Amendment 29 to the Pacific Coast Groundfish Fishery Management Plan and 2021-2022 Harvest Specifications and Management Measures

Preliminary Draft Environmental Assessment/Regulatory Impact Review

July 2020

Abstract:

This document considers environmental effects resulting from setting 2021-2022 groundfish harvest specifications and establishing related management measures under the Pacific Coast Groundfish Fishery Management Plan (PCGFMP). The Pacific Fishery Management Council (Council) in collaboration with the National Marine Fisheries Service adopt groundfish harvest specifications every two years for a biennial period/cycle, adjusting management measures for the groundfish fisheries, and implement new management measures to provide additional tools for fishery management. In addition to harvest specifications and management measures for the 2021-2022 biennium, this document evaluates the long-term impacts of changing the Council's default harvest control rule for cowcod, shortbelly rockfish, sablefish, Oregon black rockfish, and petrale sole. Included in the suite management measures included detailed in this document are allocation adjustments to widow rockfish, petrale sole, lingcod South of 40°10'N. lat., and the Slope Rockfish Complex South of 40°10' N. lat, all of which were allocated under Amendment 21 to the PCGFMP.

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Contents

Table of Tables

Table of Figures

Acronyms and Abbreviations

ABC	Acceptable biological catch
ACL	Annual catch limit
ACS	American Community Survey
ACT	Annual catch target
AFSC	Alaska Fisheries Science Center
AM	Accountability measure
APA	Administrative Procedures Act
B_0	Biomass, unfished
BIOP	Biological opinion
BRA	Bycatch reduction area
BRD	Bycatch reduction device
CalCOFI	California Cooperative Oceanic Fisheries Investigations
CA/OR/WA	California, Oregon, and Washington
CCA	Cowcod Conservation Area
CCE	California Current Ecosystem
CCIEA	California Current Integrated Ecosystem Assessment
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CP	Catcher-processor
CPFV	Commercial passenger fishing vessel
CPS	Coastal pelagic species
CPUE	Catch per unit of effort
CRFS	California Recreational Fisheries Survey
CV	Coefficient of variation
CZMA	Coastal Zone Management Act
DB-SRA	Depletion-based stock reduction analysis
DCAC	Depletion-corrected average catch
DEIS	Draft Environmental Impact Statement
DO	Dissolved oxygen
DPS	Distinct population segment
DTL	Daily trip limit (fishery)
DTS	Dover sole, thornyheads, and sablefish
E	Exploitation
EA	Environmental Assessment
EC	Ecosystem component
EDC	Economic Data Collection (Program)
EEZ	Exclusive Economic Zone
EFH	Essential fish habitat
EFHRC	Essential Fish Habitat Review Committee
EFP	Exempted fishing permit
EIS	Environmental Impact Statement
ENSO	El Niño Southern Oscillation
EO	Executive Order
ESA	Endangered Species Act
ESU	Evolutionary significant unit
EwE	Ecopath with Ecosim
F	Fishing mortality
FEIS	Final Environmental Impact Statement
FEP	Fishery Ecosystem Plan

FM	Fathom or fathoms
FMP	Fishery Management Plan
GAP	Groundfish Advisory Subpanel
GCA	Groundfish Conservation Area
GIS	Geographic information system
GMT	Groundfish Management Team
h	Stock-recruitment steepness parameter
HA	Hectares
HAPC	Habitat Areas of Particular Concern
HCR	Harvest control rule
HG	Harvest guideline
HMS	Highly Migratory Species
IBQ	Individual bycatch quota
ID	Identification
IEA	Integrated Ecosystem Assessment
IFQ	Individual fishing quota
IOPAC	Input-output model for Pacific Coast fisheries
IPCC	Intergovernmental Panel on Climate Change
ITS	Incidental take statement
IUCN	International Union for the Conservation of Nature
LE	Limited entry
LEFG	Limited entry fixed gear
LOF	List of Fisheries
M	Instantaneous rate of natural mortality
MBTA	Migratory Bird Treaty Act
MEI	Multivariate ENSO Index
MFMT	Maximum Fishing Mortality Threshold
MHHW	Mean higher high water level
MMPA	Marine Mammal Protection Act
MPA	Marine Protected Area
MRFSS	Marine Recreational Fisheries Statistical Survey
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSE	Management strategy evaluation
MSST	Minimum Stock Size Threshold
MSY	Maximum sustainable yield
MT	Metric ton
MTC	Mean temperature of catch
MTL	Mean trophic level
NAO	NOAA Administrative Order
NEPA	National Environmental Policy Act
NID	Negligible Impact Determination
NMFS	National Marine Fisheries Service
NMNU	Non-market and non-use
NOI	Notice of Intent
NORPAC	North Pacific Database Program
NPGO	North Pacific Gyre Oscillation
NWFSC	Northwest Fisheries Science Center
OA	Open access
ODFW	Oregon Department of Fish and Wildlife
OFL	Overfishing limit
OFS	Overfished species

ORBS	Ocean Recreational Boat Survey
OY	Optimum yield
P*	Overfishing probability
PacFIN	Pacific Fisheries Information Network
PBR	Potential biological removal
PCGW	Pacific Coast Groundfish and Endangered Species Workgroup
PDO	Pacific Decadal Oscillation
PMFC	Pacific Fishery Management Council (used in references)
POP	Pacific ocean perch
PPA	Preliminary Preferred Alternative
PR	Private/rental boats
PRD	NMFS Protected Resources Division
PSA	Productivity-susceptibility analysis
QP	Quota pounds
QS	Quota share
QSM	Quota species monitoring
Rec	Recreational
RecFIN	Recreational Fisheries Information Network
RBS	Rougheye/blackspotted/shortraker (rockfish complex)
RCA	Rockfish Conservation Area
RCG	Rockfish, cabezon, and greenling
RES	Research
RIR	Regulatory Impact Review
SAFE	Stock Assessment and Fishery Evaluation
SCWC	South and Central Washington Coast
SFD	Sustained Fisheries Division
SPID	Species identification code
SPR	Spawning potential ratio
SSC	Scientific and Statistical Committee
STAR	Stock Assessment Review
SWFSC	Southwest Fisheries Science Center
TAC	Total allowable catch
TCEY	Total constant exploitation yield
USFWS	United States Fish and Wildlife Service
V	Vulnerability
VMS	Vessel monitoring system
WCGOP	West Coast Groundfish Observer Program
WCR	West Coast Region
WDFW	Washington Department of Fish and Wildlife
WOC	Washington, Oregon, and California
XDB-SRA	Extended Depletion-based Stock Reduction Analysis
YOY	Young-of-the-year
YRCA	Yelloweye rockfish Conservation Area

1. Introduction

1.1 Preface

This document considers environmental effects resulting from setting groundfish harvest specifications and establishing related management measures under the Pacific Coast Groundfish Fishery Management Plan (hereafter, PCGFMP). The Pacific Fishery Management Council (Council) in collaboration with the National Marine Fisheries Service (NMFS) adopt groundfish harvest specifications every two years for a biennial period/cycle, adjusting management measures for the groundfish fisheries, and implement new management measures to provide additional tools for fishery management. In addition to harvest specifications and management measures for the 2021-2022 biennium, this document evaluates the long-term impacts of changing the Council's default harvest control rule for a stock or stock complex . These actions must conform to the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the principal legal basis for fishery management within the Exclusive Economic Zone (EEZ). This document fulfills all of the requirements for the National Environmental Policy Act (NEPA), the Magnuson-Stevens Fishery Conservation Act (MSA), Executive Order (EO) 12866, and the Regulatory Flexibility Act (RFA) for the Pacific Coast Groundfish Fishery 2021–22 Harvest Specifications and Management Measures.

Under NEPA, the longer-term framework and environmental impacts were disclosed in the Harvest Specifications and Management Measures for 2015-2016 and Biennial Periods Thereafter Final Environmental Impact Statement (EIS) (PFMC and NMFS 2015; hereafter, "the 2015 EIS"). This biennial period is the third since the 2015 EIS. Since then, NMFS has published two EAs which examined the proposed changes to the default harvest control rule and management measures, specifically Final EA for Pacific Coast Groundfish Harvest Specifications and Management Measures for 2017-2018, and Amendment 27 to the Pacific Coast Groundfish Fishery Management Plan (NMFS 2016) and Final Environmental Assessment for the 2019–20 (PFMC and NMFS, 2018)

This proposed action includes setting harvest specification and management measures for the 2021-2022 biennial period and revising Federal regulations at 50 CFR §660, Subparts C through G, accordingly. Using the best scientific information available, the Council considers harvest specifications every two years, including OFLs, acceptable biological catches (ABC), and ACLs for each management unit[1]. The Council determines the necessity of adjusting harvest specifications, rebuilding plans, and/or management measures to achieve but not exceed ACLs. As of 2019, only one Pacific Coast groundfish is designated as a rebuilding stock, yelloweye rockfish. Adjustments to the harvest specifications for a rebuilding stock or any other actively managed stock includes changes to its harvest control rule (HCR)[2]. These activities are consistent with Council policies and procedures established in the PCGFMP and is in compliance with other applicable law. NMFS and the Council support their MSA decisions with an intensive public process that includes meetings, public comments, and release of analytical documents. Details of these processes can be found in Section 1.6.

[1] Management units are stocks occurring throughout the West Coast EEZ (i.e. coastwide), geographic subdivisions of stocks in the EEZ, and geographically subdivided stock complexes composed of more than one managed species.
[2] Harvest control rule is the methods adopted to determine harvest specifications, based on criteria in the MSA and the PCGFMP. Harvest specifications are the numerical values determined by applying the harvest control rule (or harvest policy) to the best available scientific information about the status and characteristics of a stock or management unit

This consolidated document provides assessments of the environmental impacts of an action and its reasonable alternatives (the Environmental Assessment [EA]), how the action meets the requirements of MSA (MSA analysis), the economic benefits and costs of the action alternatives, as well as their distribution (the Regulatory Impact Review [RIR]), and the impacts of the action on directly regulated small entities (the Initial Regulatory Flexibility Analysis [IRFA]). A list of statutory and executive elements is found in Table 1-1. The Policy and Procedure for Compliance with the NEPA and Related Authorities[3] recognizes that the advantages of preparing consolidated documents achieve the following:

> The CEQ regulations require that, to the fullest extent possible, draft NEPA documents should be prepared concurrently with and integrated with environmental impact analyses and related surveys and studies required by other federal statutes (p.22). Additionally, the CEQ regulations allow agencies to combine an environmental document prepared in compliance with NEPA with any other agency document to reduce duplication and paperwork. 40 C.F.R. 1506.4. Thus, the decision maker may combine a NEPA document with related plans, rules, or amendments as a single consolidated document. ... The consolidated document must contain and clearly identify the required sections of the NEPA document and must stand on its own as an analytical document which fully informs decision makers and the public of the environmental effects of the proposal and those of the reasonable alternatives. (Companion Manual for NOAA Administrative Order 216-6A).

Table 1-1. Directory of Statutory and Executive elements in the Consolidated Document for the Pacific Groundfish Fishery 2021–22 Harvest Specifications and Management Measures.

Element	Location
Mandatory elements of a NEPA EA (40 CFR § 1508.9(b) and NOAA Companion Manual for NOAA Administrative Order 216-6A)	
Purpose and Need	Section 1.1
Proposed Action	Section 1.1
Alternatives	Section 2.1 Harvest Specification Alternatives Section 2.2 Management Measure Alternatives
Environmental Effects (Direct, Indirect and Cumulative)	Chapter 4 – Summary of Direct and Indirect Effects Chapter 5 – Cumulative Effects
Finding of No Significant Impact (FONSI)	Chapter 9 -to be completed with final rule
Listing of Agencies and Persons Consulted	Chapter 10
Optional elements of a NEPA EA	
Scoping and Public Input	Section 1.4
Affected Environment	Chapter 3
References	Chapter 11
Elements satisfying other statutory and executive requirements	
Regulatory Impact Review	Chapter 6
Initial Regulatory Flexibility Analysis	Chapter 7
Magnuson-Stevens Act and FMP considerations	Chapter 8

[3] http://www.nepa.noaa.gov/docs/NOAA-NAO-216-6A-Companion-Manual-03012018.pdf

1.2 Proposed Action, Purpose and Need

In accordance with MSA, NMFS' proposed actions consist of the following:

1. Adopt 2021–22 harvest specifications (OFLs, ABCs, and ACLs) and supporting accountability measures using the default harvest control rules for all stocks except Cowcod south of 40'10", Oregon Black Rockfish, Petrale Sole, Sablefish north of 36' N. lat., Shortbelly Rockfish
2. Adopt new default harvest control rules and supporting accountability measures for Cowcod south of 40'10", Oregon Black Rockfish, Petrale Sole, Sablefish north of 36' N. lat., Shortbelly Rockfish

The purpose of these actions are to prevent overfishing, rebuild overfished stocks, ensure conservation, facilitate long-term protection of essential fish habitat (EFH), and realize the full potential of the nation's fishery resources (MSA §2(a)(6)). These actions are needed to respond to new scientific data and information about the needs of fishing communities, to provide additional tools to ensure that annual catch limits (ACL) and other federal harvest guidelines (HGs) are not exceeded, and to afford additional fishing opportunities where warranted. In all cases, the No Action Alternative is also considered. The harvest specifications are set consistent with the optimum yield (OY) harvest management framework described in Chapter 4 of the PCGFMP.

1.3 Tiered NEPA Analysis

NEPA regulations at 40 CFR 1508.28 define "tiering" as follows:

> . . . the coverage of general matters in broad environmental impact statements (such as national program or policy documents) with subsequent narrower statements or environmental analyses (such as regional or basin wide program statements or ultimately site-specific statements), incorporating by reference the general discussion and concentrating solely on the issues specific to the statement subsequently prepared (40 CFR 1508.28).

In 2015, NMFS published the 2015 EIS which analyzed the impacts of implementing harvest specifications and management measures for the 2015–2016 biennial period and the long-term impacts of developing default harvest control rules (DHCR) to set biennial harvest specifications. The proposed action included Amendment 24 to PCGFMP, which articulates a decision framework around default harvest specifications intended to streamline decision making for future biennial periods. PCGFMP Section 5.1 describes both how biennial harvest specifications are set and the default harvest specifications as the application of the best scientific information available to the HCR from the previous biennial period. The default represents the continuation of the existing policy. Unless the Council takes deliberate action to adopt a new HCR, the existing rule rolls over as the basis for harvest specifications in the subsequent biennial period. This decision-making framework is intended to complement the tiering concept; the impacts of a range of harvest control rule (HCR) policies were analyzed in the 2015 EIS. NEPA documents for subsequent biennial periods evaluate changes from default harvest policies established in 2015-16 and environmental impacts outside the range of impacts evaluated in the 2015 EIS. The 2021–22 range is the third biennial period

since preparation of the 2015 EIS, and this EA also considers the actions and related impact analyses in the EAs prepared for the 2017–2018 biennial period (2016 EA) [4] and the 2019-20 biennial period (2018 EA)[5].

1.3.1 Tiered Analysis of Harvest Specifications

The 2015 EIS evaluated the impacts of setting harvest specifications and management measures over the long term by modeling a range of harvest policies over a 10-year period to 2024. The long-term analysis in the 2015 EIS used projections of spawning stock depletion, spawning stock biomass, and total biomass of key assessed groundfish stocks through 2024 under a wide range of HCRs and related harvest specifications.[6] In addition to alternative HCRs, the 2015 EIS analysis encompassed alternative states of nature that captured the key axes of uncertainty in the stock assessments used as the basis for projections. Alternative states of nature represent a likelihood distribution centered on the base case as the most probable state of nature. There are two scenarios under which information or an action is considered new or a departure from what is contained in the 2015 EIS (as updated by the 2016 EA) and is, therefore, analyzed in this document:

> The Council proposes changing an HCR. This constitutes a change in the action and under NEPA, requires an analysis of alternatives. Such a change may or may not result in a catch level that is within the range analyzed in the 2015 EIS. If outside of the range, then the effects of the catch are disclosed in this tiered document.

Updated harvest specifications, usually based on a new stock assessment, may result in the catch level of a stock that is outside of the range previously analyzed (under the assumption that all of the ACL is caught). ACLs may fall outside of the analyzed range due to a change in stock status or other new scientific information, rather than a result of a change in the HCR. This represents a change in baseline conditions anticipated in the 2015 EIS and subsequent analyses of biennial harvest specifications. The stock-specific effects of these ACLs are discussed in Chapter 3.

1.3.2 Tiered Analysis of Management Measures

As discussed in the PCGFMP, management measures are classified as either "routine" or "new," and the accompanying level of analysis differs between these two categories. If the environmental impacts of changes to measures classified as routine were previously analyzed in the 2015 EIS or other EA, then this EA tiers from those analysis. New management measures, by definition, have not been previously analyzed, so this EA presents more detailed impact analysis in all cases.

PCGFMP Section 6.1 and Section 6.2 describe the processes for establishing and adjusting management measures, including the classification of routine measures. Routine management measures are those that the Council determines are likely to be adjusted on an annual or more frequent basis. The Council may classify measures as routine, either through the biennial management process or a rulemaking process. In

[4] The 2016 EA evaluated setting alternative harvest control rules and harvest specifications for darkblotched rockfish, big skate, California scorpionfish, canary rockfish, widow rockfish, and Pacific ocean perch, establishing five new management measures for the 2017–18 biennial period and beyond, revising federal regulations at 50 CFR 660, Subparts C through G, accordingly, and implementing Amendment 27 to the Groundfish FMP.

[5] The 2018 EA evaluated setting alternative harvest control rules and harvest specifications for yelloweye rockfish, California scorpionfish, and lingcod for both north and south of 40°10' N. lat., establishing eight new management measures for the 2019-20 biennial period and beyond, and revising federal regulations at 50 CFR 660, Subparts C through G, accordingly.

[6] For the purposes of the 2015 EIS analysis, it was assumed that the full projected ACLs were harvested, making the total catches comparable to the ACLs over the projection period.

order for a measure to be classified as routine, the impacts and the rationale for their use must be analyzed before their initial implementation as routine measures.

Once a management measure has been classified as routine, and it has been adequately analyzed consistent with applicable law prior to a decision to adjust it, the measure may be modified or adjusted through a simplified rulemaking process. Routine measures are, in the main, mechanisms to control catch so that ACLs are not exceeded. Such measures may include modifications to commercial and recreational trip limits, bag limits, and season dates. For this reason, they require regular adjustment at the outset of the biennial period to align with ACL changes, as well as during the biennial period (as inseason actions), because the conduct of the fishery and resulting harvest cannot be perfectly forecast. By implication, new management measures are those that have not already been classified as routine, including those that the Council does not intend to adjust on a regular basis.

1.4 Amendment 29 to the PCGFMP

In addition to adopting harvest specifications and management measures, the proposed action includes amending the PCGFMP to change allocations of widow rockfish, petrale sole, lingcod south of 40°10 N. lat, and the Slope Rockfish complex, including blackgill rockfish, south of 40°10 from Amendment 21 formula allocation to biennial and to designate shortbelly rockfish an ecosystem component species with a specific monitoring threshold of 2,000 mt that would trigger Council investigation. To implement these changes, the PCGFMP must be amended. These changes are reflected in Section 8.3 and Appendix A

These actions are proposed to prevent overfishing, rebuild overfished stocks, ensure conservation, facilitate long-term protection of essential fish habitat (EFH), and realize the full potential of the nation's fishery resources (MSA §2(a)(6)). These actions are needed to respond to new scientific data and information about the needs of fishing communities, to provide additional tools to ensure that annual catch limits (ACL) and other federal harvest guidelines (HGs) are not exceeded, and to afford additional fishing opportunities where warranted.

1.5 Description of the Management Area

The management area for this action is the Exclusive Economic Zone (EEZ)—defined as 3 nautical miles to 200 nautical miles from state baselines along the coasts of Washington, Oregon, and California and the communities that engage in fishing in waters off these states. Figure 1-1 depicts this management area.

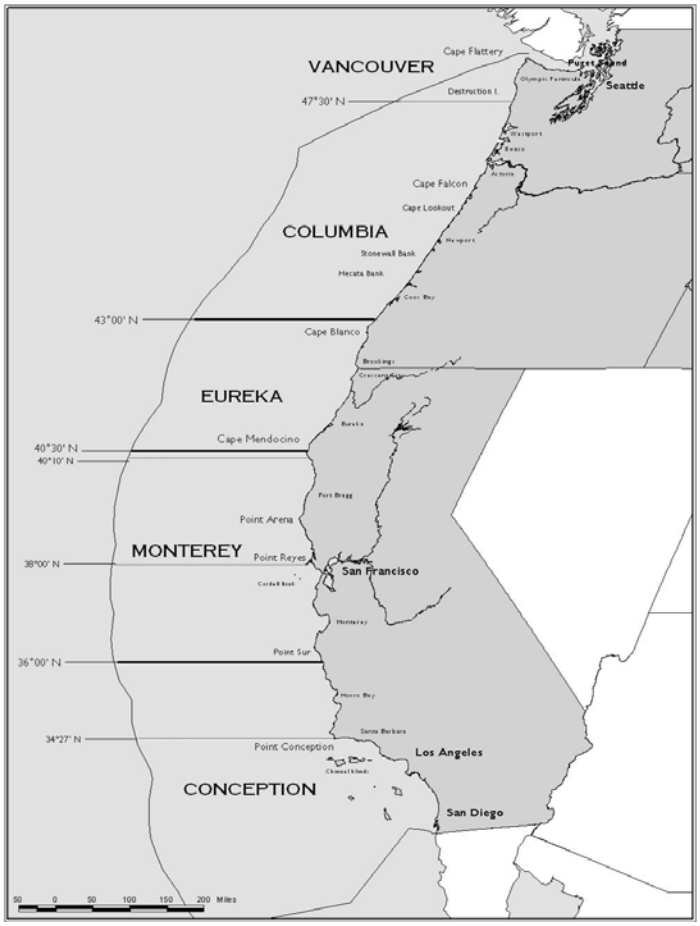

Figure 1-1. Geographic scope of the Pacific Coast Groundfish Fishery Management Plan. (Source PCGFMP, 2018)

1.6 Scoping and Public Input

To evaluate the level of NEPA analysis needed for the 2021–22 harvest specifications and management measures, NMFS examined whether the 2021–22 harvest specifications and management measure adjustments the Council proposed and their anticipated impacts were within the range of impacts are likely to result in significant impacts.

The PCGFMP lays out a five-meeting process for determining biennial harvest specifications (Table 1-2). The following table shows the meetings and what was decided when for the 2021–22 cycle. At each meeting, public input into the development process of the 2021–22 harvest specifications and management measures was invited. Council meetings are noticed in the Federal Register and meetings are broadcast live.

Table 1-2. Summary information of decisions made by the Council for the 2021-2022 harvest specifications and management measure process.

Start Date	Decisions
June 2019	1. A final process and schedule for developing groundfish harvest specifications and management measures for 2021-2022. 2. Initial discussion and guidance on new management measures considered for 2021 and beyond.
September 2019	1. Stock assessments endorsed by the SSC. 2. Final preferred alternatives (FPAs) for OFLs recommended by the SSC, where possible. 3. Alternatives for stocks where there is a desire to explore a departure from default harvest control rules: a. Determine a range of P* values and acceptable biological catches (ABCs), including preliminary preferred alternatives (PPA) for P* values and ABCs. b. A range of ACLs, including PPA ACLs. Preliminary range of new management measures.
November 2019	1. Any rebuilding analyses prepared for overfished species, stock assessments approved for further review, and new impact projection models recommended by the SSC. 2. Any remaining OFLs, stock categories, and sigmas endorsed by the SSC and not adopted at the September Council meeting. 3. FPA for P* values where there are no alternative HCRs decided for analysis. 4. FPA for ABCs where there are no alternative HCRs decided for analysis. 5. A range of ACLs and PPA ACLs if possible. 6. A tentative range of two-year allocation alternatives. 7. Final range of new management measures for detailed analysis necessary to keep catch within or attain a specification or to address a habitat or protected resources concern. Preliminary selection of exempted fishing permits for 2021-2022.
March 2020	At the March Council meeting, the Council and advisory bodies will receive an informational briefing on selected results and provide guidance or take action on emerging issues, as necessary. NMFS will also update the Council on the results of the NEPA scoping and provide a schedule for regulation deeming and FMP transmittal, as necessary.
April 2020	1. FPA for ACLs. 2. PPA for management measures from the range adopted at the November Council meeting. 3. PPA for two-year allocations.
June 2020	1. Corrections to the FPA for harvest specifications, if needed. 2. Final exempted fishing permits for 2021-2022. 3. FPA for allocations. FPA for management measures.

1.7 Public Comments

The public comments that were submitted to the Council regarding this action can be viewed in their entirety at https://pfmc.psmfc.org/. This webpage displays all Council meetings, however for the relevant meetings related to this action are, as follows: June, September, November 2019 and March, April, and June 2020. The comments are found by selecting the appropriate meeting and agenda item.

2. Alternatives

2.1 Description of Alternatives

Chapter 2 describes the alternatives (No Action, Alternative 1, Alternative 2, and Preferred) that could be implemented to manage groundfish fisheries for the 2021-2022 biennial period. The species with proposed changes to their HCR and the Alternatives are shown in Table 2-1. This Chapter is divided into two sections, Section 2.1 describes the alternatives for new harvest specifications and Section 2.2 describes the alternative management measures designed to stay with alternative harvest specifications.

Alternative 2021 and 2022 harvest specifications for stocks under consideration for a modified HCR are analyzed in this EA. Suites of 2021-2022 management measures designed to stay within the ACLs resulting from default and alternative HCRs are also analyzed. New management measures are also analyzed so that they can be considered as routine management measures that can be implemented after a one-meeting Council and NMFS process to adjust management inseason. The Federal rulemaking for implementing these routine management measures can be done without notice and comment since impacts associated with these management measures are analyzed in advance; in this case, in this EA.

Harvest specifications include OFLs, ABCs, and ACLs for all stocks and stock complexes actively managed under the Groundfish FMP. These metrics are described in detail in the Stock Assessment and Fishery Evaluation document, which is incorporated by reference. Management measures are designed to keep the mortality of these stocks and stock complexes at or below the ACLs. Management measures include the allocation of harvest opportunity between commercial and recreational groundfish fisheries, among commercial fishery sectors, and, for the purpose of managing recreational fisheries, among the three West Coast states. Many of these allocations are specified in the FMP, while others are specified as part of the biennial management process. Before these allocations are made, amounts of yield may be deducted from ACLs to account for catches in tribal fisheries, incidental open access (OA) fisheries[7], research activities, and exempted fishing permits (EFPs). These deductions from the ACL are known as off the top deductions. The subsequent amount of catch after these amounts are deducted is known as the fishery harvest guideline.

Table 2-1. Comparison of alternatives for stocks with proposed changes to their default harvest control rule for 2021-2022.

Species	No Action	Alternative 1	Alternative 2	Preferred
Oregon Black Rockfish	• HCR: ACL = ABC (P* = 0.45). • ACL are 479 mt in 2021, 472 mt in 2022.	• HCR: ACL= 2020 ABC (P* = 0.45) • 512 mt ACL for 2021 & 2022. • ACL Increase of 33 mt for 2021 and 38 mt for 2022 over No Action	Not applicable (NA)	Alternative 1 Harvest Specifications

[7] Incidental open access fisheries are those fisheries targeting non-groundfish species that incidentally harvest groundfish.

Species	No Action	Alternative 1	Alternative 2	Preferred
Cowcod	• HCR: ACL = ABC (P* = 0.45). • ACL of 98 mt in 2021 and 96 mt in 2022. • ACL is 88 mt higher than baseline	• HCR: ACL = ABC (P* = 0.40) • ACLs of 84 mt in 2021 and 82 mt in 2022. • ACL is 14 mt lower than under No Action	• HCR: ACL = ABC (P* = 0.30). • ACL of 61mt for 2021 and an ACL of 58 mt for 2022. • ACL is 37 mt lower in 2021 and 38 mt lower in 2022 than under No Action	Alternative 1 Harvest Specifications
Petrale Sole	• HCR: ACL = ABC (P* = 0.45). • ACLs of 4,115 mt for 2021 and 3,660 mt for 2022.	• HCR: ACL = ABC (P* = 0.40) • ACLs of 3,843 mt for 2021 and 3,045 mt for 2022. • ACLs are 272 mt lower in 2021 and 615 mt lower in 2022 than under No Action	• HCR: GMT-proposed "Stair Step" ACLs • ACL of 3,600 mt for 2021 and 2022. • ACLs are 515 mt lower in 2021 and 60 mt lower in 2022 than under No Action	No Action Harvest Specifications
Shortbelly Rockfish	• HCR: (P* = 0.40) • ACL specified at 500 mt for both 2021 and 2022.	• HCR: (P* = 0.40) • ACL would be set as a constant 3,000 mt for 2021-2022 • Increase of 2,500 mt over No Action	• Ecosystem Component species designation • No ACLs specified	• Alternative 2 • Ecosystem Component species designation • No ACLs specified
Sablefish a/	• HCR: ACL = ABC (P* = 0.40). • Coastwide ABC of 8,208 mt for 2021 and 7,811 mt for 2022.	• HCR: ACL = ABC (P* = 0.45) • Coastwide ABC of 8,791 mt for 2021 & 8,375 mt for 2022. • Coastwide ABC is 627 mt (2021) and 564 mt (2022) higher than under No Action	NA	• Alternative 1 Harvest Specifications • Coastwide ABC is Apportioned North (78.4%) and South (21.5%) of 36° N lat. Based on the Most Recent Rolling 5-yr. Average Trawl Survey Biomass

Species	No Action	Alternative 1	Alternative 2	Preferred

a/: The coastwide sablefish ABCs are apportioned north and south of 36° N. lat. to determine area-specific ACLs. Area-specific sablefish ACLs based on proposed apportionment methods are show in Table 2-6.

2.2 Harvest Specification Alternatives

At the national level, National Standard 1 Guidelines at 50 CFR §600.310 define harvest specifications and what must be considered when specifying them. FMP Chapter 4 describes the framework for biennial specifications. The OFL, ABC, and the ACL for each stock is based on the best scientific information available including endorsed stock assessments, changes in Scientific and Statistical Committee (SSC)-endorsed stock categories, or changes in SSC-endorsed sigma values (i.e., variances used to estimate the uncertainty in estimating OFLs. Any revised or new HCRs adopted by the Council and used to determine specifications for the subject biennial period become the new default for future biennial management cycles. The Alternatives are summarized in Table 2-1 and detailed below in Sections 2.2.1.1 – 2.2.1.3.

Alternative harvest specifications are based on the most recent assessments for actively managed stocks, including those managed in stock complexes. Results from new assessments conducted in 2019 were used to determine 2021 and 2022 harvest specifications for cabezon, cowcod south of 40°10' N lat., big skate, longnose skate, petrale sole, sablefish, gopher and black-and-yellow rockfishes (assessed as a complex of two species), and widow rockfish. All new harvest specifications are affected by the new sigma values endorsed by the SSC and adopted by the Council which increased the ABC buffers and reduced ABCs and ACLs relative to what they would have been under the old sigma/P* values. Catch-only projections updated the new harvest specifications in the most recent assessments for black rockfish (CA, OR, and WA), blackgill rockfish (S. of Cape Mendocino), the blue/deacon rockfishes complex (CA only), canary rockfish, China rockfish, darkblotched rockfish, Dover sole, lingcod, rougheye/blackspotted rockfish, longspine thornyhead, and shortspine thornyhead with actual total catches replacing the removal assumptions in the respective assessments for these stocks.

While the No Action harvest specifications are based on the same HCRs used in the previous biennium, the values have changed for some important stocks (Table 2-2). Most of these changes are based on new 2019 assessments. The largest percent difference in the ACL from 2020 to 2021 is for cowcod south of 40°10' N lat. where the ACL under the No Action alternative is almost an order of magnitude higher than in 2020 (98 mt and 10 mt in 2021 and 2020, respectively) based on the default rule described in the Groundfish FMP for a stock transitioning from a stock size below the target (e.g., under rebuilding) to above the MSY biomass target. The increase for cowcod south of 40°10' N lat. under the Preferred alternative is 740 percent (Table 2-2). Increased ACLs relative to 2020 under the No Action alternative are noted for cabezon, big skate, petrale sole, sablefish, and widow rockfish based on the results of new assessments for these stocks indicating a higher status and/or a higher exploitable biomass. In most cases, the ACLs are decreasing based on the higher sigma values used to determine ABC buffers for all stock categories. Time-varying sigmas increase with increased age of the assessment for category 1 and 2 stocks accounting for most of the changes in stocks without a new assessment in 2019. The magnitude of the decrease in ACLs from the new sigma framework was mitigated somewhat for those stocks with new catch-only projections and resulted in increased ACLs for black rockfish in Washington, darkblotched rockfish, the northern and southern lingcod stocks, and the northern and southern longspine thornyhead stocks (Table 2-2).

The preferred alternative 2021 and 2022 harvest specifications include the No Action HCRs for all stocks and stock complexes, except for cowcod south of 40°10' N lat., black rockfish in Oregon, sablefish, and shortbelly rockfish. Impact analyses of harvest specification alternatives for these four stocks, as well petrale sole, are found in Section 2.2.2.

Table 2-2. Comparison of 2020 and preferred 2021 and 2022 groundfish ACLs. Stocks and complexes with a greater than 25% change in the ACL from 2020 to 2021 in bold.

Stock/Complex	Area	ACL (mt)			% Change 2020 to 2021
		2020	2021	2022	
Yelloweye Rockfish	CW	49	50	51	2.0%
Arrowtooth Flounder	CW	12,750	9,933	8,458	-22.1%
Big Skate	CW	494	1,477	1,389	199.0%
Black Rockfish	WA	297	293	291	-1.5%
Black Rockfish	CA	326	348	341	6.7%
Bocaccio	S of 4010	2,011	1,748	1,724	*-13.1%*
Cabezon	CA	146	210	195	43.6%
Cabezon/Kelp Greenling	WA	10	20	17	92.3%
Cabezon/Kelp Greenling	OR	204	198	190	-3.1%
California Scorpionfish	CW	307	291	275	-5.4%
Canary Rockfish	CW	1,368	1,338	1,307	-2.2%
Chilipepper	S of 4010	2,410	2,358	2,259	-2.2%
Cowcod	S of 4010	10	84	82	740.0%
Darkblotched Rockfish	CW	815	882	831	8.2%
Dover Sole	CW	50,000	50,000	50,000	0.0%
English Sole	CW	10,135	9,175	9,101	-9.5%
Lingcod	N of 4010	4,541	5,369	4,958	18.2%
Lingcod	S of 4010	869	1,102	1,172	26.9%
Longnose Skate	CW	2,000	1,823	1,761	-8.9%
Longspine Thornyhead	N of 3427	2,470	2,634	2,452	6.7%
Longspine Thornyhead	S of 3427	780	832	774	6.7%
Pacific Ocean Perch	N of 4010	4,229	3,854	3,711	-8.9%
Petrale Sole	CW	2,845	4,115	3,660	44.6%
Sablefish	N of 36	5,723	6,479	6,172	13.2%
Sablefish	S of 36	2,032	2,312	2,203	13.8%
Shortbelly	CW	500	2,000	2,000	300.0%
Shortspine Thornyhead	N of 3427	1,669	1,428	1,393	-14.4%
Shortspine Thornyhead	S of 3427	883	756	737	-14.4%
Spiny Dogfish	CW	2,059	1,621	1,585	-21.3%
Splitnose	S of 4010	1,731	1,666	1,630	-3.7%
Widow Rockfish	CW	11,199	14,725	13,788	31.5%
Yellowtail Rockfish	N of 4010	5,986	6,050	5,831	1.1%
Pacific Cod	CW	1,600	1,600	1,600	0.0%
Starry Flounder	CW	452	392	392	-13.3%
Blue/Deacon/Black Rockfish	OR	611	603	600	-1.2%
Nearshore Rockfish North	N of 4010	82	77	76	-6.2%
Nearshore Rockfish South	S of 4010	1,163	1,016	1,010	-12.6%
Other Fish	CW	239	223	223	-6.5%
Other Flatfish	CW	6,041	4,802	4,838	-20.5%
Shelf Rockfish North	N of 4010	2,048	1,511	1,450	-26.2%
Shelf Rockfish South	S of 4010	1,625	1,438	1,428	-11.5%

Stock/Complex	Area	ACL (mt)			% Change 2020 to 2021
		2020	2021	2022	
Slope Rockfish North	N of 4010	1,732	1,595	1,568	-7.9%
Slope Rockfish South	S of 4010	743	709	705	-4.5%

2.2.1 Default Harvest Specifications (No Action)

Default harvest specifications would be implemented under the No Action Alternative. As discussed above, default harvest specifications are computed by applying the best scientific information available, such as new endorsed stock assessments, to current, default HCRs for all groundfish stocks. Table 2-3 and Table 2-4 list the default harvest specifications for 2021 and 2022, respectively.

The Groundfish FMP specifies the framework for the No Action harvest specifications as follows, "… the harvest controls from the previous biennium (referred to as default harvest control rules, or default HCRs) are applied to the best available scientific information to determine the numerical values of the harvest specifications for the next biennial period. The default HCR would establish the harvest specifications based on the F_{MSY} (or proxy value) used in the previous biennium applied to the best current estimate of stock biomass to determine the OFL. The ABC is determined by applying the uncertainty buffer used in the previous biennium except that if the P* approach was used, the same P* value used in the previous biennium is applied. The ACL is determined using the appropriate method for current stock status, if known. If a stock has recovered such that stock size is now above the MSY biomass target, the default harvest control sets the ACL equal to the ABC using the same P* value used in the previous biennium, if applicable. If the status has not changed or is unknown, the same method used in the previous cycle is used to compute the default HCR. This includes cases where a constant catch HCR was used in the previous cycle to set the ACL below the ABC, in which case the same constant catch numerical value is used as the default ACL for the next biennial cycle. In the case of a stock managed under a rebuilding plan, the default HCR is the one described in the current rebuilding plan."

The 2021 ACL of 50 mt and 2022 ACL of 51 mt for yelloweye rockfish, the only West Coast groundfish stock that will continue to be managed under a rebuilding plan in the next management cycle, is only 1 and 2 mt higher than in 2020, respectively. This is based on the projections from the 2017 rebuilding analysis and the default HCR specifying ACLS based on the SPR harvest rate of 65 percent. This predicted slow rate of rebuilding is anticipated for this slow growing species.

Table 2-3. 2021 harvest specifications (overfishing limits (OFLs in mt), acceptable biological catches (ABCs in mt), and annual catch limits (ACLs in mt)) under default harvest control rules for determining these specifications, for West Coast groundfish stocks and stock complexes (overfished/rebuilding stocks in CAPS; stocks with new assessments in bold; component stocks in stock complexes in italics).

