertainty associated with the impact		
Negative Negligible Positive			

5.1.2 Impacts to the Physical and Biological Environments

5.1.2.1 Impacts of Alternative 1: No Action Alternative

Under this alternative, groundfish monitoring requirements would remain as defined in Amendment 20 and subsequent rulemakings. Catcher vessels in the Pacific whiting fishery and fixed gear vessels in the Shorebased IFQ fishery would be required to obtain 100 percent observer coverage for all trips. Vessels would continue to use observers to satisfy the 100 percent observer coverage requirement and would not be able to use electronic monitoring as an alternative to observers. Vessels sorting at sea would be able to discard IFQ and non-IFQ species provided it has been documented by an observer. Catch share observers would continue to collect a suite of information on target and non-target species and protected resources on 100 percent of trips, including weight by species, length frequencies, tissue samples, gear and effort information, fishing location, and protected species interaction information. This information would continue to be used to estimate mortality and bycatch estimates and to manage target and non-target species and protected resources.

Impacts to the physical environment/EFH/habitat from fishery management actions generally result from a change to the location of fishing (i.e., to more or less sensitive habitats) or the amount of effort (i.e., amount of time gear is in contact with the seafloor). The no action alternative would not be expected to result in any increased effort, or change to the time or location of fishing, or gear types used, as a result of vessels continuing to use observers. Fishing by Pacific whiting vessels and fixed gear vessels would be expected to continue along trends being observed and catch of target species would continue to be capped by IFQs, cooperative allocations, and ACLs. Non-target species catch would continue to be limited by management measures for those species, specifically cumulative limits and ACLs. Take of protected resources would be limited by ITSs for those species. Vessels would continue to be required to comply with gear modifications and other requirements of ITSs and the groundfish FMP. Therefore, the No Action Alternative would be expected to have negligible insignificant impacts to the biological environment, including the physical environment, target and non-target species, and protected resources, relative to the baseline conditions.

5.1.2.2 Impacts of Alternative 2: Electronic Monitoring (Council Preferred)

Under this alternative, catcher vessels in the Pacific whiting fishery and fixed gear vessels in the Shorebased IFQ fishery would have the option to use electronic monitoring in place of observers to meet the requirements of Amendment 20 for 100 percent at-sea observer coverage. Vessel owners authorized to use EM would be required to obtain, install, and maintain an EM system from an approved service provider, as well as services to review the video data to generate discard estimates and to submit reports to NMFS. Vessel operators would also be required to fill out a logbook to document and report discards to NMFS. NMFS would maintain some level of observer coverage through the WCGOP on EM trips for biological sampling and other purposes.

Impacts from Changes to Fishing Location, Time, or Gear

This action would not change gear or area restrictions or catch limits and, therefore, would not be expected to change the location or amount of fishing effort. Existing gear and area restrictions would remain in place and overall effort would be limited by IFQs, cooperative allocations, and ACLs. Theoretically, some bottom trawl vessels could be incentivized to switch to midwater trawl or fixed gear to use EM, which would have less impacts to habitat. However, this is highly unlikely as bottom trawl vessels target different species from midwater trawl and fixed gear vessels and switching gear types would require a different IFQ portfolio, business model, and costly changes to the vessel and gear. In addition, the Council is already developing an EM program for bottom trawl vessels to be implemented through a future action. Therefore, impacts from Alternative 2 to the physical environment/EFH/habitat would be expected to be negligible and insignificant relative to the No Action Alternative and the baseline conditions.

Changes to the time and area of fishing and the gear types used can also impact target and non-target species and protected resources. For example, if vessels began fishing in areas or at times where overfished species or protected resources are more prevalent, it could increase bycatch of these species. However, because this action would not change gear or area restrictions or area-specific catch limits, whiting and fixed gear vessels would be expected to continue to fish under Alternative 2 as they would under the status quo and impacts would not be significant, relative to the No Action Alternative and baseline conditions. Similarly, Sub-Options A-G would not be expected to change the way whiting and fixed gear vessels fish under Alternative 2, relative to the No Action Alternative.

Impacts from Changes to Retention Requirements

Target and non-target species and protected resources could also see impacts from increased mortality as a result of maximized retention requirements. Sub-Option C1 would require all vessels to retain most catch until landing, with a few exceptions, which could increase mortality of fish that would otherwise have been discarded. Whiting vessels already practice maximized retention under the status quo regulations, however, so Sub-Option C1 would not be expected to increase mortality of target or non-target species on Pacific whiting trips relative to the No Action Alternative. The Council's preferred alternative for fixed gear vessels is Sub-Option C2, which would allow fixed gear vessels to discard species that can be differentiated on camera. Because this list may be modified over time, it would be appropriate to consider the range of retention possibilities and potential impacts to target and non-target species caught on fixed gear trips. The worst-case scenario in terms of mortality would be if fixed gear vessels were required to retain most catch until landing, similar to whiting trips and Sub-Option C1. Fixed gear is relatively selective and catches little non-target and protected species. Those fish that are bycaught would continue to be accounted for under IFQs and ACLs, which would limit fishing mortality overall. And in most cases, discard mortality is already assumed to be 100 percent, unless the best available scientific information indicates that discard mortality is less than 100 percent and a lower discard mortality rate may be used (i.e., for Pacific halibut). Thus, neither Sub-Option C1 nor C2 would be expected to increase mortality of target or non-target species above mortality limits. Sub-Options A-B and D-G would not affect retention requirements and

therefore would not be expected to change the effects of Alternative 2 relative to the No Action Alternative or baseline conditions. The impacts are considered insignificant.

Impacts from Changes to Data Collection Methods

This action could also have indirect impacts to target and non-target species and protected resources through changes to the quantity and quality of information collected by the monitoring program, which could impact management of those species. Currently, observers collect a suite of information on 100 percent of whiting and fixed gear trips, including estimates of weight of all species, length frequencies, tissue samples, otoliths, catch disposition, and gear and effort information (see the Catch Share Observer Manual for a full description of data collection duties and protocols:

https://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_collection/manuals/2018%20WCGOP%20Training%20Manual%20Final3.pdf). Under Alternative 2, EM would collect some of this information on all EM trips and WCGOP observers would continue to collect the full suite of information on some trips, but it would not be the near-census collected under the No Action Alternative. In addition, methods to estimate the weight of discards are different under an EM program from an observer program, which could affect data quality of catch estimates. The potential impacts of these changes from Alternative 2 on target species, non-target species, and protected resources are discussed below.

In the whiting fishery, the large majority of catch is whiting (99 percent on average from 2010-2014) and is retained and delivered to a plant or mothership (more than 99 percent on average from 2010-2014) (see the Groundfish Mortality Reports for the latest catch information: https://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_products/species_management.cfm). For this reason the majority of information collected about catch and bycatch in the whiting fishery is collected at the dock through first receivers, catch monitors, and port samplers, and on the mothership through the mothership observers, and would not be affected by this action. This includes information collected about bycatch of eulachon and Chinook salmon in the whiting fishery, which are not sorted at sea and therefore typically retained for sampling at the plant or on the mothership. However, for catch that is discarded, Alternative 2 could change the amount of information available about these discards, as discussed in further detail below.

Under the status quo, observers generally subsample catch to be discarded in order to extrapolate a species composition for discards from each haul. This method provides observed species composition and catch rates at the haul level, which is useful for understanding the location of bycatch hotspots and developing fine-scale management measures. This method also provides biological samples, length frequencies, and other information about target, non-target, and protected species at the haul level. In the EM EFP Program, video reviewers estimate the total weight of discards visually using frames of reference, such as deck dimensions or codend capacity. A species composition is then extrapolated from the fish ticket or mothership observer data and applied to the weight estimate to determine discarded weight by species to be debited from IFQ accounts. The EM EFP Program generally does not estimate discards of non-IFQ species, because that is not the objective of the program, but video reviewers do collect counts of protected species discards where possible, which would typically consist of large items like sturgeon and marine mammals that would be sorted and discarded by the crew. These species

are identifiable on camera and rarely caught in the whiting fishery. For larger discard events, such as spillage from a catcher vessel tying off a codend to transfer to the mothership, venting of catch from an overfull codend, or loss of an entire codend, observers and video reviewers use similar methods to account for the discards in the water by making a visual estimate of the amount of discards.

On mothership trips, the EM methods would still provide haul-specific species composition rates, albeit based on the retained catch sampled by the mothership observer. However, on shorebased trips, the EM methods would result in trip-level species compositions and catch rates and would represent a loss of haul-specific information. EM also does not collect biological samples and other such information from discards. Given the high selectivity and low proportion of discards on whiting trips, this shift in data collection methods is not likely to substantively change NMFS's ability to ensure quotas are not exceeded and to manage bycatch of non-target and protected resources. Discards of IFQ species would continue to be counted against IFQs and cooperative allocations, and the WCGOP would continue to develop estimates of mortality of non-IFQ species for use in management and stock assessments. For larger discard events observers and video reviewers use similar methods to account for the discards in the water, so Alternative 2 and the No Action Alternative would likely result in similar quality information about such events. A 2013 PSMFC study compared discard estimates by observers and EM on the same trips and found that observers captured some discard events that EM did and others that EM did not, and vice versa. Results also showed that EM tended to report higher amounts of discards from in-the-water events (twice as much in 2012, and three times as much in 2013), likely because the cameras installed on gantries high above the deck have a better view of the codend than the observer (PSMFC, 2013).² These results suggest that discard estimates based on EM would not be likely to result in underestimates of fishing mortality. In addition, NMFS would maintain the ability to deploy WCGOP observers on whiting catcher vessels should it be determined that additional data collection is needed.

On fixed gear trips, video reviewers use more precise methods for estimating the weight of discards of IFQ species. Methods used include taking length measurements and using a length-weight relationship to estimate weight, making volumetric estimates from containers of a known volume, and extrapolating an average weight using a piece count. If most IFQ species are retained, Alternative 2 would likely have little impact on data quality for catch accounting because most catch would be weighed at the dock. However, because the list of allowable discards can change, for the purpose of this analysis it is assumed that fixed gear vessels would be able to discard all species (Sub-Option C2) and that NMFS would have to rely on EM to account for discards of all IFQ species.

The results of the 2015-2017 EFPs can provide some indication of the quality of data that would be produced by an EM program under Alternative 2. Table 10 shows the estimated pounds discarded by species reported by the observer and EM for trips carrying both in the 2015-2017 EFPs. The results show overall close alignment between observer and EM estimates on fixed

² A 2012 PSMFC study also compared discard estimates between observers and EM, but observers and EM used different methods to account for discards in 2012. These methods were standardized in 2013, resulting in a more valid comparison of EM and observer estimates (PSMFC, 2013).

gear trips, suggesting that data quality of IFQ discard estimates would not be reduced under Alternative 2 relative to the No Action Alternative or baseline conditions.

Table 10: Comparison of 2015-2017 EM and observer estimates for fixed gear vessels

Year	Species	EM Discard Estimate (lbs)	Observer Discard Estimate (lbs)	
2015	Dover Sole	14	15	
	Arrowtooth Flounder	62	66	
	Lingcod	63	55	
	Pacific Hake	0	7	
	Pacific Halibut	327	370	
	Redbanded Rockfish	5	1	
	Rosethorn Rockfish	0	1	
	Darkblotched Rockfish	2	0	
	Blackgill Rockfish	2	9	
	Shortraker Rockfish	5	0	
	Aurora Rockfish	0	3	
	Red Rockfish	1	0	
	Aurora/Splitnose Rockfish	1	0	
	Sablefish	2550	2297	
	Shortspine/ Longspine Thornyhead	2	0	
	Shortspine Thornyhead	66	62	
	Unknown	6	0	
	2016	Dover Sole	14	21
		Arrowtooth Flounder	33	25
		Lingcod	52	37
Pacific Hake		4	0	
Pacific Halibut		103	130	
Rougheye Rockfish		0	5	
Blackgill Rockfish		3	2	
Sablefish		4390	4949	
Shortspine/ Longspine Thornyhead		15	0	
Shortspine Thornyhead		98	108	
2017	Longspine Thornyhead	1	6	
	Unknown	3	0	
	Dover Sole	4	9	
	Petrale Sole	0	4	
	Arrowtooth Flounder	31	67	
Lingcod	33	81		
Pacific Hake	0	0		

	Pacific Halibut	136	145
	Blackgill Rockfish	0	2
	Sablefish	5578	6908
	Shortspine/ Longspine Thornyhead	9	0
	Shortspine Thornyhead	50	80
	Longspine Thornyhead	0	7
	Unknown	0	0

Based on observer and EM data available as of December 11, 2017.

The EM program relies on proper catch handling to enable video reviewers to see the fate of each fish and estimate a weight for discards. There were some instances where discarded fish could not be identified to species, in which case video reviewers record the fish at a group level rather than species level (Table 11). These are generally small amounts relative to the total discards (Table 11). This also explains some discrepancies between EM and observer data, where the observer will record the discard to species and the reviewer will record it at a group level. A difference in method of estimating weight can also lead to discrepancies between EM and observer data; observers take actual or subsample weights whereas video reviewers must use visual methods of estimation. There were also some instances where fish were removed from camera view and the video reviewer could not determine whether they were retained or discarded (Table 12). NMFS provides feedback to vessel captains after each hard drive review to adjust their catch handling, so the number of such incidents would be expected to decline over time.

Table 11: Summary of unidentified fish from EM on all fixed gear trips 2015-2017.

Species Group	2015			2016			2017		
	Amount UnID (lb)	Total Discards (lb)	% of Total Discards	Amount UnID (lb)	Total Discards (lb)	% of Total Discards	Amount UnID (lb)	Total Discards (lb)	% of Total Discards
Flatfish	5	196	3%	0	128	0%	10	876	1%
Rockfish	4	45	9%	5	8	63%	9	119	8%
Roundfish	0	19,749	0%	4	17,030	0.02%	6	17205	0.03%
Thornyheads	7	202	3%	49	385	13%	40	374	11%
Unid	22	na		4	na		1	na	

Based on EM data available as of December 11, 2017.

Table 12: Summary of instances of fish removed from camera view from all trips in 2015-2017

	2015		2016		2017	
	# Events	# Trips	# Events	# Trips	# Events	# Trips
FixedGear	23	9	3	3	14	4
MSCV	1	1	0	0	1	1
ShoresideHake	0	0	2	2	6	4

Based on observer and EM data available as of December 11, 2017.

Uncertainty in discard estimates can also arise from data gaps resulting from system malfunctions, non-compliance, or other issues. In 2015-2017, approximately 5%, 3%, and 4% of trips had gaps in video imagery (Table 13). The majority of these were small interruptions of a few minutes caused by short power interruptions and generally did not disrupt monitoring of catch sorting. A total of 4 trips each year (less than 0.01 percent of all trips) were missing video imagery from a complete haul and 1, 4, and 7 trips, respectively, had no imagery at all. The 2016 and 2017 lost trips resulted from single corrupt hard drives with multiple trips on them.

Table 13: Summary of gaps in video footage in 2015-2017

Year	Fishery	Total Vessels	Total Trips	Trips with Gaps	Trips with Missing Haul	Missing Trip
2015	BottomTrawl	6	24	6	0	0
	FixedGear	7	58	8	0	1
	ShoresideHake	17	483	15	3	0
	MSCV	10	na	1	1	0
2016	BottomTrawl	9	109	14	0	0
	FixedGear	6	70	4	0	0
	MidwaterRockfishTarget	6	33	0	0	0
	ShoresideHake	20	651	4	3	4
	MSCV	na	na	1	1	0
2017	BottomTrawl	11	159	15	0	0
	FixedGear	9	81	4	1	0
	MidwaterRockfishTarget	9	43	0	0	0
	ShoresideHake	22	1103	30	3	7
	MSCV	14	na	1	0	0

Data from EM trips through December 11, 2017.

Although this action only considers EM for whiting and fixed gear vessels, data is shown for all gear types to present a complete picture of the performance of the EM units.

Video gaps could affect NMFS’s ability to account for discards, particularly if it occurred during a “lightning-strike”, a rare bycatch event of a large volume of an overfished species. Although data gaps are rare, lightning strikes are also rare, so, although unlikely, if they coincided as a

result of a system malfunction or an attempt to hide the bycatch event, NMFS may not be able to detect and account for the lightning strike if it was not otherwise reported. In the 2015-2016 EFPs two lightning strike events occurred, the first since implementation of the IFQ program, and both vessels were using EM without an observer onboard. Both events were reported by the captains in their logbooks, recorded by the cameras, and delivered to a plant/mothership for accounting. In the first instance, the catch event exceeded the vessel's IFQ for the species and required the vessel to forfeit the catch, face a potential violation for the overage, and exit the fishery for the remainder of 2015 and all of 2016. These two incidents presented a strong economic incentive to attempt to hide the bycatch event in order to avoid the high costs of reporting it. However, the captains did not attempt to hide the bycatch events. This suggests that the regulations and monitoring and enforcement programs in the fishery provide sufficient protections and counter-incentives to discourage misreporting of catch. As such bycatch events are rare, and misreporting of them even rarer, it appears that data gaps would not be likely to substantially affect NMFS's ability to hold vessels accountable for discards of IFQ species in the EM program.

In addition, according to WCGOP data, fixed gear is relatively selective with an average of 93 percent of catch on pot trips and 50 percent of catch on hook and line trips from 2010-2014 being composed of sablefish (see the Groundfish Mortality Reports for the latest catch information: https://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_products/species_management.cfm). This means that the information used to account for the majority of IFQ catch under Alternative 2 would continue to come from dockside data sources, which are validated with 100 percent shoreside catch monitor coverage. Therefore, Alternative 2 would not be expected to reduce the quality of catch accounting data for IFQ species from fixed gear trips relative to the No Action Alternative and baseline conditions.