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
YELLOWEYE ROCKFISH	CW	1 (Year Based)	0.40 (0.144)	97	83	50	The ACL is derived from the 2017 yelloweye rebuilding analysis under the 65% SPR harvest rate.
Arrowtooth Flounder	CW	2 (Year Based)	0.40 (0.267)	13551	9933	9933	
Big Skate	**CW**	**2 (Year Based)**	**0.45 (0.126)**	**1690**	**1477**	**1477**	
Black Rockfish	WA	1 (Year Based)	0.45 (0.083)	319	293	293	
Black Rockfish	CA	1 (Year Based)	0.45 (0.083)	379	348	348	
Bocaccio	S of 4010	1 (Year Based)	0.45 (0.074)	1887	1748	1748	7.4% of the assessed area (Conception area N to Cape Blanco) OFL is deducted to account for the portion of the stock north of 40°10’ N lat.
Cabezon	**CA**			**225**	**210**	**210**	
Cabezon	**3427 - 42**	**1 (Year Based)**	**0.45 (0.065)**	**201.8**	**188.683**		
Cabezon	**S of 3427**	**1 (Year Based)**	**0.45 (0.065)**	**23.3**	**21.7855**		
Cabezon/Kelp Greenling	WA			25	20	20	
Cabezon	***WA***	***3 (Year Based)***	***0.45 (0.222)***	***18.3***	***14.2374***	***14.2374***	
Kelp Greenling	*WA*	*3 (Year Based)*	*0.45 (0.222)*	*7.1*	*5.5238*	*5.5238*	
Cabezon/Kelp Greenling	OR			215	198	198	
Cabezon	***OR***	***1 (Year Based)***	***0.45 (0.065)***	***58.3***	***54.5105***	***54.5105***	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Kelp Greenling	*OR*	*1 (Year Based)*	*0.45 (0.083)*	*157*	*143.969*	*143.969*	
California Scorpionfish	CW	CA Scorpionfish (Year Based)	0.45 (0.086)	319	291	291	
Canary Rockfish	CW	1 (Year Based)	0.45 (0.083)	1459	1338	1338	
Chilipepper	S of 4010	1 (Year Based)	0.45 (0.083)	2571	2358	2358	93% of the coastwide chilipepper OFL is apportioned S of 40°10’ N lat. based on average historical landings.
Cowcod	**S of 4010**			**114**	**98**	**98**	
Cowcod	**S of 3427**	**2 (Year Based)**	**0.45 (0.126)**	**94.9539**	**82.9897**		
Cowcod	**3427 - 4010**	**3 (Year Based)**	**0.45 (0.222)**	**18.9**	**14.7042**		
Darkblotched Rockfish	CW	1 (Year Based)	0.45 (0.074)	953	882	882	
Dover Sole	CW	1 (Year Based)	0.45 (0.100)	93547	84192	50000	
English Sole	CW	2 (Year Based)	0.45 (0.174)	11107	9175	9175	
Lingcod	N of 4010	1 (Year Based)	0.45 (0.074)	5816	5386	5369	OFLs are projected from the 2017 assessment, which assessed two stocks north and south of 42° N lat. The relative biomass and OFLs are reapportioned north and south of the 40°10’ N lat. management line by using the most recent 5-year average percentage of survey biomass of lingcod between 40°10' and 42° N lat., which is 21.3% of the survey biomass in California.
Lingcod	S of 4010	1 (Year Based)	0.45 (0.074)	1255	1162	1102	OFLs are projected from the 2017 assessment, which assessed two stocks

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
							north and south of 42° N lat. The relative biomass and OFLs are reapportioned north and south of the 40°10' N lat. management line by using the most recent 5-year average percentage of survey biomass of lingcod between 40°10' and 42° N lat., which is 21.3% of the survey biomass in California.
Longnose Skate	CW	2 (Year Based)	0.45 (0.126)	2086	1823	1823	
Longspine Thornyhead	CW	2 (Year Based)	0.40 (0.320)	5097	3466		
Longspine Thornyhead	N of 3427	2 (Year Based)	0.40 (0.320)			2634	ACLs are determined based on an apportionment of the coastwide ABC north (76%) and south (24%) of 34°27' N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at 34°27' N lat. in the NWFSC trawl survey.
Longspine Thornyhead	S of 3427	2 (Year Based)	0.40 (0.320)			832	ACLs are determined based on an apportionment of the coastwide ABC north (76%) and south (24%) of 34°27' N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at 34°27' N lat. in the NWFSC trawl survey.
Pacific Ocean Perch	N of 4010	2 (Year Based)	0.45 (0.143)	4497	3854	3854	
Petrale Sole	**CW**	**1 (Year Based)**	**0.45 (0.065)**	**4402**	**4115**	**4115**	
Sablefish	**CW**	**1 (Year Based)**	**0.40 (0.127)**	**9402**	**8208**		

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Sablefish	N of 36	1 (Year Based)	0.40 (0.127)			6049	The ACLs are apportioned north (73.7%) and south (26.3%) of 40°10’ N lat. using the coastwide ABCs based on average trawl survey biomass from 2003-2018.
Sablefish	S of 36	1 (Year Based)	0.40 (0.127)			2159	The ACLs are apportioned north (73.7%) and south (26.3%) of 36° using the coastwide ABCs based on average trawl survey biomass from 2003-2018.
Shortbelly	CW	3 (Year Based)	0.40 (0.398)	6950	4184	500	
Shortspine Thornyhead	CW	2 (Year Based)	0.40 (0.320)	3211	2183		
Shortspine Thornyhead	N of 3427	2 (Year Based)	0.40 (0.320)			1428	ACLs are determined based on an apportionment of the coastwide ABC north (65.4%) and south (34.6%) of 34°27’ N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at 34°27’ N lat. in the NWFSC trawl survey.
Shortspine Thornyhead	S of 3427	2 (Year Based)	0.40 (0.320)			756	ACLs are determined based on an apportionment of the coastwide ABC north (65.4%) and south (34.6%) of 34°27’ N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at 34°27’ N lat. in the NWFSC trawl survey.
Spiny Dogfish	CW	2 (Year Based)	0.40 (0.346)	2479	1621	1621	
Splitnose	S of 4010	1 (Year Based)	0.45 (0.108)	1868	1666	1666	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Widow Rockfish	CW	1 (Year Based)	0.45 (0.065)	15749	14725	14725	
Yellowtail Rockfish	N of 4010	1 (Year Based)	0.45 (0.074)	6534	6050	6050	
Pacific Cod	CW	3 (Year Based)	0.40 (0.398)	3200	1926	1600	
Starry Flounder	CW	3 (Year Based)	0.40 (0.398)	652	392	392	
Blue/Deacon/Black Rockfish	OR		0.45 (0.044)	676	570	570	
Black Rockfish	*OR*	*2 (Year Based)*	*0.45 (0.159)*	*570*	*479.37*	*479.37*	
Blue	*OR*	*2 (Year Based)*	*0.45 (0.143)*	*105.7*	*90.5849*	*90.5849*	
Nearshore Rockfish North	N of 4010			94	79	79	
Black and Yellow	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.014*	*0.0109*	*0.0109*	
Blue	*42 - 4010*	*2 (Year Based)*	*0.45 (0.143)*	*33.4*	*28.6238*	*28.6238*	*10% of the CA OFL N of 34°27' N lat. is apportioned north of 40°10' N lat. (see Appendix D of the 2017 Assessment).*
Blue	*WA*	*3 (Year Based)*	*0.45 (0.222)*	*8.1*	*6.3018*	*6.3018*	
Brown	*N of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*2.0985*	*1.7333*	*1.7333*	*The portion of the coastwide stock north of 40`10 N lat. (1.2%) based on the proportion of cumulative removals by area during 1916-2012.*
Calico	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
China	*WA*	*2 (Year Based)*	*0.45 (0.159)*	*10.82*	*9.0996*	*9.0996*	*OFLs are projected from the Northern Model in the 2015 assessment.*
China	*4010 - 4616*	*2 (Year Based)*	*0.45 (0.159)*	*21.57*	*18.1404*	*18.1404*	*OFLs are projected from the Central Model in the 2015 assessment.*

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Copper	*N of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*9.8178*	*8.1095*	*8.1095*	*7.3% of the OFL estimated from the Northern Model (34°27' N lat. to U.S.-Can border) is apportioned N of 40°10' N lat. based on the proportion of cumulative removals by area during 1916-2012.*
Gopher	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Grass	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.657*	*0.5111*	*0.5111*	
Kelp	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.009*	*0.007*	*0.007*	
Olive	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.315*	*0.2451*	*0.2451*	
Quillback	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*7.37*	*5.7339*	*5.7339*	
Treefish	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.2165*	*0.1684*	*0.1684*	
Nearshore Rockfish South	S of 4010			1232	1016	1016	
Blue	*4010 - 3427*	*2 (Year Based)*	*0.45 (0.143)*	*300.6*	*257.6142*	*257.6142*	*90% of the CA OFL N of 34°27' N lat. is apportioned south of 40°10' N lat. (see Appendix D of the 2017 Assessment).*
Blue	*S of 3427*	*3 (Year Based)*	*0.45 (0.222)*	*21.8*	*16.9604*	*16.9604*	
Brown	*S of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*179.7015*	*148.4335*	*148.4335*	*The portion of the coastwide stock north of 40`10 N lat. (98.8%) based on the proportion of cumulative removals by area during 1916-2012.*
Calico	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
China	*S of 4010*	*2 (Year Based)*	*0.45 (0.159)*	*15.46*	*13.0019*	*12.22*	*OFLs are projected from the Southern Model in the 2015 assessment.*

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Copper	*S of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*247.432 2*	*204.379*	*204.379*	*92.7% of the OFL estimated from the Northern Model (34°27' N lat. to U.S.-Can border) is apportioned S of 40°10' N lat. based on the proportion of cumulative removals by area during 1916-2012.*
Gopher	***S of 4010***	***2 (Year Based)***	***0.45 (0.126)***	***136***	***118.864***	***118.864***	***Assessed and managed as a "complex" with Gopher and Black-and-Yellow rockfishes.***
Grass	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*59.6267*	*46.3896*	*46.3896*	
Kelp	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*27.6594*	*21.519*	*21.519*	
Olive	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*224.642 6*	*174.7719*	*174.7719*	
Quillback	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*5.3852*	*4.1897*	*4.1897*	
Treefish	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*13.2295*	*10.2926*	*10.2926*	
Other Fish	CW			286	223	223	
Kelp Greenling	*CA*	*3 (Year Based)*	*0.45 (0.222)*	*118.9*	*92.5042*	*92.5042*	
Leopard Shark	*CW*	*3 (Year Based)*	*0.45 (0.222)*	*167.1*	*130.0038*	*130*	
Other Flatfish	CW			7714	4802	4802	
Butter Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*4.631*	*2.7879*	*2.7879*	*Based on the average catch during 1994-1998 + a 60% discard rate estimated from the EDCP study.*
Curlfin Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*8.242*	*4.9617*	*4.9617*	*Based on the average catch during 1994-1998 + a 60% discard rate estimated from the EDCP study.*

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Flathead Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*35*	*21.07*	*21.07*	*Max. catch = 35 mt in 2005*
Pacific Sanddab	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*4801*	*2890.202*	*2890.202*	
Rex Sole	*CW*	*2 (Year Based)*	*0.40 (0.320)*	*2025.61*	*1377.414 8*	*1377.414 8*	*Bayesian projections differ from the calculated ABCs.*
Rock Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*66.7*	*40.1534*	*40.1534*	
Sand Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*773.2*	*465.4664*	*465.4664*	
Shelf Rockfish North	N of 4010			1888	1511	1511	
Bocaccio	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*284*	*220.952*	*220.952*	
Bronzespotted	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Chameleon	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Chilipepper	*N of 4010*	*1 (Year Based)*	*0.45 (0.083)*	*193.55*	*177.4854*	*177.4854*	*7% of the coastwide chilipepper OFL is apportioned N of 40°10' N lat. based on average historical landings.*
Cowcod	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.567*	*0.4411*	*0.4411*	
Flag	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.1*	*0.0778*	*0.0778*	
Freckled	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Greenblotched	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*1.3*	*1.0114*	*1.0114*	
Greenspotted	*42 - 4010*	*2 (Year Based)*	*0.45 (0.190)*	*9.3*	*7.533*	*7.34*	*The OFLs projected from the Northern California Model are apportioned north (22.2%) and south (77.8%) of 40°10' N*

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
							lat. based on average historical (1978-2001) landings.
Greenspotted	*WA - OR*	*3 (Year Based)*	*0.45 (0.222)*	*6.1*	*4.7458*	*4.7458*	
Greenstriped	*N of 4010*	*2 (Year Based)*	*0.45 (0.205)*	*896.1225*	*712.4174*	*712.4174*	*The portion of the coastwide stock north of 40°10' N. lat. (84.5%) is based on the mean of the 2003-2008 swept area biomass estimates from the NMFS trawl survey.*
Halfbanded	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Harlequin	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Honeycomb	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Mexican	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Pink	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.004*	*0.0031*	*0.0031*	
Pinkrose	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Puget Sound	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Pygmy	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Redstripe	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*269.9*	*209.9822*	*209.9822*	
Rosethorn	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*12.9*	*10.0362*	*10.0362*	
Rosy	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*3*	*2.334*	*2.334*	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Silvergray	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*159.4*	*124.0132*	*124.0132*	
Speckled	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.2*	*0.1556*	*0.1556*	
Squarespot	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.2*	*0.1556*	*0.1556*	
Starry	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0037*	*0.0029*	*0.0029*	
Stripetail	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*40.4*	*31.4312*	*31.4312*	
Swordspine	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0001*	*0.0001*	*0.0001*	
Tiger	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*1*	*0.778*	*0.778*	
Vermilion	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*9.7*	*7.5466*	*7.5466*	
Shelf Rockfish South	S of 4010			1842	1439	1438	
Bronzespotted	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*3.6*	*2.8008*	*2.8008*	
Chameleon	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Flag	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*23.4*	*18.2052*	*18.2052*	
Freckled	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Greenblotched	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*23.1*	*17.9718*	*17.9718*	
Greenspotted	*4010 - 3427*	*2 (Year Based)*	*0.45 (0.190)*	*32.58*	*26.3898*	*25.71*	*The OFLs projected from the Northern California Model are apportioned north (22.2%) and south (77.8%) of 40°10' N lat. based on average historical (1978-2001) landings.*

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Greenspotted	*S of 3427*	*2 (Year Based)*	*0.45 (0.190)*	*45.4321*	*36.8*	*36.8*	
Greenstriped	*S of 4010*	*2 (Year Based)*	*0.45 (0.205)*	*164.3775*	*130.6801*	*130.6801*	*The portion of the coastwide stock south of 40°10' N. lat. (15.5%) is based on the mean of the 2003-2008 swept area biomass estimates from the NMFS trawl survey.*
Halfbanded	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Harlequin	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Honeycomb	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*9.9*	*7.7022*	*7.7022*	
Mexican	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*5.1*	*3.9678*	*3.9678*	
Pink	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*2.5*	*1.945*	*1.945*	
Pinkrose	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Pygmy	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Redstripe	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.5*	*0.389*	*0.389*	
Rosethorn	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*2.1*	*1.6338*	*1.6338*	
Rosy	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*44.5*	*34.621*	*34.621*	
Silvergray	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.5*	*0.389*	*0.389*	
Speckled	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*39.4*	*30.6532*	*30.6532*	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Squarespot	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*11.1*	*8.6358*	*8.6358*	
Starry	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*62.6*	*48.7028*	*48.7028*	
Stripetail	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*23.6*	*18.3608*	*18.3608*	
Swordspine	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*14.2*	*11.0476*	*11.0476*	
Tiger	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.04*	*0.0311*	*0.0311*	
Vermilion	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*269.3*	*209.5154*	*209.5154*	
Yellowtail Rockfish	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*1064.4*	*828.1032*	*828.1032*	
Slope Rockfish North	N of 4010			1862	1595	1595	
Aurora	*N of 4010*	*1 (Year Based)*	*0.45 (0.091)*	*17.5*	*15.9075*	*15.9075*	*The portion of the coastwide stock north of 40º10' N lat. (19%) is based on average survey biomass.*
Bank	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*17.2*	*13.3816*	*13.3816*	
Blackgill Rockfish	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*4.7*	*3.6566*	*3.6566*	
Redbanded	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*45.3*	*35.2434*	*35.2434*	
Rougheye/Blackspotted	*N of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*232.26*	*191.8468*	*191.8468*	*98% of the coastwide OFL is apportioned north of 40°10' N. lat. based on average landings during 1985-2012.*
Sharpchin	*N of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*292.3032*	*241.4424*	*241.4424*	*80% of coastwide OFL is apportioned to the N of 40°10' N lat.*
Shortraker	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*18.7*	*14.5486*	*14.5486*	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Splitnose	*N of 4010*	*1 (Year Based)*	*0.45 (0.108)*	*1041.77*	*929.2588*	*929.2588*	
Yellowmouth	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*192.4*	*149.6872*	*149.6872*	
Slope Rockfish South	S of 4010			873	709	709	
Aurora	*S of 4010*	*1 (Year Based)*	*0.45 (0.091)*	*74.5*	*67.7205*	*67.7205*	*The portion of the coastwide stock south of 40º10' N lat. (81%) is based on average survey biomass.*
Bank	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*503.2*	*391.4896*	*391.4896*	
Blackgill Rockfish	*S of 4010*	*2 (Year Based)*	*0.45 (0.143)*	*206*	*176.542*	*176.542*	
Pacific Ocean Perch	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Redbanded	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*10.4*	*8.0912*	*8.0912*	
Rougheye/Blackspotted	*S of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*4.74*	*3.9152*	*3.9152*	*2% of the coastwide OFL is apportioned south of 40°10' N. lat. based on average landings during 1985-2012.*
Sharpchin	*S of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*73.0758*	*60.3606*	*60.3606*	*20% of coastwide OFLs are apportioned S of 40°10' N lat.*
Shortraker	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.1*	*0.0778*	*0.0778*	
Yellowmouth	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.8*	*0.6224*	*0.6224*	

Table 2-4. 2022 harvest specifications (overfishing limits (OFLs in mt), acceptable biological catches (ABCs in mt), and annual catch limits (ACLs in mt)) under default harvest control rules for determining these specifications, for West Coast groundfish stocks and stock complexes (overfished/rebuilding stocks in CAPS; stocks with new assessments in bold; component stocks in stock complexes in italics).

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
YELLOWEYE ROCKFISH	CW	1 (Year Based)	0.40 (0.152)	98	83	51	The ACL is derived from the 2017 yelloweye rebuilding analysis under the 65% SPR harvest rate.
Arrowtooth Flounder	CW	2 (Year Based)	0.40 (0.281)	11764	8458	8458	
Big Skate	CW	2 (Year Based)	0.45 (0.135)	1606	1389	1389	
Black Rockfish	WA	1 (Year Based)	0.45 (0.087)	319	291	291	
Black Rockfish	CA	1 (Year Based)	0.45 (0.087)	373	341	341	
Bocaccio	S of 4010	1 (Year Based)	0.45 (0.078)	1870	1724	1724	7.4% of the assessed area (Conception area N to Cape Blanco) OFL is deducted to account for the portion of the stock north of 40°10’ N lat.
Cabezon	**CA**			**210**	**195**	**195**	
Cabezon	***3427 - 42***	***1 (Year Based)***	***0.45 (0.070)***	***187.6***	***174.468***		
Cabezon	***S of 3427***	***1 (Year Based)***	***0.45 (0.070)***	***22.6***	***21.018***		
Cabezon/Kelp Greenling	WA			22	17	17	
Cabezon	***WA***	***3 (Year Based)***	***0.45 (0.222)***	***14.9***	***11.5922***	***11.5922***	
Kelp Greenling	*WA*	*3 (Year Based)*	*0.45 (0.222)*	*7.1*	*5.5238*	*5.5238*	
Cabezon/Kelp Greenling	OR			208	190	190	
Cabezon	***OR***	***1 (Year Based)***	***0.45 (0.070)***	***56.1***	***52.173***	***52.173***	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Kelp Greenling	*OR*	*1 (Year Based)*	*0.45 (0.087)*	*151.4*	*138.2282*	*138.2282*	
California Scorpionfish	CW	CA Scorpionfish (Year Based)	0.45 (0.091)	303	275	275	
Canary Rockfish	CW	1 (Year Based)	0.45 (0.087)	1432	1307	1307	
Chilipepper	S of 4010	1 (Year Based)	0.45 (0.087)	2474	2259	2259	93% of the coastwide chilipepper OFL is apportioned S of 40°10’ N lat. based on average historical landings.
Cowcod	**S of 4010**			**113**	**96**	**96**	
Cowcod	**S of 3427**	**2 (Year Based)**	**0.45 (0.135)**	**93.9412**	**81.2591**		
Cowcod	**3427 - 4010**	**3 (Year Based)**	**0.45 (0.222)**	**19.2**	**14.9376**		
Darkblotched Rockfish	CW	1 (Year Based)	0.45 (0.078)	901	831	831	
Dover Sole	CW	1 (Year Based)	0.45 (0.104)	87540	78436	50000	
English Sole	CW	2 (Year Based)	0.45 (0.182)	11127	9101	9101	
Lingcod	N of 4010	1 (Year Based)	0.45 (0.078)	5395	4974	4958	OFLs are projected from the 2017 assessment, which assessed two stocks north and south of 42° N lat. The relative biomass and OFLs are reapportioned north and south of the 40°10’ N lat. management line by using the most recent 5-year average percentage of survey biomass of lingcod between 40°10' and 42° N lat., which is 21.3% of the survey biomass in California.
Lingcod	S of 4010	1 (Year Based)	0.45 (0.078)	1334	1230	1172	OFLs are projected from the 2017 assessment, which assessed two stocks north

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
							and south of 42° N lat. The relative biomass and OFLs are reapportioned north and south of the 40°10’ N lat. management line by using the most recent 5-year average percentage of survey biomass of lingcod between 40°10' and 42° N lat., which is 21.3% of the survey biomass in California.
Longnose Skate	CW	2 (Year Based)	0.45 (0.135)	2036	1761	1761	
Longspine Thornyhead	CW	2 (Year Based)	0.40 (0.333)	4838	3227		
Longspine Thornyhead	N of 3427	2 (Year Based)	0.40 (0.333)			2452	ACLs are determined based on an apportionment of the coastwide ABC north (76%) and south (24%) of 34°27’ N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at 34°27’ N lat. in the NWFSC trawl survey.
Longspine Thornyhead	S of 3427	2 (Year Based)	0.40 (0.333)			774	ACLs are determined based on an apportionment of the coastwide ABC north (76%) and south (24%) of 34°27’ N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at 34°27’ N lat. in the NWFSC trawl survey.
Pacific Ocean Perch	N of 4010	2 (Year Based)	0.45 (0.151)	4371	3711	3711	
Petrale Sole	CW	1 (Year Based)	0.45 (0.070)	3936	3660	3660	
Sablefish	**CW**	**1 (Year Based)**	**0.40 (0.136)**	**9040**	**7811**		
Sablefish	**N of 36**	**1 (Year Based)**	**0.40 (0.136)**			**5757**	The ACLs are apportioned north (73.7%) and south (26.3%) of 40°10’ N lat. using the

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
							coastwide ABCs based on average trawl survey biomass from 2003-2018.
Sablefish	**S of 36**	**1 (Year Based)**	**0.40 (0.136)**			**2054**	The ACLs are apportioned north (73.7%) and south (26.3%) of 36° using the coastwide ABCs based on average trawl survey biomass from 2003-2018.
Shortbelly	CW	3 (Year Based)	0.40 (0.398)	6950	4184	500	
Shortspine Thornyhead	CW	2 (Year Based)	0.40 (0.333)	3194	2130		
Shortspine Thornyhead	N of 3427	2 (Year Based)	0.40 (0.333)			1393	ACLs are determined based on an apportionment of the coastwide ABC north (65.4%) and south (34.6%) of 34°27’ N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at 34°27’ N lat. in the NWFSC trawl survey.
Shortspine Thornyhead	S of 3427	2 (Year Based)	0.40 (0.333)			737	ACLs are determined based on an apportionment of the coastwide ABC north (65.4%) and south (34.6%) of 34°27’ N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at 34°27’ N lat. in the NWFSC trawl survey.
Spiny Dogfish	CW	2 (Year Based)	0.40 (0.358)	2469	1585	1585	
Splitnose	S of 4010	1 (Year Based)	0.45 (0.113)	1837	1630	1630	
Widow Rockfish	CW	1 (Year Based)	0.45 (0.070)	14826	13788	13788	
Yellowtail Rockfish	N of 4010	1 (Year Based)	0.45 (0.078)	6324	5831	5831	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Pacific Cod	CW	3 (Year Based)	0.40 (0.398)	3200	1926	1600	
Starry Flounder	CW	3 (Year Based)	0.40 (0.398)	652	392	392	
Blue/Deacon/Black Rockfish	OR		0.45 (0.044)	672	562	562	
Black Rockfish	*OR*	*2 (Year Based)*	*0.45 (0.167)*	*569*	*473.977*	*473.977*	
Blue	*OR*	*2 (Year Based)*	*0.45 (0.151)*	*103.1*	*87.5319*	*87.5319*	
Nearshore Rockfish North	N of 4010			93	77	77	
Black and Yellow	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0135*	*0.0105*	*0.0105*	
Blue	*42 - 4010*	*2 (Year Based)*	*0.45 (0.151)*	*33.6*	*28.5264*	*28.5264*	*10% of the CA OFL N of 34°27' N lat. is apportioned north of 40°10' N lat. (see Appendix D of the 2017 Assessment).*
Blue	*WA*	*3 (Year Based)*	*0.45 (0.222)*	*7.8*	*6.0684*	*6.0684*	
Brown	*N of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*2.0846*	*1.7052*	*1.7052*	*The portion of the coastwide stock north of 40`10 N lat. (1.2%) based on the proportion of cumulative removals by area during 1916-2012.*
Calico	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
China	*WA*	*2 (Year Based)*	*0.45 (0.167)*	*10.43*	*8.6882*	*8.6882*	*OFLs are projected from the Northern Model in the 2015 assessment.*
China	*4010 - 4616*	*2 (Year Based)*	*0.45 (0.167)*	*21.08*	*17.5596*	*17.5596*	*OFLs are projected from the Central Model in the 2015 assessment.*
Copper	*N of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*9.8594*	*8.065*	*8.065*	*7.3% of the OFL estimated from the Northern Model (34°27' N lat. to U.S.-Can border) is apportioned N of 40°10' N lat. based on the*

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
							proportion of cumulative removals by area during 1916-2012.
Gopher	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Grass	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.6567*	*0.5109*	*0.5109*	
Kelp	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0092*	*0.0072*	*0.0072*	
Olive	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.3152*	*0.2452*	*0.2452*	
Quillback	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*7.3742*	*5.7371*	*5.7371*	
Treefish	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.2165*	*0.1684*	*0.1684*	
Nearshore Rockfish South	S of 4010			1233	1011	1010	
Blue	*4010 - 3427*	*2 (Year Based)*	*0.45 (0.151)*	*302.4*	*256.7376*	*256.7376*	*90% of the CA OFL N of 34°27' N lat. is apportioned south of 40°10’ N lat. (see Appendix D of the 2017 Assessment).*
Blue	*S of 3427*	*3 (Year Based)*	*0.45 (0.222)*	*21.8*	*16.9604*	*16.9604*	
Brown	*S of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*178.5154*	*146.0256*	*146.0256*	*The portion of the coastwide stock north of 40`10 N lat. (98.8%) based on the proportion of cumulative removals by area during 1916-2012.*
Calico	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
China	*S of 4010*	*2 (Year Based)*	*0.45 (0.167)*	*15.94*	*13.278*	*12.21*	*OFLs are projected from the Southern Model in the 2015 assessment.*
Copper	*S of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*246.9806*	*202.0301*	*202.0301*	*92.7% of the OFL estimated from the Northern Model (34°27’ N lat. to U.S.-Can border) is apportioned S of 40°10’ N lat.*

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
							based on the proportion of cumulative removals by area during 1916-2012.
Gopher	***S of 4010***	***2 (Year Based)***	***0.45 (0.135)***	***137***	***118.505***	***118.505***	*Assessed and managed as a "complex" with Gopher and Black-and-Yellow rockfishes.*
Grass	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*59.6267*	*46.3896*	*46.3896*	
Kelp	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*27.6594*	*21.519*	*21.519*	
Olive	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*224.6426*	*174.7719*	*174.7719*	
Quillback	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*5.3852*	*4.1897*	*4.1897*	
Treefish	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*13.2295*	*10.2926*	*10.2926*	
Other Fish	CW			286	223	223	
Kelp Greenling	*CA*	*3 (Year Based)*	*0.45 (0.222)*	*118.9*	*92.5042*	*92.5042*	
Leopard Shark	*CW*	*3 (Year Based)*	*0.45 (0.222)*	*167.1*	*130.0038*	*130*	
Other Flatfish	CW			7808	4838	4838	
Butter Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*4.6308*	*2.7877*	*2.7877*	*Based on the average catch during 1994-1998 + a 60% discard rate estimated from the EDCP study.*
Curlfin Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*8.2423*	*4.9619*	*4.9619*	*Based on the average catch during 1994-1998 + a 60% discard rate estimated from the EDCP study.*
Flathead Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*35*	*21.07*	*21.07*	*Max. catch = 35 mt in 2005*
Pacific Sanddab	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*4801*	*2890.202*	*2890.202*	
Rex Sole	*CW*	*2 (Year Based)*	*0.40 (0.333)*	*2119.65*	*1413.8066*	*1413.8066*	*Bayesian projections differ from the calculated ABCs.*

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Rock Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*66.7*	*40.1534*	*40.1534*	
Sand Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*773.2*	*465.4664*	*465.4664*	
Shelf Rockfish North	N of 4010			1821	1450	1450	
Bocaccio	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*284.0136*	*220.9626*	*220.9626*	
Bronzespotted	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Chameleon	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Chilipepper	*N of 4010*	*1 (Year Based)*	*0.45 (0.087)*	*186.2*	*170.0006*	*170.0006*	*7% of the coastwide chilipepper OFL is apportioned N of 40°10' N lat. based on average historical landings.*
Cowcod	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.567*	*0.4411*	*0.4411*	
Flag	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0724*	*0.0563*	*0.0563*	
Freckled	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Greenblotched	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*1.2774*	*0.9938*	*0.9938*	
Greenspotted	*42 - 4010*	*2 (Year Based)*	*0.45 (0.197)*	*9.34*	*7.5*	*7.33*	*The OFLs projected from the Northern California Model are apportioned north (22.2%) and south (77.8%) of 40°10' N lat. based on average historical (1978-2001) landings.*
Greenspotted	*WA - OR*	*3 (Year Based)*	*0.45 (0.222)*	*6.078*	*4.7287*	*4.7287*	
Greenstriped	*N of 4010*	*2 (Year Based)*	*0.45 (0.212)*	*836.719*	*659.3346*	*659.3346*	*The portion of the coastwide stock north of 40°10' N. lat. (84.5%) is based on the mean*

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
							of the 2003-2008 swept area biomass estimates from the NMFS trawl survey.
Halfbanded	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Harlequin	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Honeycomb	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Mexican	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Pink	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0037*	*0.0029*	*0.0029*	
Pinkrose	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Puget Sound	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Pygmy	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Redstripe	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*269.9106*	*209.9904*	*209.9904*	
Rosethorn	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*12.8971*	*10.0339*	*10.0339*	
Rosy	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*3.034*	*2.3605*	*2.3605*	
Silvergray	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*159.4204*	*124.0291*	*124.0291*	
Speckled	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.1711*	*0.1331*	*0.1331*	
Squarespot	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.1724*	*0.1341*	*0.1341*	
Starry	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0037*	*0.0029*	*0.0029*	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Stripetail	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*40.3954*	*31.4276*	*31.4276*	
Swordspine	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0001*	*0.0001*	*0.0001*	
Tiger	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.9689*	*0.7538*	*0.7538*	
Vermilion	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*9.7168*	*7.5597*	*7.5597*	
Shelf Rockfish South	S of 4010			1832	1429	1428	
Bronzespotted	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*3.6465*	*2.837*	*2.837*	
Chameleon	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Flag	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*23.4239*	*18.2238*	*18.2238*	
Freckled	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Greenblotched	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*23.1305*	*17.9955*	*17.9955*	
Greenspotted	*4010 - 3427*	*2 (Year Based)*	*0.45 (0.197)*	*32.72*	*26.2742*	*25.71*	*The OFLs projected from the Northern California Model are apportioned north (22.2%) and south (77.8%) of 40°10' N lat. based on average historical (1978-2001) landings.*
Greenspotted	*S of 3427*	*2 (Year Based)*	*0.45 (0.197)*	*45.5369*	*36.5661*	*36.5661*	
Greenstriped	*S of 4010*	*2 (Year Based)*	*0.45 (0.212)*	*153.481*	*120.943*	*120.943*	*The portion of the coastwide stock south of 40°10' N. lat. (15.5%) is based on the mean of the 2003-2008 swept area biomass estimates from the NMFS trawl survey.*

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Halfbanded	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Harlequin	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Honeycomb	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*9.8668*	*7.6764*	*7.6764*	
Mexican	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*5.0532*	*3.9314*	*3.9314*	
Pink	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*2.5*	*1.945*	*1.945*	
Pinkrose	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Pygmy	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Redstripe	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.4926*	*0.3832*	*0.3832*	
Rosethorn	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*2.1305*	*1.6575*	*1.6575*	
Rosy	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*44.5082*	*34.6274*	*34.6274*	
Silvergray	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.5376*	*0.4183*	*0.4183*	
Speckled	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*39.3813*	*30.6387*	*30.6387*	
Squarespot	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*11.1*	*8.6358*	*8.6358*	
Starry	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*62.5716*	*48.6807*	*48.6807*	
Stripetail	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*23.6233*	*18.3789*	*18.3789*	
Swordspine	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*14.2159*	*11.06*	*11.06*	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Tiger	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0399*	*0.031*	*0.031*	
Vermilion	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*269.2764*	*209.497*	*209.497*	
Yellowtail Rockfish	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*1064.4392*	*828.1337*	*828.1337*	
Slope Rockfish North	N of 4010			1842	1568	1568	
Aurora	*N of 4010*	*1 (Year Based)*	*0.45 (0.096)*	*17.4*	*15.7296*	*15.7296*	*The portion of the coastwide stock north of 40°10' N lat. (19%) is based on average survey biomass.*
Bank	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*17.2375*	*13.4108*	*13.4108*	
Blackgill Rockfish	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*4.7*	*3.6566*	*3.6566*	
Redbanded	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*45.2618*	*35.2137*	*35.2137*	
Rougheye/Blackspotted	*N of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*233.24*	*190.7903*	*190.7903*	*98% of the coastwide OFL is apportioned north of 40°10' N. lat. based on average landings during 1985-2012.*
Sharpchin	*N of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*288.8576*	*236.2855*	*236.2855*	*80% of coastwide OFL is apportioned to the N of 40°10' N lat.*
Shortraker	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*18.7038*	*14.5516*	*14.5516*	
Splitnose	*N of 4010*	*1 (Year Based)*	*0.45 (0.113)*	*1024.53*	*908.7581*	*908.7581*	
Yellowmouth	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*192.4467*	*149.7235*	*149.7235*	
Slope Rockfish South	S of 4010			871	705	705	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Aurora	*S of 4010*	*1 (Year Based)*	*0.45 (0.096)*	*74.4*	*67.2576*	*67.2576*	*The portion of the coastwide stock south of 40º10' N lat. (81%) is based on average survey biomass.*
Bank	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*503.215*	*391.5013*	*391.5013*	
Blackgill Rockfish	*S of 4010*	*2 (Year Based)*	*0.45 (0.151)*	*205*	*174.045*	*174.045*	
Pacific Ocean Perch	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Redbanded	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*10.4057*	*8.0956*	*8.0956*	
Rougheye/Blackspotted	*S of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*4.76*	*3.8937*	*3.8937*	*2% of the coastwide OFL is apportioned south of 40°10' N. lat. based on average landings during 1985-2012.*
Sharpchin	*S of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*72.2144*	*59.0714*	*59.0714*	*20% of coastwide OFLs are apportioned S of 40°10' N lat.*
Shortraker	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.1049*	*0.0816*	*0.0816*	
Yellowmouth	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.8483*	*0.66*	*0.66*	

2.2.2 Alternative Harvest Specifications

The five stocks with alternative harvest specifications considered for 2021 and beyond are black rockfish in Oregon, cowcod south of 40°10' N lat., petrale sole, sablefish, and shortbelly rockfish (Table 2-5).

2.2.2.1 Alternative Harvest Specifications for Black Rockfish in Oregon

The default HCR informing the No Action Alternative for black rockfish occurring in waters off Oregon is ACL = ABC with an overfishing probability (P*) of 0.45. The Oregon Department of Fish and Wildlife (ODFW) recommended an alternative HCR where the 2020 ABC of 512 mt is specified in 2021 and 2022 (Alt. 1; Table 2-5) returning to the default HCR in 2023 and beyond. Black rockfish is the primary target stock for nearshore recreational and commercial fisheries in Oregon and ACL attainment is high. Oregon nearshore fisheries have been closed prematurely in recent years due to early ACL or sector harvest guideline attainment.

Alternative 1 was compelled by changes to the scientific uncertainty parameter, sigma, which informs the ABC for a stock. In March 2019, the Council's SSC recommended new sigma values for determining ABCs beginning in 2021, including larger sigmas (hence larger ABC buffers and lower ACLs) with the increasing age of a category 1 or 2 stock. The 2021 and 2022 ABC/ACLs under the No Action Alternative determined under the new sigma framework are 6.4 percent and 7.4 percent lower than the 2020 ABC/ACL, respectively. The larger sigmas and lower resulting ABCs increase the risk of early closure of Oregon nearshore fisheries. Therefore, ODFW wanted to explore the trade-offs of a two-year departure from default HCRs for Oregon black rockfish to provide time for ODFW to collect more data on black rockfish to inform a new stock assessment. The SSC endorsed this alternative in November 2019 with the caveat, "…this practice should be used sparingly in general and is not recommended on a recurring basis for any stock". The Council adopted Oregon black rockfish Alternative 1 as their preferred in April 2020.

2.2.2.2 Alternative Harvest Specifications for Cowcod South of 40°10' N lat.

A new cowcod assessment in 2019 indicated the stock south of 40°10' N lat. had transitioned from a rebuilding to a healthy status with 57 percent depletion at the start of 2019 (Dick and He 2019). The default HCR for a stock like cowcod with such a status change is ACL = ABC under the default P*, which is 0.45 for cowcod. The two action alternatives, Alternatives 1 and 2, consider P* values of 0.4 and 0.3, respectively and result in progressively lower ABCs/ACLs (Table 2-5). The primary consideration for these more conservative harvest specifications is the relatively high uncertainty in the estimated biomass and productivity in the cowcod assessment. As noted by the SSC in their September 2019 report, "A major contributor of uncertainty with the cowcod assessment is the lack of adequate data (particularly age data) for estimating growth, natural mortality, and recruitment." Further, the SSC pointed out the cowcod harvest rate under the No Action Alternative results in near-term ABCs/ACLs, "… substantially above the long-term equilibrium maximum sustained yield (MSY) estimate (73 mt) for this stock." The Council adopted cowcod Alternative 1 as their preferred in April 2020.

2.2.2.3 Alternative Harvest Specifications for Petrale Sole

The default HCR for petrale sole is ACL = ABC with a P* of 0.45. Based on an update of the 2013 petrale sole stock assessment in 2019 (Wetzel 2019), the estimated current spawning biomass is high, yet dependent on the strength of older year classes (2007, 2008, and 2009), which will be quickly gone from the population due to relatively high natural and fishing mortality rates. The trajectory of ABCs/ACLs (and spawning biomass) under the No Action Alternative start off with the highest ABCs/ACLs in the next management cycle and progressively decreasing ABCs/ACLs in the next ten years.

The GMT recommended analyzing the tradeoffs of the default harvest specifications and those under the lower harvest rates based on the Alternative 1 HCR of ACL = ABC with a P* of 0.4 and the Alternative 2 HCR that results in a "stair step" approach where a single lower ACL is set for each year of future biennial management cycles and slows the decline in the ACLs predicted under No Action and Alternative 1. The predicted biomass and ABC/ACL trajectory under Alternative 1 provides lower initial ACLs in the next management cycle and maintains that level at equilibrium in the next ten years relative to No Action. The trajectory under Alternative 2 is similar to that under Alternative 1 with lower cumulative ACLs in the 2021-2022 management cycle. The Council adopted the No Action petrale sole alternative as their preferred in April 2020 based on an increased trawl survey CPUE of petrale in 2019.

2.2.2.4 Alternative Harvest Specifications for Sablefish

A new sablefish assessment was conducted in 2019 indicating the stock was at 39 percent depletion at the start of 2019 and projected to be above target B_{MSY} of 40 percent depletion by the start of 2021 (Haltuch, *et al.* 2019). The No Action Alternative is based on the default HCR ACL = ABC with a P* of 0.4. The GMT and GAP recommended analyzing the tradeoffs of the default harvest specifications and those under the higher harvest rate based on the Alternative 1 HCR of ACL = ABC with a P* of 0.45. The 2021 and 2022 ABCs are 6.6 percent and 6.7 percent higher, respectively under Alternative 1 than under the No Action Alternative. The predicted ten-year trajectories under both alternatives indicate the stock remains above target B_{MSY}. The Council adopted Alternative 1 as their preferred alternative in April 2020.

Historically, the coastwide sablefish ABC is apportioned north and south of 36° N. lat. based on the 2003-2018 average swept area biomass estimated in the NMFS Northwest Fisheries Science Center Bottom Trawl Survey (Method 1). However, the Council is also considering another option based on a more recent 2014-2018 average trawl survey biomass estimate (Method 2). Method 2 uses a five-year rolling average to apportion ACLs for this biennium. The Council will examine this method in the future to ascertain its efficacy. . Method 1 apportions 73.6 percent of the coastwide ABC north of 36° N lat. and the Method 2 apportions 78.4 percent of the ABC to the north (Table 2-6). The Council selected Method 2 to apportion sablefish ACLs as their preferred alternative in April 2020.

2.2.2.5 Alternative Harvest Specifications for Shortbelly Rockfish

The No Action Alternative for shortbelly rockfish is a 500 mt constant catch ACL. This level of harvest is significantly less than the ABC and was specified to accommodate unavoidable incidental bycatch. The low ACL is designed to manage shortbelly rockfish as an important forage species in the California Current Ecosystem.

While shortbelly rockfish are most abundant along the continental shelf break between the northern end of Monterey Bay and Point Reyes, California and around the Channel Islands in the Southern California Bight (Love, *et al.* 2002; Moser, *et al.* 2000; Pearson, *et al.* 1991; Phillips 1964), they have increasingly been encountered and incidentally caught in midwater trawl fisheries in waters north of 40°10' N lat. as far north as northern Washington. The observed magnitude of encounters of shortbelly rockfish north of 40°10' N lat. in recent years is unprecedented and may be the result of a climate change-driven distributional shift and/or the effect of large recruitments. It appears both explanations are contributing factors given evidence of continued high recruitment and abundance in the core habitats off southern and central California. The shortbelly ACL of 500 mt was exceeded in 2018 and 2019. Given the unprecedented shortbelly rockfish encounters in the northern whiting fisheries in the last two years and the low historical bycatch of shortbelly in any groundfish fisheries, the high bycatch came as surprise when the whiting industry self-reported their high bycatch and began avoiding shortbelly in June 2019. Therefore, this has become a new management issue for west coast groundfish fisheries with solutions explored in this EA.

A higher ACL for shortbelly rockfish (Alternative 1 and the Preferred Alternative) is considered to mitigate the risk of closing midwater trawl fisheries targeting Pacific whiting and pelagic rockfish north of 40°10' N lat.; Alternative 2 avoids the risk altogether. The Council will typically close fisheries or fishing sectors, if necessary, to avoid exceeding an ACL.

Alternative 1 for shortbelly rockfish specifies a 3,000 mt ACL in 2021 and 2022 and Alternative 2 contemplates designating shortbelly rockfish an Ecosystem Component (EC) species for detailed analysis. Both alternatives are designed to avoid a premature closure of northern midwater trawl fisheries should future harvest continue to be greater than 500 mt. The Alternative 1 ACL was recommended by the Council in a separate action to modify the 2020 ACL in regulations (NMFS and PFMC 2019). Note that in April 2020, the Council modified Alternative 1 to be 2,000 mt over concerns that 3,000 mt was too high given projections of potential bycatch by the GMT. The basis for Alternative 2 is shortbelly are not targeted nor are they valued as a commercial fishery resource. Their interaction in the fishery meets the criteria for an EC designation.

The Council selected the Alternative 2 HCR of designating shortbelly rockfish as an Ecosystem Component Species for 2021 and 2022 as the species but will continued to be monitored to track the incidental bycatch of shortbelly rockfish inseason. The Council specified a trigger of 2,000 mt of cumulative annual catch to initiate Council discussion on a shortbelly rockfish management strategy. The Council stated their intent to maintain a healthy abundance of shortbelly to preserve its role as a forage species in the California Current Ecosystem. If industry fails to avoid shortbelly rockfish bycatch and the stock's ecosystem role as a forage species appears compromised by future fishery interceptions, the Council may consider removing the EC designation and again managing the stock actively with annual harvest specifications.

Table 2-5. Alternative 2021 and 2022 harvest specifications (in mt) for select West Coast groundfish stocks decided for detailed analysis.

Stock	Alternative	2021			2022			Harvest Control Rule
		OFL	ABC	ACL	OFL	ABC	ACL	
Black Rockfish in Oregon	No Action	570	479	479	569	474	474	ACL = ABC (P* = 0.45)
	Alt. 1 (Pref.)	570	512	512	566	512	512	ACL = 2020 ABC (P* = 0.45)
Cowcod South of 40°10' N lat.	No Action	114	98	98	113	96	96	ACL = ABC (P* = 0.45)
	Alt. 1 (Pref.)	114	84	84	113	82	82	ACL = ABC (P* = 0.4)
	Alt. 2	114	61	61	113	61	58	ACL = ABC (P* = 0.3)
Petrale Sole	No Action (Pref.)	4,402	4,115	4,115	3,936	3,660	3,660	ACL = ABC (P* = 0.45)
	Alt. 1	4,402	3,843	3,843	3,999	3,455	3,455	ACL = ABC (P* = 0.4)
	Alt. 2	4,402	4,115	3,600	4,054	3,770	3,600	"Stair Step" ACLs
Sablefish	No Action	9,402	8,208	See Table 2-6	9,040	7,811	See Table 2-6	ACL = ABC (P* = 0.4)
	Alt. 1 (Pref.)	9,402	8,791		9,005	8,375		ACL = ABC (P* = 0.45)
Shortbelly Rockfish	No Action	6,950	4,184	500	6,950	4,184	500	ACL = 500 mt
	Alt. 1	6,950	4,184	3,000	6,950	4,184	3,000	ACL = 3,000 mt a/
	Alt. 2	NA			NA			EC Species
	Pref.	6,950	4,184	2,000	6,950	4,184	2,000	ACL = 2,000 mt

a/ The Council revised the 3,000 mt ACL initially considered under Alternative 1 to 2,000 mt in April 2020 as the PPA.

Table 2-6. 2021 and 2022 sablefish ACLs north and south of 36° N lat. by alternative and the apportionment method used to set the ACL.

Year	Alt.	Coastwide ABC (mt)	Method 1 Long Term Apportionment		Method 2 (Pref.) 5-yr Avg. Apportionment	
			ACL (mt) N 36	ACL (mt) S 36	ACL (mt) N 36	ACL (mt) S 36
			73.6%	26.4%	78.4%	21.6%
2021	No Action	8,208	6,041	2,167	6,435	1,773
	Alt.1	8,791	6,470	2,321	6,892	1,899
2022	No Action	7,811	5,749	2,062	6,124	1,687
	Alt.1	8,375	6,164	2,211	6,566	1,809

2.2.3 The Preferred Alternative

The Council's decided their preferred harvest specifications alternative in April 2020 and June 2020 (shortbelly). The Council reconsidered their Preferred Alternative for shortbelly rockfish in June 2020. Based on new information regarding recent shortbelly recruitment and abundance (see Section 4.1.1.5), the Council selected Alternative 2, an EC designation for shortbelly rockfish, as their preferred. The Council confirmed their decision from April on their Preferred Alternative for all other stocks and complexes at their June 2020 meeting. The preferred 2021 and 2022 for west coast groundfish stocks and stock complexes are provided in Table 2-7 and Table 2-8, respectively.

Table 2-7. 2021 harvest specifications (overfishing limits (OFLs in mt), acceptable biological catches (ABCs in mt), and annual catch limits (ACLs in mt)) under preferred harvest control rules and stock complex restructuring for determining these specifications, for West Coast groundfish stocks and stock complexes (overfished/rebuilding stocks in CAPS; stocks with new assessments in bold; component stocks in stock complexes in italics).

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
YELLOWEYE ROCKFISH	CW	1 (Year Based)	0.40 (0.144)	97	83	50	The ACL is derived from the 2017 yelloweye rebuilding analysis under the 65% SPR harvest rate.
Arrowtooth Flounder	CW	2 (Year Based)	0.40 (0.267)	13551	9933	9933	
Big Skate	**CW**	**2 (Year Based)**	**0.45 (0.126)**	**1690**	**1477**	**1477**	
Black Rockfish	WA	1 (Year Based)	0.45 (0.083)	319	293	293	
Black Rockfish	CA	1 (Year Based)	0.45 (0.083)	379	348	348	
Bocaccio	S of 4010	1 (Year Based)	0.45 (0.074)	1887	1748	1748	7.4% of the assessed area (Conception area N to Cape Blanco) OFL is deducted to account for the portion of the stock north of 40°10’ N lat.
Cabezon	**CA**			**225**	**210**	**210**	
Cabezon	**3427 - 42**	**1 (Year Based)**	**0.45 (0.065)**	**201.8**	**188.683**		
Cabezon	**S of 3427**	**1 (Year Based)**	**0.45 (0.065)**	**23.3**	**21.7855**		
Cabezon/Kelp Greenling	WA			25	20	20	
Cabezon	***WA***	***3 (Year Based)***	***0.45 (0.222)***	***18.3***	***14.2374***	***14.2374***	
Kelp Greenling	*WA*	*3 (Year Based)*	*0.45 (0.222)*	*7.1*	*5.5238*	*5.5238*	
Cabezon/Kelp Greenling	OR			215	198	198	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Cabezon	***OR***	***1 (Year Based)***	***0.45 (0.065)***	***58.3***	***54.5105***	***54.5105***	
Kelp Greenling	*OR*	*1 (Year Based)*	*0.45 (0.083)*	*157*	*143.969*	*143.969*	
California Scorpionfish	CW	CA Scorpionfish (Year Based)	0.45 (0.086)	319	291	291	
Canary Rockfish	CW	1 (Year Based)	0.45 (0.083)	1459	1338	1338	
Chilipepper	S of 4010	1 (Year Based)	0.45 (0.083)	2571	2358	2358	93% of the coastwide chilipepper OFL is apportioned S of 40°10’ N lat. based on average historical landings.
Cowcod	**S of 4010**			**114**	**84**	**84**	
Cowcod	***S of 3427***	***2 (Year Based)***	***0.40 (0.238)***	***95***	***72.39***	***72.39***	
Cowcod	***3427 - 4010***	***3 (Year Based)***	***0.40 (0.398)***	***18.9***	***11.3778***	***11.3778***	
Darkblotched Rockfish	CW	1 (Year Based)	0.45 (0.074)	953	882	882	
Dover Sole	CW	1 (Year Based)	0.45 (0.100)	93547	84192	50000	
English Sole	CW	2 (Year Based)	0.45 (0.174)	11107	9175	9175	
Lingcod	N of 4010	1 (Year Based)	0.45 (0.074)	5816	5386	5369	OFLs are projected from the 2017 assessment, which assessed two stocks north and south of 42° N lat. The relative biomass and OFLs are reapportioned north and south of the 40°10’ N lat. management line by using the most recent 5-year average percentage of survey biomass of lingcod between 40°10' and 42° N

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
							lat., which is 21.3% of the survey biomass in California.
Lingcod	S of 4010	1 (Year Based)	0.45 (0.074)	1255	1162	1102	OFLs are projected from the 2017 assessment, which assessed two stocks north and south of 42° N lat. The relative biomass and OFLs are reapportioned north and south of the 40°10’ N lat. management line by using the most recent 5-year average percentage of survey biomass of lingcod between 40°10' and 42° N lat., which is 21.3% of the survey biomass in California.
Longnose Skate	**CW**	**2 (Year Based)**	**0.45 (0.126)**	**2086**	**1823**	**1823**	
Longspine Thornyhead	CW	2 (Year Based)	0.40 (0.320)	5097	3466		
Longspine Thornyhead	N of 3427	2 (Year Based)	0.40 (0.320)			2634	ACLs are determined based on an apportionment of the coastwide ABC north (76%) and south (24%) of 34°27’ N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at 34°27’ N lat. in the NWFSC trawl survey.
Longspine Thornyhead	S of 3427	2 (Year Based)	0.40 (0.320)			832	ACLs are determined based on an apportionment of the coastwide ABC north (76%) and south (24%) of 34°27’ N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at 34°27’ N lat. in the NWFSC trawl survey.

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Pacific Ocean Perch	N of 4010	2 (Year Based)	0.45 (0.143)	4497	3854	3854	
Petrale Sole	**CW**	**1 (Year Based)**	**0.45 (0.065)**	**4402**	**4115**	**4115**	
Sablefish	**CW**	**1 (Year Based)**	**0.45 (0.065)**	**9402**	**8791**		
Sablefish	**N of 36**	**1 (Year Based)**	**0.45 (0.065)**			**6892**	**The ACLs are apportioned north (78.4%) and south (21.5%) of 40°10' N lat. using the coastwide ABCs based on average trawl survey biomass from 2014-2018.**
Sablefish	**S of 36**	**1 (Year Based)**	**0.45 (0.065)**			**1889**	**The ACLs are apportioned north (78.4%) and south (21.5%) of 40°10' N lat. using the coastwide ABCs based on average trawl survey biomass from 2014-2018.**
Shortbelly	CW	3 (Year Based)	NA	NA	NA	NA	Ecosystem Component Species
Shortspine Thornyhead	CW	2 (Year Based)	0.40 (0.320)	3211	2183		
Shortspine Thornyhead	N of 3427	2 (Year Based)	0.40 (0.320)			1428	ACLs are determined based on an apportionment of the coastwide ABC north (65.4%) and south (34.6%) of 34°27' N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at 34°27' N lat. in the NWFSC trawl survey.
Shortspine Thornyhead	S of 3427	2 (Year Based)	0.40 (0.320)			756	ACLs are determined based on an apportionment of the coastwide ABC north (65.4%) and south (34.6%) of 34°27' N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
							34°27’ N lat. in the NWFSC trawl survey.
Spiny Dogfish	CW	2 (Year Based)	0.40 (0.346)	2479	1621	1621	
Splitnose	S of 4010	1 (Year Based)	0.45 (0.108)	1868	1666	1666	
Widow Rockfish	**CW**	**1 (Year Based)**	**0.45 (0.065)**	**15749**	**14725**	**14725**	
Yellowtail Rockfish	N of 4010	1 (Year Based)	0.45 (0.074)	6534	6050	6050	
Pacific Cod	CW	3 (Year Based)	0.40 (0.398)	3200	1926	1600	
Starry Flounder	CW	3 (Year Based)	0.40 (0.398)	652	392	392	
Blue/Deacon/Black Rockfish	OR		0.45 (0.044)	676	603	603	
Black Rockfish	*OR*	*2 (Year Based)*	*NA*	*570*	*512*	*512*	
Blue	*OR*	*2 (Year Based)*	*0.45 (0.143)*	*105.7*	*90.5849*	*90.5849*	
Nearshore Rockfish North	N of 4010			94	79	79	
Black and Yellow	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.014*	*0.0109*	*0.0109*	
Blue	*42 - 4010*	*2 (Year Based)*	*0.45 (0.143)*	*33.4*	*28.6238*	*28.6238*	*10% of the CA OFL N of 34°27' N lat. is apportioned north of 40°10’ N lat. (see Appendix D of the 2017 Assessment).*
Blue	*WA*	*3 (Year Based)*	*0.45 (0.222)*	*8.1*	*6.3018*	*6.3018*	
Brown	*N of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*2.0985*	*1.7333*	*1.7333*	*The portion of the coastwide stock north of 40`10 N lat. (1.2%) based on*

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
							the proportion of cumulative removals by area during 1916-2012.
Calico	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
China	*WA*	*2 (Year Based)*	*0.45 (0.159)*	*10.82*	*9.0996*	*9.0996*	*OFLs are projected from the Northern Model in the 2015 assessment.*
China	*4010 - 4616*	*2 (Year Based)*	*0.45 (0.159)*	*21.57*	*18.1404*	*18.1404*	*OFLs are projected from the Central Model in the 2015 assessment.*
Copper	*N of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*9.8178*	*8.1095*	*8.1095*	*7.3% of the OFL estimated from the Northern Model (34°27' N lat. to U.S.-Can border) is apportioned N of 40°10' N lat. based on the proportion of cumulative removals by area during 1916-2012.*
Gopher	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Grass	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.657*	*0.5111*	*0.5111*	
Kelp	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.009*	*0.007*	*0.007*	
Olive	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.315*	*0.2451*	*0.2451*	
Quillback	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*7.37*	*5.7339*	*5.7339*	
Treefish	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.2165*	*0.1684*	*0.1684*	
Nearshore Rockfish South	S of 4010			1232	1016	1016	
Blue	*4010 - 3427*	*2 (Year Based)*	*0.45 (0.143)*	*300.6*	*257.6142*	*257.6142*	*90% of the CA OFL N of 34°27' N lat. is apportioned south of 40°10' N lat. (see Appendix D of the 2017 Assessment).*

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Blue	*S of 3427*	*3 (Year Based)*	*0.45 (0.222)*	*21.8*	*16.9604*	*16.9604*	
Brown	*S of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*179.7015*	*148.4335*	*148.4335*	*The portion of the coastwide stock north of 40`10 N lat. (98.8%) based on the proportion of cumulative removals by area during 1916-2012.*
Calico	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
China	*S of 4010*	*2 (Year Based)*	*0.45 (0.159)*	*15.46*	*13.0019*	*12.22*	*OFLs are projected from the Southern Model in the 2015 assessment.*
Copper	*S of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*247.4322*	*204.379*	*204.379*	*92.7% of the OFL estimated from the Northern Model (34°27' N lat. to U.S.-Can border) is apportioned S of 40°10' N lat. based on the proportion of cumulative removals by area during 1916-2012.*
Gopher	***S of 4010***	***2 (Year Based)***	***0.45 (0.126)***	***136***	***118.864***	***118.864***	***Assessed and managed as a "complex" with Gopher and Black-and-Yellow rockfishes.***
Grass	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*59.6267*	*46.3896*	*46.3896*	
Kelp	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*27.6594*	*21.519*	*21.519*	
Olive	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*224.6426*	*174.7719*	*174.7719*	
Quillback	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*5.3852*	*4.1897*	*4.1897*	
Treefish	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*13.2295*	*10.2926*	*10.2926*	
Other Fish	CW			286	223	223	
Kelp Greenling	*CA*	*3 (Year Based)*	*0.45 (0.222)*	*118.9*	*92.5042*	*92.5042*	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Leopard Shark	*CW*	*3 (Year Based)*	*0.45 (0.222)*	*167.1*	*130.0038*	*130*	
Other Flatfish	CW			7714	4802	4802	
Butter Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*4.631*	*2.7879*	*2.7879*	*Based on the average catch during 1994-1998 + a 60% discard rate estimated from the EDCP study.*
Curlfin Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*8.242*	*4.9617*	*4.9617*	*Based on the average catch during 1994-1998 + a 60% discard rate estimated from the EDCP study.*
Flathead Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*35*	*21.07*	*21.07*	*Max. catch = 35 mt in 2005*
Pacific Sanddab	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*4801*	*2890.202*	*2890.202*	
Rex Sole	*CW*	*2 (Year Based)*	*0.40 (0.320)*	*2025.61*	*1377.4148*	*1377.4148*	*Bayesian projections differ from the calculated ABCs.*
Rock Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*66.7*	*40.1534*	*40.1534*	
Sand Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*773.2*	*465.4664*	*465.4664*	
Shelf Rockfish North	N of 4010			1888	1511	1511	
Bocaccio	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*284*	*220.952*	*220.952*	
Bronzespotted	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Chameleon	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Chilipepper	*N of 4010*	*1 (Year Based)*	*0.45 (0.083)*	*193.55*	*177.4854*	*177.4854*	*7% of the coastwide chilipepper OFL is apportioned N of 40°10' N lat. based on average historical landings.*
Cowcod	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.567*	*0.4411*	*0.4411*	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Flag	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.1*	*0.0778*	*0.0778*	
Freckled	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Greenblotched	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*1.3*	*1.0114*	*1.0114*	
Greenspotted	*42 - 4010*	*2 (Year Based)*	*0.45 (0.190)*	*9.3*	*7.533*	*7.34*	*The OFLs projected from the Northern California Model are apportioned north (22.2%) and south (77.8%) of 40°10' N lat. based on average historical (1978-2001) landings.*
Greenspotted	*WA - OR*	*3 (Year Based)*	*0.45 (0.222)*	*6.1*	*4.7458*	*4.7458*	
Greenstriped	*N of 4010*	*2 (Year Based)*	*0.45 (0.205)*	*896.1225*	*712.4174*	*712.4174*	*The portion of the coastwide stock north of 40°10' N. lat. (84.5%) is based on the mean of the 2003-2008 swept area biomass estimates from the NMFS trawl survey.*
Halfbanded	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Harlequin	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Honeycomb	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Mexican	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Pink	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.004*	*0.0031*	*0.0031*	
Pinkrose	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Puget Sound	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Pygmy	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Redstripe	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*269.9*	*209.9822*	*209.9822*	
Rosethorn	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*12.9*	*10.0362*	*10.0362*	
Rosy	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*3*	*2.334*	*2.334*	
Silvergray	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*159.4*	*124.0132*	*124.0132*	
Speckled	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.2*	*0.1556*	*0.1556*	
Squarespot	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.2*	*0.1556*	*0.1556*	
Starry	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0037*	*0.0029*	*0.0029*	
Stripetail	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*40.4*	*31.4312*	*31.4312*	
Swordspine	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0001*	*0.0001*	*0.0001*	
Tiger	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*1*	*0.778*	*0.778*	
Vermilion	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*9.7*	*7.5466*	*7.5466*	
Shelf Rockfish South	S of 4010			1842	1439	1438	
Bronzespotted	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*3.6*	*2.8008*	*2.8008*	
Chameleon	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Flag	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*23.4*	*18.2052*	*18.2052*	
Freckled	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Greenblotched	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*23.1*	*17.9718*	*17.9718*	
Greenspotted	*4010 - 3427*	*2 (Year Based)*	*0.45 (0.190)*	*32.58*	*26.3898*	*25.71*	*The OFLs projected from the Northern California Model are apportioned north (22.2%) and south (77.8%) of 40°10' N lat. based on average historical (1978-2001) landings.*
Greenspotted	*S of 3427*	*2 (Year Based)*	*0.45 (0.190)*	*45.4321*	*36.8*	*36.8*	
Greenstriped	*S of 4010*	*2 (Year Based)*	*0.45 (0.205)*	*164.3775*	*130.6801*	*130.6801*	*The portion of the coastwide stock south of 40°10' N. lat. (15.5%) is based on the mean of the 2003-2008 swept area biomass estimates from the NMFS trawl survey.*
Halfbanded	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Harlequin	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Honeycomb	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*9.9*	*7.7022*	*7.7022*	
Mexican	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*5.1*	*3.9678*	*3.9678*	
Pink	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*2.5*	*1.945*	*1.945*	
Pinkrose	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Pygmy	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Redstripe	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.5*	*0.389*	*0.389*	
Rosethorn	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*2.1*	*1.6338*	*1.6338*	
Rosy	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*44.5*	*34.621*	*34.621*	
Silvergray	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.5*	*0.389*	*0.389*	
Speckled	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*39.4*	*30.6532*	*30.6532*	
Squarespot	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*11.1*	*8.6358*	*8.6358*	
Starry	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*62.6*	*48.7028*	*48.7028*	
Stripetail	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*23.6*	*18.3608*	*18.3608*	
Swordspine	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*14.2*	*11.0476*	*11.0476*	
Tiger	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.04*	*0.0311*	*0.0311*	
Vermilion	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*269.3*	*209.5154*	*209.5154*	
Yellowtail Rockfish	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*1064.4*	*828.1032*	*828.1032*	
Slope Rockfish North	N of 4010			1862	1595	1595	
Aurora	*N of 4010*	*1 (Year Based)*	*0.45 (0.091)*	*17.5*	*15.9075*	*15.9075*	*The portion of the coastwide stock north of 40°10' N lat. (19%) is based on average survey biomass.*

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Bank	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*17.2*	*13.3816*	*13.3816*	
Blackgill Rockfish	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*4.7*	*3.6566*	*3.6566*	
Redbanded	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*45.3*	*35.2434*	*35.2434*	
Rougheye/Blackspotted	*N of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*232.26*	*191.8468*	*191.8468*	*98% of the coastwide OFL is apportioned north of 40°10' N. lat. based on average landings during 1985-2012.*
Sharpchin	*N of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*292.3032*	*241.4424*	*241.4424*	*80% of coastwide OFL is apportioned to the N of 40°10' N lat.*
Shortraker	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*18.7*	*14.5486*	*14.5486*	
Splitnose	*N of 4010*	*1 (Year Based)*	*0.45 (0.108)*	*1041.77*	*929.2588*	*929.2588*	
Yellowmouth	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*192.4*	*149.6872*	*149.6872*	
Slope Rockfish South	S of 4010			873	709	709	
Aurora	*S of 4010*	*1 (Year Based)*	*0.45 (0.091)*	*74.5*	*67.7205*	*67.7205*	*The portion of the coastwide stock south of 40º10' N lat. (81%) is based on average survey biomass.*
Bank	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*503.2*	*391.4896*	*391.4896*	
Blackgill Rockfish	*S of 4010*	*2 (Year Based)*	*0.45 (0.143)*	*206*	*176.542*	*176.542*	
Pacific Ocean Perch	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Redbanded	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*10.4*	*8.0912*	*8.0912*	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Rougheye/Blackspotted	*S of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*4.74*	*3.9152*	*3.9152*	*2% of the coastwide OFL is apportioned south of 40°10' N. lat. based on average landings during 1985-2012.*
Sharpchin	*S of 4010*	*2 (Year Based)*	*0.45 (0.174)*	*73.0758*	*60.3606*	*60.3606*	*20% of coastwide OFLs are apportioned S of 40°10' N lat.*
Shortraker	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.1*	*0.0778*	*0.0778*	
Yellowmouth	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.8*	*0.6224*	*0.6224*	

Table 2-8. 2022 harvest specifications (overfishing limits (OFLs in mt), acceptable biological catches (ABCs in mt), and annual catch limits (ACLs in mt)) under preferred harvest control rules and stock complex restructuring for determining these specifications, for West Coast groundfish stocks and stock complexes (overfished/rebuilding stocks in CAPS; stocks with new assessments in bold; component stocks in stock complexes in italics).

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
YELLOWEYE ROCKFISH	CW	1 (Year Based)	0.40 (0.152)	98	83	51	The ACL is derived from the 2017 yelloweye rebuilding analysis under the 65% SPR harvest rate.
Arrowtooth Flounder	CW	2 (Year Based)	0.40 (0.281)	11764	8458	8458	
Big Skate	**CW**	**2 (Year Based)**	**0.45 (0.135)**	**1606**	**1389**	**1389**	
Black Rockfish	WA	1 (Year Based)	0.45 (0.087)	319	291	291	
Black Rockfish	CA	1 (Year Based)	0.45 (0.087)	373	341	341	
Bocaccio	S of 4010	1 (Year Based)	0.45 (0.078)	1870	1724	1724	7.4% of the assessed area (Conception area N to Cape Blanco) OFL is deducted to account for the portion of the stock north of 40°10' N lat.
Cabezon	**CA**			**210**	**195**	**195**	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Cabezon	***3427 - 42***	***1 (Year Based)***	***0.45 (0.070)***	***187.6***	***174.468***		
Cabezon	***S of 3427***	***1 (Year Based)***	***0.45 (0.070)***	***22.6***	***21.018***		
Cabezon/Kelp Greenling	WA			22	17	17	
Cabezon	***WA***	***3 (Year Based)***	***0.45 (0.222)***	***14.9***	***11.5922***	***11.5922***	
Kelp Greenling	*WA*	*3 (Year Based)*	*0.45 (0.222)*	*7.1*	*5.5238*	*5.5238*	
Cabezon/Kelp Greenling	OR			208	190	190	
Cabezon	*OR*	*1 (Year Based)*	*0.45 (0.070)*	*56.1*	*52.173*	*52.173*	
Kelp Greenling	*OR*	*1 (Year Based)*	*0.45 (0.087)*	*151.4*	*138.2282*	*138.2282*	
California Scorpionfish	CW	CA Scorpionfish (Year Based)	0.45 (0.091)	303	275	275	
Canary Rockfish	CW	1 (Year Based)	0.45 (0.087)	1432	1307	1307	
Chilipepper	S of 4010	1 (Year Based)	0.45 (0.087)	2474	2259	2259	93% of the coastwide chilipepper OFL is apportioned S of 40°10’ N lat. based on average historical landings.
Cowcod	**S of 4010**			**113**	**82**	**82**	
Cowcod	***S of 3427***	***2 (Year Based)***	***0.40 (0.253)***	***93.9412***	***70.1433***	***70.1433***	
Cowcod	***3427 - 4010***	***3 (Year Based)***	***0.40 (0.398)***	***19.2***	***11.5584***	***11.5584***	
Darkblotched Rockfish	CW	1 (Year Based)	0.45 (0.078)	901	831	831	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Dover Sole	CW	1 (Year Based)	0.45 (0.104)	87540	78436	50000	
English Sole	CW	2 (Year Based)	0.45 (0.182)	11127	9101	9101	
Lingcod	N of 4010	1 (Year Based)	0.45 (0.078)	5395	4974	4958	OFLs are projected from the 2017 assessment, which assessed two stocks north and south of 42° N lat. The relative biomass and OFLs are reapportioned north and south of the 40°10’ N lat. management line by using the most recent 5-year average percentage of survey biomass of lingcod between 40°10' and 42° N lat., which is 21.3% of the survey biomass in California.
Lingcod	S of 4010	1 (Year Based)	0.45 (0.078)	1334	1230	1172	OFLs are projected from the 2017 assessment, which assessed two stocks north and south of 42° N lat. The relative biomass and OFLs are reapportioned north and south of the 40°10’ N lat. management line by using the most recent 5-year average percentage of survey biomass of lingcod between 40°10' and 42° N lat., which is 21.3% of the survey biomass in California.
Longnose Skate	**CW**	**2 (Year Based)**	**0.45 (0.135)**	**2036**	**1761**	**1761**	
Longspine Thornyhead	CW	2 (Year Based)	0.40 (0.333)	4838	3227		
Longspine Thornyhead	N of 3427	2 (Year Based)	0.40 (0.333)			2452	ACLs are determined based on an apportionment of the coastwide ABC north (76%) and south (24%) of 34°27’ N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at 34°27’ N lat. in the NWFSC trawl survey.

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Longspine Thornyhead	S of 3427	2 (Year Based)	0.40 (0.333)			774	ACLs are determined based on an apportionment of the coastwide ABC north (76%) and south (24%) of 34°27' N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at 34°27' N lat. in the NWFSC trawl survey.
Pacific Ocean Perch	N of 4010	2 (Year Based)	0.45 (0.151)	4371	3711	3711	
Petrale Sole	**CW**	**1 (Year Based)**	**0.45 (0.070)**	**3936**	**3660**	**3660**	
Sablefish	**CW**	**1 (Year Based)**	**0.45 (0.070)**	**9005**	**8375**		
Sablefish	**N of 36**	**1 (Year Based)**	**0.45 (0.070)**			**6172**	**The ACLs are apportioned north (78.4%) and south (21.5%) of 40°10' N lat. using the coastwide ABCs based on average trawl survey biomass from 2014-2018.**
Sablefish	**S of 36**	**1 (Year Based)**	**0.45 (0.070)**			**2203**	**The ACLs are apportioned north (78.4%) and south (21.5%) of 40°10' N lat. using the coastwide ABCs based on average trawl survey biomass from 2014-2018.**
Shortbelly	CW	3 (Year Based)	0.40 (0.398)	6950	4184	2000	
Shortspine Thornyhead	CW	2 (Year Based)	0.40 (0.333)	3194	2130		
Shortspine Thornyhead	N of 3427	2 (Year Based)	0.40 (0.333)			1393	ACLs are determined based on an apportionment of the coastwide ABC north (65.4%) and south (34.6%) of 34°27' N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at 34°27' N lat. in the NWFSC trawl survey.

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Shortspine Thornyhead	S of 3427	2 (Year Based)	0.40 (0.333)			737	ACLs are determined based on an apportionment of the coastwide ABC north (65.4%) and south (34.6%) of 34°27' N lat. based on the 2003-2012 average swept area biomass estimated north and south of Pt. Conception at 34°27' N lat. in the NWFSC trawl survey.
Spiny Dogfish	CW	2 (Year Based)	0.40 (0.358)	2469	1585	1585	
Splitnose	S of 4010	1 (Year Based)	0.45 (0.113)	1837	1630	1630	
Widow Rockfish	**CW**	**1 (Year Based)**	**0.45 (0.070)**	**14826**	**13788**	**13788**	
Yellowtail Rockfish	N of 4010	1 (Year Based)	0.45 (0.078)	6324	5831	5831	
Pacific Cod	CW	3 (Year Based)	0.40 (0.398)	3200	1926	1600	
Starry Flounder	CW	3 (Year Based)	0.40 (0.398)	652	392	392	
Blue/Deacon/Black Rockfish	OR		0.45 (0.044)	672	600	600	
Black Rockfish	*OR*	*2 (Year Based)*	*NA*	*566*	*512*	*512*	
Blue	*OR*	*2 (Year Based)*	*0.45 (0.151)*	*103.1*	*87.5319*	*87.5319*	
Nearshore Rockfish North	N of 4010			93	77	77	
Black and Yellow	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0135*	*0.0105*	*0.0105*	
Blue	*42 - 4010*	*2 (Year Based)*	*0.45 (0.151)*	*33.6*	*28.5264*	*28.5264*	*10% of the CA OFL N of 34°27' N lat. is apportioned north of 40°10' N lat. (see Appendix D of the 2017 Assessment).*

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Blue	*WA*	*3 (Year Based)*	*0.45 (0.222)*	*7.8*	*6.0684*	*6.0684*	
Brown	*N of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*2.0846*	*1.7052*	*1.7052*	*The portion of the coastwide stock north of 40`10 N lat. (1.2%) based on the proportion of cumulative removals by area during 1916-2012.*
Calico	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
China	*WA*	*2 (Year Based)*	*0.45 (0.167)*	*10.43*	*8.6882*	*8.6882*	*OFLs are projected from the Northern Model in the 2015 assessment.*
China	*4010 - 4616*	*2 (Year Based)*	*0.45 (0.167)*	*21.08*	*17.5596*	*17.5596*	*OFLs are projected from the Central Model in the 2015 assessment.*
Copper	*N of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*9.8594*	*8.065*	*8.065*	*7.3% of the OFL estimated from the Northern Model (34°27' N lat. to U.S.-Can border) is apportioned N of 40°10' N lat. based on the proportion of cumulative removals by area during 1916-2012.*
Gopher	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Grass	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.6567*	*0.5109*	*0.5109*	
Kelp	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0092*	*0.0072*	*0.0072*	
Olive	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.3152*	*0.2452*	*0.2452*	
Quillback	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*7.3742*	*5.7371*	*5.7371*	
Treefish	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.2165*	*0.1684*	*0.1684*	
Nearshore Rockfish South	S of 4010			1233	1011	1010	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Blue	*4010 - 3427*	*2 (Year Based)*	*0.45 (0.151)*	*302.4*	*256.7376*	*256.7376*	*90% of the CA OFL N of 34°27' N lat. is apportioned south of 40°10' N lat. (see Appendix D of the 2017 Assessment).*
Blue	*S of 3427*	*3 (Year Based)*	*0.45 (0.222)*	*21.8*	*16.9604*	*16.9604*	
Brown	*S of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*178.5154*	*146.0256*	*146.0256*	*The portion of the coastwide stock north of 40`10 N lat. (98.8%) based on the proportion of cumulative removals by area during 1916-2012.*
Calico	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
China	*S of 4010*	*2 (Year Based)*	*0.45 (0.167)*	*15.94*	*13.278*	*12.21*	*OFLs are projected from the Southern Model in the 2015 assessment.*
Copper	*S of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*246.9806*	*202.0301*	*202.0301*	*92.7% of the OFL estimated from the Northern Model (34°27' N lat. to U.S.-Can border) is apportioned S of 40°10' N lat. based on the proportion of cumulative removals by area during 1916-2012.*
Gopher	***S of 4010***	***2 (Year Based)***	***0.45 (0.135)***	***137***	***118.505***	***118.505***	***Assessed and managed as a "complex" with Gopher and Black-and-Yellow rockfishes.***
Grass	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*59.6267*	*46.3896*	*46.3896*	
Kelp	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*27.6594*	*21.519*	*21.519*	
Olive	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*224.6426*	*174.7719*	*174.7719*	
Quillback	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*5.3852*	*4.1897*	*4.1897*	
Treefish	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*13.2295*	*10.2926*	*10.2926*	
Other Fish	CW			286	223	223	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Kelp Greenling	*CA*	*3 (Year Based)*	*0.45 (0.222)*	*118.9*	*92.5042*	*92.5042*	
Leopard Shark	*CW*	*3 (Year Based)*	*0.45 (0.222)*	*167.1*	*130.0038*	*130*	
Other Flatfish	CW			7808	4838	4838	
Butter Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*4.6308*	*2.7877*	*2.7877*	*Based on the average catch during 1994-1998 + a 60% discard rate estimated from the EDCP study.*
Curlfin Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*8.2423*	*4.9619*	*4.9619*	*Based on the average catch during 1994-1998 + a 60% discard rate estimated from the EDCP study.*
Flathead Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*35*	*21.07*	*21.07*	*Max. catch = 35 mt in 2005*
Pacific Sanddab	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*4801*	*2890.202*	*2890.202*	
Rex Sole	*CW*	*2 (Year Based)*	*0.40 (0.333)*	*2119.65*	*1413.8066*	*1413.8066*	*Bayesian projections differ from the calculated ABCs.*
Rock Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*66.7*	*40.1534*	*40.1534*	
Sand Sole	*CW*	*3 (Year Based)*	*0.40 (0.398)*	*773.2*	*465.4664*	*465.4664*	
Shelf Rockfish North	N of 4010			1821	1450	1450	
Bocaccio	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*284.0136*	*220.9626*	*220.9626*	
Bronzespotted	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Chameleon	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Chilipepper	*N of 4010*	*1 (Year Based)*	*0.45 (0.087)*	*186.2*	*170.0006*	*170.0006*	*7% of the coastwide chilipepper OFL is apportioned N of 40°10' N lat. based on average historical landings.*
Cowcod	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.567*	*0.4411*	*0.4411*	
Flag	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0724*	*0.0563*	*0.0563*	
Freckled	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Greenblotched	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*1.2774*	*0.9938*	*0.9938*	
Greenspotted	*42 - 4010*	*2 (Year Based)*	*0.45 (0.197)*	*9.34*	*7.5*	*7.33*	*The OFLs projected from the Northern California Model are apportioned north (22.2%) and south (77.8%) of 40°10' N lat. based on average historical (1978-2001) landings.*
Greenspotted	*WA - OR*	*3 (Year Based)*	*0.45 (0.222)*	*6.078*	*4.7287*	*4.7287*	
Greenstriped	*N of 4010*	*2 (Year Based)*	*0.45 (0.212)*	*836.719*	*659.3346*	*659.3346*	*The portion of the coastwide stock north of 40°10' N. lat. (84.5%) is based on the mean of the 2003-2008 swept area biomass estimates from the NMFS trawl survey.*
Halfbanded	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Harlequin	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Honeycomb	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Mexican	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Pink	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0037*	*0.0029*	*0.0029*	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Pinkrose	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Puget Sound	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Pygmy	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Redstripe	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*269.9106*	*209.9904*	*209.9904*	
Rosethorn	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*12.8971*	*10.0339*	*10.0339*	
Rosy	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*3.034*	*2.3605*	*2.3605*	
Silvergray	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*159.4204*	*124.0291*	*124.0291*	
Speckled	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.1711*	*0.1331*	*0.1331*	
Squarespot	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.1724*	*0.1341*	*0.1341*	
Starry	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0037*	*0.0029*	*0.0029*	
Stripetail	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*40.3954*	*31.4276*	*31.4276*	
Swordspine	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0001*	*0.0001*	*0.0001*	
Tiger	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.9689*	*0.7538*	*0.7538*	
Vermilion	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*9.7168*	*7.5597*	*7.5597*	
Shelf Rockfish South	S of 4010			1832	1429	1428	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Bronzespotted	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*3.6465*	*2.837*	*2.837*	
Chameleon	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Flag	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*23.4239*	*18.2238*	*18.2238*	
Freckled	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Greenblotched	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*23.1305*	*17.9955*	*17.9955*	
Greenspotted	*4010 - 3427*	*2 (Year Based)*	*0.45 (0.197)*	*32.72*	*26.2742*	*25.71*	*The OFLs projected from the Northern California Model are apportioned north (22.2%) and south (77.8%) of 40°10' N lat. based on average historical (1978-2001) landings.*
Greenspotted	*S of 3427*	*2 (Year Based)*	*0.45 (0.197)*	*45.5369*	*36.5661*	*36.5661*	
Greenstriped	*S of 4010*	*2 (Year Based)*	*0.45 (0.212)*	*153.481*	*120.943*	*120.943*	*The portion of the coastwide stock south of 40°10' N. lat. (15.5%) is based on the mean of the 2003-2008 swept area biomass estimates from the NMFS trawl survey.*
Halfbanded	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Harlequin	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Honeycomb	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*9.8668*	*7.6764*	*7.6764*	
Mexican	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*5.0532*	*3.9314*	*3.9314*	
Pink	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*2.5*	*1.945*	*1.945*	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Pinkrose	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Pygmy	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				
Redstripe	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.4926*	*0.3832*	*0.3832*	
Rosethorn	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*2.1305*	*1.6575*	*1.6575*	
Rosy	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*44.5082*	*34.6274*	*34.6274*	
Silvergray	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.5376*	*0.4183*	*0.4183*	
Speckled	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*39.3813*	*30.6387*	*30.6387*	
Squarespot	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*11.1*	*8.6358*	*8.6358*	
Starry	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*62.5716*	*48.6807*	*48.6807*	
Stripetail	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*23.6233*	*18.3789*	*18.3789*	
Swordspine	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*14.2159*	*11.06*	*11.06*	
Tiger	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.0399*	*0.031*	*0.031*	
Vermilion	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*269.2764*	*209.497*	*209.497*	
Yellowtail Rockfish	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*1064.4392*	*828.1337*	*828.1337*	
Slope Rockfish North	N of 4010			1842	1568	1568	

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Aurora	*N of 4010*	*1 (Year Based)*	*0.45 (0.096)*	*17.4*	*15.7296*	*15.7296*	*The portion of the coastwide stock north of 40°10' N lat. (19%) is based on average survey biomass.*
Bank	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*17.2375*	*13.4108*	*13.4108*	
Blackgill Rockfish	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*4.7*	*3.6566*	*3.6566*	
Redbanded	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*45.2618*	*35.2137*	*35.2137*	
Rougheye/Blackspotted	*N of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*233.24*	*190.7903*	*190.7903*	*98% of the coastwide OFL is apportioned north of 40°10' N. lat. based on average landings during 1985-2012.*
Sharpchin	*N of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*288.8576*	*236.2855*	*236.2855*	*80% of coastwide OFL is apportioned to the N of 40°10' N lat.*
Shortraker	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*18.7038*	*14.5516*	*14.5516*	
Splitnose	*N of 4010*	*1 (Year Based)*	*0.45 (0.113)*	*1024.53*	*908.7581*	*908.7581*	
Yellowmouth	*N of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*192.4467*	*149.7235*	*149.7235*	
Slope Rockfish South	S of 4010			871	705	705	
Aurora	*S of 4010*	*1 (Year Based)*	*0.45 (0.096)*	*74.4*	*67.2576*	*67.2576*	*The portion of the coastwide stock south of 40°10' N lat. (81%) is based on average survey biomass.*
Bank	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*503.215*	*391.5013*	*391.5013*	
Blackgill Rockfish	*S of 4010*	*2 (Year Based)*	*0.45 (0.151)*	*205*	*174.045*	*174.045*	
Pacific Ocean Perch	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*				

Stock or Complex	Area	Cat.	P* (ABC Buffer)	OFL	ABC	ACL	Notes
Redbanded	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*10.4057*	*8.0956*	*8.0956*	
Rougheye/Blackspotted	*S of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*4.76*	*3.8937*	*3.8937*	*2% of the coastwide OFL is apportioned south of 40°10' N. lat. based on average landings during 1985-2012.*
Sharpchin	*S of 4010*	*2 (Year Based)*	*0.45 (0.182)*	*72.2144*	*59.0714*	*59.0714*	*20% of coastwide OFLs are apportioned S of 40°10' N lat.*
Shortraker	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.1049*	*0.0816*	*0.0816*	
Yellowmouth	*S of 4010*	*3 (Year Based)*	*0.45 (0.222)*	*0.8483*	*0.66*	*0.66*	

2.3 Management Measure Alternatives

The PCGFMP section 6.2 describes management measures stemming from the biennial harvest specifications process. Management measures considered

> "During the biennial process the Council may propose: (1) management measures to be classified as routine the first time these measures are used; or (2) adjustments to measures previously classified as routine…; or (3) new management measures, which are those management measures where the impacts have not been previously analyzed and/or have not been previously implemented in regulations." PCGFMP 6.2

Routine management measures include the allocation of harvest opportunity between commercial and recreational groundfish fisheries, among commercial fishery sectors, and, for the purpose of managing recreational fisheries, among the three West Coast states. A complete list of routine management measures is found at CFR 50 § 660.60 (c). Many of these allocations are specified in the PCGFMP, while others are specified as part of the biennial management process. Before these allocations are made, amounts may be deducted from ACLs to account for catches in tribal fisheries, incidental open access fisheries , research activities, and exempted fishing permits. Routine management measures are mainly used to regulate catch in reference to the harvest specifications for each stock or stock complex These measures are intended to mitigate the risk of exceeding 2021 and 2022 ACLs and to achieve fishery goals set by the MSA National Standards.

As noted above, NMFS determined that the allocations and adjustments to existing and routine measures were within the range of management measures analyzed in the 2015 EIS and subsequent NEPA analyses of biennial harvest specifications.

Analyses of the adjustments to allocations of ACLs and modifications of existing management measures were presented to the Council at the November 2019 through the June 2020 meetings and the analyses can be found on the Council's website within each meeting's briefing book. A detailed evaluation of the performance and effects of management measures that would be implemented for the 2021-2022 biennial period were presented to the Council at the April (Agenda Item G.6, Attachment 2, April 2020) and June 2020 (Agenda Item F.1, Attachment 8, June 2020) meetings. They were additionally succinctly summarized in the Action Item Checklist which was provided to the Council at its November 2019 (ROA), April 2020 (PPA), and June 2020 (FPA) meetings.

2.3.1 Description of Additional Management Measures

At their November 2019 meeting, the Council recommended analysis of management options in addition to proposed modifications to routine measures. While these additional measures fall under the umbrella of routine management measures used to implement the harvest specifications, they required special analyses and, as such, are summarized here. The Council reviewed these additional items at their April 2020 meeting and selected their Preferred Alternative at their June 2020 meeting.. For those items with multiple options, the options are shown in the accompanying tables with the preferred in bold. Details regarding adjustments made to existing management measures, and their anticipated impacts can be found in Chapter 4:

Retention of Yellowtail Rockfish within the Non-Trawl RCA in the Salmon Troll Fishery South of 40°10' N. lat.

As of 2020, commercial salmon trollers south of 40°10' N. lat. cannot retain incidentally caught yellowtail rockfish. The Council will consider establishing a yellowtail rockfish trip limit south of 40°10' N. lat. in the commercial salmon troll fishery. The alternatives under consideration are shown in Table 2-11. The

intent of these alternatives is to provide a wide range of options to be able to consider inseason adjustments in the future. Additionally, changing the trip limit could require modification to the IOA set-aside. Yellowtail rockfish, in this area, are managed under a cumulative open access trip limit for shelf rockfish complex south of 40°10' N. lat.; therefore, the Council will consider adjusting the 67.7 mt IOA ACL deduction for shelf rockfish south of 40°10' N. lat. in order to accommodate projected yellowtail rockfish catch by salmon trollers.

Table 2-9. Proposed yellowtail rockfish trip limit adjustments in the salmon troll fishery south of 40°10' N. lat. Preferred in bold

Option	Ratio (per trip)	Monthly Limit
1 (SQ)	No retention of yellowtail rockfish	*not applicable*
2	**1 lb. yellowtail rockfish per 2 lbs. of salmon**	**200 lbs.**

Amendment 21 Allocations for Petrale Sole, Widow Rockfish, Lingcod South of 40°10' N. lat., and Slope Rockfish Complex, including Blackgill Rockfish, South of 40°10' N. lat

The Council is considering revising the Amendment 21 (A-21) allocations of petrale sole, widow rockfish, lingcod south of 40°10' N. lat., and the slope rockfish complex, including blackgill rockfish, south of 40°10' N. lat. These stocks would become two-year allocation species with the following options under consideration for 2021-2022. Changing these species to biennial allocations would require an amendment to the PCGFMP. The alternatives under consideration, by species, are shown in below. The option selected as preferred is highlighted in bold.

Petrale sole:

- Option 1: Status Quo; A-21 allocations: 95 percent trawl, 5 percent non-trawl
- **Option 2: Two-year Allocation: 30 mt non-trawl, remainder to trawl**

Widow Rockfish:

- Option 1: Status Quo; A-21 allocations: 91 percent trawl, 9percent non-trawl
- **Option 2: Two-year Allocation: 400 mt non-trawl, remainder to trawl**

Lingcod South of 40°10' N. lat.:

- Option 1: Status Quo; A-21 allocations: 45 percent trawl, 55 percent non-trawl
- Option 2: Two-year Allocation: 43 percent non-trawl, 47 percent trawl
- Option 3: Two-year Allocation: 25 percent trawl; 75 percent non-trawl
- **Option 4: Two-year Allocation: 40 percent trawl, 60 percent non-trawl**
- Option 5: Two-year Allocation: 35 percent trawl, 65 percent non-trawl
- Option 6: Two-year Allocation: 30 percent trawl, 70 percent non-trawl

Slope Rockfish South of 40°10' N. lat:

- Option 1: Status Quo; Amendment 21 (A-21) allocations: 37 percent non-trawl, 63percent trawl

- **Option 2: Two-year Allocation: Create shares of blackgill rockfish and other slope rockfish based on the structure described in the Amendment 26 document[8] and additionally detailed in Agenda Item H.8.a, Supplemental GMT Report 2, November 2019, and create a customized southern slope trawl and non-trawl allocation based on the sum of the shares minus off-the-top deductions distributed pro rata to each sector's percentage of total shares.**

Modifications to Rockfish Conservation Areas

RCA are large, depth-based closures intended to reduce the catch of rockfish and other groundfish. The boundaries for RCAs are defined by straight lines that connect a series of latitude and longitude coordinates that approximate depth contours. A set of coordinates are defined for each depth contour (50 CFR §660.71) RCAs are implemented by gear and/or fishery (e.g. non-trawl RCA, recreational RCA, etc.). Under the action alternatives, changes to selected coordinates are proposed that more closely approximate the boundaries with depth contours that are based on the best available depth data. Modifications would maintain the intent of the RCAs by providing improved and more efficient access to target species, while minimizing interactions to rebuilding species. All of the following modifications were proposed under the No Action alternative. No RCA modifications were proposed under Alternative 1 or 2

Corrections to the Non-trawl Rockfish Conservation Area Coordinates Offshore of San Mateo County

The Preferred Alternative was the same as the No Action Alternative, the 40 fathom (fm) depth contour for the non-trawl RCA is proposed to be modified offshore of San Mateo County in central California. The modification of the coordinates is intended to better align with corresponding isobaths and would increase the available fishing area by 6.3 miles^2.

Minor Adjustments to the Recreational Rockfish Conservation Areas off California, South of 40°10' N. lat.