EM would not collect much information on catch and bycatch of non-target species and protected resources. Video reviewers would not collect counts or weight estimates of non-target species, but would collect counts of discards of protected species where possible. This would likely be of large animals that can be identified on camera, such as marine mammals, turtles, seabirds, and sturgeon. Fixed gear has been known to interact with large whales and short-tailed albatross. Large whale interactions typically occur when the whale becomes entangled in the buoy or lead line. EM may be able to capture some of these events, depending on the configuration of the cameras, but would likely miss most events because the animals are not brought on the vessel and into camera view. In addition, EM would likely miss opportunistic data collection of protected species encounters where an observer would record seeing an animal around the vessel or in the general area. Under Alternative 2, fixed gear vessels would be required to comply with seabird mitigation measures implemented by NMFS on December 18, 2015 (80 FR 71975), including the use of streamer lines and retention of short-tailed albatross carcasses for collection by FWS. NMFS would also require fixed gear vessels to retain any salmon caught to ensure accurate accounting of all listed salmonids at the dock, although fixed gear vessels have little documented bycatch of salmon. NMFS would also maintain some level of observer coverage on EM trips to continue to collect information on protected species interactions. Therefore, Alternative 2 may reduce the amount of information collected on large whale interactions on fixed gear trips, but this is not expected to have a significant adverse

impact. Alternative 2 would likely not reduce the amount of information collected on short-tailed albatross and listed salmonid interactions.

EM also would not be able to collect disposition information (e.g., injured, dead, alive), otoliths, tissue samples, and other biological information for discarded target, non-target, and protected species on fixed gear trips. Therefore, the amount of biological information available from discards on fixed gear trips would be reduced relative to the No Action Alternative and baseline conditions. To address the loss of this type of information from EM trips, NMFS would maintain some level of WCGOP observer coverage on EM trips to continue collection of the full suite of observer information.

The WCGOP is one of several components of the groundfish fishery's standardized bycatch reporting methodology program. Amendment 18 established a standardized total reporting methodology for the Pacific Coast Groundfish FMP, which encompasses reporting of the amount and type of bycatch occurring in the fishery, as required by the MSA, as well as total catch (landed catch plus bycatch mortality) in the fishery. This total catch reporting methodology uses various state, Federal, and tribal catch monitoring systems, which are coordinated through PSMFC, to estimate sector- and specific-specific total catch for use in management. The program components for commercial fisheries include:

- Observer and EM programs – At-sea observer programs are used to estimate bycatch. Observer coverage rates vary by fishery, with whiting catcher-processors and motherships being required to carry one or two observers depending on the size of the vessel. Other vessels are required to carry observers in accordance with the NMFS observer coverage plan, typically on a subsample of trips. Statistical methods are used to expand observer observations to estimate total catch across a sector. For some fishery sectors, there may not be any direct observation or reporting of bycatch, so standard bycatch rates are developed from the best available scientific information to estimate bycatch.
- Catch reports – Vessel owners and operators are required to submit logbooks to report fishing locations and effort information, and catch of species subject to trip limits and ACLs/OY. Processors are required to complete fish landing tickets from Washington, Oregon, or California, to report landed catch, gear type, fishing area, and other trip information.
- Port sampling – Landings are sampled by state personnel to collect species composition data, otoliths, lengths, and other biological data. Much of the biological data collection for the shorebased whiting fishery comes from port sampling, because this fishery practices maximized retention.
- Quota Species Monitoring (QSM) Database – The Council's Groundfish Management Team (GMT) and PSMFC manage a QSM database that is used to track all landings of target, overfished, and rebuilding species. The GMT uses the QSM to make catch forecasts and adjust landing limits inseason to control fishing mortality.
- Vessel compliance monitoring and reporting – Vessels may be required to comply with a range of reporting requirements to assist managers in monitoring total catch, including declarations, VMS, logbooks, pre-landing notifications, and other information deemed necessary for management.

A complete description of the groundfish total catch reporting methodology is contained in the Pacific Coast Groundfish FMP available on the Council's website: http://www.pcouncil.org/wp-content/uploads/2016/03/GF_FMP_FINAL_Mar2016_Mar282016.pdf.

The NWFSC WCGOP program was established in 2001 by NMFS (66 FR 20609). WCGOP's goal is to improve total catch estimates by collecting information on west coast groundfish species discarded at-sea. Detailed information on data collection methods employed in each observed fishery can be found in the WCGOP and A-SHOP manuals (NWFSC 2017, 2018). Estimates of observer coverage, observed catch, and a summary of observed fishing depths for each sector can be found at:

http://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_products/sector_products.cfm. The level of observer coverage can fluctuate over time depending on program objectives and funding, but levels of observer coverage in the groundfish fishery prior to implementation of the IFQ program may be an indication of likely coverage levels (20-25 percent of landings observed) with the EM program in place. This observer information would continue to be used for purposes of developing estimates of protected species bycatch and target and non-target species mortality, and collecting length, age, and other information for use in stock assessments and management actions. Therefore, based on the above analysis, this change to data collection methods from EM is not expected to result in a significant adverse impact target, non-target, and protected species.

Alternative 2 includes several sub-options for different components of the program. Sub-Options E-G were designed to allow consideration of different program costs and would not be expected to change the impacts of Alternative 2 to the physical and biological environments relative to the current conditions or the No Action Alternative. However, three sets of sub-options, Sub-Options A, B, and D, have the potential to change the effects of Alternative 2 and are discussed further in the following paragraphs.

Sub-Option A1 would use EM data as the primary data source to debit discards from vessel accounts and Sub-Option A2 would use the logbook as the primary data source, but use EM to audit the validity of the logbook data. For the most part, whether EM data is the primary data source or not is not likely to change the impacts of Alternative 2, relative to the No Action Alternative, because the EM discard estimates are the validation source in either case. Any impacts of Alternative 2 would result rather from the methods that would be used to estimate the discards from the video, including protocols for species identification and weight estimation and any sub-sampling methods if less than 100 percent of the video is reviewed (see discussion of Sub-Option B2 below), which would likely be similar under both sub-options. However, Sub-Option A2 would require NMFS to decide when logbook data and EM data should be used for debiting IFQ, which could introduce an additional source of uncertainty. NMFS tested Sub-Option A2 in the 2015 EFPs and presented the results to the Council at their November, 2015 and March, 2016 meetings. As shown in Figures 6 and 7, there is close agreement between logbook and EM discard estimates on the majority of shorebased and mothership trips (discrepancies were less than 1,000 lb on 97 percent and 80 percent of trips, respectively). On shorebased trips, about half the vessels overestimated discards and half the vessels underestimated them. In the mothership fishery, EM estimates tended to be greater, likely because the position of the cameras gives reviewers a clearer view of discards in the water as the

net is being retrieved. There were 7 instances where the discrepancy was greater than 10,000 lb, which accounted for most of the total discrepancy from shorebased trips. There were no instances where the EM data was missing and not able to be used to validate the logbook data. A small amount of variability is to be expected, because both logbook and EM data are estimates, and would be expected to improve over time as captains get more experience estimating discards. The majority of large differences were from nine tows on shorebased whiting trips (see PSMFC preliminary 2015 report for more detail: http://www.pcouncil.org/wp-content/uploads/2015/11/I5a_Sup_NMFS_EM_Rpt2_Nov2015BB.pdf). An updated comparison for all shoreside whiting trips from 2015-2017 shows this trend continued (Figure 8).

Figure 6: Discrepancies between EM and logbook estimates on 2015 shoreside whiting trips

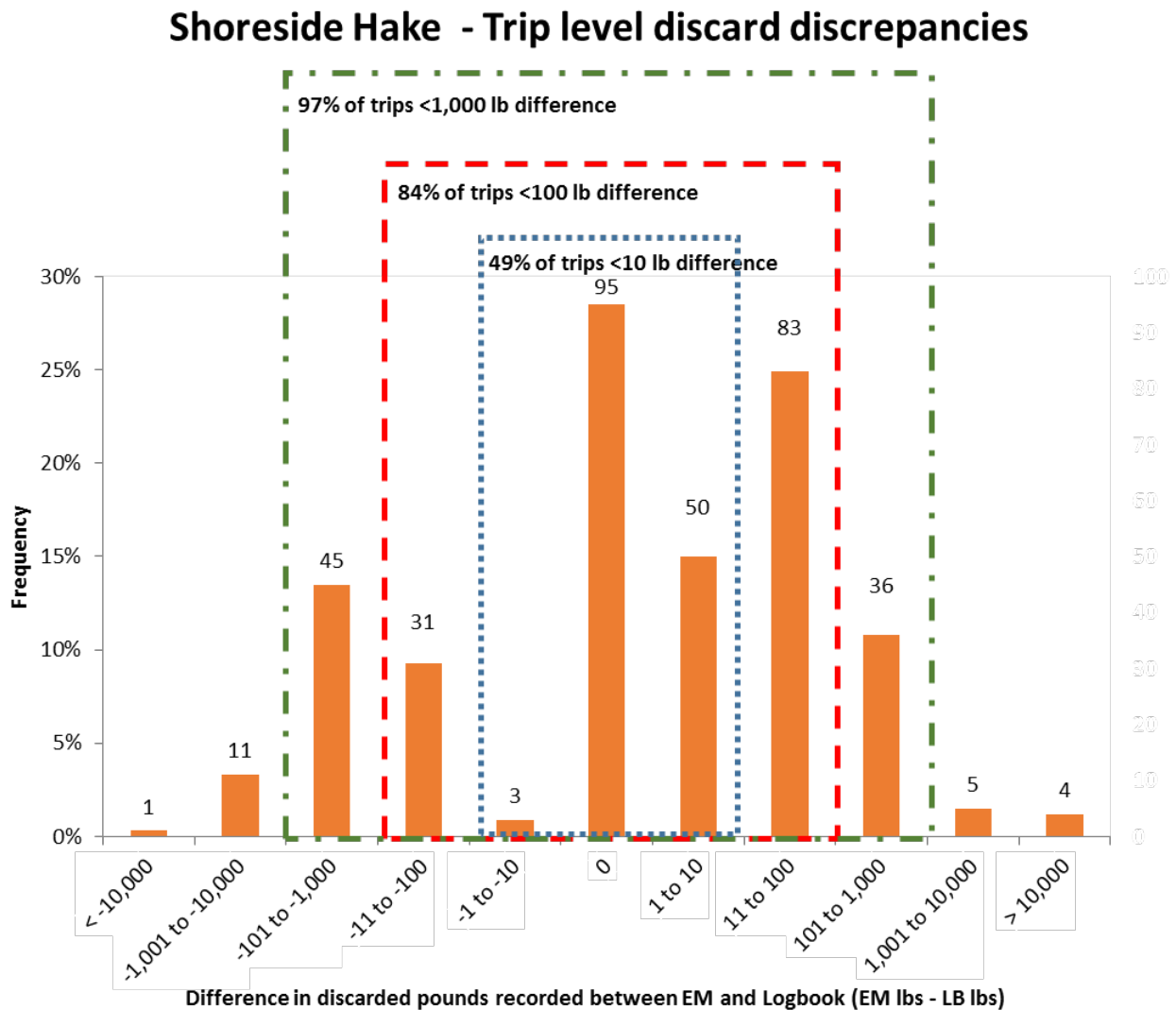


Figure 7: Discrepancies between EM and logbook estimates on 2015 MS/CV trips

Mothership Catcher Vessel - Haul level discard discrepancies

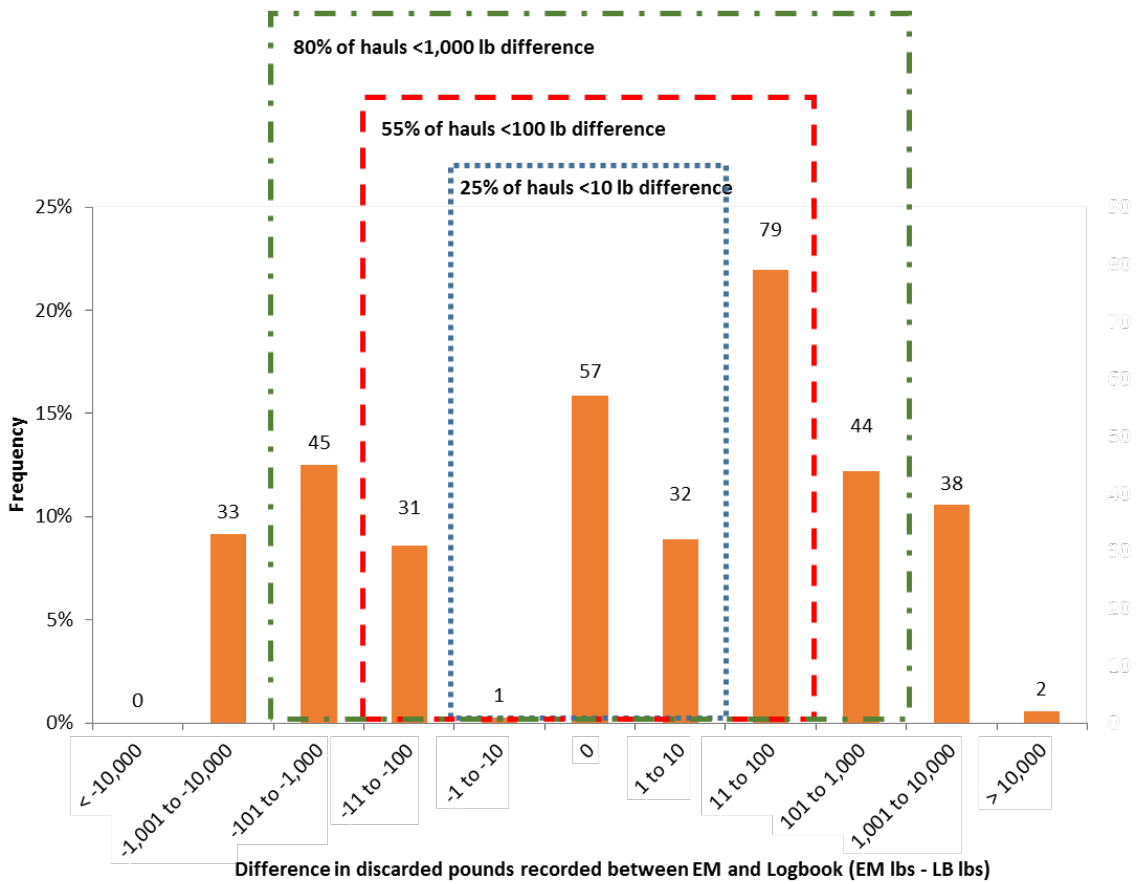
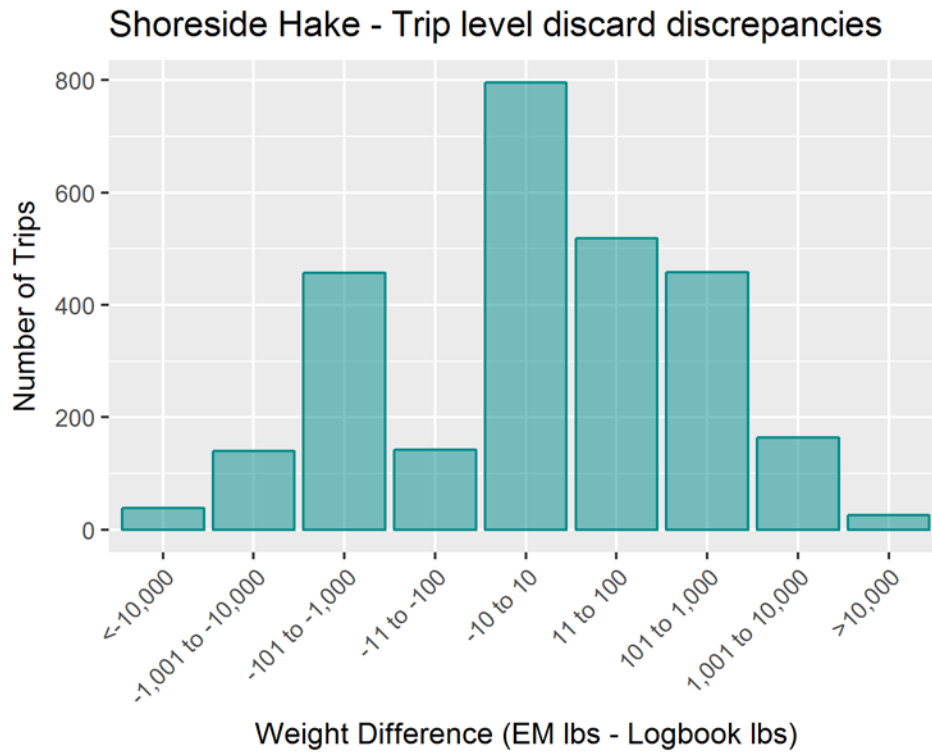


Figure 8: Discrepancies between EM and logbook estimates on 2015-2017 shoreside whiting trips



Fixed gear vessels in the 2015 EFP were fishing under maximized retention rules, meaning all catch was required to be retained with a few exceptions for mutilated and depredated fish, prohibited and protected species, large fish, and invertebrates. As a result, there was a small amount of discard data available for comparison between logbook and EM estimates. Fixed gear vessels switched to an optimized retention protocol in 2016, which allowed discards of all species, except salmon. This resulted in additional discard data for comparison, but sample sizes remain small due to the high selectivity of fixed gear. Figures 9-13 show the relationship between logbook and EM estimates of discards for all fixed gear trips from 2015-2017. The figures show overall close alignment between logbook and EM discard estimates. Figures with more than 10 data points have trend lines, which in some cases appear to show large deviations from the 1:1 line (where the trend line would be if logbook and EM estimates were equal). This is misleading, however, because the small scale of the discards (0-40 lb) exaggerate the discrepancies. This effect dissipates in figures with larger amounts of discards (Figure 12).