Under No Action, this proposal would adjust the RCA boundaries for commercial and recreational fisheries Note, the Preferred Alternative is shown below. The Council did not adopt a boundary line at Pigeon Point as detailed in Agenda Item F.1., Attachment 8 under the No Action Alternative)

The Preferred Alternative for the commercial RCA boundary line changes are as follows:

- Implement a new management line at 38°57.5′ N. lat., (Point Arena) for purposes of defining RCA boundaries.
- In the area between 38°57.5′ and 34°27′ N. lat., (Point Arena to Point Conception): Increase the depth of the shoreward RCA boundary from 40 to 50 fathoms. [NOTE: The shoreward RCA depth between 40°10′ N. lat. and 38°57.5′N. lat. would remain unchanged; at 40 fathoms.]
- From 34°27′ N. lat. (Point Conception) to the U.S.-Mexico border: Increase the depth of the shoreward RCA boundary from 75 fathoms to 100 fathoms.

The Preferred Alternative for the recreational RCA boundary line changes are as follows:

- In the Mendocino Management Area – Cape Mendocino (40° 10' N lat.) to Point Arena (38° 57.50' N lat.) – extend the RCA boundary from 20 fm to 30 fm; fishing would be prohibited seaward of the 30 fm depth contour from May 1 through October 31. From November 1 – December 31, this management area would continue to have no RCA and allow for all depth access.

[8] Amendment 26 was not adopted, however, the process by which this allocation structure was derived is contained in the document.

- In the Southern Management Area – Point Conception (34° 27' N lat.) to the California US/Mexico border – extend the RCA boundary from 75 fm to 100 fm; fishing would be prohibited seaward of the 100 fm depth contour from March 1 through December 31.
- In the San Francisco Management Area – Point Arena (38° 57.50' N lat.) to Point Pigeon (37° 11' N lat.) – extend the RCA boundary from 40 fm to 50 fm; fishing would be prohibited seaward of the 50 fm depth contour from April 1 through December 31.

Corrections to the 100 Fathom Rockfish Conservation Area Boundary Line South of 34°27' N. lat.

The Preferred Alternative for this proposal is the same as No Action, to modify (as described, in detail, in Agenda Item H.4.a Supplemental CDFW Report 1, March 2020) the 100 fm RCA depth curve south of 34°27' N. lat. to better described the isobath curve in regulation. The proposal to expand the current shoreward 75 fm line out to 100 fm Southern Management Area (south of 34° 27' N. latitude) revealed crossover with the 75 fm depth curve (described above). As such, if the existing 100 fm boundary line listed in regulation were used, this would create new closed areas in locations that are currently open to fishing activity utilizing the 75 fm line. Additionally, waypoints to approximate the 100 fm curve around the northern Channel Islands as they do not currently exist in regulation.

Removal of South Coast and Westport Offshore Yelloweye Rockfish Conservation Areas (YRCA) in Washington

This Preferred Alternative for this proposal is the same as No Action, to remove the existing South Coast and Westport Offshore YRCAs. These areas would re-open to allow for recreational fishing of groundfish and Pacific halibut year-round.

2.3.2 Alternatives Considered but not Recommended

Accountability Measure Guidelines When an Annual Catch Limit is Approached or Exceeded

Accountability Measures (AM) guidelines were developed by NMFS and provided to the Council at the March 2020 meeting under Agenda Item H.4.a, Supplemental NMFS Report 2, March 2020. This management measure was considered in conjunction with shortbelly rockfish. As the shortbelly rockfish ACL has been exceeded more than once in the last four years (2018, 2019), the National Standard Guidelines require that the Council reassess its accountability measures related to shortbelly rockfish management. The Council initially considered a range of new management measures related to shortbelly rockfish, including the setting of an annual catch target below the ACL (with associated closures) and the prohibition of directed fishing. The range of ACT options analyzed by the GMT can be found in Agenda Item F.1.a, Supplemental GMT Report 1, June 2020 and a history of the Council's deliberations on directed fishing in Agenda Item F.1.a, Supplemental GMT Report 3, June 2020. Given that the Council's preferred alternative was to make shortbelly an EC species, there were no accountability measures recommended for 2021-2022 as EC species are deemed to not be in need of management or conservation. However, the Council may consider this action in either future biennial specifications or as a separate rulemaking for groundfish stocks.

Rockfish Conservation Areas

Under No Action, the Council considered additional changes to the non-trawl RCA south of 40° 10' N. lat. that were not adopted as part of the preferred alternative:

- Establishing a management line at Pigeon Point (37°11' N lat.; as specified in CFR50 § 660.310). The Council recommended adjusting the shoreward RCA boundary line in the entire area between Pt Arena and Pt Conception from 40 fm to 50 fm. This area is #3 and #4 from CDFW's proposed (prioritized) list of Minor Line Adjustments to Rockfish Conservation Areas

(RCA) .The Pigeon Pt line was only needed if only #3 (Pigeon Pt to Pt Conception) moved forward. However, the Council may consider this action in either future biennial specifications or as a separate rulemaking for groundfish stocks if germane to the action.

- Move the seaward boundary from 150 fm to 100 fm south of 34° 27’ N. lat. and from 125 fm to 100 fm between 34° 27’ N. lat and 40° 10’ N. lat. While these changes would have permitted some additional access to deeper waters off California than those adopted in the preferred alternative, there were concerns by the Council that there was not sufficient analysis regarding potential habitat impacts in those deeper depths.

However, the Council may consider this action in either future biennial specifications or as a separate rulemaking for groundfish stocks.

[INTENTIONALLY BLANK]

3. Affected Environment

Council on Environmental Quality (CEQ) regulations at 40 CFR §1502.15 state that the EA "shall succinctly describe" the environmental components potentially affected by the proposed action. The level of detail "shall be commensurate with the importance of the impact." This EA tiers from the 2015 EIS, 2017-18 EA, and the 2019-20 EA incorporating by reference the description of the affected environment and only presenting updates to the descriptions of the affected environment where necessary. Furthermore, the 2020 Groundfish Stock Assessment and Fishery Evaluation (SAFE) (PFMC 2020) details the status of groundfish stocks, the fisheries and fishing communities, essential fish habitat (EFH), and factors affecting safety of life at sea. Information from the SAFE is incorporated by reference and summarized here as necessary. The Groundfish SAFE document describes the status and biology of the all stocks managed under the PCGFMP. The SAFE is updated for all stocks on a biennial basis.

3.1 Groundfish Fishery Sectors

The groundfish fishery can be broadly defined into three categories: commercial, Tribal, and recreational. The Groundfish SAFE (2020) document provides a detailed description of the status of the fishery. These groupings can further be specified into sectors (commercial) and modes (recreational). The following information is summarized from that source.

3.1.1 Commercial Fishery

Commercial fisheries on the West Coast are generally considered to have two sectors, the whiting sector, and the non-whiting sector.

Whiting Sector – These vessels use midwater trawl net in their operations and strictly target Pacific whiting (hereinafter whiting). Within the whiting sector, there are two fishery designations within the whiting sector, at-sea and shoreside. The ex-vessel revenue for the whiting sector, combined, has averaged about $52.4 million per year ($64.9 million in 2019)[9] since the 2015 EIS.

> **At-Sea** – The at-sea fleet consists of the catcher-processor and mothership sectors. Catcher processors (CP) both catch and process whiting at sea; whereas, motherships (MS) receives and processes whiting catch supplied by catcher vessels (MSCV).
>
> **Shoreside** – The shoreside fleet consists of vessels who catch and deliver it to a shoreside plant for processing; however, some shoreside whiting vessels do regularly participate as MCSV for motherships.

Non-Whiting – This sector of the fishery includes the non-whiting groundfish trawl (bottom and midwater trawl gear) and fixed gear (hook & line, and pot gear) fisheries. The commercial non-whiting sector has averaged $83.7 million annually since 2015 ($83.3 million)[10]. The highest ex-vessel revenue has historically been derived from sablefish, rockfish, thornyheads, flatfish (e.g. Dover and petrale sole), and lingcod.

> ***Trawl*** – The non-whiting trawl fishery operates under the shorebased IFQ program and is comprised of two primary gear types that target groundfish: midwater trawl and bottom trawl. While trawling portfolios are made up of a variety of groundfish species, the non-whiting midwater trawl fishery

[9] Data from PacFIN, accessed 4/28/2020 and is inflation adjusted
[10] Data from PacFIN, accessed 4/28/2020 and is inflation adjusted

primarily targets widow and yellowtail rockfish while bottom trawlers typically target sablefish, dover sole, thornyheads (i.e. the DTS complex), and other flatfish species.

Fixed gear – This sector targets groundfish via longline (hook gear) and/or pot gear. This fishery is divided between "limited entry" and "open access" from a regulatory standpoint, but fishery managers more commonly characterize a "non-nearshore" sector which primarily targets sablefish, a "non-nearshore non-sablefish" sector which targets groundfish other than sablefish, and a "nearshore" sector, which targets various nearshore groundfish species off of Oregon and California, including blue/deacon and black rockfish. Also included in this designation are a subset of shorebased IFQ vessels known as "gear switchers", which are trawl endorsed vessels that use fixed gear to target such species as sablefish.

Incidental OA – This sector includes a number of non-groundfish fisheries that take groundfish incidentally and have been characterized as groundfish incidental OA for the purpose of management and data presentation. In aggregate they account for a very small proportion of groundfish landings and revenue.

The ten most common species, or species groups, landed by the aforementioned sectors accounted for nearly 72 percent of nominal shoreside ex-vessel revenue in during 2012-2019. Of this amount, Pacific whiting (shoreside), rockfish (combined), flatfish (combined), petrale sole, Dover sole, and sablefish, accounted for 65 percent of revenue in 2019 in shoreside fisheries.

A variety of other mostly incidental groundfish sectors have been characterized for the purpose of management and data presentation, but in aggregate they account for a very small proportion of groundfish landings and revenue. Vessels that target non-groundfish species, (e.g. pink shrimp, sea cucumber, etc.) operate under groundfish set-asides, where, in some cases, incidentally, caught groundfish may be retained and sold. Research and exempted fishing permit (EFP) vessels also operate under set-asides and can, in some instances, sell their catch

3.1.2 Recreational Fisheries

This fishery primarily targets groundfish via hook and line, though some spear effort exists, from a variety of platforms. Groundfish species can be caught from shore, man-made structures, and boats; however, the primary platform for anglers targeting groundfish species are the boat-based modes. These modes are private boats and commercial passenger fishing vessels/charter boats. Recreational fisheries are an important part of fishery-related economic activity. Because recreational catch is not sold, however, it is more difficult to impute the economic value of these fisheries. Past Groundfish Harvest Specifications EISs have characterized recreational fisheries in terms of fishing effort (angler trips) to quantify spatio-temporal differences in West Coast recreational fisheries. It is important to note that due to the sampling and fishery estimation methodologies, recreational estimates of catch and effort for a California, Oregon, and Washington is not generally available on the same timeline as commercial data. An initial set of catch and effort estimates is generally available in March for the year prior. For example, 2019 data will be finalized in late winter of 2020. Therefore, analyses for the recreational fishery under like past bienniums, analysis of the recreational groundfish management measures largely relies on data from the year prior to what is considered the baseline year of 2019 or are estimates from 2019.

3.1.3 Tribal Groundfish Fisheries

Several Pacific Northwest Indian tribes have treaty rights to fish for groundfish in their Usual and Accustomed (U&A) fishing grounds. The Federal government has accommodated these fisheries through a regulatory process described at 50 CFR §660.50. Tribal fishery management is coordinated through the Council process so catches can be accounted for when developing management measures. Treaties specify their rights to harvest federally managed groundfish in their U&A fishing areas (§660.4). Under these treaties, the tribes manage the fisheries in which their members participate. On average, the treaty fisheries have generated an average of about $4.1 million (inflation adjusted) per year since the publication of the 2015 EIS.

The PCGFMP details the provisions for allocations or set-asides of certain species to ensure treaty rights are implemented. Tribal catches are accounted for through set-asides. Like other groundfish management on the west coast, these amounts are developed as part of the biennial harvest specification and management measure process. Tribes prosecute the commercial fishery in the same manner as described above under 3.2.1.1 as, in terms of vessels, gear, and target. The Makah Tribe participates in whiting fisheries with both a mothership and shorebased component. All four Washington coastal tribes (Makah, Quileute, Hoh, and Quinault) tribes have fixed gear vessels and the Makah are active in the bottom trawl and midwater fisheries as well. At the November 2019 Council meeting, the Quinault Nation indicated they would participate in the 2020 groundfish fishery and indicated their desire to continue into the next biennium.

3.2 Baseline

The Baseline scenario describes the regulations, management measures, and expected groundfish mortality in 2019 and is detailed at section 3.2 of Agenda Item F.1, Attachment 8, June 2020 and is incorporated through reference. It is not an alternative under consideration for implementation, but rather a description of the current conditions which can be used to better understand the proposed management measure adjustments under No Action and the Action alternatives.

3.3 Socioeconomic Environment

The following section provides a summarized description of the Pacific coast groundfish fishery's socioeconomic environment. In the 2015 EIS as well as the Groundfish SAFE document, detailed characterizations of the Pacific coast groundfish fishery. Additionally, the 2017 EA and 2018 EA update that information for the periods covered in those EAs.

3.3.1 Revenue Trends for Commercially Important Groundfish

The PCGFMP accounts for over 90 species; however, relatively few species account for the majority of the fishery's revenue. Table 3-1 shows the top three species groups ranked by revenue [sablefish, Pacific whiting (hake), and Rockfish not elsewhere identified (NEI)] accounted for 74% of total inflation adjusted groundfish ex-vessel revenue. Adding in the next two most important species groups, Dover sole and petrale sole, accounts for another 15% of total inflation adjusted groundfish ex-vessel revenue during the 2003-2019 period. Data for the 2017-2018 biennial specifications period show the highest average annual inflation-adjusted landings revenue over the period shown. Revenues from Pacific whiting and Rockfish NEI have been particularly strong in recent years.

Although 2019 data presented here is preliminary, and therefore incomplete, total revenue has increased since by $16 million, or 16 percent, from the 2015-2016 biennial period and is comparable to the 2011-2012 biennial period. However, compared to the 2017-2018 biennial period, average ex-vessel revenue is down by 14 percent While there is fluctuation in ex-vessel revenue, overall, it has remained fairly steady

These fluctuations could be a response to market conditions rather than landings. Notably, sablefish landings have averaged 5,337 mt per year with little variability per year in terms of amount landed. Whiting, however, has increased in landings over the 2003-2019 period, but as shown in Table 3-2, ex-vessel revenue remains fairly flat over the 2003-20019.

Table 3-1. Average annual inflation adjusted ex-vessel revenue, $1,000s by groundfish species for 2003-2010 and bienniums starting in 2011. (Source: Groundfish SAFE Table 12b and PacFIN comprehensive ft 01/16/2020). a/ NEI = not elsewhere identified.

	2003-2010		2011-2012		2013-2014	
	Revenue	Percent	Revenue	Percent	Revenue	Percent
Sablefish	$35,819	41%	$45,323	44%	$25,269	29%
P. Whiting	$15,830	18%	$27,337	27%	$29,740	34%
Dover Sole	$9,953	11%	$8,452	8%	$8,163	9%
Rockfish NEI[a/]	$5,856	7%	$6,789	7%	$6,631	8%
Petrale Sole	$6,733	8%	$3,998	4%	$7,016	8%
Thornyheads	$5,615	6%	$4,839	5%	$4,640	5%
Roundfish NEI[a/]	$2,980	3%	$3,191	3%	$2,847	3%
Flatfish NEI[a/]	$3,183	4%	$1,820	2%	$1,660	2%
Other	$1,136	1%	$1,375	1%	$1,325	2%
Total	$87,104	100%	$103,124	100%	$87,291	100%
	2015-2016		2017-2018		2019 (preliminary)	
	Revenue	Percent	Revenue	Percent	Revenue	Percent
Sablefish	$41,425	48%	$54,750	47%	$40,252	39%
P. Whiting	$12,470	14%	$23,957	21%	$29,246	28%
Dover Sole	$7,171	8%	$7,044	6%	$5,368	5%
Rockfish NEI[a/]	$7,029	8%	$12,047	10%	$13,862	14%
Petrale Sole	$7,685	9%	$7,897	7%	$6,650	6%
Thornyheads	$4,144	5%	$5,032	4%	$2,995	3%
Roundfish NEI[a/]	$3,529	4%	$3,419	3%	$3,038	3%
Flatfish NEI[a/]	$1,411	2%	$1,061	1%	$604	1%
Other	$1,471	2%	$908	1%	$610	1%
Total	$86,336	100%	$116,116	100%	$102,626	100%

3.3.2 Landings and Revenue for Commercial Fishery Sectors

3.3.2.1 Non-whiting Fishery Sectors

The ex-vessel revenue for the main non-whiting sectors is shown in Table 3-2 during 2013 – 2019. This table excludes shoreside whiting IFQ. Based on the table below the shoreside non-whiting IFQ (trawl and non-trawl) fisheries ex-vessel revenue accounts for an estimated 59percent of revenue in the non-whiting

groundfish fishery. The non-nearshore and nearshore fixed gear fisheries combined account for 39 percent of the ex-vessel revenue and there remaining fisheries open access (OA), exempted fishing permit (EFP), incidental open access (IOA) and research (Res) fisheries, which account for about 2.1 percent of ex-vessel revenue in the non-whiting groundfish fishery. Overall, ex-vessel revenue averaged, $57 million in ex-vessel revenue on an annual basis.

Table 3-2. Groundfish ex-vessel revenue, excluding shoreside whiting, in current dollars(inflation adjusted), $1,000, by shoreside commercial fishing sectors. (Source: PacFIN SAFE Table 12b, accessed 4/28/2020)

Year	Shoreside IFQ Trawl (Non-whiting)	Shoreside IFQ Non-trawl	Non-Nearshore Fixed Gear	Nearshore Fixed Gear	Non-fixed gear OA	IOA	EFP, Res., Misc.	Annual Total
2013	$27,688	$3,049	$13,409	$4,014	$56	$90	$1,200	$49,506
2014	$26,682	$4,883	$14,712	$3,943	$75	$134	$461	$50,890
2015	$28,042	$5,528	$17,147	$4,605	$97	$180	$474	$56,073
2016	$27,844	$6,733	$18,850	$3,728	$44	$184	$644	$58,027
2017	$32,303	$6,431	$21,765	$4,173	$31	$196	$1,665	$66,564
2018	$26,994	$4,259	$17,708	$4,133	$33	$166	$1,683	$54,976
2019 a/	$26,215	$4,102	$15,025	$4,254	$34	$207	$379	$50,216
Average	$28,280	$5,411	$18,099	$4,179	$48	$187	$969	$57,171

a/ 2019 is considered preliminary at time of data download

3.3.2.2 Whiting Fishery Sector

Whiting sector ex-vessel revenue trends from 2013 to 2019 are shown below in Table 3-3. The whiting sectors, combined, have averaged $53 million in ex-vessel revenue since 2015. In terms of total ex-vessel revenue, 2015 was the low when compared the years 2016-2019. Since 2015, ex-vessel-revenue, combined, has increased by a factor of about two since that year. Further examination of the data shows ex-vessel revenue is variable by year by sector, however, the general trend, for the CP and shoreside sectors shows increasing ex-vessel revenue -excepting 2018- over the 2015-2018 period. Whereas, the mothership sector appears to be declining in ex-vessel revenue over the same period. In 2019, the CP sector accounted for approximately 37 percent of ex-vessel revenue, the mothership sector at about 17 percent, and shoreside at approximately 46 percent.

Table 3-3. Ex-vessel revenue, current 2020 dollars (inflation adjusted), $1,000s, by whiting sectors. (Source, PacFIN SAFE table 14b, accessed 4/28/2020)

Sector	2015	2016	2017	2018	2019 a/
Catcher-Processor Total	$11,933	$22,612	$25,687	$20,654	$24,292
Mothership Total	$4,694	$12,954	$11,825	$11,760	$10,703
Shoreside Whiting Trawl Total	$10,131	$14,671	$25,182	$22,767	$30,068
Total	$29,282	$51,402	$64,610	$56,276	$65,366

a/ 2019 is considered preliminary at time of data download

3.3.2.3 Midwater Trawl Fishery

The rebuilding of canary and widow rockfish has stimulated the reemergence of a fishery using midwater trawl gear to target pelagic rockfish, principally widow and yellowtail rockfish. Widow rockfish was declared overfished in 2001 and declared rebuilt in 2011. Canary was declared overfished in 2000 and declared rebuilt in 2015. While canary was not a target, its frequency as bycatch presented a potential constraint on the midwater fishery. Figure 3-1 shows revenue from landings of widow, yellowtail, and chilipepper rockfish since 1981. From 1994 onward only landings from the non-whiting portion of the midwater trawl fishery are included; data prior to that year may include some whiting trips, however during that time the domestic shorebased whiting fishery was somewhat smaller than it is currently and non-whiting species landings tend to be very low. Therefore, the figure adequately represents the trend for midwater rockfish trawl fishery ex-vessel revenue. The figure shows landings steadily declined beginning the late 1980s, with the exception of 2000 and 2001. The non-whiting midwater trawl fishery essentially ceased while widow rockfish was rebuilding after 2001 until 2011, but has shown notable growth since.

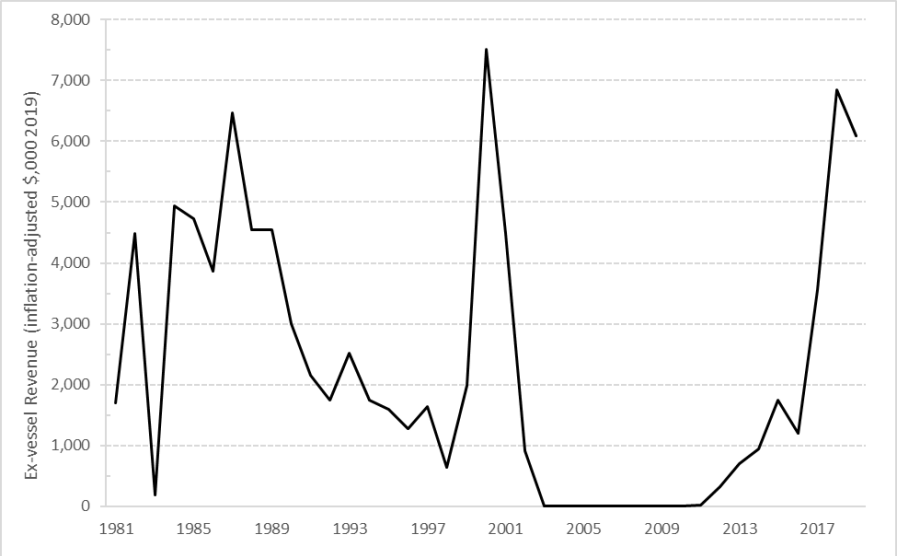

Figure 3-1. Inflation adjusted ex-vessel revenue ($1,000s) from landings of pelagic rockfish (widow, yellowtail, chilipepper), by midwater trawl gear in the non-whiting groundfish trawl sector, 1981-2019. Landings from 2004 to 2009 excluded due to data confidentiality requirements. Landings from 1994-2019 are from the non-whiting trawl sector and EFPs. (Source: PacFIN comprehensive_ft, 1/11/2018 and 1/16/2020).

Table 3-4 provides a snapshot of the pelagic rockfish fishery over the past eight years (2019 data should be considered preliminary). The data include landings made under EFPs which prior to 2017 would have been for purposes other than targeting pelagic rockfish. The fishery has ramped up substantially in recent years. Since 2012, participation (number of vessels) increased by 47 percent and landings revenue by nearly twenty-fold; ex-vessel revenue in 2018 and preliminary ex-vessel revenue in 2019 exceeded $6 million.

Table 3-4. Landings (mt), inflation adjusted ex-vessel revenue, and number of vessels making landings of pelagic rockfish (chilipepper, widow, and yellowtail rockfish) with midwater trawl gear, 2012-2017. (Source: PacFIN comprehensive ft, 1/16/2020).

Values	2012	2013	2014	2015	2016	2017	2018	2019[a/]
Metric tons	249	606	836	1,674	1,138	5,257	11,291	9,732
Thousands of dollars	$318	$698	$945	$1,743	$1,200	$3,558	$6,852	$6,095
Number of vessels	17	12	24	37	10	16	24	25

a/ 2019 data is considered preliminary

3.3.2.4 Tribal Groundfish Fisheries

Several Pacific Northwest Indian tribes have treaty rights to fish for groundfish in their Usual and Accustomed (U&A) fishing grounds. Treaties specify their rights to harvest federally managed groundfish in their U&A fishing areas (§660.4). Under these treaties, the tribes manage the fisheries in which their members participate. Tribal fishery management is coordinated through the Council process so catches can be accounted for when developing management measures. .On average, the treaty fisheries have generated about $4.1 million[11] per year ($2.3 million in 2019) since the publication of the 2015 EIS.

The tribal non-whiting sector is defined by groundfish landings other than whiting and, thus includes a variety of gear types. While all four coastal tribes have longline fleets, only the Makah Tribe currently has a trawl fleet. At the November 2019 Council meeting, the Quinault Nation indicated they would participate in the 2020 groundfish fishery and indicated their desire to continue into the next biennium. Table 3 7 shows ex-vessel revenue in tribal fisheries using hook-and-line and trawl gear. Washington tribes participate in whiting fisheries with both a mothership and shorebased component; however, the landings and revenue from this fishery cannot be reported due to data confidentiality restrictions Landings from net and pot gear cannot be reported due to data confidentiality restrictions. Landings from shrimp trawl are not reported because this fishery does not target groundfish although it does land incidentally-caught groundfish. Revenue from groundfish landings in the tribal net, pot and shrimp fisheries averaged less than $70,000 annually during 2013-2018. Hook-and-line gear accounted for nearly two thirds of revenue reported in the table. Excluding 2019, for which data is incomplete, revenue from tribal groundfish hook-and-line and trawl landings has generally increased since 2013, reaching approximately $5.8 million in 2017 and nearly $4.3 million in 2018.

Table 3-5. Treaty non-whiting groundfish ex-vessel revenue for hook-and-line and trawl gear (from groundfish only) 2013-2019, in inflation-adjusted $1,000s. (Source: Groundfish SAFE Table 13b and PacFIN comprehensive ft, 1/16/2020).

Year	Hook-and-Line	Trawl	Total
2013	$2,161	$1,777	$3,938
2014	$3,315	$1,106	$4,421
2015	$3,311	$1,795	$5,106
2016	$3,576	$1,864	$5,440
2017	$3,754	$2,030	$5,784
2018	$2,529	$1,722	$4,251
2019[a/]	$1,120	$860	$1,980
Average Annual	$2,824	$1,593	

a/ 2019 data is considered preliminary.

3.3.2.5 Recreational fishery

Recreational fisheries are an important part of fishery-related economic activity. However, it is more difficult to impute the economic value of these fisheries because recreational catch is not sold. Past Groundfish Harvest Specifications documents have characterized recreational fisheries in terms of fishing effort (angler trips) to quantify spatio-temporal differences in West Coast recreational fisheries. Income and employment impacts derived from IOPAC model impact coefficients applied to GMT estimates of effort under the Alternatives are reported in section Chapter 4.

[11] Data from PacFIN, accessed 4/28/2020 and is inflation adjusted

Recreational fisheries are broadly subdivided between private anglers and those fishing from commercial passenger fishing vessels, commonly referred to as charter vessels. Private anglers fish from shore or from private boats, while charter vessels take paying passengers.

It is important to note that due to the sampling and fishery estimation methodologies, recreational estimates of catch and effort for a California, Oregon, and Washington is not generally available on the same timeline as commercial data. An initial set of catch and effort estimates is generally available in March for the year prior. For example, 2019 data will be finalized in late winter of 2020. Therefore, these analyses are largely reliant on data from 2018, the last year of complete data.

Table 3-6 shows the annual average bottomfish/halibut angler trips compared to trips targeting other species during 2012 - 2018. Overall private and charter trips targeting bottomfish/halibut comprised 27 percent of all trips and modes during the 2012-2018 period. Table 3-7 shows the annual average counts of bottomfish/halibut and other trip type marine angler trips by state and reporting area. California accounts for 84 percent of bottomfish/halibut angler trips, with the southern California region accounting for 47 percent of coastwide trips due to its large coastal population and potential year-round fishery. Figure 3-2 summarizes bottomfish/halibut trips by state and year during 2007 to 2018. The number of bottomfish/halibut marine angler trips peaked in 2014 at 981,000 trips and subsequently declined slightly. Nonetheless, the 869,000 trips in 2018 exceeded the 12-year 2007-2018 average by 11 percent.

Table 3-6. Total coastwide recreational angler trips by type and mode, 2012-2018. (Source: GMT state reps, RecFIN).

Type:	Bottomfish+Halibut		Other Trip Types[a/]		Total	
Mode	Annual Average	Percent of All Trips	Annual Average	Percent of All Trips	Annual Average	Percent
Beach/Bank	0	0%	928,132	26%	928,132	26%
Man-made	77,455	2%	1,031,863	29%	1,109,318	30%
Charter	576,540	16%	150,183	4%	726,723	20%
Private	305,105	9%	473,469	13%	778,574	22%
Total	959,099	27%	2,583,648	73%	3,542,747	100%

a/ Other trip types: Salmon, HMS, combo, other.

Table 3-7. 2012–18 average annual bottomfish plus Pacific halibut marine angler boat trips (private and charter) by reporting area. (Source: GMT state reps, RecFIN).

	Bottomfish + Halibut		Other Trip Types[a/]		Total	
State/Region	Annual Average	% of Bottomfish + Halibut Trips	Annual Average	% Other Trips	Annual Average	% of All Trips
La Push-Neah Bay	15,338	2%	10,466	0%	25,804	1%
Westport	20,529	2%	40,864	2%	61,394	2%
Ilwaco-Chinook	3,400	0%	55,890	2%	59,290	2%
Washington Subtotal	39,268	4%	107,220	4%	146,487	4%
Astoria	613	0%	7,787	0%	8,400	0%
Tillamook	18,088	2%	18,091	1%	36,179	1%

	Bottomfish + Halibut		Other Trip Types[a/]		Total	
State/Region	Annual Average	% of Bottomfish + Halibut Trips	Annual Average	% Other Trips	Annual Average	% of All Trips
Newport	55,185	6%	26,681	1%	81,866	2%
Coos Bay	17,417	2%	24,567	1%	41,984	1%
Brookings	22,177	2%	14,158	1%	36,335	1%
Oregon Subtotal	113,480	12%	91,285	4%	204,765	6%
North Coast: Humboldt and Del Norte	38,256	4%	58,860	2%	97,116	3%
Wine District: Mendocino	19,331	2%	44,637	2%	63,968	2%
SF District: San Mateo through Sonoma	74,075	8%	308,055	12%	382,130	11%
Central Coast: San Luis Obispo through Santa Cruz	122,147	13%	317,124	12%	439,271	12%
Channel: Ventura and Santa Barbara	97,510	10%	304,403	12%	401,913	11%
South Coast: San Diego, Orange, and Los Angeles	455,033	47%	1,352,065	52%	1,807,098	51%
California Subtotal	806,352	84%	2,385,143	92%	3,191,495	90%
Grand Total	959,099	100%	2,583,648	100%	3,542,747	100%

a/ Other trip types: Salmon, HMS, combo, other.

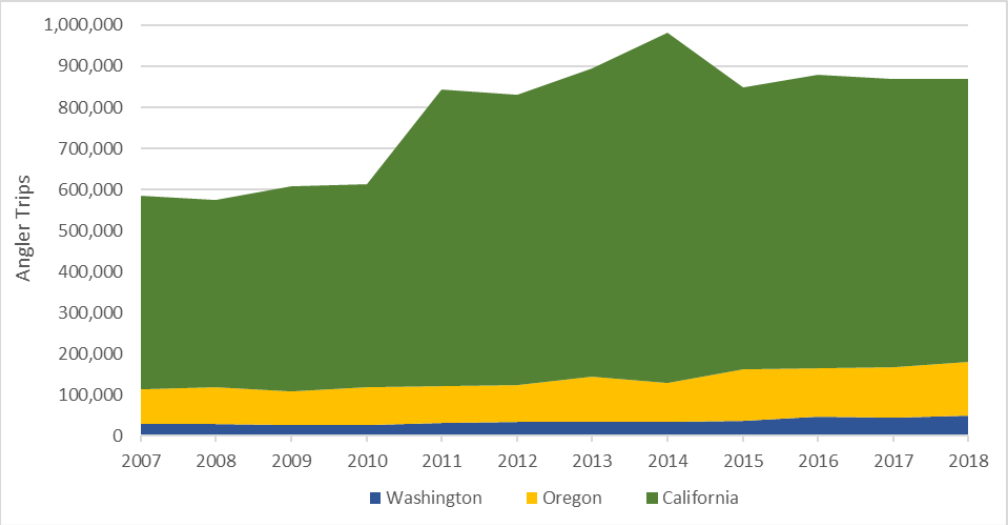

Figure 3-2. Total bottomfish plus Pacific halibut marine angler boat trips (private and charter) by state, 2007 to 2018. (Source: GMT state reps, RecFIN).

3.3.3 Fishing Communities

As in other recent decision documents, involvement by fishing communities in commercial groundfish fisheries is described below in terms of landings and ex-vessel revenue by West Coast Fisheries (IOPAC)

port group.[12] IOPAC is also used to evaluate personal income and employment impacts of proposed management measures based on projected change in landings and ex-vessel revenue.

Table 3-8 shows inflation-adjusted ex-vessel revenue from non-tribal groundfish landings in aggregate over 2013-2019 by port group and groundfish fishery sector. Note that in some cases adjacent port groups were aggregated to avoid disclosure of confidential data. Landings and revenue tend to be concentrated in relatively few ports. The four top ranked ports of the 10 shown accounted for 77 percent of coastwide revenue during the period. Astoria-Tillamook is the top-ranked port overall, accounting for 26 percent of coastwide groundfish revenue shown. Newport ranks second at 23 percent of coastwide revenue, and the combined Washington port groups third at 17 percent. Whiting landings occur in only three of the port areas shown, which are also the top three ranked groundfish ports overall (Astoria-Tillamook, Newport, and Washington). Astoria-Tillamook and Newport also rank first and second, respectively, for revenue from the non-whiting IFQ sector (combining trawl and non-trawl IFQ landings), while Coos Bay-Brookings ranks third by this measure. The combined Washington ports rank first for revenues from the non-nearshore (sablefish) fixed gear fishery followed by Newport, coos Bay-Brookings and Morro Bay-Santa Barbara. Morro Bay-Santa Barbara is top ranked for the nearshore fixed gear fishery followed by Coos Bay-Brookings, Monterey, and Crescent City-Eureka.

Focusing on the shoreside IFQ non-whiting sector, Table 3-8 shows revenues from fixed gear landings (often referred to as gear-switching) increasing from approximately 10 percent of the sector total in 2013 to 28 percent in 2018. Preliminary data show fixed gear landings were approximately 31 percent of the IFQ non-whiting sector total in 2019. For data confidentiality reasons revenue from the IFQ fixed gear sector cannot be reported for many individual ports. During 2013-2017 Newport was the dominant port for IFQ fixed gear landings by revenue, followed by Astoria-Tillamook and Morro Bay-Santa Barbara; however, the Washington ports became more prominent during 2018-2019. Coastwide IFQ fixed gear landings totaled approximately $59 million ex-vessel revenue in inflation-adjusted terms during 2013-2019. Combined ports in the state of Oregon recorded approximately 73 percent of this revenue, Washington ports approximately 30 percent, and the California ports recorded the remainder (10 percent) led by Morro Bay-Santa Barbara.

[12] See Table 9 in the NOAA Technical Memorandum NMFS-Northwest Fisheries Science Center (Leonard and Watson (2011)) for individual ports included in these port groups.

Table 3-8. Total ex-vessel revenue (inflation-adjusted $1,000s) from groundfish landings, 2013-2019, by IOPAC port group and fishery sector. (Port groups have been aggregated to avoid disclosing confidential data, 2019 data is preliminary).

Port Group	Shoreside IFQ Non-whiting[a]	Shoreside IFQ Trawl Whiting	Non-Nearshore Fixed Gear	Nearshore Fixed Gear	Other Directed and Incidental Groundfish	Grand Total	Annual Average
Washington	22,410	41,640	44,295	0	479	108,824	15,546
Astoria-Tillamook	88,805	61,504	8,909	1,256	3,437	163,910	23,416
Newport	50,312	57,236	35,697	519	1,673	145,436	20,777
Coos Bay-Brookings	34,254	-	25,945	8,121	814	69,134	9,876
Crescent City-Eureka	30,235	-	6,934	2,378	63	39,609	5,658
Fort Bragg	14,328	-	11,434	1,419	155	27,336	3,905
San Francisco (incl. Bodega Bay)	4,095	-	8,169	1,155	403	13,822	1,975
Monterey	2,056	-	5,544	2,402	133	10,134	1,448
Morro Bay-Santa Barbara	6,845	-	24,465	10,182	1,100	42,591	6,084
Los Angeles	-	-	3,480	401	167	4,047	578
San Diego	-	-	4,490	129	113	4,732	676

a/ Includes non-trawl IFQ.

Table 3-9. Annual ex-vessel revenue (inflation-adjusted $1,000s) from non-whiting IFQ groundfish landings by gear type (trawl and fixed gear).

Year	Shoreside IFQ Non-whiting Trawl	Shoreside IFQ Non-whiting Fixed Gear
2013	27,567	3,008
2014	26,552	4,385
2015	25,226	5,128
2016	28,339	9,277
2017	32,899	14,430
2018	27,520	10,864
2019[a]	26,212	11,932

3.4 Essential Fish Habitat

Fishing operations can change the abundance or availability of certain habitat features used by managed fish species to spawn, breed, feed, and grow to maturity. These changes may reduce or alter the abundance, distribution, or productivity of species. The effects of fishing on habitat depend on the intensity of fishing, the distribution of fishing with different gears across habitats, and the sensitivity and recovery rates of specific habitat features. Therefore, the Council implemented essential fish habitat along the West Coast.

EFH is defined as "waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity" The MSA (sec. 303(a)(7)) requires Councils to include in each FMP a description of EFH for all fishery management unit species and measures to minimize to the extent practicable adverse effects on such habitat caused by fishing. Under this authority, NMFS and the Council have developed a comprehensive strategy to conserve EFH, including its identification and the implementation of measures to minimize adverse impacts on EFH from fishing, such as the establishment of EFHCAs, which are areas closed to certain types of bottom contact gear to protect the important habitat features found there. Chapter 7 in the PCGFMP describes groundfish EFH (Section 7.2) and Habitat Areas of Particular Concern (HAPCs) (Section 7.3).

Groundfish EFH provisions were reviewed and revised as part of Amendment 28 to the PCGFMP (NMFS 2019). Starting in 2010, the Council reviewed the groundfish EFH designations in Amendment 19 and in April 2018 completed Amendment 28 to the PCGFMP. Amendment 28 included various measures to mitigate adverse effects and included new or modified closures of sensitive areas to specified gear types. As part of Amendment 28, 61 areas were closed to bottom trawl gear and 16 areas were closed to bottom contact commercial fishing gear other than demersal seine gear. (See section 6.8.6 in the PCGFMP for a complete list of closed areas). A bottom trawl footprint closure, covering all areas deeper than 700 fm, was also instituted (described in FMP section 6.8.7). Chapter 7 in the PCGFMP describes groundfish EFH (Section 7.2) and HAPCs (Section 7.3). Groundfish EFH is described in the PCGFMP 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.

Section 3.3 in the 2015 FEIS and Section 3 of Amendment 28 FEIS (NMFS 2019) describe the habitat resources and baseline conditions for groundfish EFH. Sections 3.3.1 and 3.3.2 of Amendment 19 FEIS (NMFS 2005) and Section 4.2.1 of Amendment 28 describe the impacts of fishing gear on groundfish EFH; effects vary by gear and benthic substrate type. Generally, bottom trawl gear has the largest effect on benthic habitat.

3.5 The California Current Ecosystem

The 2015 EIS evaluated the California Current Ecosystem (see Section 3.4 of the 2015 EIS). The Council's Fishery Ecosystem Fishery Management Plan describes the CCE as a major eastern boundary current that is dominated by strong coastal upwelling, and is characterized by fluctuations in physical conditions and productivity over multiple time scales (PFMC 2013). The food webs in these types of ecosystems tend to be structured around coastal pelagic species that exhibit boom-bust cycles over decadal time scales (PFMC 2013). The 2020 California Current Integrated Ecosystem Assessment

California Current Ecosystem (CCE) Status Reports (Agenda Item G.1.a, IEA Team Report 1 and Report 2, March 2020) assess the current status of the CCE.

These reports noted that in 2019 large-scale climate indices were consistent with low productivity. The CCE experienced weak El Niño to neutral conditions in 2019 coupled with very weak North Pacific circulation. A new, large marine heatwave emerged in May 2019 and lasted through December that was similar in intensity of the 2013-2016 "Blob". Coastwide ecological indicators suggest that that the system experienced either average or above average productivity, e.g. anchovy larvae highly abundant off CA, copepods were the lipid-rich species in the summer, etc. However, there was evidence of unfavorable ecological conditions in the CCE. Notably, krill densities were very low, juvenile rockfish had low abundance, and seabird production was also low.

3.6 Prohibited and Protected Species

Prohibited species are those species and species groups whose retention is prohibited unless authorized by provisions of the groundfish regulations (Part 660) or other applicable law. The following are prohibited species: Any species of salmonid, Pacific halibut, Dungeness crab caught seaward of Washington or Oregon, and groundfish species or species groups under the PCGFMP for which quotas have been achieved and/or the fishery closed.

The term "protected species" refers to organisms for which killing, capture, or harm is prohibited under several Federal laws, unless authorized. Incidental take of these species during operations may be allowed under provisions of applicable laws. The laws are as follows:

- The Endangered Species Act (ESA)—The ESA protects species at risk of extinction "throughout all or a significant portion of its range," and protects critical habitat from Federal actions that would appreciably reduce its value for species recovery. Species may be listed as "threatened" or "endangered." "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means a species is likely to become endangered within the foreseeable future.
- The Marine Mammal Protection Act (MMPA)—The MMPA guides marine mammal protection and conservation. Stock assessments are conducted annually for strategic stocks and every three years for non-strategic stocks. All marine mammals are protected under the MMPA.
- The Migratory Bird Treaty (MBTA)—The MBTA implements treaties and conventions between the U.S. and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds.
- Executive Order (EO) 13186—EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, directs Federal agencies to negotiate Memoranda of Understanding with the United States Fish and Wildlife Service (USFWS) that would obligate agencies to evaluate the impact on migratory birds as part of any NEPA process.

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 groundfish fishery. However, only a few of them are impacted by bottom trawl and fixed gear fishing activities; therefore, we focus our analysis on those species that have been observed interacting with the fisheries. In particular, we discuss the status of species listed under the ESA.

Information on endangered and threatened marine species under NMFS's jurisdiction, including species information, status and designated critical habitat, as well as marine mammals protected under the MMPA can be found at the following websites (hyperlinked): Protected Species and Marine Mammal Stock Assessments

The following biological opinions address the take of ESA-listed species in the groundfish fishery:

- NMFS BiOp on Continuing Operation of the Pacific Coast Groundfish Fishery (NMFS 2012). This BiOp indicated that the ongoing implementation of the groundfish fishery would not likely jeopardize non-salmonid marine species including eulachon, green sturgeon, humpback whales, Steller sea lions, and leatherback sea turtles. These species are analyzed in this document. The BiOp also indicated that the Groundfish FMP fishery would not likely have an adverse effect on 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 therefore these species are not analyzed in this document. The eastern distinct population segment (DPS) of Steller sea lions was delisted on November 4, 2013 (78 FR 66140); however, this delisting did not change the designation of the codified critical habitat for the eastern DPS of Steller sea lions. Section 3.5.2.2 in the 2015 EIS describes the Incidental Take Statement (ITS) from this BiOp (See Table 3-10 for current take limits). NMFS recently initiated a Section 7 consultation for humpback whales. The new BiOp is expected to be issued in 2021.
- The United States Fish and Wildlife Service (USFWS 2017) BiOp Regarding the Effects of the Continued Operation of the Pacific Coast Groundfish Fishery as Governed by the Pacific Coast Groundfish Fishery Management Plan and Implementing Regulations at 50 CFR Part 660 by the National Marine Fisheries Service on California Least Tern (*Sterna antillaruin browni*), Southern Sea Otter (*Enhydra lutris nereis*), Bull trout (*Salvelinus confluentus*), Marbled Murrelet (*Brachyramphus marmoratus*), and Short-tailed Albatross (*Phoebastria albatrus*). In its opinion, USFWS concurred with the determination NMFS made in its biological assessment that the proposed action is not likely to adversely affect the marbled murrelet, California least tern, southern sea otter, bull trout, nor bull trout critical habitat. USFWS also concluded that implementation of the activities as described in the NMFS biological assessment would not jeopardize the continued existence of short-tailed albatross. See Table 3-10 for current take limits.
- NMFS BiOp for impacts to ESA-listed salmon species under implementation of the Pacific Coast Groundfish Management Plan (NMFS 2017). In its 2017 opinion, USFWS concurred with the determination NMFS concluded that the action as defined by the Council (Appendix 1 to the BiOp), if conducted consistent with the terms of the Incidental Take Statement (ITS), is not likely to jeopardize the continued existence of the listed species that are subject of the opinion. Critical habitat is not present within the action area. The ITS includes non-discretionary reasonable and prudent measures and related terms and conditions that must be applied to the proposed fisheries to provide an exemption from the prohibited acts outlined in section 9 of the ESA. The Council and NMFS have addresses several of the terms and conditions since December 2017, most recently taking final action in November 2019 to develop new mitigation tools and a process for accessing the Reserve in the case of unexpected high bycatch. See Table 3-10 for current take limits
- The southern DPS of eulachon was listed as threatened under the ESA in 2010. NMFS completed a recovery plan for the SDPS of eulachon in September 2017 (NMFS 2017). A section 7 consultation for the southern Distinct Population Segment (DPS) of eulachon was concluded on October 12, 2018 (NMFS 2018). NMFS' biological opinion stated that the proposed action is not likely to jeopardize the continued existence of the SDPS of eulachon. Critical habitat has been designated for this species, but none is within the action area, and so critical habitat would therefore not be affected by the action. See Table 3-10 for current take limits

Table 3-10. Species and Incidental Take Statements Amounts from Biological Opinions.

Species	Incidental Take Amount or Extent of Take from BiOps
Eulachon	Bycatch/handling or mortality: – The precautionary and reinitiation thresholds are five year geometric means of 0.01% and 0.02% of minimum Columbia River abundance
Green Sturgeon	Non-lethal bycatch/handling in the fishery: – 28 fish/year expected and up to 86 fish/year in no more than 2 years within a period of 9 consecutive years; Lethal bycatch in the fishery: – 2 fish/year expected and up to 7 fish/year in no more than 2 years within a period of 9 consecutive years.
Humpback Whales	Injury or mortality from entanglement : – 5-year average of 1 whale/year and up to 3 whales/year in a single year.
Leatherback Sea Turtles	Injury or mortality from entanglement – 5-year average of 0.38 turtle/year and up to 1 turtle/year in a single year.
Short-tailed albatross	Injury or mortality: – should not exceed an estimated five albatross in a two-year period or one observed albatross in a two- year period
Salmon	The take guideline for the whiting sector trawl fishery is 11,000 Chinook and 474 coho salmon. The take guideline for the non-whiting fishery sectors (including trawl, commercial fixed gear, and recreational) is 5,500 Chinook and 560 coho salmon. These values exclude the Reserve amount of 3,500 fish considered for extreme bycatch events.

Marine mammal species that are not listed under the ESA occur in the action area. The taking of marine mammals (whether or not listed under the ESA) is subject to the requirements of the Marine Mammal Protection Act of 1972 as amended (MMPA). The MMPA prohibits, with certain exceptions, the take of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the U.S. The MMPA was amended in 1994 to, among other things, establish a process for authorizing fisheries to incidentally take marine mammals. In support of this, NMFS developed the List Of Fisheries document. The classification of a fishery on the LOF determines whether participants in that fishery may be required to comply with certain provisions of the MMPA, such as registration, observer coverage, and take reduction plan requirements. Under this Authorization Program all commercial fisheries must be categorized based on the relative frequency of incidental mortalities and serious injuries of marine mammals in the fishery:

- Category I designates fisheries with frequent mortalities and serious injuries incidental to commercial fishing;
- Category II designates fisheries with occasional mortalities and serious injuries;
- Category III designates fisheries with a remote likelihood or no known mortalities or serious injuries.

According to the 2020 List of Fisheries (85 FR 21079; April 16, 2020) the WA/OR/CA sablefish pot fishery is Category II because of takes of the CA/OR/WA humpback whale stock. All other Federally managed Pacific Coast groundfish fisheries are Category III. The List of Fisheries identifies the following marine

mammal stocks taken in the groundfish trawl fishery: California sea lion (U.S.) Dall's porpoise (CA/OR/WA) harbor seal (OR/WA coast), northern fur seal (Eastern Pacific) white-sided dolphin (CA/OR/WA) Steller sea lion (Eastern U.S.). The List of Fisheries identifies the following marine mammal stocks taken in the WA/OR/CA groundfish, bottomfish longline/set line fishery: bottlenose dolphin (CA/OR/WA offshore), California sea lion (U.S.), Northern elephant seal (California breeding), Sperm whale, Stellar sea lion (Eastern U.S.). The California halibut bottom trawl fishery is a state managed fishery (not under the PCFMP) but is listed as a category III fishery due to takes of California sea lion, (U.S.), harbor seal, Northern elephant seal (California breeding), Stellar sea lion (Eastern U.S.).

3.6.1 Marine Mammals

NMFS manages ten species of marine mammals listed under the Endangered Species Act that are found along the West Coast; nine different species of cetaceans and Guadalupe fur seals. The Marine Mammal Protection Act, the Endangered Species Act, and the Fur Seal Act are the relevant statutes for managing marine mammal interactions with human activities, including fishing operations. Marine mammals are primarily affected by fisheries through interactions with fishing gear, disturbance by fishing activity or vessel movement, or prey competition. The stock status of marine mammals can be found at: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-species-stock.

In 2016, NMFS published a final rule revising the listing status of humpback whales which included 14 distinct population segments (DPS). The revised listing met one of the reinitiation criteria of the BiOp and necessitated reevaluating the effects of the fishery on humpback whales. Prior to the June 2019 Workgroup meeting, NMFS requested reinitiation of formal section 7 ESA consultation for the continued operation of the groundfish fishery based on the humpback whale DPS changes. NMFS is working to provide additional information needed for the consultation, including the recent data on groundfish fishery interactions to humpback whales compiled for the 2016-2017 bycatch report.[13] The workgroup noted in Agenda Item I.4.a, Groundfish Endangered Species Workgroup Report that the limited entry sablefish fishery had one observed interaction occurred in 2014 and there was one observed interaction in the open access pot fishery in 2016. Since 2013, there has been an overall increase in whale entanglements; however, the most common entanglement source identified is Dungeness crab gear. In 2018, there was total of 29 confirmed and 5 unconfirmed entanglements of humpback whales (NOAA Fisheries 2018). Of the 17 entanglements where gear type could be confirmed, 11 were from Dungeness crab gear, two from spot prawn gear, and 4 from gillnet (NOAA Fisheries 2018). In 2019, 17 confirmed humpback entanglements occurred and of these entanglements, seven were from crab gear and ten were unknown sources (NOAA Fisheries 2019).

The current ITS is for injury or mortality from entanglement is a 5-year average of 1 whale/year and up to 3 whales/year in a single year. NOAA entanglement reports (NOAA Fisheries 2018; NOAA Fisheries 2019) emphasize that the observed location of entangled whales does not necessarily reflect where and when an entanglement originated. Whales can remain entangled for weeks or months and travel long distances from the point of entanglement to where the entangled whale was observed. In recent years, the distribution and duration of time humpback whales stay on the feeding grounds has changed. More humpback whales have been observed in Puget Sound, the mouth of the Columbia River, San Francisco Bay, and closer to shore in general than has been observed since the end of commercial whaling (Calambokidis et al. 2017).

The incidental take of a second humpback whale in the federally managed groundfish fisheries within the last five years highlights the need for additional actions to improve the precision of interactions estimates

[13] See Agenda Item I.4.a, NMFS Report 4: Humpback whale bycatch in 2016 – 2017 in the U.S. West Coast Groundfish Fisheries

and to identify potential mitigation measures. The Workgroup discussed several of the conservation recommendations from the humpback whale bycatch report including gear marking issues, storing of gear at sea, and lost fishing gear. Given that a sizeable portion of entangled gear remains unidentifiable (Caretta et al. 2018), the Workgroup identified the need for improved marking of fixed gear in order to better track gear interactions with humpback whales by sector or fishery. The Workgroup did not think lost fishing gear interactions with humpback whales was a major issue as observer-derived estimates indicate low levels of lost gear. The Workgroup noted that rough estimates derived from the fishing effort report ranged between 0.1 to 1.0 percent per year lost pots in IFQ and LEFG.

3.6.2 Eulachon

On March 16, 2010, NMFS listed the SDPS of eulachon as a threatened species (75 FR 13012). This DPS encompasses all populations within the states of Washington, Oregon, and California and extends from the Skeena River in British Columbia south to the Mad River in Northern California (inclusive). The 2018 BiOp summarizes the life history and distribution of eulachon (NMFS 2018). In addition, Agenda Item I.4.a, NMFS Report 4 from June 2019 Council meeting summarizes some life history information. The analysis in NMFS Report 4 suggests that eulachon bycatch in U.S. West Coast groundfish fisheries is likely driven by both eulachon distribution and cyclic abundance. Based on the overall magnitude of bycatch in U.S. West Coast groundfish fisheries, either there is limited interaction with eulachon in these fisheries or most eulachon encounters result in fish escaping or avoiding trawl gear. The current ITS for bycatch/handling or mortality contains precautionary and reinitiation thresholds as five-year geometric means of 0.01% and 0.02% of minimum Columbia River abundance.

In 2018 NMFS removed the minimum trawl mesh size for the commercial groundfish fishery. Therefore, it is likely that most eulachon would readily pass through the mesh openings of groundfish trawl nets. We currently have no direct data to estimate escape or avoidance mortality of eulachon in any sector of the groundfish fishery and we are unaware of any studies that have directly investigated the fate of osmerid smelt species passing through groundfish trawl nets.

3.6.3 Green Sturgeon

There are two DPS for green sturgeon on the West Coast: Southern DPS and Northern DPS. Only the Southern DPS is listed under the ESA. DPS cannot be determined morphologically upon bycatch encounter, so a GSI technique is used. Agenda Item F.1.a, NMFS Report 3 from the June 2019 Council meeting provide the most recent information regarding life history and bycatch in groundfish fisheries.

The current ITS is as follows:

- Non-lethal bycatch/handling in the fishery - 28 fish/year expected and up to 86 fish/year in no more than 2 years within a period of 9 consecutive years;
- Lethal bycatch in the fishery - 2 fish/year expected and up to 7 fish/year in no more than 2 years within a period of 9 consecutive years.

Between 2002 and 2017, green sturgeon were encountered in the following federal sectors and years:

- LE bottom trawl fishery (in 2002, 2004, 2005, 2007, 2009, and 2010). Note that this fishery
    - transitioned into the IFQ bottom trawl fishery in 2011.
    - IFQ bottom trawl fishery (in 2011-2017).
    - At-sea hake fishery (in 2005 and 2006).

Fishing effort in the LE/IFQ bottom trawl fishery is widely distributed from central California to northern Washington and observed green sturgeon bycatch in this fishery was highest in southern Washington and northern Oregon, near the mouth of the Colombia River. The 2012 BiOp only concerns federally-managed fisheries; however, the WCGOP observes the state-managed California halibut fishery and California nearshore fixed-gear fishery, both of which also encountered green sturgeon. Fishing effort in the LE/OA California halibut fishery was highest outside the San Francisco Bay, with some fishing occurring further south. Green sturgeon bycatch in this fishery primarily occurs close to shore outside the San Francisco Bay.

Observed green sturgeon bycatch in LE/IFQ bottom trawl fishery was highest in southern Washington and northern Oregon, near the mouth of the Colombia River. Green sturgeon bycatch generally occurred in trawl depths of <40 fathoms in the LE/IFQ trawl fishery and the California halibut trawl. There are no documented interactions with Southern DPS green sturgeon in the recreational or fixed gear fisheries. The potential effects of bottom trawl fisheries on green sturgeon critical habitat are difficult to evaluate until more definitive information is known about marine habitat use and feeding habitats of the species. However, the low expected impacts to green sturgeon prey resources support the conclusion that the proposed fishing is not likely to reduce the value of designated critical habitat for the conservation of Southern DPS green sturgeon.

3.6.4 Leatherback Sea Turtles

Leatherback sea turtles are widely distributed across the oceans of the world and face a variety of threats depending on the region in which they occur. Identified threats in the marine environment include direct harvest, debris entanglement and ingestion, fisheries bycatch, and boat collisions, among other threats. Agenda Item I.4.a NMFS Report 5 from the June 2019 Council meeting provides the most recent information regarding life history and bycatch in groundfish fisheries.

Leatherback turtle entanglements in the groundfish fishery are rare events. No leatherback sea turtles were observed as bycatch in the most recent five-year period (2015-2019) and thus, all U.S. west coast groundfish fisheries are below the BiOp ITS take limit of an average of 0.38 leatherbacks per year for the most recent five-year period (and up to one turtle in a single year). Since 2006, there has been one observed leatherback sea turtle caught in U.S. west coast groundfish fishing gear. This occurred in 2008 by a vessel using pot gear in the open access fishery sector.

Based on this information the analysis in this EA excludes further discussion of sea turtle impacts.

3.6.5 Seabirds and Short-Tailed Albatross

Bycatch of short-tailed albatrosses in commercial fisheries throughout the Pacific continues to be a major conservation concern. Since 1983, 19 short-tailed albatross takes have been documented throughout the North Pacific. The lone short-tailed albatross mortality in the Pacific Coast Groundfish Fisheries was documented off the Oregon coast on April 11, 2011 in the limited-entry sablefish longline fishery. From 2013-2019, no short-tailed albatross takes were documented in the West Coast groundfish fisheries. Short-tailed albatross continue to be seen feeding next to vessels fishing with bottom trawl, midwater trawl, pot gear and bottom longline gear.

In response to the mortality, the Pacific Fisheries Management Council adopted recommendations for seabird bycatch mitigation, requiring streamer lines be deployed during setting operations on commercial fixed gear vessels 55 feet (17 m) or greater in length. Outreach efforts have increased seabird bycatch awareness as has voluntary use of seabird deterrents throughout the U.S. portion of the range of this species.

Agenda Item I.4.a, NMFS Report 6 from the June 2019 Council meeting, provides the most recent information regarding bycatch in groundfish fisheries. Based on the analysis presented in the bycatch report, the groundfish fishery did not exceed the ITS thresholds of an estimated five albatross in a two-year period or one observed albatross in a two-year period. The bottom trawl fishery is restricted to ITS for short-tailed albatross under the 2017 BiOp for seabirds (NMFS 2017). Section 6.1.2 and 6.2 of the Biological Opinion discusses take in the trawl fishery.

At its June 2019 meeting the Council recommend that NMFS implement regulations (84 FR 67674) to reduce or mitigate seabird interactions. The requirements are to either use streamer lines according to the Alaska streamer line requirements or deploy gear between one hour after local sunset and one hour before local sunrise when declared into a Federal fishery and fishing in Federal waters. These requirements apply to non-tribal vessels 26 feet and greater LOA using bottom longline gear (as defined under 50 CFR 660.11) in the limited entry fixed gear and open access fixed gear sectors, and longline vessels under the Shorebased IFQ Program. When fishing south of 36° N. latitude, vessels would be exempted from the requirement to deploy streamer lines or night set. Additionally, for vessels 26-55 feet LOA, deploying streamer lines would be discretionary when a small craft wind advisory or higher is declared, in the area where the vessel is fishing. NMFS implemented these regulations on January 10, 2020.

3.6.6 Salmon

Historically, salmon bycatch has mostly comprised Chinook salmon with small amounts of coho salmon. Most of the bycatch has occurred in the groundfish trawl fishery and in particular fisheries targeting Pacific whiting with midwater gear. The Council developed several mitigation measures to keep the groundfish fishery within the ITS, including limits on the number of salmon by fishery sector, block area closures and selective flatfish trawl gear requirements. NMFS monitors the catch of salmon in near real time.

Salmon bycatch has been subject to Section 7 ESA consultations since 1990 and several species of Chinook, Coho and steelhead are listed as either threatened or endangered. On December 11, 2017, NMFS finalized a new Biological Opinion (NMFS 2017) under section 7 of the ESA for the Pacific Coast Groundfish FMP. The 2017 Biological Opinion concluded that the impacts of the groundfish FMP fisheries may have an adverse effect on the following ESA-listed species:

- Chinook Salmon ESUs
    - Puget Sound ESU
    - Lower Columbia River ESU
    - Upper Willamette River ESU
    - Upper Columbia River Spring-run ESU
    - Snake River Spring/Summer-run ESU
    - Snake River Fall-run ESU
- Coho Salmon ESUs
    - Lower Columbia River ESU
    - Oregon Coast ESU
    - Southern Oregon/Northern California Coast ESU
    - Central California Coast ESU

NMFS concluded that the groundfish fishery, including the proposed action, was conducted consistent with the terms of the incidental take statement (ITS), it is not likely to jeopardize the continued existence of the listed salmonid species that are subject of the opinion. Critical habitat for salmon species is not present within the action area. Other listed species occurring in the action area and affected by the proposed action

are covered under an existing, long-term ESA opinion or NMFS has determined that the proposed action is not likely to adversely affect the species. For additional information, see NMFS 2017.

Bycatch (or take) of ESA-listed salmon in the groundfish fishery is mainly Chinook salmon caught by trawl vessels. Since net mesh size is not large enough for salmon to slip through, they are usually caught with other target species and do not survive when brought aboard the vessel. Excluder devices and escape panels are not required but some fisherman use them.

Salmon are rarely caught by hook and line bottom longlines and pot gear; therefore, we do not provide annual encounter rates. Differences in depth and behavior between the species support the lack of observed salmon bycatch in commercial halibut fisheries (NMFS 2017c).

Most salmon are caught in the midwater trawl whiting fishery (shoreside and at-sea), midwater trawl rockfish fishery and the bottom trawl fishery. Bycatch consists of primarily subadult Chinook and coho (i.e., two- and three-year-olds), with coho averaging 2 percent of all salmon taken annually. Although listed and unlisted evolutionarily significant unit (ESUs) contributed to bycatch, available information suggests several ESUs (Central Valley Spring, Sacramento Winter-run, Upper Columbia Spring, and Snake River Spring/summer Chinook) are not or have rarely been taken in the groundfish fisheries.

The Council most recently took action in November 2019 to develop rules for managing the groundfish fisheries to prevent exceedance of the ITS (Agenda Item H9, Attachment 1 - November 2019). Threshold values were developed in the BiOp ITS as a guide for conditions that would trigger reinitiation of consultation. The take guideline for the whiting trawl fishery is 11,000 Chinook and 474 coho salmon and for the non-whiting fishery sectors (including trawl, commercial fixed gear, and recreational) is 5,500 Chinook and 560 coho salmon. These values exclude the Reserve amount of 3,500 fish considered for extreme bycatch events. The Council also developed other mitigation tools, including block area closures and selective flatfish trawl gear requirements. These tools were implemented in 2020 and NMFS monitors the catch of salmon in near real time with observers at sea and catch monitors at point of landing.

3.6.7 Prohibited species (other than protected species) caught in groundfish fisheries

Prohibited species other than salmon include Pacific halibut and Dungeness crab off Oregon and Washington. These species are caught in groundfish fisheries. No new information since the 2015 EIS indicates that bycatch of these species are negatively affecting their survivability or stock assessment for Pacific halibut. There have been no changes in harvest policies or fishery performance since the 2015 EIS was published that would be expected to result in substantive changes in the incidentally caught non-groundfish composition. This element, therefore, is not further considered in this EA.

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4. Direct and Indirect Effects of the Alternatives

4.1 Impacts of Harvest Specifications

This section evaluates how alternative harvest specifications affect the future status of managed groundfish stocks. Harvest specifications are by themselves management objectives with no direct effect on the environment. Harvest specifications indirectly affect managed groundfish stocks by setting limits on how much of each stock may be caught. It is important to note that the stock assessments and projections underlying this evaluation assume that ACLs are fully attained during the projection period as a default; that is, realized catch equals the ACL. For most stocks, however, catch has historically been less than the ACL. If roughly similar patterns persist in the 2021-22 biennial period, the actual impact of fishing mortality on the future status of most stocks is likely to be less than is forecast in the assessment projections.

There are four stocks with preferred HCRs that depart from the default HCRs used for 2021-22 harvest specifications (black rockfish in Oregon, cowcod south of 40°10' N lat., sablefish, and shortbelly rockfish) with alternative HCRs under consideration. Alternative 1 harvest specifications are preferred for these stocks. Stock-specific biological impacts associated with the alternatives analyzed for these stocks are provided in Section 4.1.1.

Impacts of the alternative harvest specifications for these four stocks relative to the No Action Alternative for four environmental impact categories are provided in 4-1. While the No Action Alternative was ultimately decided for petrale sole, the impacts of petrale alternatives are shown in 4-1 these alternatives were decided for detailed analysis.

Table 4-1. Impacts of harvest specification alternatives for five west coast groundfish stocks by environmental impact category relative to the No Action Alternative. Petrale sole alternatives were analyzed and shown in the table; the No Action Alternative was preferred.

Stock	Environmental Impact Category.			
	Stock Conservation	**Protected Species**	**EFH**	**Socioeconomic**
Oregon Black Rockfish - Alt. 1 (Pref.)	Slightly negative short-term impacts	Effects consistent with No Action	Effects consistent with No Action	Higher positive impact
Cowcod South of 40°10' N lat. - Alt. 1 (Pref.)	Higher positive impact	Effects consistent with No Action	Effects consistent with No Action	Higher negative impact
Cowcod South of 40°10' N lat. – Alt. 2	Highest positive impact	Effects consistent with No Action	Effects consistent with No Action	Highest negative impact
Petrale Sole - Alt. 1	Higher positive impact	Effects consistent with No Action	Effects consistent with No Action	Lower impact
Petrale Sole - Alt. 2	Higher positive impact (similar to Alt. 1)	Effects consistent with No Action	Effects consistent with No Action	Lower impact (similar to Alt. 1)

Stock	Environmental Impact Category.			
	Stock Conservation	**Protected Species**	**EFH**	**Socioeconomic**
Sablefish - Alt. 1 (Pref.)	Slightly negative impacts	Effects consistent with No Action	Effects consistent with No Action	Higher positive impact
Shortbelly Rockfish - Alt. 1	Negligible impact	Effects consistent with No Action	Effects consistent with No Action	Lower risk of a negative impact
Shortbelly Rockfish - Alt. 2 (Pref.)	Negligible impact	Effects consistent with No Action	Effects consistent with No Action	Lowest risk of a negative impact

4.1.1 Stocks with Alternative Harvest Control Rules under Consideration

4.1.1.1 Black Rockfish in Oregon

Ten-year projections of depletion and spawning output of the Oregon black rockfish indicate the stock will maintain a healthy status (i.e., depletion > 40%; Table 4-41) and abundance (Figure 4-2) under the alternatives. There is a negligible difference in predicted depletion and abundance; both alternatives converge on 54% depletion in 2030.

The difference in the two alternatives directly affecting fishery opportunity is the larger ABC removals in 2021 and 2022 under Alternative 1 result in relatively lower removals beginning in 2023 before converging by the end of the projection period in 2030 (Figure 4-3). Such a short term gain of larger ACLs in the next two years is "paid back" immediately thereafter with relatively lower ACLs. The ten-year projections shown in Figure 4-1 and Figure 4-2 assume no change in the management strategy as defined in Section 2.1.2.1. However, given the importance of black rockfish to nearshore fisheries, this stock will have a relatively high assessment frequency. Any new assessment that is endorsed for management use will update the dynamics of the population; e.g., recruitment assumptions in the projections in previous assessments are updated with realized recruitment. A new assessment will also re-evaluate the effect of the management strategy or HCR on the population. If a new assessment indicates recruitment is less than the average currently predicted for the population or the management strategy is shown to be too aggressive given estimated stock abundance and productivity, the higher removals under Alternative 1, if realized, will mean a more drastic reduction in future ACLs relative to maintaining the No Action HCR.

When Alternative 1 for Oregon black rockfish was decided for analysis in November 2019, the rationale was to explore the trade-offs of a two-year suspension of the ABC harvest control rule to allow time to collect data to inform a stock assessment in 2021. The Council will decide 2021 stock assessment priorities in March and June 2020. In March 2020, the Oregon Department of Fish and Wildlife recommended deferring a black rockfish assessment until 2023 to provide adequate time for ODFW to develop a visual-hydroacoustic survey of nearshore pelagic rockfish such as black rockfish. Implementing Alternative 1 for black rockfish may result in a lower ABC specified in 2023 for Oregon black rockfish (465 mt) than under the No Action Alternative (470 mt) (Figure 4-3). The difference in future predicted ABCs under both alternatives diminishes over time in ten-year projections with the predicted 2030 ABC under Alternative 1 estimated to be 1 mt less than the No Action ABC (442 mt vs. 443 mt; Figure 4-3). If a black rockfish assessment is deferred until 2023, harvest specifications informed by a new 2023 assessment would be implemented beginning in 2025. The difference in cumulative 2021-24 ABC removals between the alternatives is 62 mt more yield under Alternative 1.

The relative difference in biological impacts of the alternative harvest control rules analyzed for black rockfish in Oregon are negligible. The only differential impacts are the socioeconomic impacts associated with available ACLs in the next four years under an assumption a new assessment will inform management of this stock beginning in 2025.

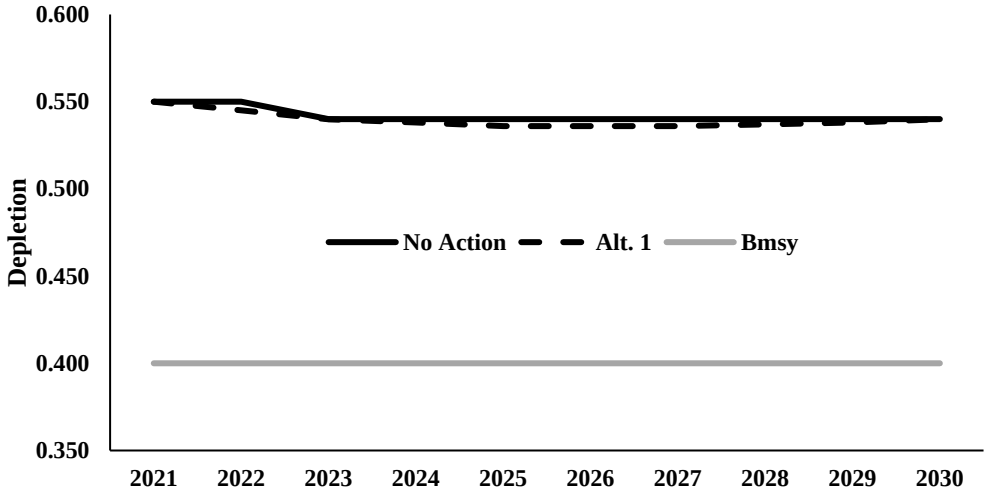


Figure 4-1. Predicted depletion of Oregon black rockfish under two alternative harvest control rules, 2021-2030.

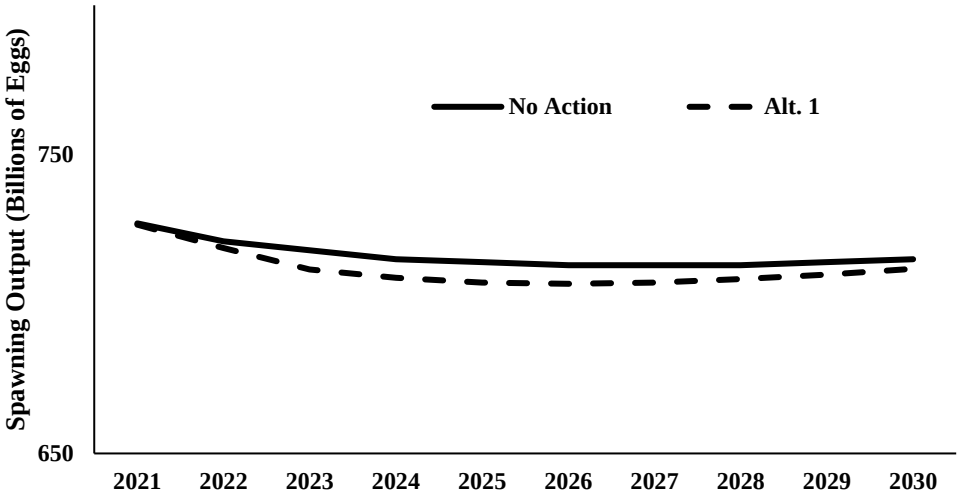


Figure 4-2. Predicted spawning output of Oregon black rockfish under two alternative harvest control rules, 2021-2030.

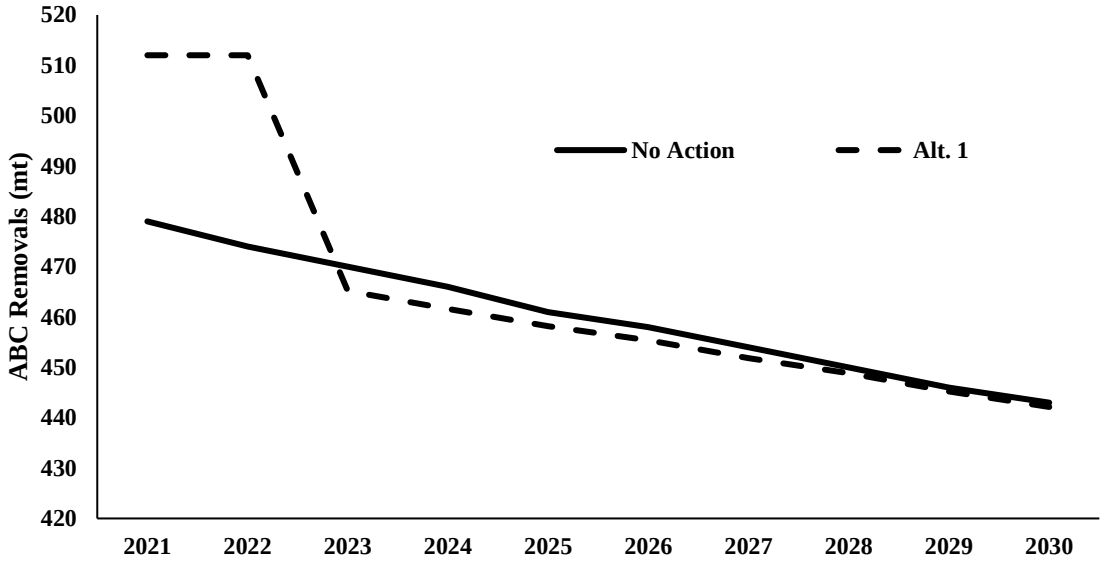


Figure 4-3. Predicted ABC/ACL removals of Oregon black rockfish under two alternative harvest control rules, 2021-2030.

4.1.1.2 Cowcod South of 40°10' N lat.

Ten-year depletion projections by alternative under the base case model in the 2019 cowcod assessment indicate the stock remains healthy across all the alternatives (). However, only Alternative 2 harvest control rules are projected to continue to rebuild the stock in the next ten years under the base model.

Dick and He (2019) noted the base model estimates current spawning output to be above target in 2019, and therefore estimates of OFL and ABC may exceed the SPR proxy for MSY (i.e., >73 mt) in the short term. Uncertainty in current stock status and productivity is greatly underestimated by the base model due to lack of sufficient information in estimating natural mortality, the form and parameters of the stock recruitment relationship, recruitment variability, and historical fishery selectivity. Catch uncertainty affects the precision of population scale (and therefore yield) and is not accounted for in the current assessment. Therefore, the STAT recommended that target yields be set well below the MSY proxy until data become available to better inform stock productivity and status.

The short term (2021-22) ABCs projected under the No Action Alternative are above the MSY proxy (Table 4-2 and Table 4-3). Short term Alternative 1 ABCs are just under the proxy MSY and the Alternative 2 ABCs are well below the proxy MSY. The short-term removals under Alternative 2 harvest control rules or the removals under the low state of nature model correspond best to the precautionary advice offered by Dick and He (2019).

Table 4-2. The average yield in 2021-22 ABC removals by alternative and under the low state of nature model for cowcod south of Pt. Conception relative to the proxy MSY in the 2019 cowcod assessment.

	No Action	Alt. 1	Alt. 2	Low State of Nature a/
2021-22 Avg. ABC removal (mt)	82.1	71.4	52.0	45.7
Percent of proxy MSY of 73 mt	112.5%	97.8%	71.2%	62.5%

a/ Projected removals under the low state of nature model in the 2019 assessment under No Action harvest control rules.

The low state of nature model poses assessment outcomes with a lower natural mortality rate (the mortality rate assumed in the 2013 assessment) and a lower commercial length at 50% selectivity (Table 4-3). If the low state of nature model is true, the scale of the population decreases relative to the base case model and depletion is estimated to be below the target spawning output of 40% unfished. Only Alternative 2 harvest control rules are projected to rebuild the population in the next ten years (2027) under the low state of nature (Table 4-3 and Figure 4-4).

The SSC agreed with the precautionary advice regarding short term harvest specifications offered by the STAT when they endorsed the 2019 cowcod assessment in September 2019. The SSC recommended short term (e.g., 2021 and 2022) removals based on the low state of nature in the assessment (Table 4-2) should be considered when deciding ACLs. Alternative 2 ABCs/ACLs are the closest to those removals.

The Council selected Alternative 1 as its Preferred Alternative for setting 2021 and 2022 ACLs. However, they selected Alternative 2 as the basis for preferred 2021 and 2022 ACTs (see section 2.2.2.2). The preferred management measures for fishery sectors south of 40°10’ N lat. are designed to stay within the more precautionary Alternative 2 harvest limits. The reason given for basing the ACLs on Alternative 1 harvest limits is this defines the future default harvest control rule for cowcod and the Council desired increased flexibility in future decisions as they learn more about cowcod fishery interactions in the next management period.

Table 4-3. Ten-year projections of spawning output and depletion of cowcod south of 40°10' N lat. under three alternative harvest control rules and the base case and low state of nature models in the 2019 cowcod assessment (grey shading indicates the stock is estimated to be below the target spawning output of 40% of unfished).

Year	Alternative	ABC Removals (mt)	State of nature			
			Low M=0.055, $L_{50\%}$=35 cm		Base case M=0.088, $L_{50\%}$=45.6 cm	
			Spawning Output	Depletion	Spawning Output	Depletion
2021	No Action	83.0	330	38.1%	343	60.3%
2022		81.3	329	38.0%	340	59.7%
2023		79.7	328	37.8%	337	59.2%
2024		78.1	326	37.6%	334	58.7%
2025		76.7	324	37.3%	331	58.1%
2026		75.3	321	37.0%	328	57.6%
2027		74.1	318	36.7%	325	57.2%
2028		72.9	315	36.4%	323	56.7%
2029		71.7	312	36.0%	321	56.4%
2030		70.7	309	35.6%	319	56.0%
2021	Alt. 1	72.4	330	38.1%	343	60.3%
2022		70.5	331	38.2%	342	60.0%
2023		68.7	331	38.2%	340	59.8%
2024		67.1	331	38.2%	339	59.5%
2025		65.5	331	38.2%	337	59.3%
2026		64.0	330	38.1%	336	59.0%
2027		62.6	330	38.0%	335	58.9%
2028		61.3	329	37.9%	334	58.7%
2029		60.0	328	37.8%	333	58.6%
2030		58.8	327	37.7%	333	58.5%
2021	Alt. 2	54.0	330	38.1%	343	60.3%
2022		52.0	334	38.5%	344	60.5%
2023		50.1	337	38.9%	345	60.7%
2024		48.3	340	39.2%	347	60.9%
2025		46.5	343	39.6%	348	61.2%
2026		44.8	346	39.9%	350	61.4%
2027		43.2	349	40.2%	351	61.7%
2028		41.7	352	40.6%	353	62.0%
2029		40.3	355	40.9%	355	62.4%
2030		38.9	358	41.3%	357	62.8%

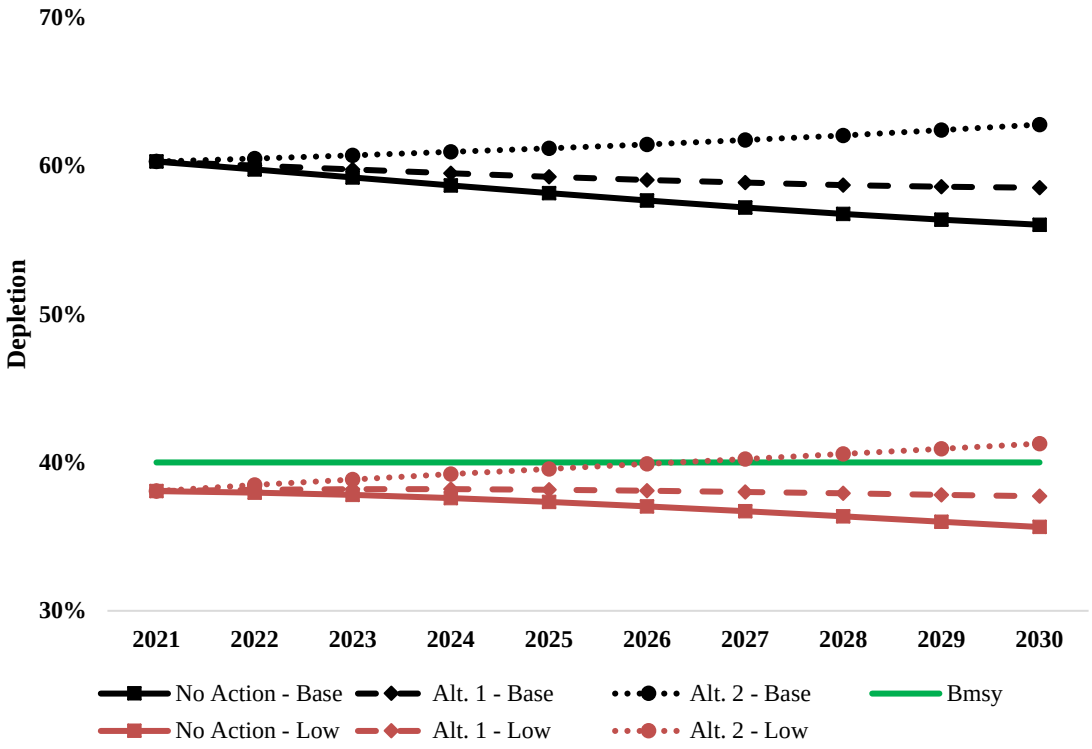


Figure 4-4. Predicted depletion of cowcod south of 40°10' N lat. under the base case and low state of nature models in the 2019 assessment model and three alternative harvest control rules, 2021-2030.

4.1.1.3 Petrale Sole

In November 2019, the GMT recommended the two action alternatives for petrale sole, both of which are more precautionary than the No Action Alternative. Alternative 1, which specifies 2021 and 2022 ABCs based on a P* of 0.4, and a GMT-proposed Action Alternative 2, which would specify stair-step decreases of the ACL beginning in 2021 and continuing in subsequent management cycles. Alternative 1 would result in larger ABC/ACL reductions in the next management cycle, is more of a constant catch scenario than Alternative 2, and is the more precautionary of the two proposed action alternatives. The Council selected Alternative 1 as their preliminary preferred alternative.

The GMT-recommended precaution in setting petrale sole harvest limits is based on considerations posed in the 2019 update assessment (Wetzel 2019). The 2018 biomass estimate from the trawl survey declined, which the assessment failed to fit. If the 2018 trawl survey CPUE estimate is indicative of a declining abundance in the near future not captured in the current assessment, then the projections in the 2019 assessment could be overly optimistic. Further, new fecundity data for petrale sole, which could not be incorporated in the 2019 update assessment, are likely to result in slightly more depleted estimates of stock size when incorporated into the next full assessment. Given such possibilities, there was desire to explore a more conservative management strategy for petrale sole in the near term before a new full assessment is conducted. Alternatives 1 and 2

The GAP recommended the No Action Alternative for petrale sole. They noted the importance of petrale sole to the trawl industry and the fact that the current population is past the point of peak production due to diminishing year class strength and more exploitable fish are succumbing to natural mortality. These older fish will die due to either natural mortality or to being caught; the industry prefers harvesting them.

Ten-year projections of depletion under all alternatives indicate the stock maintains a healthy status at an equilibrium or with a slightly increasing trend (Figure 4-5). The divergence in depletion estimates by year under the alternatives with a maximum estimated divergence of two percentage points in 2030 (29% under No Action; 31% under Alternative 1; 30% under Alternative 2). Spawning biomass trajectories exhibit a similar pattern of minimal divergence with maximum difference in estimated spawning biomass in 2030 (9,700 mt under No Action; 10,350 mt under Alternative 1; 10,124 mt under Alternative 2; Figure 4-6).

Petrale sole is an important trawl target species in the west coast groundfish fishery and assessment frequency is relatively high. Therefore, anticipating outcomes ten years in the future is unrealistic since the stock will likely be re-assessed much sooner.

The relative biological impacts to the stock of the alternatives are minimal, Alternative 1 is more precautionary than the No Action Alternative and slightly more precautionary than Alternative 1. The potential of a more pessimistic result in the next assessment (e.g., the trawl survey index continues to show a declining CPUE or the effect of new fecundity data) compels consideration for precaution.

The tradeoff is to the point made by the GAP that the higher exploitation rate under the No Action Alternative provides higher short-term economic benefits associated with harvesting more petrale sole in the next management cycle that would otherwise succumb to natural mortality. Under an assumption of 100 percent ACL attainment of petrale ACLs in 2021 and 2022, the foregone yield under Alternative 1 relative to the No Action Alternative is 1,526 mt and 940 mt is foregone under Alternative 2 (Figure 4-7).

The Council initially selected Alternative 1 petrale sole harvest specifications as their preliminary preferred as a precautionary measure given a potential downturn in the stock trajectory based on the lower CPUE of petrale in the NMFS NWFSC west coast bottom trawl survey as indicated in the 2019 assessment. In April 2020, the 2019 trawl survey CPUE estimate was higher than the 2018 estimate, which indicated the survey trend is in line with the average trend between 2014 - 2017 (Figure 4-8). The 2019 update stock assessment for petrale sole identified new fecundity data as an additional item of concern, which would likely be incorporated in future assessments, and would result in a slightly less optimistic estimate of stock status. However, the Council considered the standard level of precaution incorporated in the $P^* = 0.45$ approach, combined with time-varying sigma values, will result in sufficiently conservative ACLs under the No Action alternative. Additionally, the No Action alternative is expected to increase ex-vessel revenue by up to $378,502 per year on average compared to Alternative 1. Setting sustainable ACLs for petrale sole will provide additional opportunities to access other co-occurring groundfish species and reduce the likelihood of petrale sole limits constricting their harvest, which could occur under Alternative 1 or Alternative 2.