Figure 9: Relationship of EM to logbook for rockfish discards on 2015-2017 fixed gear trips

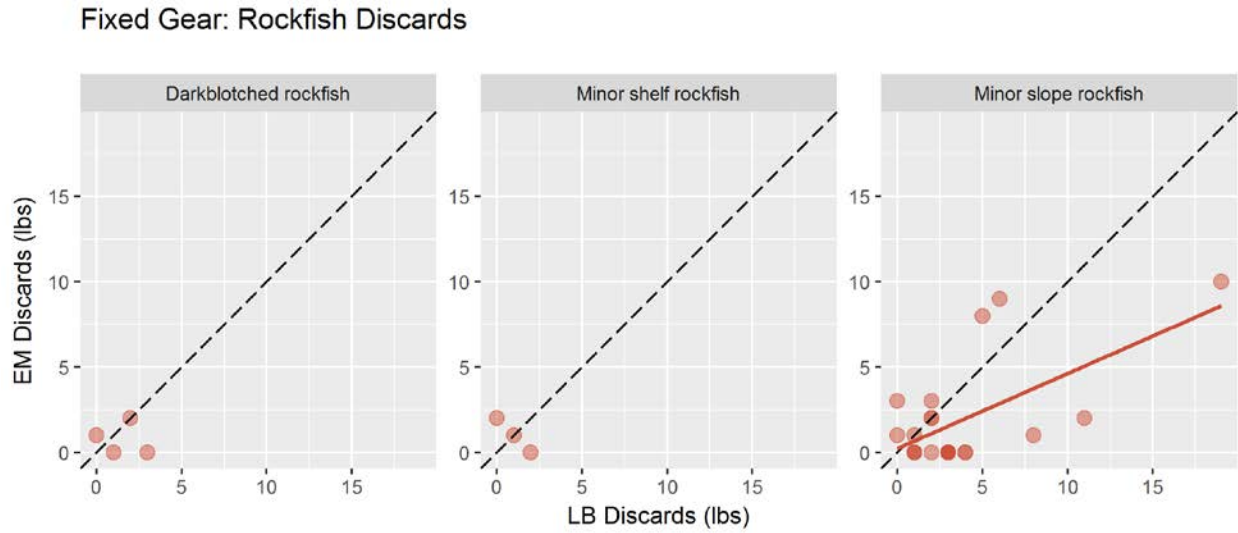


Figure 10: Relationship of EM to logbook for flatfish discards on 2015-2017 fixed gear trips

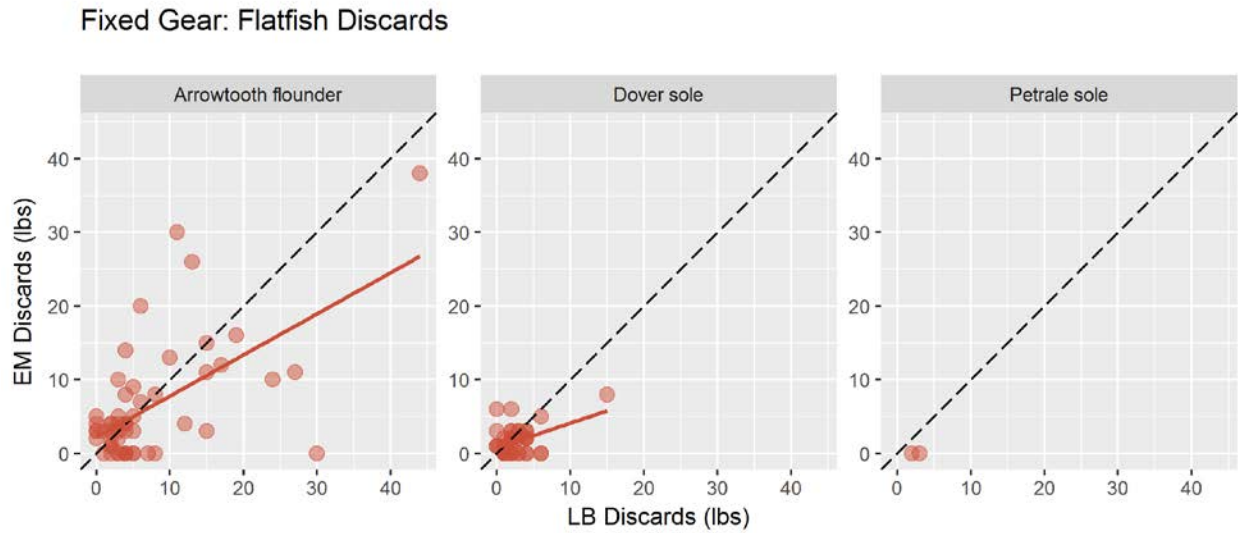


Figure 11: Relationship of EM to logbook for thornyhead discards on 2015-2017 fixed gear trips

Fixed Gear: Thornyhead Discards

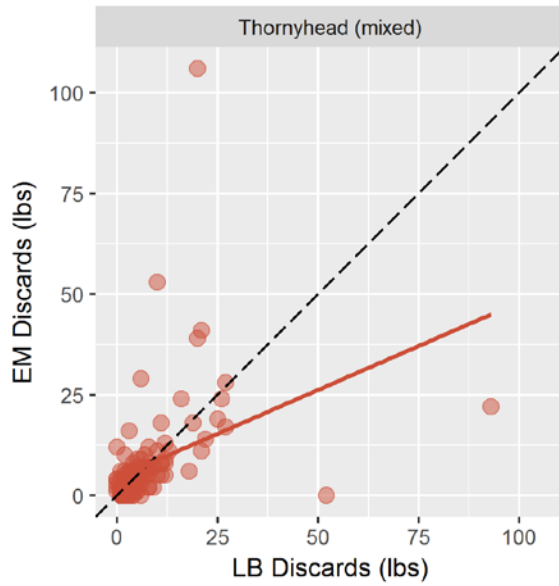


Figure 12: Relationship of EM to logbook for sablefish discards on 2015-2017 fixed gear trips

Fixed Gear: Sablefish Discards

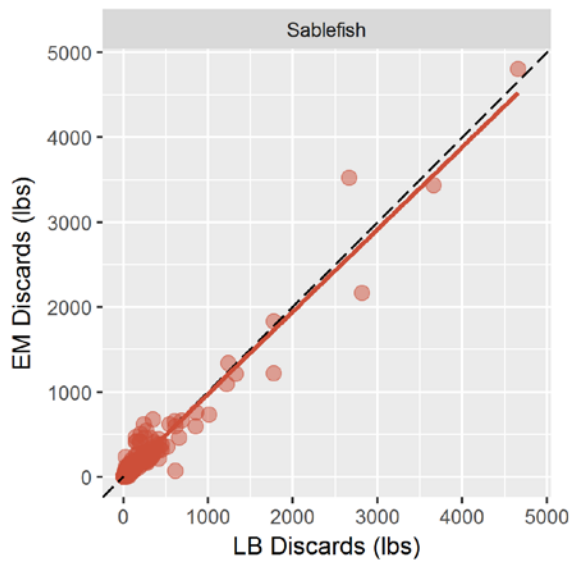
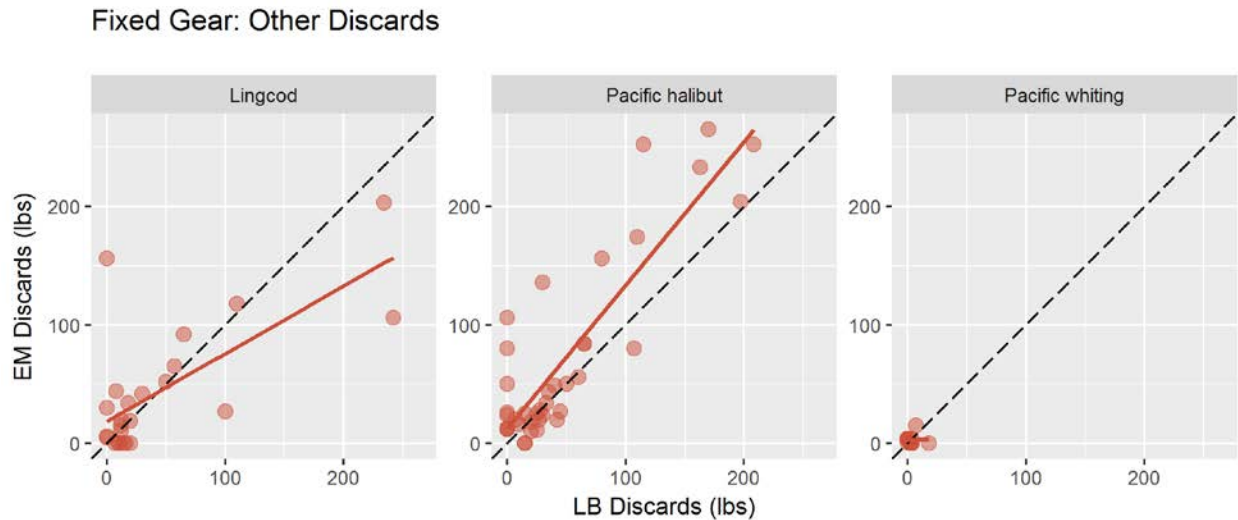


Figure 13: Relationship of EM to logbook for other discards on 2015-2017 fixed gear trips



The close alignment between logbook and EM data on both whiting and fixed gear trips suggests that data quality under Sub-Option A2 would not be substantially different from Sub-Option A1 and neither would result in significant adverse impacts to target and non-target species. Therefore, impacts to these VECs from sub-options A would be expected to be negligible.

Sub-Option B1 would require 100 percent of video to be reviewed and Sub-Option B2 would allow a sub-sample of the video to be reviewed. The level of review would be established by NMFS and must be sufficient for NMFS to determine that the EM program is providing the best available scientific information for catch accounting. Reviewing less than 100 percent of video could increase uncertainty in catch information if rare events or non-compliance are missed in the portion of the video that was not reviewed. However, NMFS would have to assess these trade-offs when determining a sub-sampling method and ensure that the method selected provides sufficient information to meet the program's objectives of individual accountability. Therefore, impacts from Sub-Option B2 would be expected to be negligible relative to Sub-Option B1 and considered insignificant.

Sub-Option D1 would require that all discards be debited from IFQ or cooperative allocations, consistent with the status quo. Two other sub-options were also considered by the Council (D2 and D3) that would have allowed some unintentional and minor amounts of IFQ discards to be debited from cooperative or sector allocations preseason. Sub-Option D1 would provide the greatest incentive for individual vessels to minimize discards of IFQ species in order to maximize the value of their IFQ. Sub-Options D2 and D3, while continuing to account for all catch, would not provide as strong an incentive for the individual vessel operator to minimize

discards of IFQ species, because they would not see the immediate and individual consequences of their discarding activity. In addition, discards debited preseason may not reflect actual discards inseason, and may underestimate discards over time, particularly if the incentive to minimize discards is reduced. Therefore, Sub-Options D2 and D3 would be expected to have low negative impacts to target species relative to Sub-Option D1; however, these impacts are considered insignificant.

In summary, impacts from Alternative 2 and the various sub-options to target, non-target, and protected species would be expected to be negligible and insignificant relative to the No Action Alternative and baseline conditions. Although Alternative 2 would reduce the amount of information collected on discarded target, non-target, and protected species on EM trips, NMFS would continue to receive estimates of IFQ discards and maintain collection of detailed catch information using the total catch reporting methodology, including first receivers, catch monitors, port samplers, and mothership observers. In addition, NMFS would maintain some level of WCGOP coverage on EM trips in order to collect information sufficient to provide the best scientific information available for management of target and non-target species, and protected resources bycatch. The fishery would continue to comply with the terms and conditions of current ITSs and vessels would continue to be held accountable for all catch of target and non-target species. Alternative 2 would not change the location or time of fishing or gear type used, and therefore impacts to the physical environment would be expected to be negligible and insignificant.

5.1.3 Impacts to Human Communities

5.1.3.1 Impacts of Alternative 1: No Action Alternative

Under this alternative, groundfish monitoring requirements would remain as defined in Amendment 20 and subsequent rulemakings. Catcher vessels in the Pacific whiting fishery and fixed gear vessels in the Shorebased IFQ fishery would be required to obtain 100 percent observer coverage for all trips. Vessels would continue to use observers to satisfy the 100 percent observer coverage requirement and would not be able to use electronic monitoring as an alternative to observers. Vessels sorting at sea would be able to discard IFQ and non-IFQ species provided it has been documented by an observer. Catch share observers would continue to collect a suite of information on target and non-target species and protected resources on 100 percent of trips, including weight by species, length frequencies, tissue samples, gear and effort information, fishing location, and protected species interaction information. This information would continue to be used to estimate mortality and bycatch and to manage target and non-target species and protected resources.

Under the No Action Alternative, harvesters would not have the flexibility to use EM and would continue to bear the cost of observers. Information from the WCGOP indicates that observers cost approximately \$450-500/seaday. Vessel owners may be separately charged by the service provider for travel and lodging of the observer, so some vessels in remote ports have higher total observer costs. The total annual cost for an observer depends on the number of seadays fished, but the Economic Data Collection program estimates that average annual vessel cost for observers in 2012 was \$5,000, which translates into an average variable cost net revenue of

\$240,000 (NOAA, 2015).³ Some harvesters may see a cost savings from EM (see Section 5.1.3.2), which could increase their variable cost net revenue. For these harvesters, the No Action Alternative would have low insignificant negative impacts for their operations. There has been some speculation that if some vessels switch to EM, observer seaday rates will increase, because the fixed costs of the observer providers will be spread across fewer vessels. If this occurs, the No Action Alternative may have low positive impacts by maintaining observer seaday rates at current levels for vessels that would continue to use observers under Alternative 2.

Some first receivers benefit from harvesters using observers, because the observer can also monitor the offload of the vessel when it reaches the dock, negating the need for the first receiver to get a separate catch monitor. According to anecdotal reports, service providers generally split the cost of the observer that day between the harvester and first receiver. EDC data from 2014 estimates annual average monitoring costs for first receivers to be \$7,000. The No Action Alternative would have low positive impacts for first receivers relative to electronic monitoring, because of these efficiencies.

Under the No Action Alternative, observer service providers and observers would continue to be used by harvesters to meet monitoring requirements. NMFS does not have any information on the revenues of observer providers, as this information is confidential business information and is not collected by the agency, but it is likely that observer service providers would see more business under the No Action Alternative and observers would have more employment opportunities, compared to Alternative 2. Therefore, for observer providers and observers, the No Action Alternative would have low positive impacts relative to the baseline. The No Action Alternative would have negative impacts to EM providers relative to Alternative 2, because it would not authorize an EM program.

The No Action Alternative may have some indirect impacts to permit and quota share holders, first receivers, motherships, and fishing communities, to the extent that they are affected by the economic and social well-being of harvesters. These secondary effects would likely be quite small. Therefore, the No Action Alternative would be expected to have low negative to negligible insignificant impacts to harvesters, low positive to negligible insignificant impacts to first receivers, and negligible impacts to other secondary businesses and fishing communities, relative to baseline conditions.

5.1.3.2 Impacts of Alternative 2: Electronic Monitoring (Council Preferred)

Under this alternative, catcher vessels in the Pacific whiting fishery and fixed gear vessels in the Shorebased IFQ fishery would have the option to use electronic monitoring in place of observers to meet the requirements of Amendment 20 for 100 percent at-sea observer coverage. Vessel owners authorized to use EM would be required to obtain, install, and maintain an EM system from an approved service provider, as well as services to review the video data to generate discard estimates and to submit reports to NMFS. Vessel operators would also be required to fill

³ Variable cost net revenue is revenue minus variable costs (e.g., wages, fuel, observer, food, ice, and bait). Annual reports from the Economic Data Collection Program are available on the NWFSC's website: https://www.nwfsc.noaa.gov/research/divisions/fram/economic/economic_data_reports.cfm

out a logbook to document and report discards to NMFS. NMFS would maintain some level of observer coverage through the WCGOP on EM trips for biological sampling and other purposes. Under Alternative 2, harvesters would have the flexibility to use EM in place of observers to meet monitoring requirements. Harvesters using EM would be responsible for the costs of the EM system, and procuring installation and maintenance services from an EM service provider. Harvesters would also be responsible for having the video reviewed and stored for a period of time, and catch data reported to NMFS. Table 14 below shows estimated cost differences between observers and EM for whiting and fixed gear vessels, based on cost and participation information from the 2015 EM EFPs.

Table 14: Summary of estimate EM program costs compared to observer costs

	Trap	MS/CV	Shoreside whiting
# of vessels	7	16	18
Average annual sea days per vessel	32.71	25	72.21
Average review minutes per haul	27.28	8.59	8.87
Average review rate	0.30	0.25	0.16
Average review hours per trip	5.82	2.84	0.64
Per Sea Day Costs			
Equipment cost	\$133	\$78	\$55
Review cost	\$72	\$12	\$11
Data storage cost	\$23	\$26	\$26
Service & maintenance fees	\$173	\$226	\$78
Total Per Sea Day Costs			
EM cost per sea day	\$402	\$341	\$170
Observer cost per sea day	\$500	\$500	\$500
EM Savings Per Sea Day			
With camera cost	\$98	\$159	\$330
Without camera cost	\$232	\$236	\$385

These cost estimates suggest that EM would likely be a cost savings for vessels, particularly whiting vessels. In addition to the ongoing program costs in Table 15, vessel owners would also have fixed costs to purchase or lease EM equipment. Vessels that participated in the 2015 EFPs already received equipment and would not need to purchase equipment. The estimated cost of an EM system is \$10,000 to purchase, and \$2,000-3,000 per year to lease. Leasing cost would be an ongoing annual cost. The purchase cost would be a recurring periodic cost, to upgrade or replace an aging or broken system. EM service providers estimate an EM system to last 3-5 years. EFP vessels that already have EM units would save an estimated \$232 per sea day for fixed gear vessels, \$236 for MS/CV vessels, and \$385 per sea days for shorebased whiting vessels. Vessels that need to purchase EM units would be estimated to save \$98 for fixed gear vessels, \$159 for MS/CV vessels, and \$330 for shorebased whiting vessels (assuming an EM unit cost of \$10,000 amortized over 3 years). Whiting vessels would be expected to see the most cost savings, due to the low video review costs driven by the lack of discarding at sea. In addition, the high level of activity spreads the fixed costs over many sea days, resulting in a lower cost per sea day for

whiting trips. Fixed gear vessels and MS/CV vessels fish comparatively fewer sea days, resulting in higher costs per sea day.