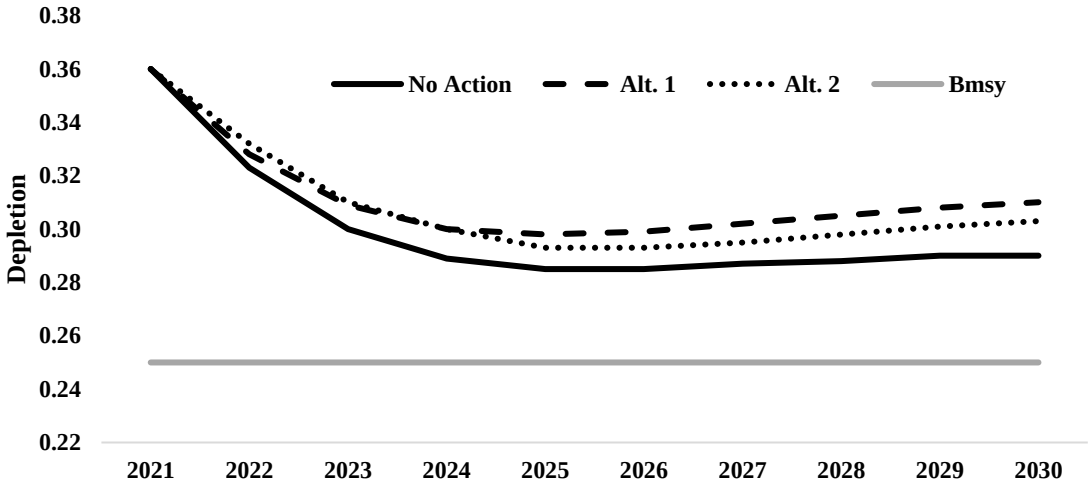


Figure 4-5. Predicted depletion of petrale sole under three alternative harvest control rules, 2021-2030.

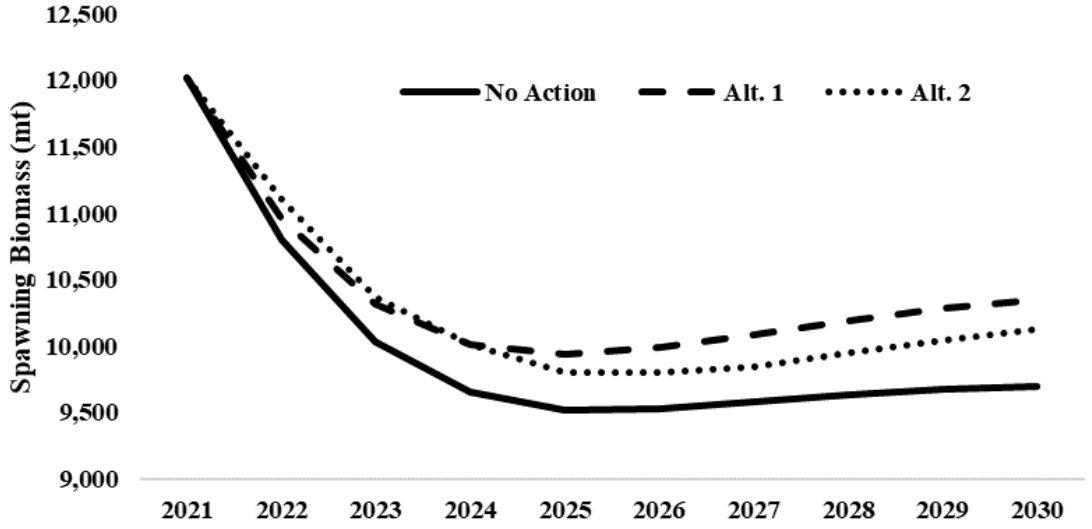


Figure 4-6. Predicted spawning biomass of petrale under three alternative harvest control rules, 2021-2030.

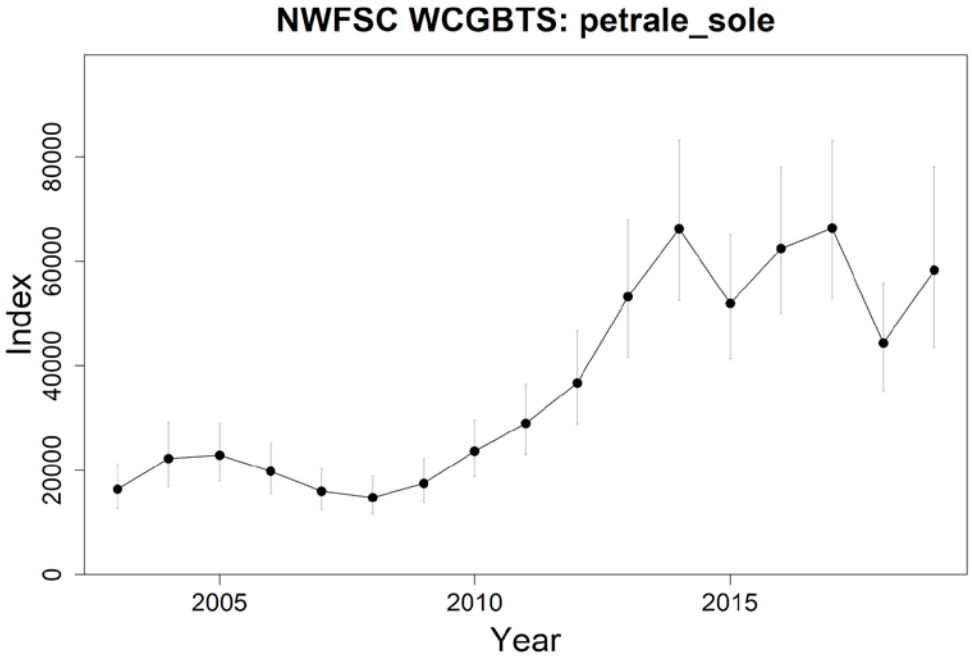


Figure 4-7. Estimated index of abundance for petrale sole from 2003-2019 NWFSC west coast bottom trawl survey data.

4.1.1.4 Sablefish

The coastwide sablefish stock is predicted to maintain a healthy status in the next ten years under both alternatives, with a slightly increasing trend under the more precautionary No Action Alternative and a slightly decreasing trend under Alternative 1 (Figure 4-9).

West coast sablefish has long been managed in a precautionary manner due to the stock's importance and value to the fishery and its persistence in the precautionary zone (i.e., below target biomass (B_{MSY} < 40% depletion)). The precautionary zone status in recent years led to an automatic reduction of the ACL relative to the ABC with implementation of the 40-10 rule. However, the Council has managed this stock with a more precautionary ABC harvest control rule (P* = 0.40) as well to foster stock rebuilding to a healthy status. The prediction the stock is increasing in abundance and will transition from the precautionary zone to a healthy status compelled consideration for Alternative 1, which specifies a higher P* (0.45). This transition has a high probability of occurring due to the strength of the 2016 year class. The 2019 assessment projects this outcome even under the more pessimistic low state of nature model (Table 4-4).

Table 4-4 also provides an "Alt. Catch" stream requested by the GMT. This catch stream is a more realistic catch stream for the next management cycle given the low attainment of the south of 36° N lat. ACL. Under this low catch stream, projections from the low state of nature assessment model indicate the stock never drops below the biomass target of 40% of unfished. All the impacts analyzed in this section assume removals on a coastwide basis. Given the more realistic catch assumptions in the Alt. Catch stream, it appears the risk of a management miscue leading to future decreases in stock abundance and productivity are very low.

Notwithstanding the interpretation of low risk associated with the alternative model projections in Table 4-4, Haltuch et al. (2019) acknowledge estimates of uncertainty around the point estimate of unfished

biomass are large across the range of models explored within the 2019 assessment, suggesting that the unfished spawning biomass could range from just under 100,000 mt to over 200,000 mt. This uncertainty is largely due to the confounding of natural mortality, absolute stock size, and productivity. The point estimate of 2019 spawning biomass from the base model is 57,444 mt (Figure 4-10); however, the 95% interval ranges broadly from 32,776 to 82,112 mt. The 2019 point estimate of spawning stock biomass is 39% of the unfished state with a 95% confidence interval of 26-52%.

Despite sablefish model uncertainty, the relative trend in spawning biomass is robust to uncertainty in the leading model parameters. Further, there are strong recent recruitments contributing to the increasing biomass trend. The above-average cohorts from 2008, 2010, 2013, and 2016 are contributing to a slightly increasing spawning stock size. The 2016 cohort is estimated to be the largest since the mid-1970s.

The ABC removals under Alternative 1 are larger than those under the No Action Alternative, which will provide more positive economic benefits to the commercial fisheries targeting sablefish (Figure 4-9). The cumulative difference in the ten-year (2021-2030) projections analyzed is 5,682 mt more yield under Alternative 1. The cumulative difference in ABC removals during the next management cycle in 2021-22 is 1,147 mt.

The considerations for changing the apportionment method used to allocate the coastwide ABC to area-specific ACLs north and south of 36° N lat. adds no biological impacts for the sablefish stock beyond what is analyzed herein since these analyses assume coastwide removals. Recent genetic analyses also indicate sablefish throughout their range in the northeast Pacific Ocean are a single panmictic population (Jasonowicz, *et al.* 2017); therefore, a different apportionment of west coast sablefish ACLs will not have any negative genetic consequences such as localized depletion. The effect of a reapportionment that shifts more yield to the north will likely mean a higher attainment of the coastwide ABC since northern fisheries tend to attain most of their annual harvest guidelines, while the southern ACL has been consistently under-attained.

Higher ACLs and the higher ACL apportionment in the north will increase the allocation of sablefish in tribal and non-tribal fisheries north of 36° N lat. There may be a compensatory increase in bottom trawl effort north of 36° N lat. to the extent that sablefish quota in the trawl IFQ fishery currently limits effort. To the extent that overall fixed gear effort increases due to these higher allocations, there may be an increase in the incidental bycatch of yelloweye rockfish. Current yelloweye impacts in these sectors have not risked attainment of specified HGs and therefore, there is a buffer to mitigate impacts in the next management period. Such impacts are considered in the analysis of management measures in Section 4.2.2.4

The Council selected Alternative 1 sablefish harvest specifications as their preferred in April 2020 given the higher positive socioeconomic impacts and the prospect of a healthy status in the next decade under this more aggressive harvest control rule.

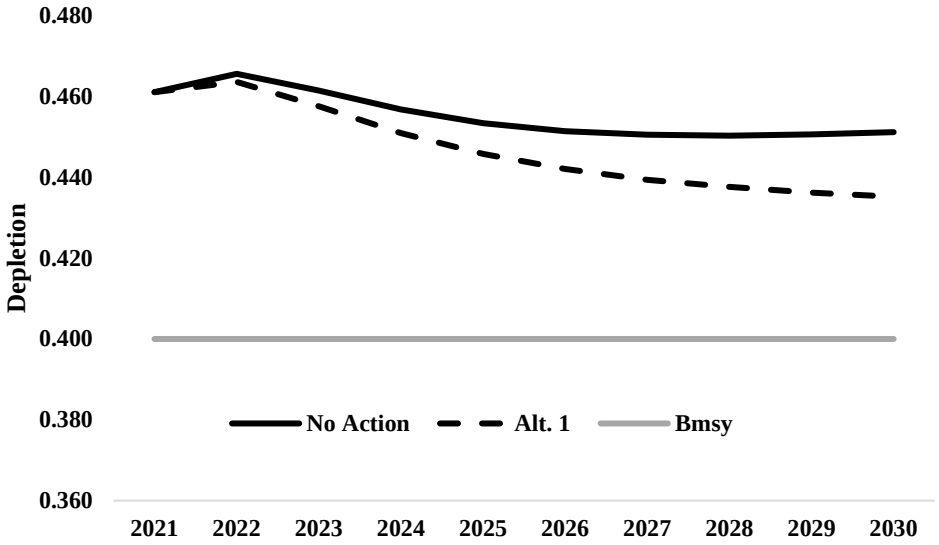


Figure 4-8. Predicted depletion of sablefish under two alternative harvest control rules, 2021-2030.

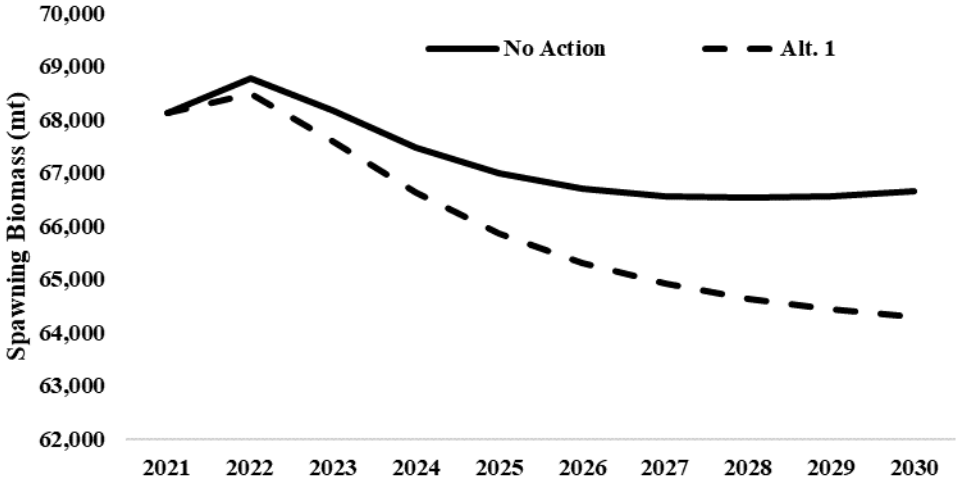


Figure 4-9. Predicted spawning biomass of sablefish under two alternative harvest control rules, 2021-2030.

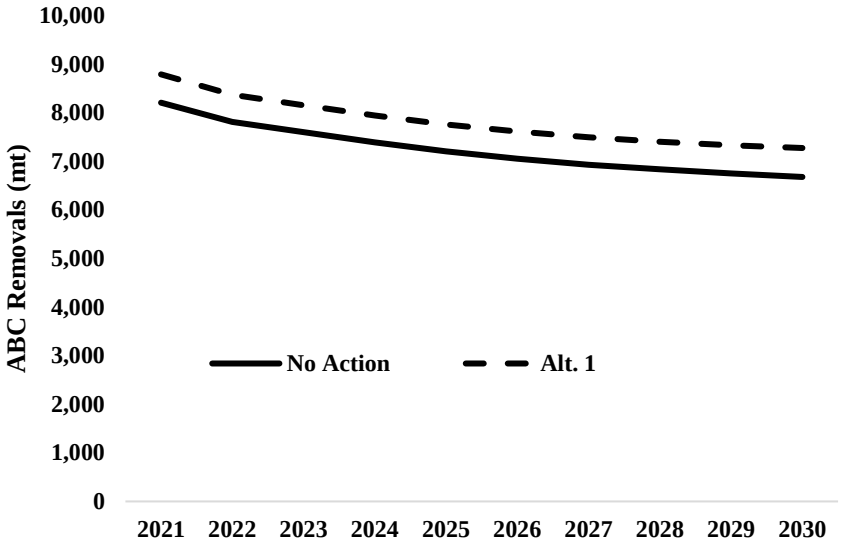


Figure 4-10. Predicted ABC removals of sablefish under two alternative harvest control rules, 2021-2030

Table 4-4. Ten-year projections of spawning biomass and depletion of sablefish under four catch scenarios (including the No Action Alternative and Alternative 1) and the base case and low state of nature models in the 2019 sablefish assessment (grey shading indicates the stock is estimated to be below the target spawning biomass of 40% of unfished).

Catch scenario	Year	Total catch	Low state (0.25)		Base (0.5)	
			SSB	Depletion	SSB	Depletion
P*=0.35	2021	7,644	51,414	45%	68,120	46%
	2022	7,269	51,922	46%	69,059	47%
	2023	7,064	51,094	45%	68,740	47%
	2024	6,849	49,847	44%	68,316	46%
	2025	6,668	48,544	43%	68,079	46%
	2026	6,513	47,297	41%	68,038	46%
	2027	6,382	46,136	40%	68,145	46%
	2028	6,279	45,063	40%	68,354	46%
	2029	6,182	44,064	39%	68,629	46%
	2030	6,105	43,135	38%	68,953	47%
P*=0.40; No Action Alt.	2021	8,208	51,414	45%	68,120	46%
	2022	7,811	51,636	45%	68,778	47%
	2023	7,599	50,517	44%	68,177	46%
	2024	7,388	48,988	43%	67,482	46%
	2025	7,207	47,411	42%	66,984	45%
	2026	7,055	45,902	40%	66,691	45%

Catch scenario	Year	Total catch	Low state (0.25)		Base (0.5)	
			SSB	Depletion	SSB	Depletion
	2027	6,930	44,489	39%	66,555	45%
	2028	6,837	43,169	38%	66,525	45%
	2029	6,752	41,925	37%	66,564	45%
	2030	6,679	40,750	36%	66,652	45%
P*=0.45; Alt. 1 (Pref.)	2021	8,791	51,414	45%	68,120	46%
	2022	8,375	51,342	45%	68,488	46%
	2023	8,158	49,920	44%	67,594	46%
	2024	7,946	48,097	42%	66,618	45%
	2025	7,758	46,241	41%	65,851	45%
	2026	7,614	44,468	39%	65,304	44%
	2027	7,499	42,799	38%	64,918	44%
	2028	7,401	41,226	36%	64,643	44%
	2029	7,331	39,739	35%	64,445	44%
	2030	7,275	38,320	34%	64,296	44%
Alt. Catch	2021	6,657	51,414	45%	68,120	46%
	2022	6,365	52,421	46%	69,528	47%
	2023	6,208	52,084	46%	69,648	47%
	2024	6,053	51,294	45%	69,625	47%
	2025	5,919	50,399	44%	69,742	47%
	2026	5,807	49,518	43%	70,014	47%
	2027	5,715	48,684	43%	70,400	48%
	2028	5,645	47,905	42%	70,858	48%
	2029	5,583	47,173	41%	71,354	48%
	2030	5,529	46,486	41%	71,874	49%

4.1.1.5 Shortbelly Rockfish

The apparent range extension of shortbelly rockfish to northern waters has resulted in a large bycatch of shortbelly in midwater trawl fisheries targeting Pacific whiting. The 500 mt shortbelly rockfish ACL (the ACL considered under the No Action Alternative) was exceeded by 8 mt (102 percent of the ACL) in 2018 and 154 mt in 2019 (131 percent of the ACL). The estimated total mortality in 2019 is considered preliminary and incomplete; final catch estimates are anticipated from the West Coast Groundfish Observer Program in September 2020. The 2019 estimated total mortality was downloaded from Report GMT007 on PacFIN's Apex Reporting dashboard on February 19, 2020.

Shortbelly rockfish have never been targeted and are recognized as an important forage species in the California Current ecosystem with the center of its population distribution historically on the shelf/slope break off central California (Field, *et al.* 2008). The Council originally considered designating shortbelly

rockfish an EC species when FMP Amendment 23 was being considered but ultimately decided to specify a low 50 mt ACL to accommodate unavoidable incidental bycatch beginning in 2011. This ACL was considered a safe level of harvest that would not disrupt groundfish fisheries while allowing most of the harvestable surplus of the stock to be available as forage. This low level of bycatch was considered safe given the observed mortalities at that time; the 2002-2009 average coastwide annual total mortality was 14.4 mt (Table 4-5).

The ACL was raised to 500 mt in 2015 in anticipation of the re-emergence of the midwater trawl rockfish fishery after widow and canary rockfish were declared rebuilt. Incidental bycatch remained low until 2017 when it abruptly increased by an order of magnitude and has been increasing since (Table 4-5 and Figure 4-11). Most of this bycatch occurred in the Pacific whiting midwater trawl fisheries north of 40°10' N lat.

The Council received public comment at their June 2019 meeting from representatives of the at-sea whiting fishery asking for inseason relief by not closing the fishery given the high bycatch of shortbelly rockfish. They also asked for an increase in the 2020 shortbelly ACL to avoid exceeding the ACL again. The at-sea whiting fleets employ a fishery monitoring company, Sea State, Inc., to monitor each catcher vessel's bycatch in near real time. When there is a large bycatch event (aka a "lightning strike") for a non-target species of concern, Sea State notifies the entire fleet of the location and magnitude of the bycatch event and advises vessels to move from these bycatch "hot spots". There were several shortbelly rockfish lightning strikes during the 2019 whiting fishery. While the fleets were not necessarily monitoring shortbelly rockfish bycatch as a noted species of concern (shortbelly were rarely encountered north of 40°10' N lat. and the fleet does not operate in the south), these lightning strikes in such a short period compelled the fleet to investigate and self-reported these bycatches to NMFS. They also immediately implemented the Sea State protocol to move from these bycatch areas and actively avoid shortbelly rockfish. NMFS responded with a public notice to all fishery participants, including shoreside trawl vessels that do not employ Sea State, to avoid shortbelly rockfish and the areas where the at-sea fleets experienced high bycatch. While the ACL had not been exceeded at the time of the June 2019 Council meeting, it was clear this would happen given the season was ongoing and sector whiting allocations were not close to being attained. NMFS advised the Council and industry they would not automatically close the 2019 fishery upon attainment of the shortbelly ACL and urged avoidance to minimize shortbelly bycatch. The Council initiated a process to increase the 2020 ACL culminating in their final decision to recommend a 3,000 mt in November 2019 (85 FR 21372).

Once the fleets became aware of the shortbelly rockfish bycatch issue and the NMFS notice was published notifying fishermen to avoid shortbelly, there was a significant reduction in bycatch. A comparison of cumulative catches of Pacific whiting and shortbelly rockfish by week of the 2019 and 2020 shoreside (Figure 4-12) and at-sea (Figure 4-13) whiting fisheries indicates the at-sea fleets, which are more mobile than the shoreside fleet, dramatically reduced their shortbelly rockfish bycatch rate. Shoreside whiting vessels are bound to waters close to their home ports where deliveries need to be made within 24 hours of catching the fish, thus reducing their ability to actively avoid shortbelly. In theory, fleets in the north should be able to better distinguish schools of shortbelly and their preferred target species with experience as older fishermen in California had previously reported.

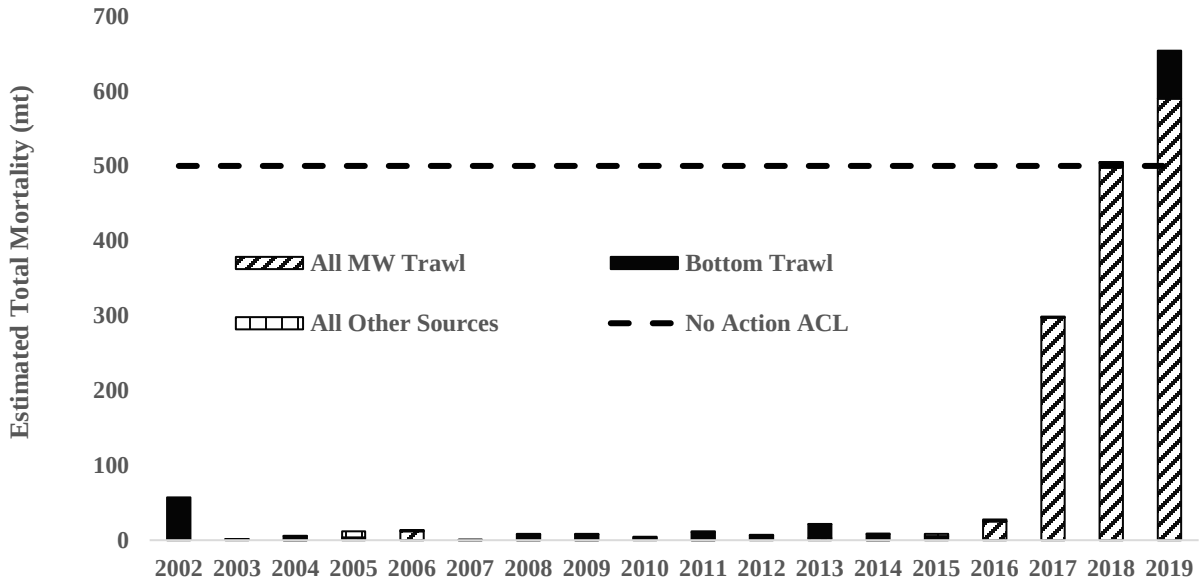


Figure 4-11. Total fishing-related mortality of shortbelly rockfish on the West Coast, 2002-2019. Mortalities in 2019 are preliminary estimates. The dotted horizontal line is the No Action ACL.

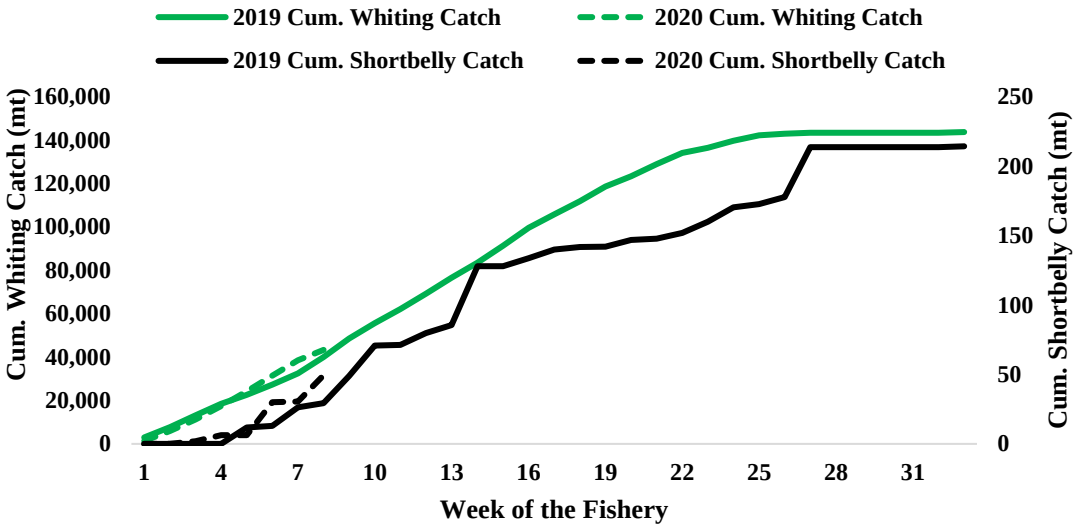


Figure 4-12. Cumulative catches of Pacific whiting and shortbelly rockfish by week in the 2019 and 2020 (catches to date) shoreside whiting trawl fishery.

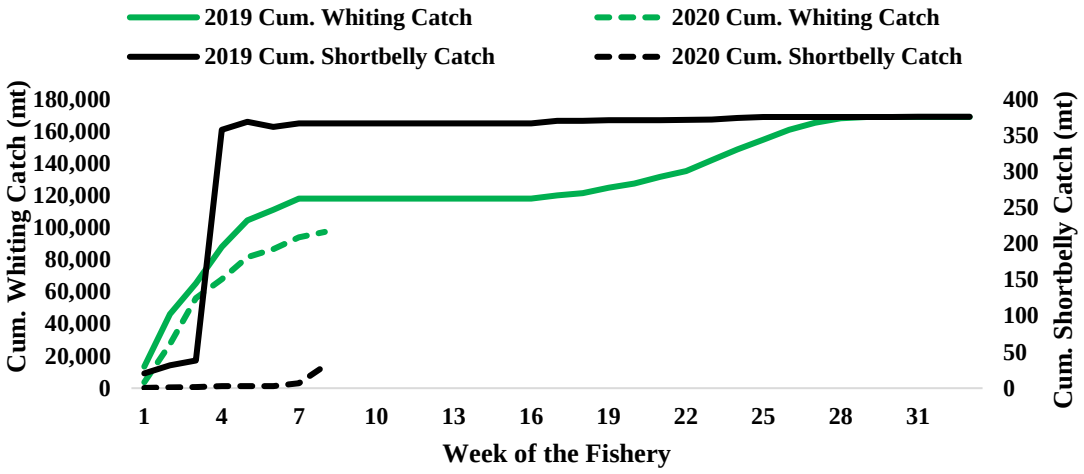


Figure 4-13. Cumulative catches of Pacific whiting and shortbelly rockfish by week in the 2019 and 2020 (catches to date) at-sea whiting trawl fishery.

Table 4-5. Estimated total fishing-related mortality (in mts) by sector of shortbelly rockfish on the U.S. West Coast, 2002-2019.

Year	Commercial Fisheries							WA Tribal Shoreside	Research	Estimated Fishing Mortality	All MW Trawl	All Other Sources	Percent of 500 mt ACL Attainment c/
	IFQ/Co-op Management						Non-IFQ						
	Bottom Trawl	FG	MW Rockfish	Shoreside MW Hake	At-sea MW CP	At-sea MW MSCV	Total b/						
2002	56.61	--	--	0.07	0.48	0.10	0.00	--	--	57.26	0.65	0.00	11%
2003	0.47	--	--	0.04	0.49	0.02	0.01	--	--	1.03	0.55	0.01	0%
2004	5.29	--	--	0.01	0.00	0.02	6.51	--	--	18.33	0.03	0.09	4%
2005	0.84	--	--	--	0.01	2.69	1.91	--	8.21	15.56	2.69	8.21	3%
2006	0.84	--	--	0.28	0.31	11.24	0.00	--	1.10	13.77	11.82	1.10	3%
2007	0.24	--	--	--	0.00	0.01	0.08	0.03	0.33	0.77	0.01	0.38	0%
2008	7.03	--	--	0.00	--	--	0.02	--	1.21	8.27	0.00	1.23	2%
2009	7.42	--	--	0.05	--	--	0.00	--	1.09	8.57	0.05	1.09	2%
2010	2.47	--	--	0.33	--	0.00	0.24	--	1.77	5.04	0.33	1.77	1%
2011	10.55	--	--	0.00	--	--	0.21	--	1.45	12.42	0.00	1.45	2%
2012	5.46	--	--	0.09	0.02	0.27	0.38	--	1.22	7.82	0.38	1.22	2%
2013	18.22	0.00	0.02	2.12	0.00	0.73	3.49	0.02	0.50	28.59	2.87	0.52	6%
2014	8.02	0.00	--	0.01	0.01	0.00	8.92	--	0.74	26.61	0.02	0.74	5%
2015	4.49	--	0.01	0.73	0.02	0.01	0.93	--	3.09	10.21	0.77	3.09	2%
2016	0.60	--	0.00	22.88	0.24	1.91	2.23	--	2.16	32.26	25.03	2.16	6%
2017	0.58	--	3.64	125.31	140.81	27.73	21.57	0.01	0.57	341.78	297.48	0.62	68%
2018	0.69	--	31.75	243.65	85.89	142.16	3.72	0.00	0.48	512.07	503.45	1.19	102%
2019 a/	64.13	--	--	214.34	31.13	344.52	0.00			654.12	589.99	0.00	131%
2002-2019 average	10.78	0.00	7.09	38.12	18.53	35.43	2.79	0.02	1.71	97.47	79.78	1.38	19%
2002-2009 average	9.84	0.00	0.00	0.08	0.08	3.49	1.42	0.03	2.39	10.88	2.43	2.02	2%
2002-2016 average	8.57	0.00	0.01	2.05	0.14	1.42	1.66	0.03	1.91	16.43	3.01	1.54	3%
2018-2019 average	32.41	0.00	31.75	229.00	58.51	243.34	1.86	0.00	0.48	583.10	546.72	0.59	117%

a/ 2019 catches are incomplete and considered draft until reconciled by the West Coast groundfish Observer Program (anticipated in September 2020). The estimated total catch was obtained from the Apex Dashboard (Report GMT007) on the PacFIN web site on February 19, 2020.

b/ Non-IFQ fisheries total includes CA halibut, Sea Cucumber, Pink Shrimp, Ridgeback Prawn, Non-nearshore Fixed Gear, Nearshore Fixed Gear, and Incidental Open Access fisheries.
c/ The ACL (OY prior to 2011) was 13,900 mt from 2002-2008; 6,900 mt from 2009-2010; 50 mt from 2011-2014; and 500 mt from 2015-2019.

Any prediction of future incidental bycatch of shortbelly rockfish in trawl fisheries north of 40°10' N lat. is highly uncertain given the unprecedented amount of bycatch observed since 2017. Whether the magnitude of recent bycatch is the "new normal", whether one can expect an increasing trend in bycatch rates, or whether bycatch will return to pre-2017 levels is a matter of speculation. This will make it very difficult to decide the risk of exceeding any of the alternative shortbelly ACLs.

Regardless of the ACL decided within the 500-3,000 mt ACL range, there is no anticipation a higher level of allowable harvest will induce targeting of shortbelly given the lack of a market. Industry has indicated that shortbelly rockfish is not currently marketable and does not expect it to become so in the near future. The low ex-vessel price of $0.01-$0.03 per pound in recent years supports industry reports that the fish is primarily used as fishmeal or discarded at sea. The median West Coast limited entry trawl permitted vessel has variable operating costs of $0.46 per pound, according to the most recent Economic Data Collection Report, and is unlikely to pursue a targeting strategy for such a low value species, as the revenues would be less than typical operating costs. There was also public testimony at the November 2019 Council meeting from participants in the Pacific whiting fishery that they would avoid shortbelly rockfish regardless of a higher ACL. A mixed bag of shortbelly and whiting not only increases the sorting of the low value shortbelly rockfish bycatch, it tends to physically ruin the whiting. This significantly reduces the economic efficiency of the Pacific whiting fishery and reduces the value of whiting quota. Therefore, there is no incentive in that fishery to target shortbelly rockfish and, in fact, much incentive to avoid them.

It is not anticipated that an increase in fishing mortality of shortbelly rockfish would negatively affect its role as forage in the ecosystem. Scientific information currently available provides evidence of above average forage conditions in the California Current Ecosystem with higher abundances of forage species such as anchovy and a high overall shortbelly rockfish population.

It is posited the order of magnitude increase in shortbelly rockfish bycatch since 2017 was due to a climate change-driven northerly range extension potentially accompanied by exceptionally large recruitment. It is interesting the pink shrimp trawl bycatch of shortbelly rockfish in 2017 increased by nearly an order of magnitude relative to the average bycatch in the previous 15 years before returning to an average level in 2018 (21.54 mt of the 2017 Non-IFQ mortality of 21.57 mt occurred in the pink shrimp fishery; (Table 4-5). Incidental rockfish caught in recent year pink shrimp fisheries tend to be very small young-of-the-year (YOY) fish given the fish excluder grates mandated in pink shrimp trawls. The 2017 spike in shortbelly rockfish bycatch in the pink shrimp fishery could be indicative of a large recruitment.

Two data sets with information on shortbelly, the Rockfish Recruitment and Ecosystem Analysis Survey (RREAS) and the California Cooperative Oceanic Fisheries Investigations (CalCOFI) survey sets were examined to provide some insight into overall population size and distribution, respectively.

The RREAS uses midwater (30 m) trawls to capture young of the year rockfishes and provides an index of annual rockfish recruitment (Dick, *et al*. 2018; Dick and MacCall 2013). The "Core" RREAS sample locations are between Monterey Bay and Bodega Bay, California and have been sampled annually since 1990 (Figure 4-14). The survey expanded to include North-Central, South-Central, and Southern parts of California in 2004 and far North California in 2013 (Figure 4-15). The RREAS provides information on the relative number of rockfish that survive to become pelagic juveniles. Because mortality for pelagic juveniles is much lower than for larvae, the number of pelagic juveniles correlates positively with the number of one-year old rockfish the following year and the number of adults in subsequent years. Thus, if the number of pelagic juveniles is high (i.e., recruitment is high), then it is likely that there will be high numbers of adults in the future. Because 50% of 2-year old shortbelly rockfish are sexually mature (Love, *et al*. 2002), a high recruitment class is likely to augment the spawning stock biomass after just two years.

The California Current Ecosystem (CCE) experienced a Marine Heatwave (MHW) from 2014-2016, resulting in the warmest 3-year period on record (Jacox, *et al.* 2016). The unusual oceanographic conditions during the MHW were highly conducive for shortbelly recruitment (Figure 4-15). All RREAS regions recorded historically high shortbelly rockfish recruitment between 2013 and 2016, and recruitment in the Core region was more than an order of magnitude higher than previous values dating back to 1990. Recruitment remained high in 2017 throughout California, and recruitment was 2nd highest in 2017 since 2013 in the North. The extraordinarily high recruitment events between 2013 and 2017 suggest that overall adult shortbelly population size was very high in 2018 and 2019.

CalCOFI has systematically collected plankton samples off California since 1951 and is the longest-running ocean monitoring program on the planet. The patterns of mean shortbelly larvae abundance collected by oblique net tows (McClatchie 2014) during winter, which is the peak shortbelly rockfish spawning season (Moser, *et al.* 2001; Moser, *et al.* 2000) were examined (Figure 4-16). Larval abundance correlates with adult biomass (Hsieh, *et al.* 2005), and larval abundances is used as an index of spawning stock biomass (Dick and MacCall 2013). If larval abundance is low in southern California, then it is likely that adult population size is also low. Shortbelly rockfish larval abundance was slightly below average in 2018 in southern California. Larval abundance in 2018 was the 26th highest out of 48 sample years. It thus appears that while shortbelly rockfish are not booming in southern California, they are present at levels consistent with the long-term average.

Taken together, RREAS and CalCOFI surveys suggest that the overall shortbelly rockfish population was very high in 2018-2019, and that the population size in southern California is at close to average level. The presence of shortbelly rockfish in southern California does not necessarily preclude the possibility that the bulk of the population moved from central or northern California into Oregon and Washington, but it does show that this species has not abandoned the southern portion of its range within California.

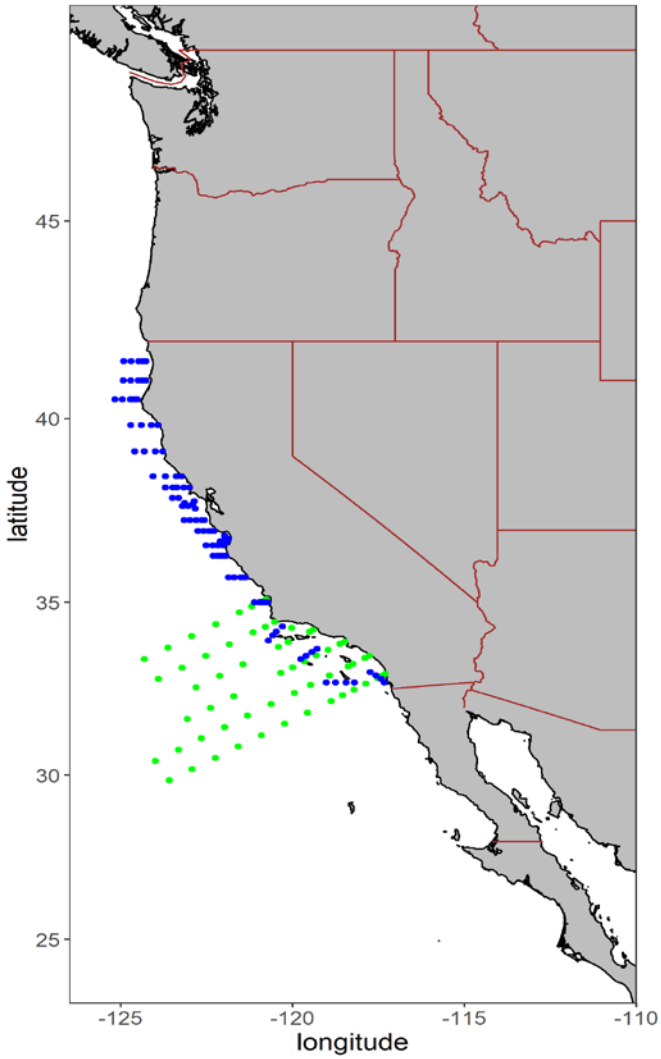


Figure 4-14. Locations of RREAS and CalCOFI sampling. RREAS locations are subdivided among North, North-Central, Core, North-Southern and Southern regions. The CalCOFI stations depict the 66 core stations that have been sampled regularly since 1951

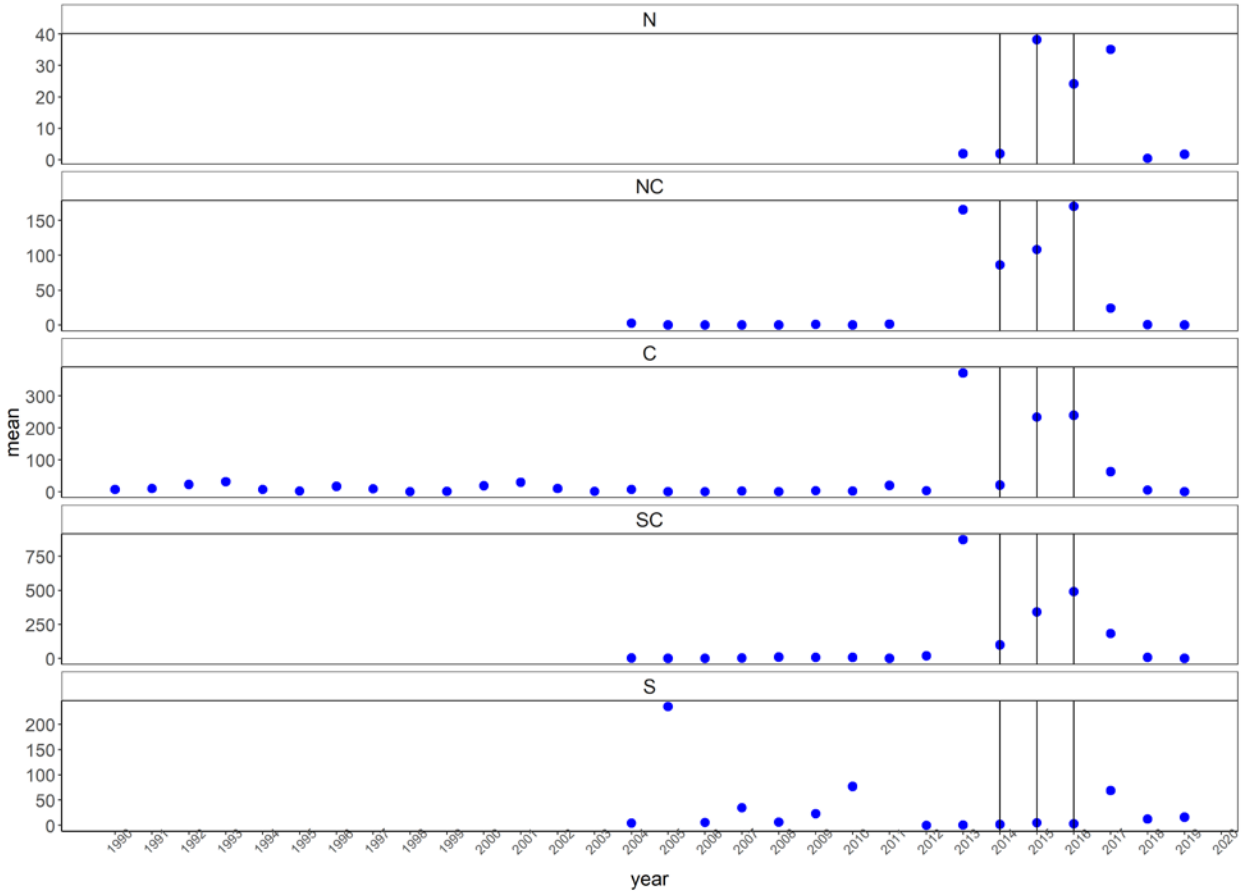


Figure 4-15. Mean abundance of young of the year shortbelly rockfishes from North (N), North-Central (NC), Core (C), South-Central (SC) and South (S) regions of the RREAS

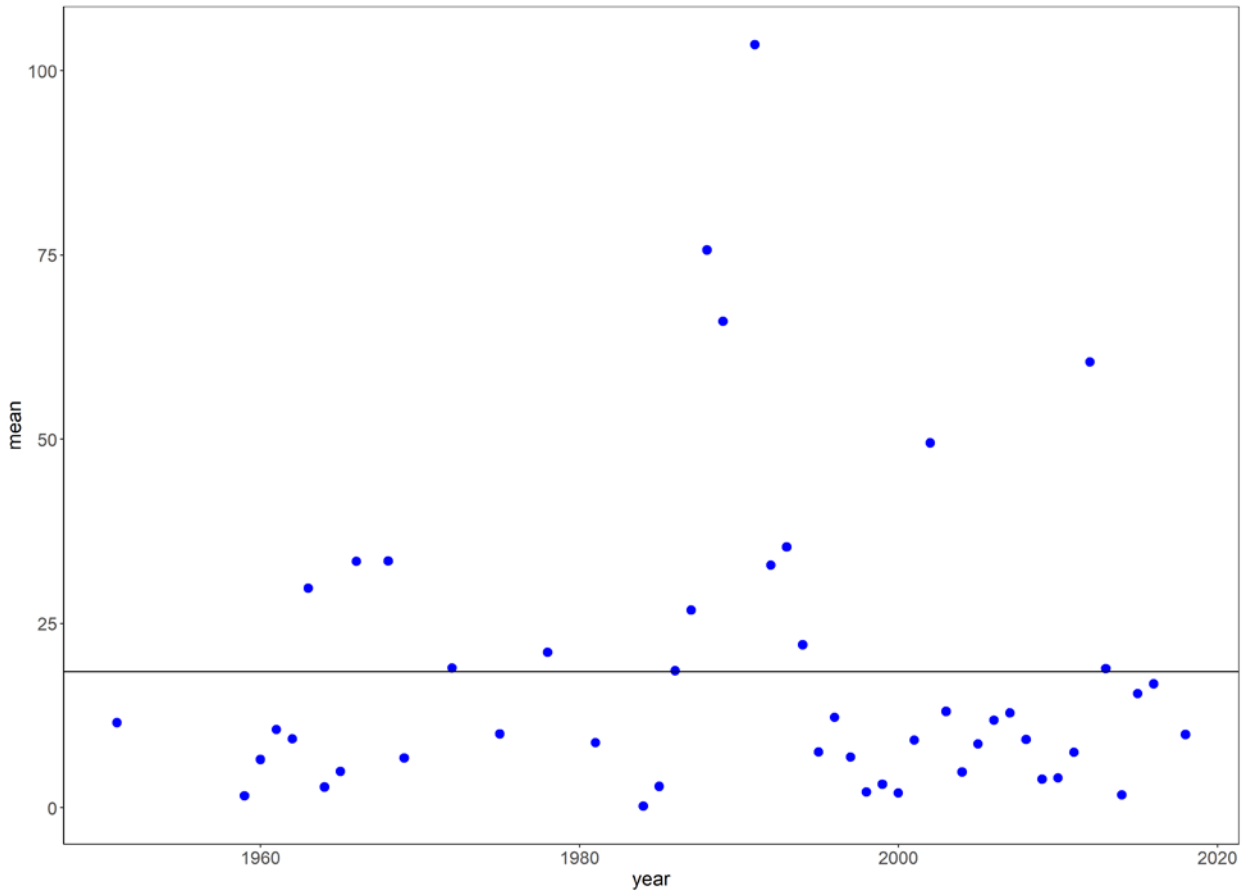


Figure 4-16. Mean winter larval shortbelly abundances from core CalCOFI stations from 1951-2018. Identification of 2017 are not yet complete and 2017 data was excluded from the plot.