When there is a shift to the industry paying for video review, NMFS in association with the Pacific States Marine Fisheries Commission will shift into auditing mode. The table below shows the Program Transition Costs. It assumes that the industry will pay for the 100 percent of the video and associated storage costs and that NMFS will be auditing 50 percent of the video. It includes government costs for managing the program. These are costs “government fixed costs” in addition to video reviewer costs, including NMFS and PSMFC program managers, statistician, IT services, and overhead. These costs are prorated to each fleet based on each sector’s proportion of government total video review costs. With the full transition, government costs will be approximately \$286,000. Under current “Cost Recovery” fee percentages, only the mothership catcher vessel fleet portion will be recouped by the cost recovery fee as the other fleets are already at the maximum level of 3%. The mothership catcher vessel cost recovery fee is expected to increase by 0.02%.

Table 15: Government administrative costs.

		Program Transition Costs				Total
		Trawl	Fixed	MSCV	Shoreside Whiting	
Total Industry Video Review Costs	100%	\$72,381.86	\$21,848.94	\$15,018.26	\$48,004.65	\$157,253.71
Government total video review costs as % of Industry	50%	\$36,190.93	\$10,924.47	\$15,018.26	\$24,002.32	\$86,135.98
Share of total audit costs		42.02%	12.68%	17.44%	27.87%	
Government Fixed Costs		\$84,032	\$25,366	\$34,871	\$55,731	\$200,000
Total Government Costs		\$120,223	\$36,290	\$49,889	\$79,734	\$286,136
Current Cost Recovery Fee		3.00%	3.00%	1.20%	3.00%	
Affect on cost Covery Fee		0.00%	0.00%	0.02%	0.00%	

Additional information regarding the potential costs of EM and the assumptions used in developing these estimates is available in the Regulatory Impact Review and Final Regulatory Flexibility Analysis available on the NMFS’s West Coast Region’s website: http://www.westcoast.fisheries.noaa.gov/fisheries/groundfish_catch_shares/electronic_monitoring.html

Some vessels in remote ports that have higher observer costs for travel and housing, may experience even greater cost savings from EM. Reducing monitoring costs would increase variable cost net revenue for vessels using EM. Alternative 2 would also provide greater operational flexibility to some vessels using EM, because they would not have to plan fishing activities to accommodate observer availability or scheduling. On the other hand, vessels using EM would have to accommodate service visits to maintain or repair equipment, which could disrupt fishing operations. Vessels continuing to use observers may see an increase in observer costs, as the fixed costs of the observer services are spread over fewer vessels, reducing variable cost net revenue. However, Alternative 2 would provide harvesters the flexibility to weigh these trade-offs of cost and convenience and choose the monitoring option that works best for their individual operation. Impacts to their operations are considered insignificant.

If EM reduces the quality or quantity of data used for management, it may result in increased costs for harvesters through less effective or less-specific management measures. For example, if lower quality data resulted in ineffective controls on fishing mortality, which resulted in reduced yield from the fishery, harvesters and their fishing communities would suffer from reduced revenues. However, as discussed in Section 5.1.2, Alternative 2 would not be likely to affect NMFS's ability to manage the fishery to mortality limits and, therefore, would not be likely to bring such negative impacts to fishing communities.

As was also discussed in Section 5.1.2, EM would result in the loss of some haul-specific catch information from shorebased whiting trips, which could have negative impacts to harvesters and their communities. For example, bycatch of Chinook salmon is a concern in the whiting fishery and the whiting fishery is subject to an incidental take statement for this species. If in some future action, managers wanted to implement gear or area-based restrictions to reduce bycatch of salmon, they would use observer data and EM data to determine what areas and what gears had the highest bycatch of salmon. Observer data would provide them this information at the haul-level for shorebased whiting trips, which would allow managers to design measures to be specific to smaller areas or only certain gear types or mesh sizes. But under EM, catch composition from shorebased whiting trips would be available at the trip level, which may mean that catch rates have to be an average over larger areas or multiple gear types/mesh sizes, leading to broader management measures. In this way, moving to EM data could have negative impacts to harvesters and their communities in the way of lost fishing opportunities resulting from broader management measures. However, these impacts are not considered significant.

First receivers accepting landings from EM vessels would no longer be able to use an observer on the vessel to monitor offloads and would have to obtain a catch monitor for these offloads. This may result in increased monitoring costs for first receivers under Alternative 2. First receivers would be required to sort and dispose of any prohibited or protected species retained by EM vessels. First receivers already have such disposition requirements for landings from Pacific whiting maximized retention trips, but this action would expand the existing whiting sorting and disposition requirements to landings from all EM trips. First Receivers may have already adjusted to the effects of these provisions under the EM EFP program that has been in effect 2015-2016. To the extent that permit and quota share holders, first receivers, motherships, and fishing communities benefit from the economic well-being of harvesters, there may be some small indirect insignificant positive effects on these entities from Alternative 2.

Under Alternative 2, there would be EM service providers that would compete for monitoring business with observer providers. This is likely to reduce revenue for observer providers and employment opportunities for observers relative to the No Action Alternative and baseline conditions. However, Alternative 2 would provide new opportunities for and increase revenue for EM service providers and employment opportunities for their staff. Service providers that provide both EM and observer services may not see much change in revenue compared to the No Action Alternative and baseline conditions.

Alternative 2 includes several sub-options for different components of the program. Most of these sub-options were designed to allow consideration of different program costs. Sub-Option A1 would use EM data as the primary data source to debit discards from vessel accounts and

Sub-Option A2 would use the logbook as the primary data source, but use EM to audit the validity of the logbook data. For the most part, whether EM data is the primary data source or not is not likely to change the impacts of Alternative 2, because the EM discard estimates are the validation source in either case. Sub-Option A1 would not require the vessel operator to complete a discard logbook, which may be more convenient for vessel operators than Sub-Option A2. Therefore, impacts under these sub-options are considered negligible and insignificant.

Sub-Option B1 would require 100 percent of video to be reviewed and Sub-Option B2 would allow a subsample of the video to be reviewed. The level of review would be established by NMFS and must be sufficient for NMFS to determine that the EM program is providing the best available scientific information for catch accounting. Reviewing less than 100 percent of video would reduce costs for fixed gear vessels resulting in low positive impacts for vessel owners relative to Sub-Option B1, but not appreciably for whiting vessels for which video can be reviewed very quickly. Therefore, impacts under these sub-options are considered insignificant.

Sub-Option C1 would require vessel operators to retain all catch until landing and Sub-Option C2 would allow all vessel operators to discard those species that can be identified on camera. As discussed in more detail in Section 5.1.2, Sub-Option C1 is status quo for whiting vessels and therefore would be expected to have negligible insignificant impacts to harvesters compared to the No Action Alternative. Under Sub-Option C2 the list of allowable discard species can change over time, so this analysis considers a range of impacts from maximized retention (Sub-Option C1) to discarding all species. If fixed gear vessels were required to retain most catch until landing, they may be inconvenienced having to accommodate this additional catch on the vessel and finding a way to dispose of it. They may also see increased costs from having to dispose of unmarketable fish. The first receiver receiving these unmarketable fish may also see costs from disposing of this catch. Allowing fixed gear vessels to discard species selectively would negate the inconvenience and cost for harvesters and first receivers to deal and dispose of unmarketable fish. However, fixed gear vessel operators may have the inconvenience of sorting and displaying all these fish to the cameras to allow them to be identified and accounted for before discarding. This may also increase sorting time and thereby increase operational costs. Vessel operators would have the option to retain these species, even if they were allowed to be discarded, to avoid having to sort and present all of them to the camera, which could negate any operational costs of dealing with unmarketable fish. The vessel would also have the option to carry an observer to avoid onerous catch handling requirements and to weigh these trade-offs. Therefore, impacts under these sub-options are considered negligible and insignificant.

Sub-Option D1 would require that all discards be debited from IFQ or cooperative allocations, consistent with the status quo. Two other sub-options were also considered by the Council (D2 and D3) that would have allowed some unintentional and minor amounts of IFQ discards to be debited from cooperative or sector allocations preseason. Sub-Options D2 and D3 were developed by the Council because they were thought to reduce review costs relative to Sub-Option D1, by allowing reviewers to ignore most discard events. However, as shown in Table 18, review of whiting hauls is so rapid and inexpensive, this would not make a substantive difference in monitoring costs for whiting vessels. Therefore, Sub-Options D2, and D3 would be

expected to have negligible impacts relative to Sub-Option D1. Therefore, impacts under these sub-options are considered insignificant.

Sub-Option E1 would allow a representative of the vessel to submit the hard drive to the EM service provider, while Sub-Option E2 would require the EM service provider to retrieve it, and Sub-Option E3 would require the catch monitor or some other third party to retrieve it. In terms of costs, the Sub-Option E1 would likely have lower costs, and low positive impacts, for harvesters relative to Sub-Option E2 or E3, because the harvester would be able to deliver the hard drives themselves. Sub-Option E2 would require the EM service provider to deploy a technician to the vessel to retrieve the hard drive, and the harvester would likely bear the service and travel costs that would entail. Under Sub-Option E3, a catch monitor would be responsible for retrieving the hard drive and delivering it to the service provider. This would likely be less costly than Sub-Option E2, because a catch monitor would already be present and would not have to incur additional travel costs to retrieve the hard drive. However, it may require that catch monitors be trained by EM service providers on how to retrieve the hard drives, costs for which would likely be passed on to the first receivers or harvesters. Therefore, impacts under these sub-options are considered insignificant.

Sub-Option F1 would reduce the administrative burden on vessel owners relative to Sub-Option F2, because it would not require resubmission of an application package each year. Sub-Option F2 would require resubmission of an application package each year. Therefore, Sub-Option F1 would be expected to have low positive, insignificant impacts to vessel owners relative to Sub-Option F2.

Sub-Option G1 would allow vessel owners to freely switch between EM and observers, providing the most flexibility and efficiency for their operations. Sub-Options G2 and G3 would set some limit on switching and would be more restrictive on vessel owners than Sub-Option G, potentially resulting in some loss of efficiency, or increased costs if it affects their ability to maximize their fishing opportunities in different fisheries. Sub-Option G4 would be the most restrictive and have low negative impacts on vessel owners relative to the other sub-options. However, industry representatives indicated during regulatory development that they would not be likely to switch between observers and EM, except in the case of malfunctions. Therefore, none of these sub-options is likely to have significant impacts to vessel owners.

In summary, Alternative 2 and the various sub-options would be expected to have negligible to low positive impacts to harvesters relative to the No Action Alternative and baseline conditions, because it would increase operational flexibility and reduce monitoring costs for vessels using EM, but could increase monitoring costs for those vessels continuing to use observers. Alternative 2 would be expected to have low negative impacts to first receivers, because it would likely increase their monitoring costs relative to the No Action Alternative and baseline conditions, due to the need to obtain catch monitors for offloads of EM vessels. Alternative 2 would have low negative impacts to observer providers and low positive impacts to EM providers and their employees. Alternative 2 would have neutral impacts to fishing communities, as a result of improved economic well-being for vessels using EM, but increased costs for first receivers and vessels using observers. Overall, Alternative 2 would be expected to

have neutral to low positive impacts to human communities relative to the No Action Alternative and baseline conditions.

5.1.4 Summary of the Direct and Indirect Effects of the Preferred Alternative

Table 16 provides a summary of conclusions regarding direct and indirect impacts that would occur as a result of the alternatives under consideration. Approval of either Alternative 1 (No Action) or Alternative 2 (EM) would have negligible impacts to the physical and biological environment. Alternative 2 would create an EM option for whiting and fixed gear vessels and have low positive impacts to harvesters and their communities. Alternative 1 would not create an EM program and would have low negative impacts to harvesters and their communities. Alternative 2 would have low positive impacts to EM service providers, but low negative impacts to observer service providers. Alternative 1 would have the opposite effect, resulting in neutral impacts overall for both alternatives. For individual impacts of the No Action Alternative and Alternative 2 please refer to Sections 5.1.2-5.1.3.

Table 16: Summary of direct and indirect effects of the preferred alternative and alternatives.

Valued Ecosystem Components (VECs)						
	Physical Environment	Biological Environment			Human Communities	
Alternative		Target Species	Non-target Species and Bycatch	Protected Resources	Harvesters	Fishing Communities
ALT 1 – No Action	Negl	Negl	Negl	Negl	L-	L-
ALT 2 – EM and Sub-Options A-C, E-G	Negl	Negl	Negl	Negl	L+	L+
SO D1	Negl	Negl	Negl	Negl	L+	L+
SO D2	Negl	L-	Negl	Negl	L+	L+
SO D3	Negl	L-	Negl	Negl	L+	L+

5.2 CUMULATIVE EFFECTS ANALYSIS

5.2.1 Temporal Scope

The temporal scope of past and present actions for the affected resources is primarily focused on actions that have occurred after FMP implementation (1982) and more importantly, since

implementation of the Amendment 20 to the FMP which established the current management regime (2011). The temporal scope of future actions for all affected resources extends about five years into the future. This period was chosen because the dynamic nature of resource management and lack of information on future projects makes it very difficult to predict impacts beyond this timeframe with any certainty.

5.2.2 Past, Present, and Reasonably Foreseeable Future Actions

Information on the past, present, and reasonably foreseeable future actions that may impact this action can be found below.

Fishery Related Actions

A regular cycle of stock assessment, setting harvest specifications, and establishing related management measures allows the Council and NMFS to regularly assess the status of the fisheries and to make necessary adjustments to ensure that there is a reasonable expectation of meeting the objectives of the Groundfish FMP and the MSA, especially the objective of achieving optimum yield (OY). Achieving OY involves monitoring stock characteristics (fishing mortality, recruitment, etc.) and formally assessing stocks where the data are available. The management framework is adaptive such that the receipt of new information informs decisions about setting harvest limits in future years through each biennial harvest specifications cycle. New information also informs changes to gear restrictions, area restrictions, and other management measures to support achieving OY, reducing fishing mortality, or minimizing the impacts of fishing on habitat, bycatch, and other components of the environment. Compliance with this regulatory regime should result in positive long-term outcomes taking into account the cumulative impacts of past, present, and reasonably foreseeable future Federal fishery management actions. Limiting fishing effort or catch through regulatory actions can often have negative short-term socioeconomic impacts. These impacts are usually necessary to bring about long-term sustainability of a given resource, which should, in the long-term, promote positive effects on human communities, especially those that are economically dependent upon groundfish stocks.

Non-Fishery Actions

For many of the proposed non-fishing activities to be permitted under other Federal agencies (such as offshore energy facilities, etc.), those agencies would conduct examinations of potential impacts on the affected resources. The Magnuson-Stevens Act (50 CFR 600.930) imposes an obligation on other Federal agencies to consult with the Secretary of Commerce on actions that may adversely affect EFH.

Cyclical Phenomena and Climate Change

Section 4.2.1 broadly describes the California Current Ecosystem. Cyclical phenomena include ENSO, PDO, and NPGO. The Council's Fishery Ecosystem Plan provides more detailed information on climate change and the effects of climate on ecosystem components

(http://www.pcouncil.org/wpcontent/uploads/FEP_FINAL.pdf). Range shifts of target species may cause the biggest climate change-related impact on fisheries.

5.2.3 Magnitude and Direction of Impacts of Actions Other Than Proposed Action

In determining the magnitude and significance of the cumulative effects, the additive and synergistic effects of the proposed action, as well as past, present, and reasonably foreseeable future actions, must be taken into account. This section discusses the potential effects of these actions on each of the managed resources.

5.2.3.1 Physical and Biological Environments

Those past, present, and reasonably foreseeable future actions that may affect habitat (including EFH for FMP species), target and non-target species, bycatch, and protected resources, and the direction of those potential effects are listed in Table 17, below. Those actions with known direct or indirect negative effects listed in Table 17 are localized in nearshore areas and marine project areas where they occur. The magnitude of the negative effects of actions other than the proposed action on the physical and biological environments may be small when considered in the context of the large geographic scope of this action; however, the negative and ongoing effects of such human activities as pollution may be severe in discreet locations. The potential effects of several non-fishing activities vary depending on the geographic scale and scope of those activities, whether those activities are likely to occur, and the scale and scope of the potential effects of the activities. As described above (Section 5.2.5), NMFS has several means by which it can review non-fishing actions of other Federal or state agencies that may affect NMFS's managed resources and the habitat on which they rely prior to permitting or implementing those projects. To the extent that NMFS and other agencies reach concurrence on measures needed to protect and preserve habitat or other managed resources, those review processes help to minimize the extent and magnitude of direct and indirect negative effects those actions could have on the physical and biological environments.