Schroeder et al. (2018) indicate that several strong recruitment years could continue to impact the midwater trawl fishery in 2020 and beyond. The 2018 and 2019 high bycatch levels were driven by relatively strong 2013 and 2014 year classes off central California. As the shortbelly rockfish recruits aged, they moved north into Oregon and Washington. Schroeder et al. (2018) show that 2013 was the highest recruitment anomaly of any rockfish in any year since records began in 1983 (Figure 4-17). If individuals from this record year class continue to remain in the north, off of Oregon and Washington, they will continue to be encountered as bycatch in coming years. Furthermore, Schroeder et al. (2018) show that there were also atypically high year classes in 2014, 2015, and 2016 that could start to become encountered as bycatch in 2019, and beyond.

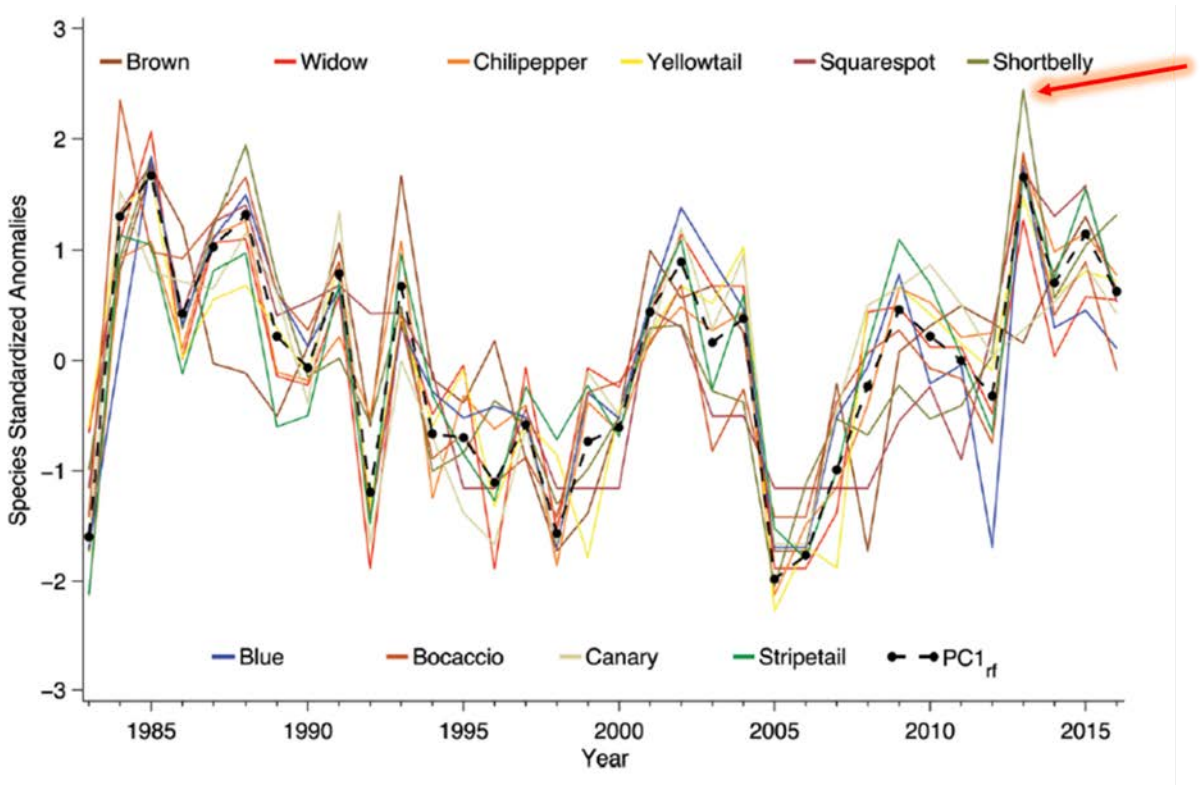


Figure 4-17. Standardized abundance anomalies of the top ten most abundant pelagic juvenile rockfish species and the common trend (Principle Component 1 rockfish; PC1rf) collected by the RREAS midwater trawls from 1983-2016 (this is figure 3 from Schroeder et al.) The glowing red arrow is pointing to the 2013 standardized shortbelly anomaly.

Encounters of shortbelly rockfish in the NMFS West Coast Bottom Trawl Survey were also explored to ascertain whether there was a recent distribution shift of shortbelly rockfish northward or whether the increased bycatch in trawl fisheries north of 40°10' N lat. may have been the result of increased coastwide recruitment. While the bottom trawl survey does not deploy gear selective to a pelagic rockfish such as shortbelly rockfish, the relative encounter rate of shortbelly rockfish north and south in the survey over time shows there have been increased encounters of shortbelly rockfish in the survey off Oregon and Washington since 2013. In addition, there has been a significantly increased encounter rate in the north since 2017 without a coincident decrease in the shortbelly rockfish encounter rate off California (Figure 4-18). This supports the conclusion that the shortbelly rockfish population did not simply shift to northern waters and the relative abundance of shortbelly rockfish in waters off California has not decreased in recent years. Increased encounters of shortbelly rockfish in northern midwater trawl fisheries is more likely the result of increased recruitment and biomass coastwide coupled with an expansion of its geographic range on the West Coast. It is unclear whether this pattern of abundance and distribution will persist.

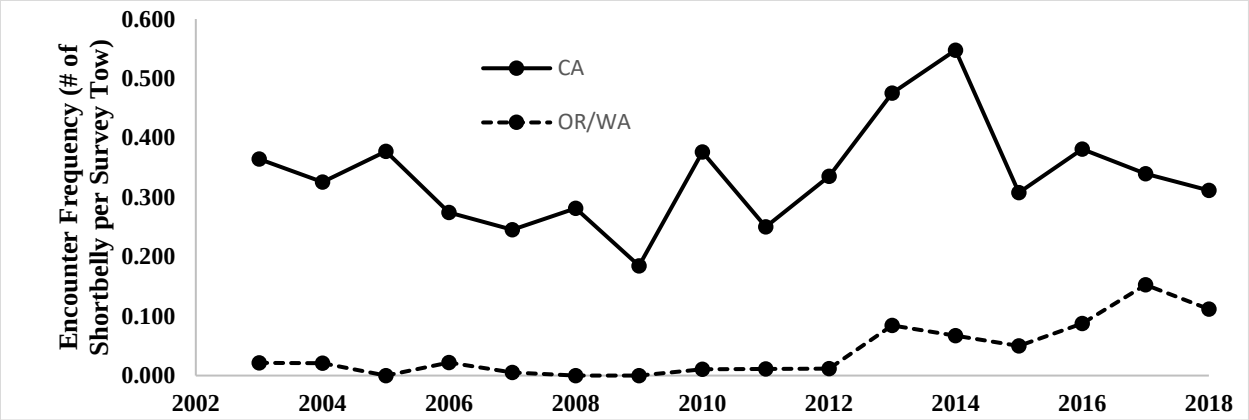


Figure 4-18. Encounter frequency (number of positive tows with shortbelly rockfish/total number of tows each year) of shortbelly rockfish in the NMFS West Coast Bottom Trawl Survey, 2003-2018.

The standardized abundance anomalies shown in Figure 4-18 from Schroeder et al. (2018) can obscure the massive strength of the 2013-2016 year classes and expected population boom. Standardized anomalies put all species on the same scale so that the data can be used in a multivariate Principle Components Analysis, but this can obscure true abundance variability. To better understand and put into context the actual abundance differences, RREAS abundance data from 1990-2016 for the 10 rockfish species analyzed by Schroeder et al. (2018) were used to calculate mean abundances for each species in each year using delta means (delta mean is a technique to calculate means for data that are zero-inflated). Evaluation of mean abundance rather than standardized anomalies illuminates the scale of shortbelly rockfish recruitment from 2013-2016 (Figure 4-19). Shortbelly rockfish mean recruit abundance in 2013 was 25 times higher than the next largest non-shortbelly yearly mean (chilipepper rockfish in 1993). Further, shortbelly rockfish recruitment in 2013 was more than three orders of magnitude (4,303) times higher than the average yearly recruitment among all rockfishes from 1990-2012. Each of the shortbelly recruitment classes from 2013-2016 were larger than any recruitment class for any species besides shortbelly from 1990-2012. Shortbelly rockfish recruitment and subsequent adult populations are currently the highest observed.

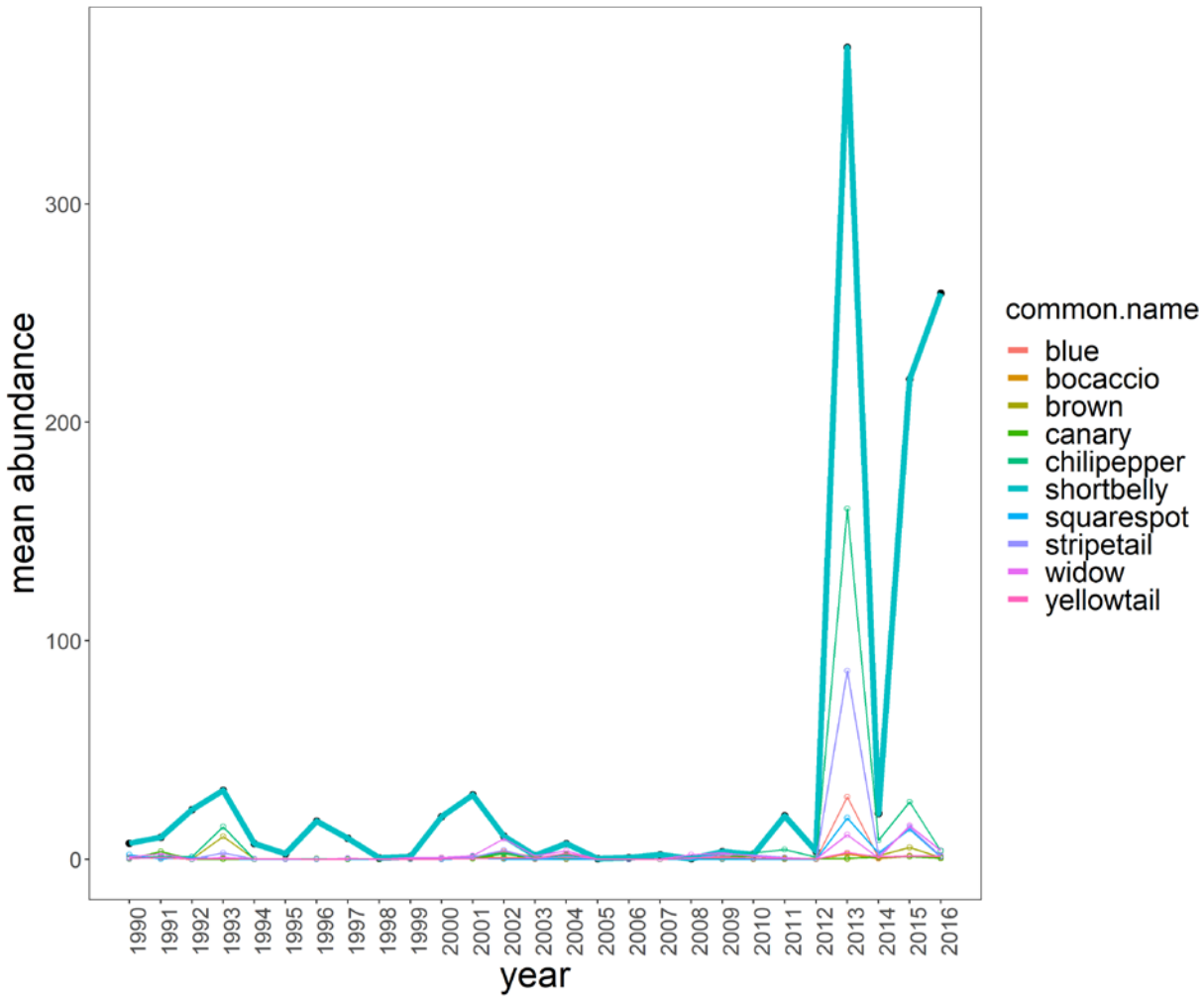


Figure 4-19. Mean yearly abundances, based on number of individuals per 15-minute tow time, from 1990-2016 for the ten rockfishes analyzed by Schroeder et al. (2018). The heavy, turquoise line depicts shortbelly rockfish.

The GMT underscored the OFL and ABC under the No Action Alternative and Alternative 1 (6,950 mt and 4,184 mt, respectively) are based on the 2007 assessment, which utilized various data sources up to 2005. Shortbelly recruitment in 2013 was 51 times higher than 2004 and 1,750 times higher than 2005. This suggests that shortbelly population sizes in 2019 may be on the order of 1,000 times greater than in 2005. There is no modeling technique that would be able to provide reliable future bycatch projections because so many factors are highly uncertain (e.g., if the fish will remain north, how large the population will grow with high year classes, if better avoidance techniques are developed). The overall adult shortbelly rockfish population size is currently high and abundance will likely remain high over the next decade based on high recent recruitment. It is not fully understood why so many individuals moved north in recent years and whether this incursion will continue.

The Case for a Higher ACL under Alternative 1

Despite the lack of incentive to target shortbelly rockfish, a higher ACL (3,000 mt under Alternative 1) will reduce the risk of closing northern trawl fisheries if it becomes necessary to close a fishery to prevent exceeding an ACL. One advantage to this strategy relative to an EC designation under Alternative 2 is that

specifying an ACL will also provide a disincentive to dismiss avoidance measures, which could be expensive for affected vessels when fleets need to frequently move to avoid shortbelly.

The Case for an Ecosystem Component Species Designation under Alternative 2

Shortbelly rockfish were initially considered for an EC species designation under FMP Amendment 23. The case for a reconsideration of an EC designation for shortbelly rockfish under Alternative 2 has not changed since Amendment 23 considerations other than the unprecedented interaction with current midwater trawl fisheries north of 40°10' N lat. A stock identified as an EC species is one that does not require conservation and management based on the considerations and factors outlined in the National Standard 1 (NS1) guidelines. According to the NS1 guidelines, "Any stocks that are predominately caught in Federal waters and are overfished or subject to overfishing, or likely to become overfished or subject to overfishing, are considered to require conservation and management. Beyond such stocks, Councils may determine that additional stocks require "conservation and management."

According to the Magnuson-Stevens Act definition at 16 U.S.C. 1802(5), the term "conservation and management" refers to all of the rules, regulations, conditions, methods, and other measures (A) which are required to rebuild, restore, or maintain, and which are useful in rebuilding, restoring, or maintaining, any fishery resource and the marine environment; and (B) which are designed to assure that—

(i) a supply of food and other products may be taken, and that recreational benefits may be obtained, on a continuing basis;

(ii) irreversible or long-term adverse effects on fishery resources and the marine environment are avoided; and

(iii) there will be a multiplicity of options available with respect to future uses of these resources.

Based on this definition of conservation and management, and other relevant provisions of the Magnuson-Stevens Act, a Council should consider the following non-exhaustive list of factors when deciding whether additional stocks require conservation and management:

i) The stock is an important component of the marine environment.

ii) The stock is caught by the fishery.

(iii) Whether an FMP can improve or maintain the condition of the stock.

(iv) The stock is a target of a fishery.

(v) The stock is important to commercial, recreational, or subsistence users.

(vi) The fishery is important to the Nation or to the regional economy.

(vii) The need to resolve competing interests and conflicts among user groups and whether an FMP can further that resolution.

(viii) The economic condition of a fishery and whether an FMP can produce more efficient utilization.

(ix) The needs of a developing fishery, and whether an FMP can foster orderly growth.

(x) The extent to which the fishery is already adequately managed by states, by state/Federal programs, or by Federal regulations pursuant to other FMPs or international commissions, or by industry self-regulation, consistent with the requirements of the Magnuson-Stevens Act and other applicable law.

Shortbelly rockfish have never been targeted and are not commercially valuable due to their small size. Therefore, there has never been interest in developing a shortbelly fishery. They are not overfished nor are they subject to overfishing. However, the stock is an important forage species in the California Current Ecosystem and shortbelly have been caught in midwater trawl fisheries in increasing amounts in an apparent recruitment and distribution shift north of 40°10' N lat. in recent years. This is truly incidental bycatch occurring despite a high incentive to avoid shortbelly schools when targeting Pacific whiting (this is further

explained below). Shortbelly rockfish meet the NS1 criteria of an EC species designation as considered under Alternative 2.

The analyses below explain the nature of the recent shortbelly interactions with northern trawl fisheries and provides the case under either action alternative that the stock will not be targeted nor will the stock's importance as a forage species be compromised. While Alternative 1 provides an ACL as a disincentive to catch too many shortbelly rockfish, Alternative 2 will not arguably result in higher impacts since there is a high incentive to avoid shortbelly schools when targeting Pacific whiting since their presence in a whiting trawl damages the whiting and reduces the economic value of the haul (this is further explained below). Consistent with National Standard 9, MSA section 303(b)(12), and other applicable MSA sections, management measures can be adopted in order to, for example, collect data on the EC species, minimize bycatch or bycatch mortality of EC species, protect the associated role of EC species in the ecosystem, and/or to address other ecosystem issues. Such management measures could be contemplated in the future under Alternative 2.

Rationale for the Preferred Alternative

The Council selected a 2,000 mt shortbelly rockfish ACL for 2021 and beyond as their Preferred alternative to balance the risk of an early closure of one or more sectors of the trawl fishery in the next management cycle while preserving a healthy forage base of shortbelly in the California Current Ecosystem. This decision maintains the Council's management philosophy to preserve the shortbelly resource for its importance in the ecosystem while not significantly disrupting fisheries attempting to avoid shortbelly. The increase in the shortbelly HCR/ACL is a management adaption to the increased abundance of shortbelly rockfish north of Cape Mendocino. In theory, fleets in the north should be able to better distinguish schools of shortbelly and their preferred target species with experience as older fishermen in California had previously reported.

The Council's Preferred Alternative is shortbelly rockfish be designated an EC species in 2021 and beyond to minimize the risk of an early closure of one or more sectors of the trawl fishery in the next management cycle. The evidence of a series of strong shortbelly cohorts and the potential of a high abundance of shortbelly in the north for the foreseeable future, coupled with a generally strong forage base in the California Current Ecosystem reduced concern the current level of bycatch would affect shortbelly abundance nor its ecosystem role. The Council underscored there is no change in their management philosophy to preserve the shortbelly resource for its importance in the ecosystem while not significantly disrupting fisheries attempting to avoid shortbelly. The Council specified a cumulative annual catch level of 2,000 mt would trigger a Council discussion on shortbelly management and whether precautionary bycatch reduction measures need to be considered. The GMT will continue to track the bycatch of shortbelly in the species scorecard used to monitor catches of important groundfish stocks and complexes inseason. This satisfies the monitoring requirement under an EC designation

4.2 Impacts of Management Measure Alternatives

4.2.1 The Preferred Alternative

The Council adopted No Action for harvest specifications for all stocks except for Oregon black rockfish (Alternative 1), sablefish north of 36° N. lat. (Alternative 1), cowcod (Alternative 1), and shortbelly rockfish (Alternative 2, Ecosystem Component Species). Alternative 1 specifications for those select species can be found in Section 4.2.3. The following section describes the 2021-2022 management measures identified by the Council at the June 2020 as part of their Preferred Alternative.

4.2.1.1 Deductions from the ACL

The deductions from groundfish ACLs for the treaty tribal fisheries, exempted fishing permits (EFPs), scientific research, and incidental open access (IOA; non-groundfish fisheries) are, with the exception of shortbelly rockfish, darkblotched rockfish, and sablefish north of 36° N. lat., the same as described under No Action (Section 4.3.1)[14]. Table 4-8 and Table 4-9 shows the Preferred Alternative for off-the-top deductions and resulting HGs for 2021 and 2022, respectively. Further, the Council recommended that all EFPs share a 100 Chinook salmon bycatch limit and that these Chinook be included in non-whiting salmon bycatch guideline (Agenda Item H.5.a, Supplemental GMT Report 1, November 2019). The impacts to the resulting HGs and allocations are discussed below.

Darkblotched Rockfish

As described in Section 4.2.1.1, the No Action set-aside was set at the historical high of 24.6 mt. This amount was based on anomalously high mortality of darkblotched rockfish in the pink shrimp fishery in 2014 and is the highest on record (since 2002). Furthermore, it is approximately three times higher than the bycatch in the IOA fisheries since 2014. As such, the Council recommended modifying the IOA set aside to the historical average of 9.8 mt for the 2021-2022 biennium. This modification increases the fishery HG from No Action and allocates an additional 14.8 mt to the groundfish fisheries. As detailed in Agenda Item G.6.a, Supplemental GMT Report 1, April 2020, even if the IOA sector were to exceed the set-aside, low attainments in the groundfish fishery would reduce the risk of the ACL being exceeded. This modification to the IOA set-aside changed the final off-the-top sum and, subsequently, the fishery HG for darkblotched rockfish (Table 4-6).

Table 4-6. Preferred darkblotched rockfish off-the-top deductions and resulting fishery HG for 2021-2022.

Year	ACL	Tribal	EFP	Res	IOA	Sum	Fishery HG
2021	831.0	0.2	0.6	8.5	9.8	19.1	811.9
2022	882.0	0.2	0.6	8.5	9.8	19.1	862.9

Sablefish north of 36° N. lat.

As noted in Section 4.1, the Council adopted Method 2 apportionment for allocating ACLs north and south of 36° N. lat. (i.e. recent five year average), for sablefish and a Preferred Alternative of Alternative 1 (P* 0.45). Table 4-7 below describes the off-the-top deductions and resulting commercial HG for 2021-22.

Table 4-7. Sablefish north of 36° N. lat. off-the-top deductions under the Preferred Alternative for 2021-2022.

Year	ACL	Tribal Share	Research	Rec.	EFP	Commercial HG
2021	6,892.0	689.2	30.7	6.0	1.1	6,165.0
2022	6,566.0	656.6	30.7	6.0	1.1	5,871.6

Shortbelly rockfish

Shortbelly rockfish was designated as an ecosystem component species by the Council at the June 2020 meeting (i.e. Alternative 2). As such, this species does not have harvest specifications and active

[14] Errors identified between the April and June Council meetings on EFP set-asides adopted by the Council in April were noted Appendix 1, Tables A-1 and A-2 in Agenda Item F.1.a, Supplemental GMT Report 1, June 2020. This document incorporates the corrected values.

management measures associated and, therefore, is no longer in the following ACL deductions and allocation tables.

Given the concern for this species' role as a forage base in the California Current Ecosystem, the Council adopted a precautionary policy measure under which the Council would closely monitor the species as part of the routine inseason agenda item. Under this policy guidance, should catch exceed 2,000 mt in a calendar year, the Council will investigate the cause(s) of such amounts and reconsider its ECS designation. The Council would also have the opportunity to recommend management measures to curtail catch of this species including, but not limited to, area closures, gear prohibitions, etc.

Salmon Troll North of 40°10' N. lat.

The Council recommended an increase to the salmon troll trip limits for incidentally caught yellowtail rockfish north of 40°10′ N. lat. from a ratio of 1 lb of yellowtail rockfish for every 2 lbs of salmon landed, with a cumulative limit of 200 lbs per month[15] to a monthly limit of 500 lbs. of yellowtail rockfish with no ratio (i.e. yellowtail rockfish may be landed as long as salmon is present), both within and outside the RCA. As described in Agenda Item G.6.a, Supplemental GMT Report 1, April 2020, the increased trip limit may increase attainment of yellowtail rockfish north of 40°10′ N. lat.; however, the increased trip limit is not expected to create behavioral changes or increase catch by salmon trollers that results in catch levels above the current IOA set-aside of 7 mt (Agenda Item G.6, Attachment 3, April 2020). The IOA set aside is based on the historical maximum mortality in 2005, and catches have been less than 4.6 mt since that time with an average of 2.7 mt.

Salmon Troll South of 40°10' N. lat.

The Council recommended establishing trip limits for incidentally caught yellowtail rockfish south of 40°10′ N. lat. in the salmon troll fishery as described under No Action. The Preferred Alternative is 1 lb. of yellowtail rockfish per 2 lb. of Chinook salmon landed, with a cumulative monthly limit of 200 lbs. of yellowtail rockfish, both within and outside the RCA. This limit would be within the Council preferred open access shelf rockfish complex south of 40° 10′ N. lat. trip limit (Table 4-26 and Table 4-27). As described under No Action, yellowtail rockfish south of 40° 10′ N. lat. are within the Shelf Rockfish Complex south, however, the Council did not recommend changes to the IOA set-aside for this complex. Similar to the above recommendation for yellowtail rockfish north of 40° 10′ N. lat,, the mortality associated with the trip limit is expected to be within the status quo set aside of 67.7 mt, which is based on the historic high of the IOA fisheries.

[15] This limit was within a 200 lb per month combined limit for widow rockfish, shelf rockfish north of 40° 10' N. lat., and yellowtail rockfish, not in addition. Note that as part of the 2017-2018 biennial cycle, yellowtail rockfish was removed from the open access multi-stock trip limit, and a new separate trip limit was set at 500 lbs. per month; however, the salmon troll yellowtail rockfish trip limit did not reflect this change.

Table 4-8. Preferred off-the-top deductions and resulting fishery HGs for 2021. All values in metric tons

Stock/Complex	Area	ACL	Tribal	EFP	Research	IOA	Set-aside Total	Fishery HG
Arrowtooth flounder	Coastwide	9,933	2,041	0.1	12.98	41.00	**2,095.08**	7,837.9
Big skate	Coastwide	1,477	15	0.1	5.49	36.72	**57.31**	1,419.7
Black rockfish	Washington	293	18	0.0	0.10	0.00	**18.10**	274.9
Black rockfish	California	348	-	1.0	0.08	1.18	**2.26**	345.7
Bocaccio	S of 40°10' N. lat.	1,748	-	40.0	5.60	2.22	**47.82**	1,700.2
Cabezon (CA)	S of 42° N. lat.	211	-	1.0	0.02	0.26	**1.28**	209.2
California scorpionfish	S of 34°27' N. lat.	291	-	0.0	0.18	3.71	**3.89**	287.1
Canary rockfish	Coastwide	1,338	50	8.0	10.08	1.31	**69.39**	1,268.6
Chilipepper	S of 40°10' N. lat.	2,358	-	70.0	14.04	13.66	**97.70**	2,260.3
Cowcod	S of 40°10' N. lat.	84	-	1.00	10.00	0.17	**11.17**	72.8
Darkblotched rockfish	Coastwide	882	0.2	0.6	8.46	9.80	**19.06**	862.9
Dover sole	Coastwide	50,000	1,497	0.1	50.84	49.27	**1,597.21**	48,402.8
English sole	Coastwide	9,175	200	0.1	8.01	42.52	**250.63**	8,924.4
Lingcod	N of 40°10' N. lat.	5,369	250	0.1	16.60	11.68	**278.38**	5,090.6
Lingcod	S of 40°10' N. lat.	1,102	-	1.5	3.19	8.31	**13.00**	1,089.0
Longnose skate	Coastwide	1,823	220	0.1	12.46	18.84	**251.40**	1,571.6
Longspine thornyhead	N of 34°27' N. lat.	2,634	30	0.0	17.49	6.22	**53.71**	2,580.3
Longspine thornyhead	S of 34°27' N. lat.	832	-	0.0	1.41	0.83	**2.24**	829.6
Pacific cod	Coastwide	1,600	500	0.1	5.47	0.53	**506.10**	1,093.9
Pacific ocean perch	N of 40°10' N. lat.	3,854	9.2	0.1	5.39	10.04	**24.73**	3,829.3
Pacific whiting	Coastwide	*TBD*	*TBD*	1.1	*TBD*	1,500.00	**1,501.10**	TBD
Petrale sole	Coastwide	4,115	350	0.1	24.14	13.30	**387.54**	3,727.5
Sablefish	N of 36° N. lat.	6,892	**See Table 4-7**					
Sablefish	S of 36° N. lat.	1,890	-	0.0	2.40	25.00	**27.40**	1,862.6
Shortspine thornyhead	N of 34°27' N. lat.	1,428	50	0.1	10.48	17.82	**78.40**	1,349.6
Shortspine thornyhead	S of 34°27' N. lat.	756	-	0.0	0.71	6.00	**6.71**	749.3
Spiny dogfish	Coastwide	1,621	275	1.1	34.27	33.63	**344.00**	1,277.0
Splitnose rockfish	S of 40°10' N. lat.	1,666	-	1.5	11.17	5.75	**18.42**	1,647.6
Starry flounder	Coastwide	392	2	0.1	0.57	45.71	**48.38**	343.6

Stock/Complex	Area	ACL	Tribal	EFP	Research	IOA	Set-aside Total	Fishery HG
Widow rockfish	Coastwide	14,725	200	28.0	17.27	3.05	**248.32**	14,476.7
YELLOWEYE ROCKFISH	Coastwide	50	5	0.24	2.92	0.69	**8.85**	41.2
Yellowtail rockfish	N of 40º10' N. lat.	6,050	1,000	10.0	20.55	7.00	**1,037.55**	5,012.5
Stock Complexes								
Nearshore rockfish North	N of 40º10' N. lat.	77	1.5	0.5	0.47	0.61	**3.08**	73.9
Nearshore rockfish South	S of 40º10' N. lat.	1,016	-	0.0	2.68	1.74	**4.42**	1,011.6
Shelf rockfish North	N of 40º10' N. lat.	1,511	30	1.5	15.32	25.62	**72.44**	1,438.6
Shelf rockfish South	S of 40º10' N. lat.	1,438	-	50.0	15.10	67.67	**132.77**	1,305.2
Slope rockfish North	N of 40º10' N. lat.	1,595	36	0.5	10.51	18.88	**65.89**	1,529.1
Slope rockfish South	S of 40º10' N. lat.	709	-	1.0	18.21	19.73	**38.94**	670.1
Other fish	Coastwide	223	-	0.1	6.29	14.95	**21.34**	201.7
Other flatfish	Coastwide	4,802	60	0.1	23.63	137.16	**220.89**	4,581.1
Oregon black/blue/deacon rockfish	Oregon	603	-	0.5	0.08	1.74	**2.32**	600.7
Oregon cabezon/kelp greenling	Oregon	198	-	0.1	0.05	0.06	**0.21**	197.8
Washington cabezon/kelp greenling	Washington	20	2	0.0	-	-	**2.00**	18.0

Table 4-9. Preferred off-the-top deductions and resulting fishery HGs for 2022. All values in metric tons

Stock/Complex	Area	ACL	Tribal	EFP	Research	IOA	Set-aside Total	Fishery HG
Arrowtooth flounder	Coastwide	8,458	2,041	0.1	12.98	41.00	**2,095.08**	6,362.9
Big skate	Coastwide	1,389	15	0.1	5.49	36.72	**57.31**	1,331.7
Black rockfish	Washington	291	18	0.0	0.10	0.00	**18.10**	272.9
Black rockfish	California	341	-	1.0	0.08	1.18	**2.26**	338.7
Bocaccio	S of 40º10' N. lat.	1,724	-	40.0	5.60	2.22	**47.82**	1,676.2
Cabezon (CA)	S of 42º N. lat.	195	-	1.0	0.02	0.26	**1.28**	193.7
California scorpionfish	S of 34°27' N. lat.	275	-	0.0	0.18	3.71	**3.89**	271.1
Canary rockfish	Coastwide	1,307	50	8.0	10.08	1.31	**69.39**	1,237.6
Chilipepper	S of 40º10' N. lat.	2,259	-	70.0	14.04	13.66	**97.70**	2,161.3
Cowcod	S of 40º10' N. lat.	82	-	1.0	10.00	0.17	**11.17**	70.8
Darkblotched rockfish	Coastwide	831	0.2	0.6	8.46	9.80	**19.06**	811.9

Stock/Complex	Area	ACL	Tribal	EFP	Research	IOA	Set-aside Total	Fishery HG
Dover sole	Coastwide	50,000	1,497.0	0.1	50.84	49.27	**1,597.21**	48,402.8
English sole	Coastwide	9,108	200.0	0.1	8.01	42.52	**250.63**	8,857.4
Lingcod	N of 40º10' N. lat.	4,958	250.0	0.1	16.60	11.68	**278.38**	4,679.6
Lingcod	S of 40º10' N. lat.	1,172	-	1.5	3.19	8.31	**13.00**	1,159.0
Longnose skate	Coastwide	1,761	220.0	0.1	12.46	18.84	**251.40**	1,509.6
Longspine thornyhead	N of 34º27' N. lat.	2,452	30.0	0.0	17.49	6.22	**53.71**	2,398.7
Longspine thornyhead	S of 34º27' N. lat.	774	-	0.0	1.41	0.83	**2.24**	772.2
Pacific cod	Coastwide	1,600	500.0	0.1	5.47	0.53	**506.10**	1,093.9
Pacific ocean perch	N of 40º10' N. lat.	3,711	9.2	0.1	5.39	10.04	**24.73**	3,686.3
Pacific whiting	Coastwide	*TBD*	*TBD*	1.1	*TBD*	1,500.00	**1,501.10**	*TBD*
Petrale sole	Coastwide	3,660	350	0.1	24.14	13.30	**387.54**	3,272.5
Sablefish	N of 36º N. lat.	6,566	**See Table 4-7**					
Sablefish	S of 36º N. lat.	1,801	-	0.0	2.40	25.00	**27.40**	1,773.6
Shortspine thornyhead	N of 34º27' N. lat.	1,393	50	0.1	10.48	17.82	**78.40**	1,314.6
Shortspine thornyhead	S of 34º27' N. lat.	737	-	0.0	0.71	6.00	**6.71**	730.3
Spiny dogfish	Coastwide	1,585	275	1.1	34.27	33.63	**344.00**	1,241.0
Splitnose rockfish	S of 40º10' N. lat.	1,630	-	1.5	11.17	5.75	**18.42**	1,611.6
Starry flounder	Coastwide	392	2	0.1	0.57	45.71	**48.38**	343.6
Widow rockfish	Coastwide	13,788	200	28.0	17.27	3.05	**248.32**	13,539.7
YELLOWEYE ROCKFISH	Coastwide	51	5	0.24	2.92	0.69	**8.85**	42.2
Yellowtail rockfish	N of 40º10' N. lat.	5,831	1,000	10.0	20.55	7.00	**1,037.55**	4,793.5
Stock Complexes								
Nearshore rockfish north	N of 40º10' N. lat.	76	1.5	0.5	0.47	0.61	**3.08**	72.9
Nearshore rockfish south	S of 40º10' N. lat.	1,010	-	0.0	2.68	1.74	**4.42**	1,005.6
Shelf rockfish north	N of 40º10' N. lat.	1,450	30	1.5	15.32	25.62	**72.44**	1,377.6
Shelf rockfish south	S of 40º10' N. lat.	1,428	-	50.0	15.10	67.67	**132.77**	1,295.2
Slope rockfish north	N of 40º10' N. lat.	1,568	36	0.5	10.51	18.88	**65.89**	1,502.1
Slope rockfish south	S of 40º10' N. lat.	705	-	1.0	18.21	19.73	**38.94**	666.1
Other fish	Coastwide	233	-	0.1	6.29	14.95	**21.34**	211.7
Other flatfish	Coastwide	4,838	60	0.1	23.63	137.16	**220.89**	4,617.1

Stock/Complex	Area	ACL	Tribal	EFP	Research	IOA	Set-aside Total	Fishery HG
Oregon black/blue/deacon rockfish	Oregon	600	-	0.5	0.08	1.74	**2.32**	597.7
Oregon cabezon/kelp greenling	Oregon	190	-	0.1	0.05	0.06	**0.21**	189.8
Washington cabezon/kelp greenling	Washington	17	2	0.0			**2.00**	15.0

4.2.1.2 Allocating the Fishery HG

Under the Preferred Alternative, the Council adopted the allocation percentages as described under No Action except for changes recommended to the biennial canary rockfish allocations and the A-21 allocations of petrale sole, widow rockfish, lingcod south of 40°10′ N. lat., and slope rockfish complex south of 40° 10' N. lat. (see Section 4.2.2.3). The updated allocations for these species are shown in Table 4-13 and Table 4-14 below.

Allocation Alternatives

Canary rockfish

The Council adopted the No Action Option 4, as their Preferred Alternative. The biennial allocation for canary rockfish is the same as under No Action,; however, Option 4 merges the non-nearshore and nearshore split amounts into a single allocation. This merger will allow for increased operational flexibility but otherwise does not change impacts..

Petrale Sole

The Council adopted a two-year allocation structure for petrale sole whereby 30 mt would be allocated to the non-trawl sector with the remainder to trawl for 2021-2022 (i.e. Option 2) as their Preferred Alternative. This is a change from previous biennium in which it was managed under A-21 allocation structure of 95 percent trawl, 5 percent non-trawl split. This change will reduce the non-trawl sector's allocation by shifting 156.4 mt and 133.6 mt compared to the previous allocation scheme for 2021 and 2022, respectively, to the trawl sector. The non-trawl allocation of 30 mt is nearly double the historical maximum mortality (since 2002), and predicted mortality for 2021 and 2022, of 14 mt and therefore the modification is not expected to constrain the non-trawl sector.

Widow Rockfish

The Council adopted a two-year allocation structure for widow rockfish, allocating 400 mt to the non-trawl sector with the remainder to trawl as their Preferred Alternative as described under No Action. This allocation structure would yield a trawl allocation of 14,076.7 mt in 2021 and 13,139.7 mt for 2022. Historically, this species was managed under A-21 allocation structure whereby 91 percent was allocated to trawl and 9 percent was allocated to non-trawl. This modification would increase opportunities through higher trip limits for non-trawl fisheries (2021-22 projected mortality = 87 mt), and would still provide an additional 861 mt per year on average to the individual fishing quota (IFQ) fisheries compared to the status quo Amendment 21 allocations (Agenda Item F.1.a, Supplemental GMT Report 2, June 2020) The 400 mt is approximately five times higher than the projected average annual mortality for 2021-2022 of 80 mt, and therefore is not expected to constrain the non-trawl fisheries. The 400 mt allocation was formally recommended by the Council at their April 2020 meeting. Furthermore, as described in G.6.a, Supplemental GMT Report 1, April 2020, it is more than 200 mt higher than the historical maximums from the 1980s and 1990s before there were restrictive RCAs and other measures (e.g. bag limits). The IFQ sector is achieving over 95 percent attainment in 2018-2019 with the implementation of the trawl gear EFP and associated trawl gear regulations..

Lingcod South of 40°10′ N. lat.

The Council adopted a two-year allocation structure for lingcod south of 40°10′ N. lat. (hereinafter "lingcod south") of 40 percent trawl and 60 percent non-trawl as their Preferred Alternative. This change concomitantly increases and decreases the allocation percentage by 5 percent to the sectors when compared to No Action. Trawl sector attainments in the south have averaged 11 percent per year since 2017, with a maximum of 18 percent in 2018; whereas, the non-trawl sector has averaged 63 percent in the same period,

with a maximum of 74 percent (Table 4-60). This preferred allocation scheme is not expected to constrain trawl fisheries on the fleet or individual level, while still allowing for rebuilding of the IFQ fisheries off California (see Agenda Item G.6.a, Supplemental GMT Report 1, April 2020). While only a five percent change, this will likely result in significant benefit to the non-trawl sectors, as it will reduce the need for inseason trip and bag limit reductions, which has been necessary to stay within the non-trawl allocations in recent years.

Slope rockfish south of 40° 10′ N. lat.

The Council recommended an allocation structure of Option 2, which was based on customized shares of blackgill rockfish and the other southern slope rockfish species based on the percentages considered in Amendment 28 as their Preferred Alternative. Table 4-10 below shows the resulting trawl and non-trawl allocations for the southern slope complex based on the shares for blackgill rockfish and other slope species. As described in Section 4.2.2.3, these shares are expected to cover mortality in both trawl and non-trawl sectors while not constraining individuals. Furthermore, if the trawl sector mortality of blackgill rockfish is projected to exceed its share, then a trip limit could be implemented to reduce mortality (Section 4.2.2.4).