Fishery management actions taken through FMP processes since 1996 have had positive trends in the cumulative effects of fisheries on habitat and EFH and target species. The MSA requires, on an ongoing basis, that NMFS base conservation and management measures on the best scientific information available (16 U.S.C. 1851(a)(2)), consider actions to conserve and enhance EFH (16 U.S.C. 1855(b)), and minimize bycatch and bycatch mortality to the extent practicable (16 U.S.C. 1851(a)(9)). Together, those requirements anticipate a Federal fisheries management regime that results in additional direct and indirect positive effects on habitat through actions that protect EFH for federally-managed species and that protect the ecosystem services on which these species' productivity depends. Of the specific fishery management actions listed in Table 18, the 2019-2020 groundfish specifications and management measures and revisions to EFH and Rockfish Conservation Areas may have minor negative effects for EFH between 40°10' N. latitude and 45°46' N. latitude because that action is likely to expand allowable fishing area for at least some trawl fishery participants. Additionally, the action to allow expanded use of chafing gear on groundfish trawl nets may also have minor negative effects on bottom habitat by allowing mid-water trawl nets to operate closer to the ocean floor and rock formations (PFMC 2014b).

The Federal fisheries management regime would also be expected to result in direct and indirect positive effects on target and non-target species and protected resources through actions that limit harvest to sustainable levels based on the best available science and measures to reduce and minimize bycatch. The impacts of fishing activities to protected resources are further minimized by actions taken under the ESA and MMPA to limit takes of ESA-listed and MMPA species. Of the specific actions listed in Table 17, the 2019-2020 harvest specifications and revisions to EFH and Rockfish Conservation Areas would likely have minor negative effects on biological resources compared to the absence of fishing. Taken as a whole, however, fisheries management within the EEZ has had a long-term positive and broad scope trend in minimizing the adverse effects of fishing gear on habitat, ending overfishing and rebuilding overfished stocks, and minimizing bycatch, and is expected to continue in that positive trend.

For the physical and biological environments, there are direct and indirect negative effects from actions that may be localized or broad in scope; however, positive actions that have broad implications have been, and NMFS anticipate will continue to be, taken to improve the condition of habitat, target species, non-target species and bycatch, and protected resources. Some actions beyond the scope of NMFS and PFMC management, such as coastal population growth and human-caused climate change, will indirectly affect habitat and ecosystem productivity. Overall, non-fishing and fishing actions other than this action have had, or will have, a mix of positive, neutral or negative impacts on habitat, including EFH, depending on whether and how those actions increase human interactions with the physical environment. Fisheries actions have been, and NMFS anticipate will continue to be, trending toward positive effects, as have many non-fisheries actions, such as the regulation of ballast water and other pollutants. The magnitude of the indirect effects of ongoing non-fishing activities on the physical environment of the U.S. West Coast EEZ is unpredictable and whether it trends towards positive or negative effects in the future will depend largely on our Nation’s ability to mitigate for myriad small and often localized effects of anticipated coastwide increases in human populations.

Table 17: Summary of the effects of past, present, and reasonably foreseeable future actions on the physical and biological environments

Action	Past to the Present	Reasonably Foreseeable Future
Original FMPs and subsequent Amendments to the FMPs	Indirect Positive	
Update to the MSA List of Authorized Fisheries and Gear	None	
Oil contamination of nearshore sediments	Uncertain and Infrequent – Direct Negative	
Shoreline modification or armoring	Direct Negative	
Power plant intake entrainment	Neutral	
Offshore energy installation	Uncertain – Likely Direct Negative	

Offshore water pollution	Uncertain – Likely Indirect Negative, Depending on Magnitude of Occurrence		
Ballast water regulation	Uncertain – Likely Indirect Positive		
National marine sanctuary expansion	Uncertain – Likely Indirect Positive and Minor		
Recovery planning for ESA-listed species	Uncertain – Likely Indirect Positive and Minor		
Increased Navy training activities	Uncertain – Likely Indirect Negative and Minor		
2019-2020 Groundfish Biennial Harvest Specifications			Uncertain – Likely Negative and Minor
Expanded opportunities for trawl chafing gear use in 2019 and beyond			Likely Negative and Minor
Sablefish and trawl permit joint registration in 2018 and beyond			Likely Neutral
Revisions to EFH and Rockfish Conservation Areas in 2020 and beyond			Uncertain – Likely Negative
Climate change			Uncertain
Summary of past, present, and future actions excluding those proposed in this document	Overall, actions have had, or will have, a mix of positive, neutral or negative impacts on habitat, including EFH, depending on whether and how those actions increase human interactions with the physical environment. While many trends in human effects on the physical environment are trending positive, some negative effects have yet to be resolved and some human activities have at least some chance of resulting in catastrophic accidents.		

5.2.3.2 Human Communities

Those past, present, and reasonably foreseeable future actions that may affect human communities, and the direction of those potential effects are listed in Table 18, below. Those actions with known direct or indirect negative effects listed in Table 18 are localized in nearshore areas and marine project areas where they occur. The magnitude of the negative effects of actions other than the proposed action on the human environments may be small when considered in the context of the large geographic scope of this action; however, the negative and ongoing effects of such human activities as pollution may be severe in discreet locations. The potential effects of several non-fishing activities vary depending on the geographic scale and scope of those activities, whether those activities are likely to occur, and the scale and scope of the potential effects of the activities. As described above (Section 5.2.2), NMFS has several

means by which it can review non-fishing actions of other Federal or state agencies that may affect NMFS's managed resources, the habitat on which they rely, and the fishing communities that rely on them, prior to permitting or implementing those projects. To the extent that NMFS and other agencies reach concurrence on measures needed to protect and preserve habitat or other managed resources, those review processes help to minimize the extent and magnitude of direct and indirect negative effects those actions could have on the physical and biological environments and, consequently, on the fishing communities that depend on them.

As described above, fishery management actions taken through FMP processes since 1996 have had positive trends in the cumulative effects of fisheries on habitat and EFH and target species. The ending of overfishing and rebuilding of overfished stocks have had negative economic consequences on fishing communities in the short term due to reductions in catch limits and increases in fishing regulations. However, rebuilding of overfished stocks has provided more fishing opportunities for harvesters and increased revenues and is expected to continue to do so in the long term. In addition, the requirements of the MSA to use the best scientific information available to manage fishing at sustainable levels and in a fair and equitable manner and to minimize adverse economic effects to fishing communities, and to promote safety at sea, anticipates such trends to continue into the foreseeable future. Of the specific fishery management actions listed in Table 18, the 2019-2020 groundfish specifications and management measures and revisions to EFH and Rockfish Conservation Areas may have minor positive effects for fishing communities because that action is likely to expand allowable fishing area for at least some trawl fishery participants. Additionally, the action to allow expanded use of chafing gear on groundfish trawl nets may also have minor positive effects on fishing communities by allowing mid-water trawl nets to more flexibility in operations that may result in greater CPUE (PFMC 2014b). The joint registration of sablefish and trawl permits would likely have low positive effects to fixed gear vessels by increasing their flexibility to move between the limited entry sablefish and limited entry trawl fisheries.

For the human communities, there are direct and indirect negative effects from actions that may be localized or broad in scope; however, positive actions that have broad implications have been, and NMFS anticipate will continue to be, taken to improve the condition of the physical and biological resources to the benefit of human communities. Some actions beyond the scope of NMFS and PFMC management, such as coastal population growth and human-caused climate change, will indirectly affect habitat and ecosystem productivity, and the fishing communities that depend on them. Overall, non-fishing and fishing actions other than this action have had, or will have, a mix of positive, neutral or negative impacts on the human environment, on whether and how those actions increase human interactions with the physical and biological environments. Direct negative effects are related to fishing and non-fishing actions that create area closures that force the fleet off of desirable fishing grounds. Fisheries actions have been, and NMFS anticipate will continue to be, trending toward positive effects, as have many non-fisheries actions, such as the regulation of ballast water and other pollutants. The magnitude of the indirect effects of ongoing non-fishing activities on the human environment of the U.S. West Coast is unpredictable and whether it trends towards positive or negative effects in the future will depend largely on our Nation's ability to mitigate for myriad small and often localized effects of anticipated coastwide increases in human populations.

Table 18: Summary of the effects of past, present, and reasonably foreseeable future actions on the human environment.

Action	Past to the Present		Reasonably Foreseeable Future
Original FMPs and subsequent Amendments to the FMPs	Direct and Indirect Positive		
Update to the MSA List of Authorized Fisheries and Gear	None		
Oil contamination of nearshore sediments	Uncertain and Infrequent – Indirect Negative		
Shoreline modification or armoring	Indirect Negative		
Power plant intake entrainment	Neutral		
Offshore energy installation	Uncertain – Likely Direct Negative		
Offshore water pollution	Uncertain – Likely Indirect Negative, Depending on Magnitude of Occurrence		
Ballast water regulation	Uncertain – Likely Indirect Positive		
National marine sanctuary expansion	Uncertain – Likely Indirect Negative to Positive and Minor		
Recovery planning for ESA-listed species	Uncertain – Likely Indirect Negative to Positive and Minor		
Increased Navy training activities	Uncertain – Likely Indirect Negative and Minor		
2019-2020 Groundfish Biennial Harvest Specifications			Uncertain – Likely Direct Positive
Expanded opportunities for trawl chafing gear use in 2019 and beyond			Likely Direct Positive
Sablefish and trawl permit joint registration in 2018 and beyond			Likely Direct Positive
Revisions to EFH and Rockfish Conservation Areas in 2020 and beyond			Uncertain – Likely Positive
Climate change			Uncertain
Summary of past, present, and future actions excluding those proposed in this document	Overall, actions have had, or will have, a mix of positive, neutral or negative impacts on habitat, including EFH, depending on whether and how those actions increase human interactions with the physical environment. While many trends in human effects on the physical environment are trending positive, some negative effects		

	<p>have yet to be resolved and some human activities have at least some chance of resulting in catastrophic accidents.</p>
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5.2.4 Magnitude and Significance of Cumulative Effects

Considering the direct and indirect impacts of the proposed action when added to the impacts of past, present, and reasonably foreseeable future actions listed above, the cumulative impacts of the proposed action, including the various sub-options, are determined to be not significant for each resource. In addition, the cumulative effects of the no action alternative when added to the impacts of the past, present, and reasonable foreseeable future actions listed above, are determined to be not significant for each resource.

With respect to the physical environment, many of these activities are concentrated near-shore and likely work either additively or synergistically to decrease habitat quality. In addition, the use of EM by whiting and fixed gear vessels would have negligible impacts on habitat and EFH, since using EM or an observer would not be expected to change the location of fishing or gear used. Other non-fishing factors such as climate change and ocean acidification are also thought to play a role in the degradation of habitat. The effects of these actions, combined with impacts resulting from years of commercial fishing activity, have negatively affected habitat. However, impacts from both the proposed action and no action alternative were found to be negligible. The combination of the current condition of the VEC combined with these past, present, and reasonably foreseeable future actions when considered with the proposed action and with the no action alternative would not result in significant cumulative impacts.

The long-term trend has been positive for cumulative impacts to target species, non-target, and bycatch species. While some groundfish species remain overfished, effort reductions since implementation of Amendment 20 have ended overfishing, allowed several stocks to rebuild, and the rebuilding process for others is underway. Gear entanglement continues to be a source of injury or mortality for protected species, resulting in some adverse effects on most protected species to varying degrees. One of the goals of future management measures and biological opinions will be to decrease the number of protected species interactions with commercial fishing operations. In addition, the use of EM or observers by whiting and fixed gear vessels would have negligible impacts on target, non-target, bycatch, and protected species, because using EM or observers would not be expected to change the time or location of fishing effort, or the amount of fishing mortality, relative to baseline conditions. Fishing mortality would continue to be accounted for using logbooks, EM, and observer coverage, and limited by ACLs for target and non-target species, and ITSs for protected species. Also, the effects from non-fishing actions are expected to be low negative as the potential for localized harm to VECs exists. These factors, when considered in conjunction with the proposed action which would have negligible impacts to biological resources due to existing catch and bycatch limits, would not have any significant cumulative impacts. The combination of the current condition of the VEC combined with these past, present, and reasonably foreseeable future actions when considered with the proposed action, or the no action alternative, would not result in significant cumulative impacts.

The use of EM by whiting and fixed gear vessels would have an overall positive impact on human communities, including harvesters and fishing communities. Although the proposed action would reduce monitoring costs and increase flexibility for some harvesters, it may be offset by increased costs for harvesters continuing to use observers and processors needing to obtain catch monitor coverage. Recent information from the EDC shows that this would continue the trend in groundfish revenues since implementation of the catch share program in Amendment 20 (2011). Although some past management measures, such as strict limits on bycatch of overfished species and closed areas, have had a negative impact on communities that depend on the groundfish fishery, groundfish stocks have begun to rebuild allowing managers to lift some restrictions. Recent and foreseeable future actions to lift effort controls would continue to provide flexibility to fishermen and expand fishing opportunities. The effects from non-fishing actions are also expected to be negligible to low negative as the potential for localized harm to VECs exists. Impacts, both positive and negative, from the proposed action would likely do little to change this finding. Similarly, impacts from the no action alternative would continue these trends. The combination of the current condition of the VEC combined with these past, present, and reasonably foreseeable future actions when considered with the proposed action, or the no action alternative, would not result in significant cumulative impacts.

Conclusion

In conclusion, the summary of impacts from the preferred alternative and CEA Baseline would be negligible on habitat, target species, non-target species and bycatch, and protected resources; and likely low positive to human communities (Table 19). The summary of impacts from the no action alternative and CEA Baseline would be negligible on habitat, target species, non-target species and bycatch, and protected resources; and likely low negative to human communities (Table 19). These impacts would not be significant due to the reasons stated in this assessment.

Table 19: Magnitude and significance of the cumulative effects; the additive and synergistic effects of the proposed action and no action, as well as past, present, and reasonably foreseeable future actions.

Affected Resources	Status in 2015	Magnitude of Net Impact of Past, Present, and Reasonably Foreseeable Future Actions	Magnitude of the Impact of the Preferred Alternative	Magnitude and Significance of Cumulative Effects (Preferred)	Magnitude of the Impact of the No Action	Magnitude and Significance of Cumulative Effects (No Action)
Physical and Biological Resources	Complex and variable (Sections 4.1-4.5)	Mixed – Positive, Neutral, and Negative (Section 5.2.3.1)	Negligible	None	Negligible	None

Socio-economic/ Human Communities Resources	Complex and variable (Section 4.6)	Mixed – Positive, Neutral, and Negative (Section 5.2.3.2)	Negligible to Low positive	None	Negligible to Low negative	None
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6.0 LIST OF PREPARERS AND CONTACTS

The following staff members of the NMFS West Coast Regional Office and Northwest Fisheries Science Center collaborated on the preparation of this document:

NMFS West Coast Regional Office

Melissa Hooper, Branch Chief, Permits & Monitoring Branch
 Steve Freese, Acting Assistant Regional Administrator for Sustainable Fisheries
 Abigail Harley, Regional Economist
 Shelby Mendez, NEPA Coordinator
 Galeeb Kachra, NEPA Coordinator

NMFS Northwest Fisheries Science Center

Jon McVeigh, Program Manager, West Coast Groundfish Observer Program

To obtain a copy of this document please visit <http://www.regulations.gov> or contact:

Melissa Hooper, Branch Chief, Permits & Monitoring Branch
 National Marine Fisheries Service
 7600 Sandpoint Way NE
 Seattle, WA 98115

7.0 PERSONS AND AGENCIES CONSULTED

Staff members of NMFS West Coast Regional Office and Northwest Fisheries Science Center, Pacific Fishery Management Council, and Pacific States Marine Fisheries Commission, were also consulted in preparing this EA. No other persons or agencies were consulted.

8.0 COMPLIANCE WITH OTHER APPLICABLE LAWS AND EXECUTIVE ORDERS

8.1 Magnuson-Steven Fishery Conservation and Management Act (MSA)

Section 301 of the Magnuson-Stevens Act requires that FMPs contain conservation and management measures that are consistent with the ten National Standards. Changes implemented by Amendments 20 and 21 address how the proposed management actions comply with the National Standards. Under Amendments 20 and 21, the Council adopted conservation

and management measures that would end overfishing and rebuild groundfish stocks to achieve, on a continuing basis, the optimum yield for groundfish stocks and the U.S. fishing industry using the best scientific information available consistent with National Standards 1 and 2. Under Amendment 23, the Council revised the harvest specifications framework to be consistent with the MSA and the 2009 revisions to the National Standard 1 guidelines. Amendment 24 established default harvest control rules to guide future decision-making on harvest specifications. The FMP and implementing regulations manage all 90 species throughout their range, to the extent practicable, as required by National Standard 3. As described in Chapter 6 of Amendment 20, the FMP does not discriminate among residents of different states consistent with National Standard 4, do not have economic allocation as their sole purpose (National Standard 5), account for variations in these fisheries (National Standard 6), avoids unnecessary duplication (National Standard 7), take into account fishing communities (National Standard 8), addresses bycatch in fisheries (National Standard 9), and promote safety at sea (National Standard 10). By proposing to meet the National Standards requirements of the Magnuson-Stevens Act through future FMP amendments and framework actions, the Council will ensure that overfishing is prevented, overfished stocks are rebuilt, and the maximum benefits possible accrue to the ports and communities that depend on these fisheries and the Nation as a whole.

The proposed action would comply with all elements of the Magnuson-Stevens Act, including the National Standards, and the Pacific Coast Groundfish FMP. This action is being taken in conformance with the Pacific Coast Groundfish FMP, which through Amendment 20 provided for vessels participating in the trawl program to use EM in place of observers. Amendment 20 to the FMP established the catch share program and the framework for future changes to its provisions, including monitoring requirements. Nothing in this action changes the findings in Amendments 20, 21, 23, and 24, that the FMP complies with the provisions of the Magnuson-Stevens Act. There are no adverse impacts associated with this action, so no EFH assessment or EFH consultation is required, as determined by a Habitat Conservation Division Review on August 3, 2016.

8.2 Endangered Species Act (ESA)

On December 11, 2017, NMFS issued a biological opinion concluding that the continued implementation of the PCGFMP, including implementation of this final action, is likely to adversely affect but is not likely to jeopardize the continued existence of the following listed salmon evolutionary significant units: Puget Sound Chinook, Snake River Fall Chinook, Lower Columbia River Chinook, Upper Willamette River Chinook, Snake River spring/summer Chinook, California Coastal Chinook, Lower Columbia River coho, Oregon Coast coho, Southern Oregon/Northern California coho, and Central California Coast coho. The opinion concludes that the implementation of the PCGFMP is not likely to adversely affect Sacramento Winter-run Chinook or Central Valley Spring-run Chinook. The 2019-2020 harvest specifications and management includes bycatch mitigation measures as required under the reasonable and prudent measures to minimize incidental take.

On December 7, 2012, NMFS issued a biological opinion concluding that the continued implementation of the PCGFMP is not likely to jeopardize non-salmonid marine species including the southern distinct population segment (DPS) of green sturgeon, humpback whales,

the eastern DPS of Steller sea lions, and leatherback sea turtles. The opinion also concluded that the fishery is not likely to adversely modify critical habitat for green sturgeon or leatherback sea turtles. It further concluded that the fishery is not likely to adversely affect green sea turtles, olive ridley sea turtles, loggerhead sea turtles, sei whales, North Pacific right whales, blue whales, fin whales, sperm whales, Southern Resident killer whales, Guadalupe fur seals, or the critical habitat for Steller sea lions.

In November 2018, NMFS reinitiated consultation on humpback whales. The current consultation is ongoing. On October 30, 2018, NMFS West Coast Region made determinations under ESA sections 7(a)(2) and 7(d) that this action is not likely to jeopardize humpback whales, nor will it make any irreversible or irretrievable commitment of resources that would have the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures prior to the completion of a new biological opinion. In the event the consultation identifies reasonable and prudent alternatives to address jeopardy concerns or reasonable and prudent measures to minimize incidental take, NMFS will coordinate with the Council to put additional alternatives or measures into place, as required.

On October 12, 2018, NMFS issued a biological opinion analyzing the effects of ongoing implementation of the PCGFMP on listed eulachon. The opinion concluded that continued implementation of the PCGFMP, is likely to adversely affect threatened eulachon, but it is unlikely to jeopardize eulachon or their critical habitat.

On May 2, 2017, the U.S. Fish and Wildlife Service (FWS) issued a biological opinion concluding that the continued implementation of the PCGFMP will not jeopardize the continued existence of the short-tailed albatross. The FWS also concurred that the fishery is not likely to adversely affect the marbled murrelet, California least tern, southern sea otter, bull trout, or adversely modify bull trout critical habitat.

After reviewing the available information, NMFS has concluded that fishing activities pursuant to this rule will not affect endangered and threatened species or critical habitat in any manner not considered in prior consultations on this fishery. Further, the proposed action does not trigger re-initiation of the current consultations on the Groundfish FMP. The proposed action would not change the time, location, amount of fishing effort, or the gear types used, and therefore NMFS concludes that the proposed action would not have impacts beyond those previously analyzed in existing consultations. For further information on the potential impacts of the fishery and proposed action on listed species, see Sections 4.5 and 5.1.2.

8.3 Marine Mammal Protection Act (MMPA)

West Coast pot fisheries for sablefish are considered Category II fisheries under the MMPA's List of Fisheries, indicating occasional interactions. All other West Coast groundfish fisheries, including the trawl fishery, are considered Category III fisheries under the MMPA, indicating a remote likelihood of or no known serious injuries or mortalities to marine mammals. The proposed action would not change the time, location, amount of fishing effort, or gear types

used, therefore NMFS concludes the proposed action would not change any of the effects on marine mammals of the groundfish fisheries.

8.4 National Environmental Policy Act (NEPA)

8.4.1 Finding of No Significant Impact (FONSI)

Background

Selected Alternative:

- Alternative 2 – Electronic Monitoring (*Council/NMFS Preferred*)
 - Sub-Option A2: Logbook data is used as the primary data source to debit vessel accounts and EM data is used to audit the validity of the logbook data. (*Council/NMFS Preferred*)
 - Sub-Option B2: Less than 100 percent of the video is reviewed. The level would initially be 100 percent, but NMFS would have the ability to modify the percentage based on performance in consultation with the Council. (*Council/NMFS Preferred*)
 - Sub-Option C1: Vessel operators would be required to retain all catch until landing, with a few exceptions for prohibited and protected species and discards for safety reasons. (*Council/NMFS Preferred for Whiting*)
 - Sub-Option C2: Vessel operators would be able to discard those species that can be differentiated on camera. The list of species that may be discarded may be modified through a routine action as defined in the Pacific Coast Groundfish FMP. (*Council/NMFS Preferred for Fixed Gear*)
 - Sub-Option D1: All discards would be debited from IFQ and cooperative allocations. (*Council/NMFS Preferred*)
 - Sub-Option E1: A representative of the vessel (vessel operator or crew) would be responsible for delivering the hard drive to the EM service provider. (*Council/NMFS Preferred*)
 - Sub-Option F1: Vessel monitoring plans would be effective until revised (*Council/NMFS Preferred*)
 - Sub-Option G1: No limit on switching between EM and observers. (*Council/NMFS Preferred for Fixed Gear*)

Sub-Option G2: There would be some limit on switching, to be determined by NMFS, with the exception that an observer could be used in the event of an EM system failure. (*Council/NMFS Preferred for Whiting*) **Related Environmental Documents and Consultations**

Related ESA Section 7 consultations are listed in Section 4.5.3.

Significance Review

The Council on Environmental Quality (CEQ) Regulations state that the determination of significance using an analysis of effects requires examination of both context and intensity, and lists ten criteria for intensity (40 CFR 1508.27). In addition, the Companion Manual for National

Oceanic and Atmospheric Administration Administrative Order 216-6A provides sixteen criteria, the same ten as the CEQ Regulations and six additional, for determining whether the impacts of a proposed action are significant. Each criterion is discussed below with respect to the proposed action and considered individually as well as in combination with the others.

1. Can the proposed action reasonably be expected to cause both beneficial and adverse impacts that overall may result in a significant effect, even if the effect will be beneficial?

Impacts from the proposed action (Alternative 2 and the various sub-options) to target, non-target, and protected species would be expected to be negligible and insignificant relative to the No Action Alternative and baseline conditions. Although Alternative 2 would reduce the amount of information collected on discarded target, non-target, and protected species on EM trips, NMFS would continue to receive estimates of IFQ discards and maintain collection of detailed catch information using the total catch reporting methodology, including first receivers, catch monitors, port samplers, and mothership observers. In addition, NMFS would maintain some level of WCGOP coverage on EM trips in order to collect information sufficient to provide the best scientific information available for management of target and non-target species, and protected resources bycatch. The fishery would continue to comply with the terms and conditions of current ITSs and vessels would continue to be held accountable for all catch of target and non-target species. Alternative 2 would not change the location or time of fishing or gear type used, and therefore impacts to the physical environment would be expected to be negligible and insignificant.

2. Can the proposed action reasonably be expected to significantly affect public health or safety?

The proposed action would provide an alternative method of monitoring catch in the groundfish trawl fishery, which would be expected to change the amount and type of information available for management. The proposed action would not be expected to change fishing practices, times, or locations, that would affect public health or safety of either people directly involved in the fishing industry or the public at large.

3. Can the proposed action reasonably be expected to result in significant impacts to unique characteristics of the geographic area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?

The proposed action would not adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, nor is it expected to cause loss or destruction to significant scientific, cultural, or historical resources, because none of these features are present in the affected area. The proposed action is specific only to Federally-managed fisheries that operate in the Exclusive Economic Zone (EEZ), as described in chapters 1, 4, and 5, and the unique areas described herein do not occur in the action area.

4. Are the proposed action's effects on the quality of the human environment likely to be highly controversial?

The impacts on the quality of the human environment of the proposed action are not expected to be highly controversial. The proposed action endeavors to establish an alternative method of monitoring catch in the groundfish trawl fishery that would still provide the best available scientific information for management of target, non-target, and protected species. The effects of these methodologies, including data collection, analysis and reporting to fisheries scientists and managers, on the human environment are described in chapter 5 and are found to be negligible (on the physical environment, target, non-target, and protected species) to neutral-to-low positive impacts (on human communities) relative to baseline conditions.

5. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Implementation of the proposed action is not expected to result in highly uncertain effects on the human environment or involve unique or unknown risks. NMFS has data from 46 EFPs from 2015-2017 testing the use of EM. The preferred alternatives presented in the document (chapter 3) were developed using the best available science and are consistent with currently employed tools and practices. The analyses provided in the document clearly demonstrate that none of the elements of the proposed action would result in direct or indirect impacts to the environment (chapter 5) that are more than negligible or low positive compared to current (baseline) conditions. Furthermore, the proposed action endeavors to establish a methodology for EM to ensure that the discard data obtained by NMFS remains sufficient to provide the best available scientific information for management.

6. Can the proposed action reasonably be expected to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?

The implementation of the proposed action does not establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration. The data collection methods being implemented are necessary to meet the objectives under the Magnuson-Stevens Act, Pacific Coast Groundfish FMP, and Amendment 20 to the FMP (described in chapters 1 and 2). The measures included in the Regulatory Amendment were designed and chosen to achieve specific objectives given local conditions and issues, and are therefore not expected to establish a precedent for future actions. In the future, NMFS would similarly evaluate data collection methods and needs in order to respond to specific issues, such as changes to environmental, regulatory, economic, and/or fishing industry conditions. Therefore, monitoring and reporting requirements for each FMP and/or administrative region would be evaluated separately based upon its own unique factual situation. Furthermore, while data collected under the proposed action may influence fisheries management decisions throughout the region for years to come, each of those future management decisions would be the subject of its own environmental review under NEPA. As such, this action would not establish a precedent for any forthcoming decision or analysis.

7. Is the proposed action related to other actions that when considered together will have individually insignificant but cumulatively significant impacts?

No. As described in chapter 5 of the document, the proposed action and alternatives are being considered solely address the methods through data and information on catch and bycatch occurring in portions of the groundfish trawl fishery are collected, analyzed, and reported to fishery scientists and managers. The Regulatory Amendment does not address bycatch reduction or other issues related to the management measures utilized in the groundfish fishery. There are no incremental impacts to any fishing areas or living marine resources associated with the proposed action relative to the no action baseline. Therefore, given the limited and administrative nature of this action and the preferred alternatives, the Regulatory Amendment is not related to any other actions with individual insignificant but cumulatively significant impacts.

8. Can the proposed action reasonably be expected to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources?

There is no evidence that the implementation of the proposed action will adversely affect entities listed in or eligible for listing in the National Register of Historic Places or will cause loss or destruction of significant scientific, cultural, or historic resources. Compliance with the preferred measures will not result in the permanent loss or destruction of resources.

9. Can the proposed action reasonably be expected to have a significant impact on endangered or threatened species, or their critical habitat as defined under the Endangered Species Act of 1973?

The measures proposed in the Regulatory Amendment are not expected to adversely affect endangered or threatened species, or critical habitat of these species. As described in chapters 1, 2, and 3, this amendment is solely concerned with methods to be used to obtain, analyze, and report information regarding discards occurring in some segments of the groundfish trawl fishery. The measures would not impose or result in any changes to fishing operations, fishing behavior, fishing gears used, or areas fished. As such, the impacts of the preferred alternatives, described and analyzed in chapter 5, are not expected to results in any direct or indirect adverse impacts on any endangered or threatened species, or their critical habitat. NMFS analyzed the impacts of the proposed action and found that the proposed action would have no effect. Therefore this action does not trigger reinitiation of any of those consultations. This determination was documented in a memorandum to the record dated August 15, 2016.

10. Can the proposed action reasonably be expected to threaten a violation of Federal, state, or local law or requirements imposed for environmental protection?

There is no evidence that implementation of the proposed action would result in a violation of a Federal, state, or local law for environmental protection. In fact, the proposed action is expected to support Federal laws because it was developed to address the objectives of the Magnuson-Stevens Act and Pacific Coast Groundfish FMP. Furthermore, an analysis of the relationship of the proposed action with applicable Federal laws and Executive Orders was conducted (chapter 8) and it was determined that the measures included in the proposed action are consistent with all applicable Federal laws and Executive Orders.

11. Can the proposed action reasonably be expected to adversely affect stocks of marine mammals as defined in the Marine Mammal Protection Act?

The measures proposed in the Regulatory Amendment are not expected to adversely affect marine mammals. As described in chapters 1, 2, and 3, this amendment is solely concerned with methods to be used to obtain, analyze, and report information regarding discards occurring in some segments of the groundfish trawl fishery. The measures would not impose or result in any changes to fishing operations, fishing behavior, fishing gears used, or areas fished. As such, the impacts of the preferred alternatives, described and analyzed in chapter 5, are not expected to result in any direct or indirect adverse impacts on any marine mammals.

12. Can the proposed action reasonably be expected to adversely affect managed fish species?

The proposed action is not expected to jeopardize the sustainability of any target species that may be affected by the action. As described in chapters 1, 2, and 3, the focus of this Regulatory Amendment is on the methods by which catch information is obtained, analyzed, and utilized for a portion of the groundfish trawl fishery. The measures would not impose or result in any changes to fishing operations, fishing behavior, fishing gears used, or areas fished. As such, the impacts of the preferred alternatives, described and analyzed in chapter 5, on any species that may be affected by the measures are expected to be negligible relative to baseline conditions.

13. Can the proposed action reasonably be expected to adversely affect essential fish habitat as defined under the Magnuson-Stevens Fishery Conservation and Management Act?

The proposed action is not expected to adversely affect essential fish habitat that may be affected by the action. As described in chapters 1, 2, and 3, the focus of this Regulatory Amendment is on the methods by which catch information is obtained, analyzed, and utilized for a portion of the groundfish trawl fishery. The measures would not impose or result in any changes to fishing operations, fishing behavior, fishing gears used, or areas fished. As such, the impacts of the preferred alternatives, described and analyzed in chapter 5, on any EFH that may be affected by the measures are expected to be negligible relative to baseline conditions. There are no adverse impacts associated with this action, so no EFH assessment or EFH consultation is required, as determined by a Habitat Conservation Division Review on August 3, 2016.

14. Can the proposed action reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?

The proposed action is not expected to adversely affect vulnerable marine or coastal ecosystems, including deep coral ecosystems. As described in chapters 1, 2, and 3, the focus of this Regulatory Amendment is on the methods by which catch information is obtained, analyzed, and utilized for a portion of the groundfish trawl fishery. The measures would not impose or result in any changes to fishing operations, fishing behavior, fishing gears used, or areas fished. As such, the impacts of the preferred alternatives, described and analyzed in chapter 5, on any vulnerable marine or coast ecosystems are expected to be negligible relative to baseline conditions.

15. Can the proposed action reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

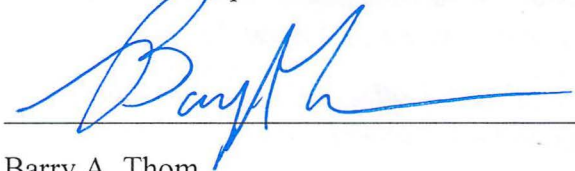
The proposed action is not expected to adversely affect biodiversity or ecosystem functioning. As described in chapters 1, 2, and 3, the focus of this Regulatory Amendment is on the methods by which catch information is obtained, analyzed, and utilized for a portion of the groundfish trawl fishery. The measures would not impose or result in any changes to fishing operations, fishing behavior, fishing gears used, or areas fished. As such, the impacts of the preferred alternatives, described and analyzed in chapter 5, on biodiversity or ecosystem functioning are expected to be negligible relative to baseline conditions.

16. Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

The proposed action is not expected to result in the introduction or spread of a nonindigenous species. As described in chapters 1, 2, and 3, the focus of this Regulatory Amendment is on the methods by which catch information is obtained, analyzed, and utilized for a portion of the groundfish trawl fishery. The measures would not impose or result in any changes to fishing operations, fishing behavior, fishing gears used, or areas fished, and would not involve the transport of non-indigenous species. The fishing vessels participating in the proposed action would not increase the risk of introduction through ballast water or hull fouling.

DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for the Regulatory Amendment to the Pacific Coast Groundfish Fishery Management Plan to Implement an Electronic Monitoring Program, it is hereby determined that the Regulatory Amendment to the Pacific Coast Groundfish Fishery Management Plan to Implement an Electronic Monitoring Program will not significantly impact the quality of the human environment as described above and in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an environmental impact statement for this action is not necessary.



Barry A. Thom
Regional Administrator

Feb. 14, 2019

Date

Date	Meeting Type	Location
11/3-7/2012	Council Meeting	Costa Mesa, CA
2/25-27/2013	Electronic Monitoring Workshop	Portland, OR
4/6-11/2013	Council Meeting	Portland, OR
6/18-25/2013	Council Meeting	Garden Grove, CA
8/20-21/2013	Groundfish Electronic Monitoring Policy and Technical Advisory Committees Meeting (GEMPAC/GEMTAC)	
9/11-17/2013	Council Meeting	Boise, ID
10/15-16/2013	GEMPAC and GEMTAC Meeting	Seattle, WA
10/30-11/6/2013	Council Meeting	Costa Mesa, CA
4/3-10/2014	Council Meeting	Vancouver, WA
5/7-8/2014	GEMPAC and GEMTAC Meeting	
6/18-25/2014	Council Meeting	Garden Grove, CA
9/10-17/2014	Council Meeting	Spokane, WA
9/8-16/2015	Council Meeting	Sacramento, CA
11/13-19/2015	Council Meeting	Garden Grove, CA
1/20/2016	GEMPAC and GEMTAC Webinar	Portland, OR
3/8-14/2016	Council Meeting	Sacramento, CA
4/8-14/2016	Council Meeting	Vancouver, WA
9/6-10/6/2016	Public comment period on proposed rule and draft EA	N/A
4/6-11/2017	Council Meeting	Sacramento, CA
9/6/2017	GEMPAC and GEMTAC Webinar	Portland, OR
9/11-18/2017	Council Meeting	Boise, ID
11/14-20/2017	Council Meeting	Costa Mesa, CA
6/7-13/2018	Council Meeting	Spokane, WA
11/1-8/2018	Council Meeting	San Diego, CA

8.5 Administrative Procedure Act (APA)

Section 553 of the Administrative Procedure Act establishes procedural requirements applicable to informal rulemaking by Federal agencies. The purpose of these requirements is to ensure public access to the Federal rulemaking process, and to give the public adequate notice and opportunity for comment. At this time, the NMFS is not planning any abridgement of the rulemaking process for this action.

8.6 Paperwork Reduction Act (PRA)

The purpose of the PRA is to control and, to the extent possible, minimize the paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by, or for, the Federal Government. This proposed rule contains a

collection-of-information requirement that is subject to review and approval by the Office of Management and Budget (OMB) under the PRA. This requirement will be submitted to OMB for approval.

8.7 Coastal Zone Management Act (CZMA)

Section 307(c)(1) of the CZMA requires that all Federal activities which affect any coastal use or resource be consistent with approved state coastal zone management programs (CZMP) to the maximum extent practicable. NMFS has made a consistency determination that the regulatory amendment is consistent to the maximum extent practicable with the enforceable policies of the approved coastal management programs of Washington, Oregon, and California. This determination was submitted on August 15, 2016, for review by the responsible state agencies under section 307 of the CZMA.

8.8 Information Quality Act (IQA)

Pursuant to NOAA guidelines implementing Section 515 of Public Law 106-554 (the Data Quality Act), all information products released to the public must first undergo a Pre-Dissemination Review to ensure and maximize the quality, objectivity, utility, and integrity of the information (including statistical information) disseminated by or for federal agencies. The following section addresses these requirements.

8.8.1 Utility of Information Product

The environmental assessment (EA) and the Federal Register document prepared for this action include a description of the proposed measures; the reasons why such measures are necessary; and the biological, economic, and social impacts of the proposed measures. The information in the EA is useful to understand the rationale for the action, along with the anticipated impacts associated with the proposed measures. The Federal Register notice provides a summary of the information contained in the EA to inform interested public of the scope and purpose of the proposed measures and to define regulations that implement such measures. The proposed measures, except for those measures identified as problematic, are consistent with the Pacific Coast Groundfish FMP, the conservation and management goals of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and other applicable law.

The proposed measures are based upon the most recent fishery information, including the 2016 Stock Assessment and Fishery Evaluation (SAFE) report, the 2014 Economic Data Collection program, the 2015 West Coast Groundfish Observer Program (WCGOP) catch tables (fishing years 2002-2014), and 2015-2017 electronic monitoring exempted fishing permits. The EA also includes data summarizing the status of the stocks; recent characteristics of the fishery, including the number of permits, trips, gear types deployed, etc.; fishing revenues from recent fishing years; and an assessment of the impacts of proposed measures. The proposed management measures included in the regulatory amendment are revisions to existing management tools included in the FMP, in order to achieve the goals and objectives of the FMP. Both the EA and the proposed rule to implement the regulatory amendment will be made available to the public to

review via publication in the Federal Register, along with posting on both the Pacific Fishery Management Council (Council) and NMFS websites.

The Federal Register document that announces the proposed measures, as well as the EA that analyzes the potential impacts of such measures, will be made available in printed publication and on the Internet websites for the NMFS West Coast Regional Office and the Council. Electronic files will use a standard format accessible to all operating systems. The proposed rule provides catch information in pounds and metric tons, consistent with previous groundfish actions.

8.8.2 Integrity of Information Product

Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NOAA Fisheries Service adheres to the standards set out in Appendix III, "Security of Automated Information Resources," of OMB Circular A-130; the Computer Security Act; and the Government Information Security Act. All confidential information (e.g., dealer purchase reports) is safeguarded pursuant to the Privacy Act; Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business, and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

8.8.3 Objectivity of Information Product

Any management action under the Groundfish FMP must comply with the requirements of the MSA; the National Environmental Policy Act; the Regulatory Flexibility Act; the Administrative Procedures Act; the Paperwork Reduction Act; the Coastal Zone Management Act; the Endangered Species Act; the Marine Mammal Protection Act; and Executive Orders 12612 (Federalism), 12630 (Property Rights), 12866 (Regulatory Planning), and 13158 (Marine Protected Areas). NMFS has determined that the proposed rule to implement the measures included in the regulatory amendment, with the exception of those measures identified as problematic, is consistent with the National Standards of the MSA and all other applicable laws. The regulatory amendment used the latest fishery information to develop the proposed management measures. This fishery information is the best scientific information available. In addition, the revised management measures proposed in this action were first developed by the Council's Groundfish Electronic Monitoring Policy (GEMPAC) and Technical Advisory Committees (GEMPTAC), and evaluated by the Council's Scientific and Statistical Committee, Groundfish Management Team (GMT), Groundfish Advisory Panel (GAP), and Enforcement Consultants committee. The draft EA contains updated information describing catch of regulated species and fishing revenue in the fishery based upon information collected through the observer program, electronic monitoring program, and commercial fish ticket databases. Analysis for ESA-listed species reflects current evaluations on the status of these species and how fishing activities will affect the future abundance of these species. Additional information is presented in the EA that has been accepted and published in peer-reviewed journals or by

scientific organizations. Original analyses in the EA were prepared using data from accepted sources. The summary of the impacts of proposed measures in the proposed rule is based upon information in the EA.

National Standard 2 of the MSA requires that the FMP's conservation and management measures shall be based upon the best scientific information available. Analyses of the proposed measures incorporate the most complete data set from recent fishing years that is available to assess the impacts of the proposed measures. These data represent the best information available and are consistent with the principles for evaluating best scientific information available, as proposed in the National Standard 2 Guidelines (74 FR 65724; December 11, 2009) regarding relevance, inclusiveness, objectivity, transparency, timeliness, verification, validation, and peer review. These measures have been determined to be in compliance with National Standard 2 based upon the best scientific information available.

The policy choices (i.e., management measures) that are proposed are supported by the available scientific information whenever possible. The rationale for each measure is outlined in the EA, along with analysis supporting the proposed measures. Further, a description of each measure and the reason for such measures is contained in the proposed rule for this action. The supporting materials and analyses used to develop these measures are contained in readily available documents that are properly referenced in the EA and the proposed rule according to commonly accepted standards for scientific literature to ensure transparency. All of the information used to support this action has been made available to the public via the Internet on the Council's website, and at meetings held by the Council and its advisory bodies.

The development of the regulatory amendment involved the Council, Northwest Fisheries Science Center (Center), the West Coast Regional Office, and NMFS Headquarters. The development of management measures was conducted by the Council's advisory bodies that include biologists and economists from non-governmental organizations, state agencies, and the Center, policy analysts from both the Council and NMFS, and others of particular expertise from outside organizations such as the University of Washington. Once completed, a review of the EA is conducted by scientists at the Center with specialties in biology and fisheries sampling methods. Review by staff at the Regional Office is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and knowledge of applicable law. Final approval of the regulatory amendment and clearance of the proposed rule is conducted by staff at NMFS Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget. Each of these reviews is conducted by specialists who routinely work with fishery management plans and are familiar with the management of the groundfish fishery.

8.9 Executive Order 13175 (Tribal Government)

EO 13175 is intended to ensure regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates upon Indian tribes. The Secretary recognizes the sovereign status and co-manager role of Indian tribes over shared Federal and tribal fishery resources. In Section 302(b)(5), the MSA reserves a seat on the Council for a representative of an Indian tribe

with federally recognized fishing rights from California, Oregon, Washington, or Idaho. The U.S. government formally recognizes the four Washington coastal tribes (Makah, Quileute, Hoh, and Quinault) that have treaty rights to fish for groundfish. In general terms, the quantification of those rights is 50 percent of the harvestable surplus of groundfish available in the tribes' usual and accustomed fishing areas (described at 50 CFR 660.324). Each of the treaty tribes has the discretion to administer its fisheries and to establish its own policies to achieve program objectives. The proposed action would not affect treaty tribe vessels. However, the treaty tribes had opportunity to participate in the development of the proposed action through the tribal appointment on the Council and the public comment at Council meetings.

8.10 Migratory Bird Treaty Act (MBTA)

The MBTA of 1918 was designed to end the commercial trade of migratory birds and their feathers that, by the early years of the 20th century, had diminished the populations of many native bird species. The MBTA states that it is unlawful to take, kill, or possess migratory birds and their parts (including eggs, nests, and feathers), and it is a shared agreement between the United States, Canada, Japan, Mexico, and Russia to protect a common migratory bird resource. The MBTA prohibits the directed take of seabirds, but the incidental take of seabirds does occur. This action does not conflict with the provisions implemented to protect migratory birds. Vessels participating in Pacific Coast groundfish fishery rarely interact with migratory birds or their habitat, and those that do would continue to be required to comply with measures implemented to reduce or mitigate the injury or mortality of migratory birds.

8.11 Executive Order 13132 (Federalism)

EO 13132, which revoked EO 12612, an earlier federalism EO, enumerates eight "fundamental federalism principles." The first of these principles states "Federalism is rooted in the belief that issues that are not national in scope or significance are most appropriately addressed by the level of government closest to the people." In this spirit, the EO directs agencies to consider the implications of policies that may limit the scope of or preempt states' legal authority. Preemptive action having such "federalism implications" is subject to a consultation process with the states; such actions should not create unfunded mandates for the states; and any final rule published must be accompanied by a "federalism summary impact statement." : The proposed action does not have federalism implications subject to EO 13132.

8.12 Executive Order 12866 (Regulatory Impact Review) and Regulatory Flexibility Act

EO 12866, Regulatory Planning and Review, covers a variety of regulatory policy considerations and establishes procedural requirements for analysis of the benefits and costs of regulatory actions. It directs agencies to choose those approaches that maximize net benefits to society, unless a statute requires another regulatory approach. The agency must assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only after a reasoned determination that the benefits of the intended regulation justify the costs. In reaching its decision, the agency must use the best reasonably obtainable information, including scientific, technical and economic data, about the

need for and consequences of the intended regulation. NMFS requires the preparation of a regulatory impact review (RIR) for all regulatory actions of public interest. The purpose of the analysis is to ensure that the regulatory agency systematically and comprehensively considers all available alternatives, so that the public welfare can be enhanced in the most efficient and cost-effective way. The RIR addresses many of the items in the regulatory philosophy and principles of EO 12866. Pursuant to the procedures established to implement section 6 of E.O. 12866, the Office of Management and Budget has determined that this proposed rule is not significant.

The Regulatory Flexibility Act requires government agencies to assess the effects that regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those effects. For RFA purposes only, NMFS has established a small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing (see 50 CFR 200.2). A business primarily engaged in commercial fishing (NAICS code 11411) is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of \$11 million for all its affiliated operations worldwide. For for-hire fishing and fish processing entities, the Small Business Administration (SBA) defines a small business as one that is: independently owned and operated; not dominant in its field of operation; has annual receipts not in excess of \$7.0 million in the case of for-hire fishing entities; or if it has fewer than 500 employees in the case of fish processors, or 100 employees in the case of fish dealers. If the projected impact of the regulation exceeds \$100 million, it may be subject to additional scrutiny by the Office of Management and Budget.

NMFS prepared an RIR/IRFA to accompany the proposed rule and EA that is available on the West Coast Region's website:

http://www.westcoast.fisheries.noaa.gov/fisheries/groundfish_catch_shares/electronic_monitoring.html. The IRFA describes the economic impact this proposed rule, if adopted, would have on small entities. Each of the statutory requirements of section 603(b) and (c) have been addressed and is summarized in the Classification section of the proposed rule. Pursuant to the procedures established to implement section 6 of E.O. 12866, the Office of Management and Budget has determined that the proposed rule is not significant. NMFS also prepared a final RIR/FRFA to accompany the final rule and EA that is available from the West Coast Region. Each of the statutory requirements of section 603(b) and (c) have been addressed and is summarized in the Classification section of the proposed and final rules.

9.0 REFERENCES

Agostini, V. N., R. C. Francis, A. B. Hollowed, S. D. Pierce, C. Wilson, and A. N. Hendrix. 2006. The relationship between Pacific hake (*Merluccius productus*) distribution and poleward subsurface flow in the California Current system. *Canadian Journal of Fisheries and Aquatic Sciences* 63:2648-2659.

Al-Humaidhi, A., Colpo, D., Donovan, C., and Easton, R. 2014. Final Report Electronic Monitoring Program: Review of the 2013 Season. 36 pp. Available at: http://www.pcouncil.org/wp-content/uploads/F2b_PSMFC_Rpt_JUNE2014BB.pdf.

- Allen, M. J. 1982. Functional structure of soft-bottom fish communities of the southern California shelf. Ph.D Dissertation. University of California.
- Allen, M. J. and G. B. Smith. 1988. Atlas and zoogeography of common fishes in the Bering Sea and northeastern Pacific.
- Archibald, C., P. D. Fournier, and B. M. Leaman. 1983. Reconstruct of stock history and development of rehabilitation strategies for Pacific ocean perch in Queen Charlotte Sound, Canada. *N. Amer. J. Fish. Mgmt.* 3:283-294.
- Auster, P. J. 2005. Are deep water corals important habitat for fishes? In A. Freiwald and J.M. Roberts (editors) *Coldwater corals and ecosystems*. Springer Berlin Heidelberg: New York. pp. 747-760.
- Bailey, K. M. 1982. The early life history of the Pacific hake, *Merluccius productus* *Fish.Bull.* 80:589-598. Bailey, K. M., R. C. Francis, and P. R. Stevens. 1982. The life history and fishery of Pacific whiting, *Merluccius productus* *Calif.Coop.Oceanic Fish.Invest.Rep.* 23:81-98.
- Banas, N.S., P. MaCready and B.M Hickey. 2008. The Columbia River plume as cross-shelf exporter and along-coast barrier. *Continental Shelf Research* 29(1): 292-301.
- Beamish, R. J. and G. A. McFarlane. 1988. Resident and dispersal behavior of adult sablefish (*Anoplopoma fimbria*) in the slope waters off Canada's West Coast. *Can.J.Fish.Aquat.Sci.* 45:152-164.
- Boehlert, G. W. and M. Y. Yoklavich. 1985. Larval and juvenile growth of sablefish *Anoplopoma fimbria* as determined from otolith increments. *Fish.Bull.* 83:475-481.
- Botsford, L. and C.A. Lawrence. 2002. Patterns of covariability among California Chinook salmon, Coho salmon, Dungeness crab, and physical oceanographic conditions. *Progress in Oceanography* 53: 283-305.
- Brodeur, R. D., I. A. Fleming, J. M. Bennett, and M. A. Campbell. 2009. Summer distribution and feeding of spiny dogfish off the Washington and Oregon coasts. in V. F. Gallucci, G. A. McFarlane, and G. G. Bargmann, editors. *Biology and Management of Dogfish Sharks*. American Fisheries Society.
- Cailliet, G. M., E. K. Osada, and M. Moser. 1988. Ecological studies of sablefish in Monterey Bay. *Calif. Dept. Fish and Game* 74:133-153.
- Caretta, J.V., K.A. Forney, E.M. Oleson, D.W. Weller, A.R. Lang, J. Baker, M.M. Muto, B. Hanson, A.J. Orr, H. Huber, M.S. Lowry, J. Barlow, J.E. Moore, D. Lynch, L. Carswell, R.L. Brownell Jr. 2017. U.S. Pacific Marine Mammal Stock Assessments. NOAA Tech. Memo. NMFS F/SWFSC-577.

- Checkley, D.M. and J.A. Barth. 2009. Patterns and processes in the California Current System. *Progress in Oceanography* 83: 49–64.
- Cortes, E. 2002. Incorporating uncertainty into demographic modeling: Application to shark populations and their conservation. *Conservation Biology* 16:1048-1062.
- Dark, T. A. and M. E. Wilkins. 1994. Distribution, abundance, and biological characteristics of groundfish off the coast of Washington, Oregon and California, 1977-1986. NOAA.
- Dorn, M. W. and R. D. Methot. 1991. Status of the coastal Pacific whiting resource in 1990. NOAA Tech.Memo NMFS F/AFSC-47.
- Dorn, M. W. and R. D. Methot. 1992. Status of the coastal Pacific whiting resource in 1992. in. Pacific Fishery Management Council, Portland, Oregon.
- Dorn, M. 1995. Effects of age composition and oceanographic conditions on the annual migration of Pacific whiting, *Merluccius productus* Calif.Coop.Oceanic Fish.Invest.Rep. 36:97-105.
- Ebert, D. D., W. T. White, K. J. Goldman, L. J. V. Compagno, T. S. Daly-Engel, and R. D. Ward. 2010. Resurrection and redescription of *Squalus suckleyi* (Girard, 1854) from the North Pacific, with comments on the *Squalus acanthias* subgroup (Squaliformes: Squalidae). *Zootaxa* 2612:22-40.
- Eschmeyer, W. N., E. S. Herald, and H. Hammon. 1983. *A Field Guide to Pacific Coast Fishes of North America*. Houghton Mifflin, Boston.
- Etnoyer, P. and L. Morgan. 2005. Habitat-forming deep-sea corals in the Northeast Pacific Ocean. In A. Freiwald and J.M. Roberts (editors). *Cold-water corals and ecosystems* Springer, New York, NY. pp. 331-343.
- Fiscus, C. H. 1979. Interactions of marine mammals and Pacific hake. *Mar.Fish.Rev.* 41:1-9
- Francis, R. C., J.E. Little and J.A. Bloeser. 2009. Matching spatial scales of ecology, economy, and management for groundfish of the US West Coast marine ecosystem: a state of the science review. A report to the Lensfest Ocean Program at the Pew Charitable Trusts. <http://nsgl.gso.uri.edu/washu/washut09008.pdf>.
- Gertseva, V., S. E. Matson, and E. Councill. 2015. Status of the darkblotched rockfish resource off the continental U.S. Pacific Coast in 2015. Pacific Fishery Management Council, Portland, OR.
- Gunderson, D. R. 1971. Reproductive patterns of Pacific ocean perch (*Sebastes alutus*) off Washington and British Columbia and their relation to bathymetric distribution and seasonal abundance. *J.Fish.Res.Board Canada* 28:417-425.
- Hart, J. L. 1988. Pacific Fishes of Canada. *Bull.Fish.Res.Bd.Canada* 180:1-730.

Heifetz, J., J. N. Ianelli, D. M. Clausen, D. L. Courtney, and J. T. Fujioka. 2000. Slope rockfish. in Stock assessment fishery evaluation report for the groundfish resources of the Gulf of Alaska as projected for 2001. North Pacific Fishery Management Council, Anchorage.

Herke, W. H. and B. D. Rogers. 1993. Maintenance of the estuarine environment. In C. C. Kohler and W. A. Hubert (editors) *Inland Fisheries Management in North America*. American Fisheries Society, Bethesda, Maryland. pp. 263-286.

Hickey, B.M. and N.S. Banas. 2008. Why is the northern end of the California Current system so productive? *Oceanography* 21(4): 90-107.

Holden, M. J. 1974. Problems in the rational exploitation of elasmobranch populations and some suggested solutions. Pages 117-137 in *Sea Fisheries Research*. John Wiley & Son, New York, NY.

Hollowed, A. B. 1992. Spatial and temporal distribution of Pacific hake, *Merluccius productus*, larvae and estimates of survival during early life stages. *Calif.Coop.Oceanic Fish.Invest.Rep.* 33:100-123.

Hoss, D. E. and G. W. Thayer. 1993. The importance of habitat to the early life history of estuarine dependent fishes. *American Fisheries Society Symposium* 14:147-158.

Ito, D. H., D. K. Kimura, and M. E. Wilkins. 1986. Appendix 3: Current status and future prospects for the Pacific ocean perch resource in waters off Washington and Oregon. in *Status of the Pacific coast groundfish fishery through 1986 and recommended acceptable biological catches for 1987*. Pacific Fishery Management Council, Portland, OR.

Johnson, K. F., M. B. Rudd, M. Pons, C. A. Akselrud, Q. Lee, F. Hurtado-Ferro, and coauthors. 2015. Status of the U.S. sablefish resource in 2015. Pacific Fishery Management Council, Portland, OR.

Kendall, A. W., Jr. and A. C. Matarese. 1987. Biology of eggs, larvae, and epipelagic juveniles of sablefish, *Anoplopoma fimbria*, in relation to their potential use in management. *Marine Fisheries Review* 49:1-13.

King, J. R. and G. A. McFarlane. 2003. Marine fish life history strategies: applications to fishery management. *Fisheries Management and Ecology* 10:249-264.

Love, M. S. 1996. *Probably more than you want to know about the fishes of the Pacific Coast*. Really Big Press, Santa Barbara, California.

Love, M. S., P. Morris, M. McCrae, and R. Collins. 1990. Life history aspects of 19 rockfish species (*Scorpaenidae: Sebastes*) from the southern California bight.

- Love, M. S., M. Yoklavich, and L. Thorsteinson. 2002. The rockfishes of the northeast Pacific. University of California Press, Berkeley, California.
- Mann, K.H., and J.R.N. Lazier. 1996. Dynamics of Marine Ecosystems. Blackwell, Cambridge
- Hickey, B.M. 1998. Coastal oceanography of Western North America from the tip of Baja California to Vancouver Island. In A.R. Robinson and K.H. Brink (editors) *The Sea*, Volume 11. John Wiley and Sons: New York.
- Marliave, J.B., K.W. Conway, D.M. Gibbs, A. Lamb, and C. Gibbs. 2009. Biodiversity and rockfish recruitment in sponge gardens and bioherms of southern British Columbia, Canada. *Marine Biology* 156: 2247-2254.
- Mason, J. C., R. J. Beamish, and G. A. McFarlane. 1983. Sexual maturity, fecundity, spawning, and early life history of sablefish (*Anoplopoma fimbria*) in waters off the Pacific coast of Canada. *Canadian Journal of Fisheries and Aquatic Sciences* 40:2621-2134.
- MBC. 1987. Ecology of important fisheries species offshore California. Minerals Management Service, Pacific Outer Continental Shelf Region, Washington, D.C.
- McFarlane, G. A. and R. Beamish. 1983a. Preliminary observations on the juvenile biology of sablefish (*Anoplopoma fimbria*) off the west coast of Canada. in *Proceedings of the International Sablefish Symposium*. Alaska Sea Grant Report 83-3.
- McFarlane, G. A. and R. J. Beamish. 1983b. Biology of adult sablefish (*Anoplopoma fimbria*) in waters off western Canada. Alaska Sea Grant College Program, University of Alaska, Anchorage, 1983.
- McFarlane, G. A. and R. J. Beamish. 1986. Biology and fishery of Pacific hake, *Merluccius productus*, in the Strait of Georgia. *Int.N.Pac.Fish.Comm.Bull.* 50:365-392.
- Miller, D. J. and R. N. Lea. 1972. Guide to the coastal marine fishes of California. *Calif.Dept.Fish and Game, Fish.Bull.* 157:249.
- NMFS (National Marine Fisheries Service). 1999. Section 7 Consultation. Fishing Conducted under the Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery. Sustainable Fisheries Division, Northwest Region, Seattle, December 15, 1999. 68 pp.
- NMFS. 2005. Pacific Coast Groundfish Fishery Management Plan Essential Fish Habitat Designation and Minimization of Adverse Impacts Final Environmental Impact Statement. National Marine Fisheries Service, Northwest Region, Seattle, WA.
- NMFS. 2006. Reinitiation of Section 7 Consultation Regarding the Pacific Fisheries Management Council's Groundfish Fishery Management Plan. Endangered Species Act Section 7 Consultation – Supplemental Biological Opinion. NMFS Sustainable Fisheries Division, Northwest Region, Seattle, March 11, 2006.

NMFS. 2012a. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Section 7(a)(2) "Not Likely to Adversely Affect" Determination; Continuing Operation of the Pacific Coast Groundfish Fishery. National Marine Fisheries Service Northwest Region, Seattle, December 7, 2012, PCTS Number: NWR-2012-876.

NMFS. 2012b. Endangered Species Act Section 7 Consultation – Biological Assessment on the Continued Operation of the Pacific Coast Groundfish Fisheries, Seattle, WA, January 17th, 2012.
NMFS. 1992. Section 7 Consultation -Biological Opinion: Fishing conducted under the Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington groundfish fishery. Northwest Region, Seattle, WA. August 28, 1992. 53 pp.

NMFS. 2017. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion; Reinitiation of Section 7 Consultation Regarding the Pacific Fisheries Management Council's Groundfish Fishery Management Plan, December 11, 2017.

NMFS. 2018a. Pacific Coast Groundfish Fishery 2019–20 Harvest Specifications, Yelloweye Rebuilding Plan Revisions, and Management Measures. National Marine Fisheries Service, West Coast Region, Seattle, December 2016.

NMFS. 2018b. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion Continuing Operation of the Pacific Coast Groundfish Fishery (Reinitiation 2018), October, 12, 2018.

NOAA. 1990. West coast of North America coastal and ocean zones strategic assessment: Data atlas. OMA/NOS, Ocean Assessments Division, Strategic Assessment Branch, NOAA.

NOAA Fisheries. 2017. 2016 West Coast Entanglement Summary, March 2017.

NOAA Fisheries. 2018. 2017 West Coast Entanglement Summary, May 2018.

(NRC) National Research Council. 2002. Effects of trawling and dredging on seafloor habitat. Ocean Studies Board, Division on Earth and Life Studies, National Research Council. National Academy Press, Washington, D.C. 126 p.

(NWFSC) Northwest Fisheries Science Center, At-Sea Hake Observer Program, 2017 Sampling Manual. Fishery Resource Analysis and Monitoring, At-Sea Hake Observer Program. NWFSC, 2725 Montlake Blvd. East, Seattle, Washington 98112.

(NWFSC) Northwest Fisheries Science Center. 2018 Training Manual. West Coast Groundfish Observer Program. NWFSC, 2725 Montlake Blvd. East, Seattle, Washington, 98112. (NWFSC) Northwest Fisheries Science Center, At-Sea Hake Observer Program, 2016 Observer Sampling Manual. Fishery Resource Analysis and Monitoring, At-Sea Hake Observer Program. NWFSC, 2725 Montlake Blvd. East, Seattle, Washington 98112.

O'Connell, V. M. and F. C. Funk. 1986. Age and growth of yelloweye rockfish (*Sebastes ruberrimus*) landed in southeastern Alaska. Pages 171-185 in, volume 87-2. Alaska Sea Grant College Program, Anchorage, Alaska, 1986.

O'Connell, V. M. and D. W. Carlile. 1993. Habitat-specific density of adult yelloweye rockfish *Sebastes ruberrimus* in the eastern Gulf of Alaska. *Fish.Bull.* 91:304-309.

Orr, J. W., M. A. Brown, and D. C. Baker. 1998. Guide to Rockfishes (Scorpaenidae) of the Genera *Sebastes*, *Sebastolobus*, and *Adelosebastes* of the Northeast Pacific Ocean

(PFMC) Pacific Fishery Management Council. 2006. Groundfish FMP Chapter 6, Amendment 19.

PFMC. 2010. Rationalization of the Pacific coast groundfish limited entry trawl fishery [FMP Amendment 20] Final Environmental Impact Statement. Pacific Fishery Management Council and National Marine Fisheries Service, Portland, OR.

PFMC. 2013. Pacific Fishery Ecosystem Plan for the U.S. Portion of the California Current Large Marine Ecosystem. Pacific Fishery Management Council, Portland (OR), July 2013.

(PFMC) Pacific Fishery Management Council. 2012. Groundfish Essential Fish Habitat Review Committee. 2012. Pacific Coast Groundfish 5- Year Review of Essential Fish Habitat Report to the Pacific Fishery Management Council, Phase 1: New Information, August 23, 2012.

(PFMC) Pacific Fishery Management Council. 2014. Status of the Pacific Coast Groundfish Fishery: Stock Assessment and Fishery Evaluation. December 2014. Available at: http://www.pcouncil.org/wp-content/uploads/2015/03/SAFE_Dec2014_v12.pdf

(PFMC) Pacific Fishery Management Council. 2016. Draft Status of the Pacific Coast Groundfish Fishery: Stock Assessment and Fishery Evaluation. April 2016. Available at: http://www.pcouncil.org/wp-content/uploads/2016/03/F3_Att3_SAFE_Apr2016_ElectronicOnly_APR2016BB.pdf.

PFMC and NMFS. 2015. Proposed Harvest Specifications and Management Measures for the 2015-2016 Pacific Coast Groundfish Fishery and Amendment 24 to the Pacific Coast Groundfish Fishery Management Plan to Establish a Process for Determining Default Harvest Specifications, Final Environmental Impact Statement. National Marine Fisheries Service, Northwest Region, Seattle, WA, January 25. 1089 pp.

Phillips, J. B. and S. Inamura. 1954. The sablefish fishery of California. *Pac. Mar. Fish. Comm. Bull.* 3:5-38.

Richardson, S. L. and W. A. Laroche. 1979. Development and occurrence of larvae and juveniles of the rockfishes *Sebastes cramerii* , *Sebastes pinniger* , and *Sebastes helvomaculatus* (Family Scorpaenidae) off Oregon. *Fish.Bull.* 77:1-46.

Rosenthal, R. J., L. Haldorson, L. J. Field, V. Moran-O'Connell, M. G. LaRiviere, J. Underwood, and coauthors. 1982. Inshore and shallow offshore bottomfish resources in the southeastern Gulf of Alaska (1981-1982). Alaska Dept. Fish and Game, Juneau, Alaska.

Sakuma, K. M. and S. Ralston. 1995. Distribution patterns of late larval groundfish off central California in relation to hydrographic features during 1992 and 1993. Calif.Coop.Oceanic Fish.Invest.Rep. 36:179-192.

Saunders, M. W. and G. A. McFarlane. 1993. Age and length at maturity of the female spiny dogfish, *Squalus acanthias*, in the Strait of Georgia, British Columbia, Canada. Environ.Biol.Fish. 38:49- 57.

Sherr, E. B., B.F. Sherr and P.A.Wheeler. 2005. Distribution of coccoid cyanobacteria and small eukaryotic phytoplankton in the upwelling ecosystem off the Oregon coast during 2001 and 2002. Deep Sea Research II 52(1): 317-330.

Smith, P. E. 1995. Development of the population biology of the Pacific hake, *Merluccius productus* Calif.Coop.Oceanic Fish.Invest.Rep 36:144-152.

Smith, S. E., D. W. Au, and C. Show. 1998. Intrinsic rebound potentials of 26 species of Pacific sharks. Marine and Freshwater Research 49:663-678.

Sumida, B. Y. and H. G. Moser. 1984. Food and feeding of Bocaccio and comparison with Pacific hake larvae in the California current. Calif.Coop.Oceanic Fish.Invest.Rep. 25:112-118.

Stevenson, D., L. Chiarella, D. Stephan, R. Reid, K. Wilhelm, J. McCarthy, and M. Pentony. 2004. Characterization of the fishing practices and marine benthic ecosystems of the northeast U.S. shelf, and an evaluation of the potential effects of fishing on essential fish habitat. NOAA Tech. Memo. NMFS-NE-181. 179 p.

Stewart, I. J., J. T. Thorson, and C. Wetzel. 2011. Status of the U.S. sablefish resource in 2011. Pacific Fishery Management Council, Portland, OR

Suryan, R.M., G.R., Balogh, and K.N. Fischer. 2007. Marine Habitat Use of North Pacific Albatross During the Non-breeding Season and Their Spatial and Temporal Interactions with Commercial Fisheries in Alaska. North Pacific Research Board Project 532 Final Report. 69 pp. (Balogh and Suryan 2005,

Tagart, J.V. 1987. Description of the Washington State fishery for widow rockfish. pp 11-12. In: Widow rockfish proceedings of a workshop, Tiburon, California, December 11-12, 1980, ed.

Taylor, I. G. 2008. Modeling spiny dogfish population dynamics in the Northeast Pacific. University of Washington, Seattle, WA.

Taylor, I.G., C. Grandin, A.C. Hicks, N. Taylor, and S. Cox. 2015. Status of the Pacific Hake (whiting) stock in U.S. and Canadian waters in 2015. Prepared by the Joint Technical Committee

of the U.S. and Canada Pacific Hake/ Whiting Agreement; National Marine Fishery Service; Canada Department of Fisheries and Oceans. 159 p.

Tissot, B.N., M.M. Yoklavich, M.S. Love, K. York, and M. Amend. 2006. Benthic invertebrates that form habitat on deep banks off southern California, with special reference to deep sea corals. *Fishery Bulletin* 104: 167-181.

USFWS (United States Fish and Wildlife Service). 2008. Short-tailed albatross recovery plan. Anchorage, AK, 105 pp.

USFWS (United States Fish and Wildlife Service). 2017. Biological Opinion Regarding the Effects of the Continued Operation of the Pacific Coast Groundfish Fishery as Governed by the Pacific Coast Fishery Management Plan and Implementing Regulations at 50 CFR Part 660 by the National Marine Fisheries Service on California Least Tern (*Sterna antillarum browni*), Southern Sea Otter (*Enhydra lutris nereis*), Bull trout (*Salvelinus confluentus*), Marbled Murrelet (*Brachyramphus marmoratus*), and Short-tailed Albatross (*Phoebastria albatrus*). United States Fish and Wildlife Service, Oregon Fish and Wildlife Office, Portland (OR), May 2, 2017, FWS Reference Number 01EOW00-2017-F-0316.

Whitmire, C.E. and Clarke M.E. 2007. State of Deep Coral Ecosystems of the U.S. Pacific Coast: California to Washington. pp. 109-154. In S.E. Lumsden, Hourigan T.F., Bruckner A.W. and Dorr G. (editors) *The State of Deep Coral Ecosystems of the United States*. NOAA Tech. Memo., CRCP-3, Silver Spring, MD 365 pp.
http://coris.noaa.gov/activities/deepcoral_rpt/Chapter3_PacificCoast.pdf

W.H. Lenarz and D.R. Gunderson. U.S. Dept. Commerce, NOAA Tech. Rept. NMFS 48:57 p.
Ebert, D. A. 2003. *Sharks, Rays and Chimaeras of California*. University of California Press, Berkeley, CA.

Williams, E.H. and S. Ralston. 2002. Distribution and co-occurrence of rockfishes (family: Sebastidae) over trawlable shelf and slope habitats of California and southern Oregon. *Fishery Bulletin* 100: 836-855.

Wiseman, W.J. Jr., and R. W. Garvine. 1995. Plumes and coastal currents near large river mouths. *Estuaries*. 18(3): 509-517.