Table 4-10. Preferred allocations for the southern slope rockfish complex and the shares for blackgill rockfish south of 40° 10' N. lat. and other slope rockfish south of 40° 10' N. lat. for 2021-2022. (metric ton = mt)

Category	2021		2022	
	Trawl	Non-trawl	Trawl	Non-trawl
Blackgill rockfish shares (41% trawl; 59% NT) in mt	72.4	104.2	71.4	102.7
Other slope shares (91% trawl; 9% NT) in mt	484.5	47.9	483.2	47.8
Total share in mt	556.9	152.1	554.5	150.5
% of total share	78.5%	21.5%	78.6%	21.4%
Total off-top deductions for southern slope complex in mt	38.9		38.9	
Apportioned off-the-top deductions based on % of total share in mt	30.5	8.4	30.6	8.3
Southern slope complex Allocation mt	526.4	143.7	523.9	142.2

Cowcod

The Council selected a cowcod ACT of 50 mt as the Preferred Alternative to manage this stock in a conservative, yet flexible manner. The 50 mt ACT is within the 40 to 60 mt analyzed under the Alternatives (Agenda Item G.6.a, Supplemental GMT Report 1, April 2020). Direct groundfish mortality is expected to remain under 10 mt in 2021-2022 (Agenda Item F.1.a, Supplemental GMT Report 2, June 2020). As this species has long been categorized as overfished or in the process of rebuilding, the Council indicated their preferred approach was to be cautious in managing this stock, especially when taking into account the relative uncertainty of results from the 2019 stock assessment. The ACT of 50 mt is not expected to constrain fisheries as cowcod landings are to remain prohibited for all non-trawl sectors. Noting the recreational fishery is the primary source of mortality for cowcod (Table 4-11) and that California Recreational Fishery Survey (CRFS) is designed to report catch estimates in a timely manner, the Council will receive updates relating to catch during the routine inseason agenda item and can act appropriately should the ACT be projected to be attained. It is important to note, that while the RCA proposals considered by the Council in this biennium may increase fishing effort in cowcod habitat, and subsequently increase cowcod bycatch mortality, these impacts are projected to remain well below the ACT. Considering the combination of reporting and the amount between the ACT and ACL, the risk of exceeding the Preferred Alternative ACL is very low.

Additionally, the Council recommended to establish formal 50/50 formal non-trawl allocation split between commercial non-trawl and recreational for cowcod as their Preferred Alternative. The allocation (64%) to non-trawl is 32 mt (Table 4-12). The 50/50 split would yield 16 mt to commercial non-trawl and 16 mt to recreational. As described in Agenda Item G.6.a, Supplemental GMT Report 1, April 2020, since there is little information to determine how catch may or may not increase due to other management measures (e.g., 50 mt ACT, increase in RCA seaward depth boundaries, etc.), this sub-allocation allows each sector to operate without impacting the other.

Table 4-11. Estimated mortality by sector from 2010 through 2019 for cowcod south of 40°10 N lat.

Year	Off-the-top (mt)*	Commercial Trawl (mt)	Commercial Non-trawl (mt)*	Recreational (mt)	Annual Total (mt)
2010	0.0	0.3	-	0.4	0.7
2011	0.1	0.0	-	1.3	1.5
2012	0.2	0.1	-	0.7	1.0
2013	0.2	0.2	-	1.4	1.8
2014	0.2	0.2	0.0	0.7	1.1
2015	0.5	0.4	-	0.5	1.4
2016	0.3	0.3	-	0.7	1.3
2017	0.5	0.4	-	0.8	1.7
2018	0.8	0.4	1.0	1.0	3.2
2019*	0.8	0.8	1.0	2.4	5.2

Data source: WCGOP GEMM data product, unless noted otherwise.

*2019 WCGOP Mortality estimates for research and commercial non-trawl are expected to be provided in September 2020. 2018 estimates were used as a proxy for 2019.

Table 4-12. Cowcod allocated for the 50:50 sub allocation split between commercial non-trawl and recreational. Values in metric tons (mt)

	2021 (mt)	2022 (mt)
ACL	84	82
ACT	50	50
Trawl	18	18
Non Trawl	32	32
Commercial	16	16
Recreational	16	16

Table 4-13. Preferred trawl and non-trawl allocations under the Preferred Alternative for 2021. Trawl values in percent (%) and metric tons (mt). Cells without values are designated with a dash (-).

Stock	Area	Fishery HG (mt)	Allocation Type	Trawl		Non-Trawl	
				%	mt	%	mt
Arrowtooth Flounder	Coastwide	7837.9	A-21	95	7446	5	391.9
Big Skate	Coastwide	1419.7	Biennial	95	1,348.7	5	71
Black Rockfish	WA	274.9	-	-	-	-	-
Black Rockfish	CA	345.7	-	-	-	-	-
Blue/Deacon/Black Rockfish	OR	600.7	-	-	-	-	-
Bocaccio	S of 40° 10’ N. lat.	1700.2	Biennial	39.04	663.8	60.96	1,036.4
Cabezon	CA	208.7	-	-	-	-	-
Cabezon/Kelp Greenling	WA	18	-	-	-	-	-
Cabezon/Kelp Greenling	OR	197.8	-	-	-	-	-
California Scorpionfish	Coastwide	287.1	-	-	-	-	-
Canary Rockfish	Coastwide	1268.6	Biennial	72.281	917	27.719	351.6
Chilipepper	S of 40° 10’ N. lat.	2260.3	A-21	75	1,695.2	25	565.1
Cowcod	S of 40° 10’ N. lat.	50	Biennial	36	18	64	32
Darkblotched Rockfish	Coastwide	862.9	A-21	95	819.8	5	43.1
Dover Sole	Coastwide	48402.8	A-21	95	4,5982.7	5	2,420.1
English Sole	Coastwide	8924.1	A-21	95	8,477.9	5	446.2
Lingcod	N of 40° 10’ N. lat.	5090.6	A-21	45	2,290.8	55	2,799.8
Lingcod	S of 40° 10’ N. lat.	1089	Biennial	40	435.6	60	653.4
Longnose Skate	Coastwide	1571.6	Biennial	90	1,414.4	10	157.2
Longspine Thornyhead	N of 3427	2580.3	A-21	95	2,451.3	5	129
Longspine Thornyhead	S of 3427	829.8	-	-	-	-	-
Nearshore Rockfish	N of 4010	73.9	-	-	-	-	-
Nearshore Rockfish	S of 40° 10’ N. lat.	1011.6	-	-	-	-	-
Other Fish	Coastwide	201.7	-	-	-	-	-
Other Flatfish	Coastwide	4581.1	A-21	90	4123	10	458.1
Pacific Cod	Coastwide	1093.9	A-21	95	1,039.2	5	54.7
Pacific Ocean Perch	N of 40° 10’ N. lat.	3829.3	A-21	95	3,637.8	5	191.5
Petrale Sole	Coastwide	3727.9	Biennial	-	3,697.9	-	30
Sablefish	S of 36° N. lat.	1862.6	A-21	42	782.3	58	1,080.3
Shelf Rockfish	N of 40° 10’ N. lat.	1435.6	Biennial	60.2	864.2	39.8	571.4
Shelf Rockfish	S of 40° 10’ N. lat.	1305.2	Biennial	12.2	159.2	87.8	1146
Shortspine Thornyhead	N of 34° 27’ N. lat.	1349.6	A-21	95	1,282.1	5	67.5

Stock	Area	Fishery HG (mt)	Allocation Type	Trawl		Non-Trawl	
				%	mt	%	mt
Shortspine Thornyhead	S of 34° 27’ N. lat.	749.3	A-21	0.067	50	99.933	699.3
Slope Rockfish	N of 40° 10’ N. lat.	1528.1	A-21	81	1,237.8	19	290.3
Slope Rockfish	S of 40° 10’ N. lat.	670.1	Biennial	63	526.4	37	143.7
Spiny Dogfish	Coastwide	1277	-	-	-	-	-
Splitnose	S of 40° 10’ N. lat.	1647.6	A-21	95	1,565.2	5	82.4
Starry Flounder	Coastwide	343.6	A-21	50	171.8	50	171.8
Widow Rockfish	Coastwide	14476.7	Biennial	-	14,076.7	-	400
Yelloweye Rockfish	Coastwide	41.2	Biennial	8	3.3	92	37.9
Yellowtail Rockfish	N of 40° 10’ N. lat.	5002.5	A-21	88	4402.2	12	600.3

Table 4-14. Preferred trawl and non-trawl allocations under the Preferred Alternative for 2022. Trawl values in percent (%) and metric tons (mt). Cells without values are designated with a dash (-).

Stock	Area	Fishery HG	Allocation Type	Trawl		Non-Trawl	
				%	mt	%	Mt
Arrowtooth Flounder	Coastwide	6362.9	A-21	95	6,044.8	5	318.1
Big Skate	Coastwide	1331.7	Biennial	95	1265.1	5	66.6
Black Rockfish	WA	272.9	-	-	-	-	-
Black Rockfish	CA	338.7	-	-	-	-	-
Blue/Deacon/Black Rockfish	OR	597.7	-	-	-	-	-
Bocaccio	S of 40° 10’ N. lat.	1676.2	Biennial	39.04	654.4	60.96	,1021.8
Cabezon	CA	193.7	-	-	-	-	-
Cabezon/Kelp Greenling	WA	15	-	-	-	-	-
Cabezon/Kelp Greenling	OR	189.8	-	-	-	-	-
California Scorpionfish	Coastwide	271.1	-	-	-	-	-
Canary Rockfish	Coastwide	1237.6	Biennial	72.281	894.6	27.719	343.1
Chilipepper	S of 40° 10’ N. lat.	2161.3	A-21	75	1,621	25	540.3
Cowcod	S of 40° 10’ N. lat.	50	Biennial	36	18	64	32
Darkblotched Rockfish	Coastwide	811.9	A-21	95	771.3	5	40.6
Dover Sole	Coastwide	48402.8	A-21	95	4,5982.7	5	2,420.1
English Sole	Coastwide	8850.8	A-21	95	8408.3	5	442.5
Lingcod	N of 40° 10’ N. lat.	4679.6	A-21	45	2,105.8	55	2,573.8
Lingcod	S of 40° 10’ N. lat.	1159	Biennial	40	463.6	60	695.4
Longnose Skate	Coastwide	1509.6	Biennial	90	1,358.6	10	151

Stock	Area	Fishery HG	Allocation Type	Trawl		Non-Trawl	
				%	mt	%	Mt
Longspine Thornyhead	N of 34° 27’ N. lat.	2398.3	A-21	95	2278.4	5	119.9
Longspine Thornyhead	S of 34° 27’ N. lat.	771.8	-	-	-	-	-
Nearshore Rockfish	N of 40° 10’ N. lat.	72.9	-	-	-	-	-
Nearshore Rockfish	S of 40° 10’ N. lat.	1005.6	-	-	-	-	-
Other Fish	Coastwide	201.7	-	-	-	-	-
Other Flatfish	Coastwide	4617.1	A-21	90	4,155.4	10	461.7
Pacific Cod	Coastwide	1093.9	A-21	95	1,039.2	5	54.7
Pacific Ocean Perch	N of 40° 10’ N. lat.	3686.3	A-21	95	3502	5	184.3
Petrale Sole	Coastwide	3272.5	Biennial		3,242.5		30
Sablefish	S of 36° N. lat.	1773.6	A-21	42	744.9	58	1,028.7
Shelf Rockfish	N of 40° 10’ N. lat.	1374.6	Biennial	60.2	827.5	39.8	547.1
Shelf Rockfish	S of 40° 10’ N. lat.	1295.2	Biennial	12.2	158	87.8	1,137.2
Shortspine Thornyhead	N of 34° 27’ N. lat.	1314.6	A-21	95	1,248.9	5	65.7
Shortspine Thornyhead	S of 34° 27’ N. lat.	730.3	A-21	0.067	50	99.933	680.3
Slope Rockfish	N of 40° 10’ N. lat.	1501.1	A-21	81	1,215.9	19	285.2
Slope Rockfish	S of 40° 10’ N. lat.	666.1	Biennial	63	515.6	37	142.1
Spiny Dogfish	Coastwide	1241	-	-	-	-	-
Splitnose	S of 40° 10’ N. lat.	1611.6	A-21	95	1531	5	80.6
Starry Flounder	Coastwide	343.6	A-21	50	171.8	50	171.8
Widow Rockfish	Coastwide	13539.7	Biennial		13,139.7		400
Yelloweye Rockfish	Coastwide	42.2	Biennial	8	3.4	92	38.8
Yellowtail Rockfish	N of 40° 10’ N. lat.	4783.5	A-21	88	4,209.4	12	574

Furthermore, sablefish north of 36° N. lat. is allocated under the Amendment 6 framework, which allocates the commercial HG between the limited entry (trawl and fixed gear) and open access sectors. The preferred allocations for sablefish north are found in Table 4-15.

Table 4-15. Sablefish north of 36° N. lat. commercial harvest guidelines (HG) under the Preferred Alternative and allocations to limited entry and open access in metric tons (mt). Limited entry is further allocated to trawl and fixed gear (FG) sectors.

Year	Commercial HG	Limited Entry HG		Limited Entry Trawl		Limited Entry FG		Open Access HG	
		%	mt	%	mt	%	mt	%	mt
2021	6,165	90.6	5,586	58	3,240	42	2,346	9.4	580
2022	5,872	90.6	5,320	58	3,085	42	2,234	9.4	552

Rebuilding Species Allocation

As of the 2021-2022 biennium, yelloweye rockfish will be the only remaining rebuilding species. The Council adopted the No Action allocation structure, including managing the non-trawl sector with both HGs and ACTs at the sector level, as their Preferred Alternative. However, the Council also adopted an option to modify the yelloweye rockfish allocation structure as detailed by the GMT in Agenda Item G.6.a, Supplemental GMT Report 1, April 2020. This option creates a single HG and single ACT for yelloweye rockfish for all commercial non-trawl fisheries by combining the coastwide non-nearshore and nearshore HG and ACTs. This option reduces overall non-trawl sector constraints and should provide additional opportunity for these sectors. Table 4-16 details the allocation structure under the Preferred Alternative.

Table 4-16. Yelloweye rockfish allocations, HGs, and ACTs for 2021-22 under the Preferred Alternative. Values in metric tons

Year	2021		2022	
ACL	50		51	
Fishery HG	41.2		42.2	
Trawl (8%)	3.3		3.4	
At-Sea	0		0	
IFQ	3.3		3.4	
Non-trawl (92%)	**HG**	**ACT**	**HG**	**ACT**
	37.9	29.5	38.8	30.4
Non-nearshore / Nearshore	7.9	6.2	8.1	6.3
WA Rec (25.6%)	9.7	7.5	9.9	7.8
OR Rec (23.3%)	8.8	6.9	9.0	7.1
CA Rec (30.2%)	11.4	8.9	11.7	9.2

Shortbelly Rockfish

The Council designated shortbelly rockfish as an EC species as their Preferred Alternative (Alternative 2). After considering all the information provided by the GMT and GAP (F.1.a, Supplemental GMT Report 3, June 2020, and F.1.a, Supplemental GAP Report 1, June 2020), and written and oral public testimony, the Council determined management of this species met the criteria for an EC species designation. Additionally, the Council heard from industry, who stated they actively attempt to avoid this species as

catch decreases efficiency of operations, has little to no economic value and, as note in public testimony, may reduce catch of target species significantly. As an ECS, it is unlikely there would be negative fishing impacts on this species is not targeted and no market exists for them. They are caught incidental to midwater trawl fishing and are actively avoided as they impact fishing activities negatively.

As described in the aforementioned GMT Report 3 and in the 2019 EA/RIR/IRFA for Cowcod and Shortbelly Rockfish, there has been a dramatic increase in shortbelly population and distributional shift northward. The Council noted the challenge of managing this species to an ACLs due to the wide variability of this stock's abundance and distribution and that at this point, ACL management may not be effective for shortbelly. Shortbelly rockfish are a healthy species and estimated to have the highest productivity of any West Coast rockfish (Field, et al. 2007a,b) and recruitment trends continue to be high. It has been well documented that shortbelly rockfish are forage for fish, seabirds, and marine mammals; thus, are an important ecosystem component. Noting the importance for this species' ecosystem role and that it is an important forage base in the California Current Ecosystem, the Council adopted a precautionary policy measure under which the Council would closely monitor the species as part of the routine inseason agenda item. Under this policy guidance, should catch exceed 2,000 mt in a calendar year, the Council will investigate the cause(s) of such amounts and reconsider its ECS designation. The Council would also have the opportunity to recommend management measures to curtail catch of this species including, but not limited to, area closures, gear prohibitions, etc. The Council also noted there is precedent to reclassify an ECS as a managed species, as this measure was taken for big skate.

4.2.1.3 Harvest Guidelines

Under the Preferred Alternative, the HGs and state quotas for blackgill rockfish south of 40° 10' N. lat. and nearshore rockfish north of 40° 10' N. lat. are the same as described under No Action (Section 4.2.2.3) and shown in Table 4-13 and Table 4-14 Table 4-64. The Council did make changes to within non-trawl HGs, as described below, to canary rockfish and bocaccio south of 40°10 N. lat.

Canary Rockfish

The Council recommended the adoption of Option 4 (Agenda Item G.6.a, Supplemental GMT Report 1, April 2020) as their Preferred Alternative. This Option maintains the status quo trawl and non-trawl allocations (shown in Table 4-13 and Table 4-14 above) but would reduce the at-sea set aside from 46 mt to 36 mt (discussed further in Section 4.2.1.5 below) and would merge the nearshore and non-nearshore HGs similar to yelloweye rockfish shown above. The resulting preferred non-trawl HGs for 2021-2022 are shown in Table 4-17.

Table 4-17. Canary rockfish preferred non-trawl HGs for 2021-2022.

Sector	2021	2022
Non-Trawl Allocation	351.6	343.1
Nearshore	126.6	123.5
Non-Nearshore		
WA Recreational	43.3	42.2
OR Recreational	65.1	63.5
CA Recreational	116.7	113.9

Bocaccio South of 40° 10' N. lat.

Similar to yelloweye and canary rockfish, the Council recommended the combination of the nearshore and non-nearshore HGs for bocaccio south of 40° 10' N. lat. as shown in Table 4-18 as their Preferred

Alternative. While there was historically a minor amount allocated to the nearshore (0.4 percent of the non-trawl allocation), given that bocaccio is primarily encountered in the non-nearshore fishery, this again is intended to provide flexibility for the fleets and managers.

Table 4-18. Bocaccio south of 40° 10' N. lat. non-trawl HGs for 2021-2022.

Sector	Preferred Alternative	
	2021	2022
Non-trawl	1036.4	1021.8
CA Recreational (69.1%)	716.2	706.1
Non-nearshore (30.5%)	320.3	315.7
Nearshore (0.4%)		

4.2.1.4 At-Sea Management Measures

The Council adopted the No Action (Section 4.2.2.5) management measures as their Preferred Alternative Under the Preferred Alternative, the at-sea set asides would be those described in Table 4-19-Table 4-21 below. The amounts below would be for the combined at-sea sectors (CP and MS).

Impact (Groundfish Mortality)

The first category of set aside stocks, shown in Table 4-19, consists of stocks with negligible mortality in the at-sea sectors. The Council's Preferred Alternative is to not have a set aside for these stocks in 2021 and 2022. While four of the five stocks have historically had a 5 mt set aside, the at-sea mortality contributions for these stocks are so minor that an at-sea set aside is not needed. As shown in Table 4-77, the at-sea sectors have contributed to less than 0.2 mt of mortality for these stocks annually from 2015 to 2019, with most years having zero associated mortality. Given these extremely low levels, significant mortality for any of these stocks in 2021-2022 is unlikely. Regarding yelloweye rockfish, there has historically never been an at-sea set aside (i.e. was 0 mt when there was a table in regulation), because, similar to the other four stocks, there has been negligible mortality in the at-sea sector since 2011.

If the at-sea sectors were to encounter any of these species for which there was a set-aside in 2019, there would likely be no negative impact on the IFQ sector given that the stocks proposed for set aside removal are all under attained (less than 20 percent from 2017-2019). With regard to yelloweye rockfish, even though ACL attainment has increased in recent years with rebuilding of the stock and liberalizations of management measures across sectors, there is little risk to the at-sea sectors, or the trawl allocation, in maintaining a zero set aside given that only four pounds has been caught in the last nine years, and ACL attainment was estimated at less than 60 percent in 2019 (Agenda Item H.9.a, Supplemental GMT Report 1, November 2019). As set-asides are not managed inseason and actions are only required if there is an unforeseen impact on another sector, risk to the ACL or trawl allocation, or a conservation concern (see 50 CFR 660.150(c) and 660.160(c)), there is also a negligible risk that the at-sea sector would be negatively impacted in not having a set aside for these five species.

Table 4-19. Stocks with no proposed set aside for 2021/22 under the Preferred Alternative - in metric tons (mt)

Stock/Species	Area
YELLOWEYE ROCKFISH	Coastwide
English sole	Coastwide
Longspine thornyhead	N. of 34° 27' N. lat.

Stock/Species	Area
Pacific cod	Coastwide
Starry flounder	Coastwide

The second category, shown in Table 4-20, are stocks where the risk of exceeding the ACL in the 2021-2022 biennium is low. These stocks are characterized by low to moderate ACL attainments. Under the Preferred Alternative,, the set aside for 2021-2022 would be set at the historical maximum mortality from 2015-2019 (generally rounded to the nearest five mt). By setting the set aside at the historical mortality, it increases the likelihood that bycatch from both sectors as a whole will be within the combined amount based on past performance. While recent mortalities for some stocks are well beneath moralities for stocks shown in Table 4-77, bycatch of these stocks does vary by year and sector, and therefore these set aside amounts would provide the at-sea sectors with more flexibility in their operations. Furthermore, there is little benefit to decreasing these set aside amounts from the status quo approach given that the IFQ sector attainment of these species is low.

Two stocks of note in this category are minor slope rockfish north of 40° 10′ N. lat. and yellowtail rockfish north of 40° 10′ N. lat. For the slope rockfish north complex, there has been a significant increase in the amount of bycatch of this stock complex, specifically rougheye rockfish, in recent years. IFQ attainments have averaged approximately 17 percent in the last three years and therefore by increasing the set aside, it is expected to cover the recent trends seen in the at-sea sectors while not impacting the IFQ sector. For yellowtail rockfish north of 40° 10′ N. lat., while IFQ attainments have been increasing with the re-emergence of the midwater rockfish fishery (averaging 75 percent in 2018-2019), the increase in the set aside by 20 mt is not expected to have an impact on the IFQ sector.

Table 4-20. Stocks with low risk of exceeding the ACL and for which the Preferred Alternative is Option A, the status quo method. Values in metric tons (mt). Status Quo = SQ

Stock/Species	Area	Approach	2021/22 Preferred (mt)
Arrowtooth flounder	Coastwide	Option A (SQ)	70
Dover sole	Coastwide	Option A (SQ)	10
Lingcod	N. of 40°10' N. lat.	Option A (SQ)	15
Longnose skate	Coastwide	Option A (SQ)	5
Minor shelf rockfish	N. of 40°10' N. lat.	Option A (SQ)	35
Minor slope rockfish b/	N. of 40°10' N. lat.	Option A (SQ)	300
Other flatfish	Coastwide	Option A (SQ)	35
Pacific halibut a/	Coastwide	Option A (SQ)	10
Shortspine thornyhead	N. of 34° 27' N. lat.	Option A (SQ)	70
Yellowtail rockfish	N. of 40°10' N. lat.	Option A (SQ)	320

a/ The set-aside for Pacific halibut is determined via a separate process and is not under consideration for being changed for the 2021-2022 biennium.

The final category, shown in Table 4-21, includes stocks that potentially risk exceeding the ACL and/or require a more customized approach to optimize benefits for the IFQ and at-sea sectors. Below, the rationale behind the FPA set asides is discussed.

Table 4-21. Stocks with potential risk of exceeding the ACL or for which a customized approach is proposed as the Preferred Alternative to optimize benefits to the IFQ and at-sea sectors. Note that significant digits differ to reflect that the Amendment-21 formula specifies the set-aside to the nearest tenth of a metric ton, unlike maximum values which are rounded to integer values. Values in metric tons (mt)

Stock/Species	Area	Approach	2021/22 Preferred (mt)
Canary rockfish	Coastwide	Custom	36
Darkblotched rockfish	Coastwide	Maximum mortality (2015-2019)	76.4
Pacific ocean perch	N. of 40°10' N. Lat.	Custom	300
Petrale sole	Coastwide	Option A (SQ)	5
Sablefish	N. of 36° N. Lat.	Option B	100
Widow rockfish	Coastwide	Maximum mortality (2015-2019)	476

Canary rockfish: The Council adopted Option 3 as the Preferred Alternative for a sector-combined set aside amount of 36 mt, and thereby allocate an additional 10 mt to the IFQ sector compared to No Action. While the at-sea sectors' catch rates have remained relatively stable in recent years (3.6 mt on average in the last five years; Table 4-77), there have been increased bycatch rates in the shoreside whiting fishery suggesting a possible shift in future ocean and fishing conditions. Specifically, following canary rockfish being declared rebuilt in 2016, the shoreside whiting sector has experienced higher rates of bycatch with instances of over 13 mt of bycatch being caught in a single tow (Agenda Item G.6.a, Supplemental GMT Report 1, April 2020). Therefore, providing 36 mt would provide a buffer for uncertainty and may allow the at-sea sector flexibility in implementing avoidance measures and minimize associated costs given other constraining species (e.g. salmon or sablefish north).

Darkblotched rockfish: The Council recommended a Preferred Alternative of 76.4 mt, which is the maximum mortality since 2015. Darkblotched rockfish is under attained in the IFQ fishery at approximately 40 percent, and while the uncertainty surrounding future catch given the reopening of the RCA is unknown, the change from status quo set asides is not expected to constrain the fleet or individuals. As noted in Agenda Item G.6.a, Supplemental GMT Report 1, April 2020, "catch of darkblotched rockfish in the MS, CP, and IFQ sectors has risen dramatically in the past three years (2017-2019), since the stock was declared rebuilt and quotas were increased. The 2017 update stock assessment for darkblotched rockfish estimated a very large 2013 year class entering the fishery (Wallace and Gertseva, 2017)." Therefore, the increased bycatch of darkblotched rockfish seen in recent years in the at-sea fishery may continue into the next biennium (or further). Darkblotched rockfish has historically been one of the most constraining species in the at-sea sectors, resulting in inseason actions to find additional quota in the past. The 76.4 mt Preferred Alternative will provide a greater probability of the fleet not exceeding the set aside while also giving the fleet, who operates with the set asides as a guideline, more flexibility in their operations.

Pacific ocean perch (POP): . The Council selected a 300 mt set aside based as their Preferred Alternative. Under the 300 mt set aside, the IFQ sector would receive an additional ~40 mt on average for the biennium. During the overfished era, POP had considerably lower ACLs and hard cap allocations that constrained both at-sea and IFQ sectors. To provide flexibility for the at-sea sectors, the Council shifted to management of POP (and darkblotched) through set asides under Amendment 21-3. The stock was then declared rebuilt in 2017, partially driven by an exceptionally large 2013 year class (Wetzel et al. 2017), leading to ACLs increasing by nearly sixteen-fold in 2019-2020. Under status quo, the set aside amounts would have been determined by the Amendment 21 formulas, which would have set aside 357.7 mt and 321.3 mt in 2021-

22 respectively. In assessing the proposed options described in Section 4.2.2.5, none of the options based on recent averages (see Table 4-77, Table 4-78, and Table 1 of Agenda Item G.6.a, Supplemental Attachment 4, April 2020) would have come close to covering the recent historical maximum of 141.7 mt that occurred in 2019. Furthermore, given the increase in catch of 2.5 times from 2018 to 2019, using the historical maximum may not have provided sufficient set aside to cover future mortality if bycatch patterns persist. While this is a small increase to a stock that is significantly underutilized in the IFQ fishery, the 300 mt amount was seen as an amount that would be sufficient to cover bycatch and not constrain the at-sea fisheries. Specifically, this stock could provide opportunities for the at-sea whiting sectors to fish in areas where POP are prevalent (e.g., off of northern Washington), thereby allowing the sectors to avoid areas where other more constraining species (e.g., salmon, sablefish) occur.

Petrale sole: The Council selected to maintain the 5 mt set aside as their Preferred Alternative for petrale sole. Petrale sole is a highly attained IFQ species (99 percent on average in the last three years), and while the at-sea sectors have caught less than six pounds historically from 2002-2019, there were concerns that by removing the set aside, that it could result in unforeseen action on the at-sea sectors if there were unexpected bycatch. Given that the trawl sector under the Preferred Alternative is to receive an additional 145 mt on average under the preferred allocation option (Section4.2.2.3), the decreasing or ultimate removal of the set aside for petrale sole appears to have little benefit.

Sablefish north of 36° N. lat.: The Council recommended a 100 mt set aside for 2021-2022 for sablefish north of 36° N. lat. This amount would cover the recent five-year average (76.1 mt), and would provide additional flexibility to the at-sea sectors in implementing bycatch avoidance measures given other constraints (i.e. salmon). As described under Section 4.2.2.5, the overage in 2017, by over 100 mt, was one of the causes that led to the exceedance of the ACL. Furthermore, under the Council's Preferred Alternative harvest specification of P* 0.45 and using the Method 2 apportionment methodology (78.4 percent to North; 21.6 percent to South), the trawl allocation for sablefish would increase from 2,857 mt on average under No Action to 3,163 mt on average under the Preferred Alternative. While sablefish north is a highly attained species in the IFQ sector (98 percent average attainment from 2017-2019), the increase in the trawl allocation under the FPA in addition to increasing the set aside in the at-sea sectors reduces the likelihood of the ACL being exceeded.

Widow Rockfish: The Council recommended a set aside of 476 mt as their Preferred Alternative. This amount is based on the recent historical maximum and will provide some buffer over the recent mortalities of ~210 mt seen in 2018-2019. While the Amendment-21 formulas were to be used as a starting point with the implementation of Amendment 21-4, it would have resulted in 764.1 mt and 714.6 mt being set aside in 2021 and 2022 respectively for the at-sea fisheries off the top of the trawl allocation. Widow rockfish has become one of the most highly attained species in the IFQ fishery with the re-emergence of the midwater rockfish fishery, with 2018-2019 attainments reaching an average of 95 percent. Similar to petrale and sablefish north of 36° N. lat., the intent behind this set aside would be to ensure that if unforeseen high bycatch were to occur in the at-sea fisheries, there would be enough set aside to prevent the implementation of mitigation measures or potential closures to prevent exceedance of the trawl allocation or the ACL.

4.2.1.5 Shorebased IFQ Management Measures

The Council adopted the principle management measures for the shorebased IFQ fishery as described under No Action (Section 4.2.2.6) as their Preferred Alternative. The only changes under the Preferred Alternative are to have unlimited trip limits for big skate and develop a trip limit mechanism for blackgill rockfish south of 40°10′ N. lat. (discussed below). Table 4-24 and Table 4-25 detail trip limits for north and south of 40°10' N. lat, respectively

Impacts (Groundfish Mortality)

The majority of benefits to the Preferred Alternative are related to the Council selecting options that maximize the IFQ allocations for sablefish, petrale sole, and widow rockfish (Table 4-22). Each of these species is projected to have greater than 90 percent attainment in 2021-22.

Another noteworthy change from No Action is the preferred 50 mt ACT under Alternative 1 (ACL = ABC P*0.40) for cowcod, which will greatly reduce constraints of individual trawlers that were problematic in 2019. The annual vessel QP limit will be raised from 858 lbs. in 2019 to 7,024 lbs. with the 50 mt ACT, which is approximately ten times higher than any boat caught in 2019.

As discussed above in Section 4.2.1.2, there are a few additional allocation changes and harvest specifications that could impact the IFQ fishery; however, none are expected to cause any noteworthy changes to the IFQ fishery. The Preferred Alternative uses the new custom sharing approach for the southern slope rockfish complex, but that is not expected to impact the IFQ sector since their projected mortality is low relative to the trawl shares of blackgill rockfish and "other slope rockfish" (Section 4.2.2.3) Under this new allocation structure, a blackgill rockfish trip limit could be implemented to control catch within the IFQ share; however, it is unlikely to be needed, and therefore will start as unlimited (see Section 4.2.2.4 for more details on analysis). Finally, the Council made a slight modification to the southern lingcod allocations in which the IFQ allocation would be reduced from 45 percent to 40 percent (Section 4.2.2.3. This reduction is not expected to negatively impact the IFQ sector as a whole as the resulting allocation would be approximately 4.5 times higher than the predicted 2021-2022 catch. The reduced lingcod allocation would also not be expected to negatively impact individual IFQ participants as the resulting annual vessel QP limit would be approximately 50 percent higher than the maximum catch of any vessel in the past three years (2016-2019; Agenda Item G.6.a, Supplemental GMT Report 1, April 2020). There are considerable economic benefits for the IFQ sector, shoreside processors, and coastal communities associated with the Preferred Alternative (Table 4-22). The Preferred Alternative is expected to increase the annual ex-vessel revenue for the IFQ sector by $1.7 million compared to No Action (Table 4-23).

The Council adopted No Action allocations for the remainder of the species as their Preferred Alternative, with the only impacts to the IFQ allocations resulting from changes in the at-sea set asides (discussed above in Section 4.2.1.5).

Non-IFQ Species

As described above, the Council's Preferred Alternative includes an unlimited trip limit for big skate in 2021-2022. New model results indicate that an unlimited big skate trip limit could increase IFQ revenue by $42,000 per year and attainments are expected to remain low relative to the landings target (i.e. 188 mt of landings compared to the 1,348.7 mt landings target).

Table 4-22. The Preferred Alternative for shorebased IFQ. 2021-22. Allocations and projected catch in metric tons

Stock	2021			2022		
	Allocation	Proj. Catch	% Attain	Allocation	Proj. Catch	% Attain
Arrowtooth flounder	7,376.0	869.6	11.8%	5,974.8	843.0	14.1%
Bocaccio rockfish South of 40°10' N.	663.8	268.6	40.5%	654.4	264.8	40.5%
Canary rockfish	881.0	382.9	43.5%	858.6	375.5	43.7%
Chilipepper rockfish South of 40°10' N.	1,695.2	540.4	31.9%	1,621.0	516.8	31.9%
Cowcod South of 40°10' N.	18.0	6.3	35.0%	18.0	6.3	35.0%
Darkblotched rockfish	743.4	392.4	52.8%	694.9	371.5	53.5%
Dover sole	45,972.7	5,948.0	12.9%	45,972.7	5,948.0	12.9%
English sole	8,477.9	210.8	2.5%	8,408.3	210.6	2.5%
Lingcod North of 40°10' N.	2,275.8	526.5	23.1%	2,090.8	487.2	23.3%

Stock	2021			2022		
	Allocation	Proj. Catch	% Attain	Allocation	Proj. Catch	% Attain
Lingcod South of 40°10' N.	435.6	77.6	17.8%	463.6	82.5	17.8%
Longspine thornyheads North of 34°27' N.	2,451.3	312.5	12.7%	2,278.4	293.7	12.9%
Minor shelf rockfish North of 40°10' N.	829.2	397.1	47.9%	792.5	385.0	48.6%
Minor shelf rockfish South of 40°10' N.	159.2	8.0	5.0%	158.0	8.0	5.1%
Minor slope rockfish North of 40°10' N.	937.8	229.7	24.5%	915.9	228.8	25.0%
Minor slope rockfish South of 40°10' N.	526.4	42.9	8.2%	515.6	42.8	8.3%
Other flatfish	4,088.0	462.7	11.3%	4,120.4	463.3	11.2%
Pacific cod	1,039.2	14.2	1.4%	1,039.2	14.2	1.4%
Pacific halibut (IBQ) North of 40°10' N.	69.6	33.7	48.5%	69.6	33.2	47.8%
Pacific ocean perch North of 40°10' N.	3,337.8	484.4	14.5%	3,202.0	465.6	14.5%
Pacific whiting	169,126.0	144,851.7	85.6%	169,126.0	144,851.7	85.6%
Petrale sole	3,692.9	3,680.9	99.7%	3,237.5	3,227.3	99.7%
Sablefish North of 36° N.	3,139.6	3,088.1	98.4%	2,985.4	2,945.7	98.7%
Sablefish South of 36° N.	782.0	73.1	9.3%	745.0	70.0	9.4%
Shortspine thornyheads North of 34°27' N.	1,212.1	458.8	37.9%	1,248.9	472.7	37.8%
Shortspine thornyheads South of 34°27' N.	50.0	0.0	0.0%	50.0	0.0	0.0%
Splitnose rockfish South of 40°10' N.	1,565.2	20.1	1.3%	1,531.0	20.1	1.3%
Starry flounder	171.8	0.5	0.3%	171.8	0.5	0.3%
Widow rockfish	13,600.7	12,446.2	91.5%	12,663.7	11,651.3	92.0%
Yelloweye rockfish	3.3	0.6	19.0%	3.4	0.6	17.6%
Yellowtail rockfish North of 40°10' N.	4,082.2	3,154.1	77.3%	3,889.4	3,067.3	78.9%

a/ Historical estimates of mortality were generated using the NMFS Pacific Coast IFQ Program Database (January 2020). Pacific whiting values include inseason allocation reapportionments.
b/ Pacific halibut is managed using IBQ, see regulations at §660.140. The 2021 Pacific halibut TAC was unavailable during the preparation of the analysis; therefore, the 2019 values were used.
c/ The 2021/2022 Pacific whiting TAC was unavailable during the preparation of the analysis; therefore the 2019 values were used (post-reapportionment).

Table 4-23. Projected results of the Preferred Alternative for the IFQ sector on average per year*.

Species	Average Allocations (mt)	Predicted avg catch (mt)	Predicted avg $ ex-vessel
Arrowtooth flounder	6,675	856	$107,179
Bocaccio rockfish South of 40°10' N.	659	267	$259,889
Canary rockfish	870	379	$378,686
Chilipepper rockfish South of 40°10' N.	1,658	529	$478,745
Cowcod South of 40°10' N.	18	6	$4,352
Darkblotched rockfish	719	382	$278,009
Dover sole	45,973	5,948	$5,501,717
English sole	8,443	211	$93,168
Lingcod North of 40°10' N.	2,183	507	$992,925
Lingcod South of 40°10' N.	450	80	$144,231
Longspine thornyheads North of 34°27'	2,365	303	$247,732
Minor shelf rockfish North of 40°10' N.	811	391	$164,572
Minor shelf rockfish South of 40°10' N.	159	8	$3,943
Minor slope rockfish North of 40°10' N.	927	229	$110,551
Minor slope rockfish South of 40°10' N.	521	43	$24,765
Other flatfish	4,104	463	$351,349
Pacific cod	1,039	14	$17,563
Pacific halibut (IBQ) North of 40°10' N.	70	33	$432

Species	Average Allocations (mt)	Predicted avg catch (mt)	Predicted avg $ ex-vessel
Pacific ocean perch North of 40°10' N.	3,270	475	$275,180
Pacific whiting	169,126	144,852	$28,728,329
Petrale sole	3,465	3,454	$8,997,988
Sablefish North of 36° N.	3,063	3,017	$6,396,495
Sablefish South of 36° N.	764	72	$158,780
Shortspine thornyheads North of 34°27'	1,231	466	$524,885
Shortspine thornyheads South of 34°27' N	50	0	$0
Splitnose rockfish South of 40°10' N.	1,548	20	$8,392
Starry flounder	172	0	$878
Widow rockfish	13,132	12,049	$7,024,801
Yelloweye rockfish	3	1	$499
Yellowtail rockfish North of 40°10' N.	3,986	3,111	$2,087,939
Total non-whiting	108,326	33,314	$34,635,644
Total IFQ	277,452	178,165	$63,363,973

**Based on Method 1 ACL (status quo) to reflect economic gains associated with the Preferred Alternative having a higher northern sablefish apportionment*

Table 4-24. Preferred Alternative Limited entry trawl RCA and trip limits for north of 40□ 10' N. lat. for 2021-2022.

Table 1 (North) to Part 660, Subpart D -- Limited Entry Trawl Rockfish Conservation Areas and Landing Allowances for non-IFQ Species and Pacific Whiting North of 40°10' N. Lat.

This table describes Rockfish Conservation Areas for vessels using groundfish trawl gear. This table describes incidental landing allowances for vessels registered to a Federal limited entry trawl permit and using groundfish trawl or groundfish non-trawl gears to harvest individual fishing quota (IFQ) species.

Other Limits and Requirements Apply -- Read § 660.10 - § 660.399 before using this table 01012019

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
Rockfish Conservation Area (RCA)[1/]:							
1	North of 45°46' N. lat.	100 fm line[1/] - 150 fm line[1/]					
2	45°46' N. lat. - 40°10' N. lat.	Block Area Closures (BACs) may be implemented, and will be announced in the Federal Register.					

See provisions at § 660.130 for gear restrictions and requirements by area. Vessels fishing groundfish trawl quota pounds with groundfish non-trawl gears, under gear switching provisions at § 660.140, are subject to the limited entry groundfish trawl fishery landing allowances in this table, regardless of the type of fishing gear used. Vessels fishing groundfish trawl quota pounds with groundfish non-trawl gears, under gear switching provisions at § 660.140, are subject to the limited entry fixed gear non-trawl RCA, as described in Tables 2 (North) and 2 (South) to Part 660, Subpart E.

See § 660.60, § 660.130, and § 660.140 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.70-660.74 and §§ 660.76-660.79 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, Cordell Banks, and EFHCAs).

State trip limits and seasons may be more restrictive than federal trip limits, particularly in waters off Oregon and California.

3	**Minor Nearshore Rockfish, Washington Black rockfish & Oregon Black/blue/deacon rockfish**	300 lb/ month
4	**Whiting[3/]**	
5	midwater trawl	Before the primary whiting season: CLOSED. -- During the primary season: mid-water trawl permitted in the RCA. See §660.131 for season and trip limit details. -- After the primary whiting season: CLOSED.
6	large & small footrope gear	Before the primary whiting season: 20,000 lb/trip. -- During the primary season: 10,000 lb/trip. -- After the primary whiting season: 10,000 lb/trip.
7	**Oregon Cabezon/Kelp Greenling complex**	50 lb/ month
8	**Cabezon in California**	50 lb/ month
9	**Shortbelly rockfish**	Unlimited
10	**Spiny dogfish**	60,000 lb/ month
11	**Big skate**	Unlimited
12	**Longnose skate**	Unlimited
13	**Other Fish [4/]**	Unlimited

TABLE 1 (North)

1/ The Rockfish Conservation Area is an area closed to fishing by particular gear types, bounded by lines specifically defined by latitude and longitude coordinates set out at §§ 660.71-660.74. This RCA is not defined by depth contours, and the boundary lines that define the RCA may close areas that are deeper or shallower than the depth contour. Vessels that are subject to the RCA restrictions may not fish in the RCA, or operate in the RCA for any purpose other than transiting.

2/ The "modified" fathom lines are modified to exclude certain petrale sole areas from the RCA.

3/ As specified at §660.131(d), when fishing in the Eureka Area, no more than 10,000 lb of whiting may be taken and retained, possessed, or landed by a vessel that, at any time during the fishing trip, fished in the fishery management area shoreward of 100 fm contour.

4/ "Other Fish" are defined at § 660.11 and include kelp greenling off California and leopard shark.

To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 4-25. Limited entry trawl RCA and trip limits for south of 40°10’ N. lat. for 2021-2022.

Table 1 (South) to Part 660, Subpart D -- Limited Entry Trawl Rockfish Conservation Areas and Landing Allowances for non-IFQ Species and Pacific Whiting South of 40°10' N. Lat.

This table describes Rockfish Conservation Areas for vessels using groundfish trawl gear. This table describes incidental landing allowances for vessels registered to a Federal limited entry trawl permit and using groundfish trawl or groundfish non-trawl gears to harvest individual fishing quota (IFQ) species.

Other Limits and Requirements Apply -- Read § 660.10 - § 660.399 before using this table 01012019

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[1/]:						
1	South of 40°10' N. lat.	Block Area Closures (BACs) may be implemented, and will be announced in the Federal Register.					
	See provisions at § 660.130 for gear restrictions and requirements by area. Vessels fishing groundfish trawl quota pounds with groundfish non-trawl gears, under gear switching provisions at § 660.140, are subject to the limited entry groundfish trawl fishery landing allowances in this table, regardless of the type of fishing gear used. Vessels fishing groundfish trawl quota pounds with groundfish non-trawl gears, under gear switching provisions at § 660.140, are subject to the limited entry fixed gear non-trawl RCA, as described in Tables 2 (North) and 2 (South) to Part 660, Subpart E.						
	See § 660.60, § 660.130, and § 660.140 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.70-660.74 and §§ 660.76-660.79 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, Cordell Banks, and EFHCAs).						
	State trip limits and seasons may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
2	**Longspine thornyhead**						
3	South of 34°27' N. lat.	24,000 lb/ 2 months					
4	**Minor Nearshore Rockfish, California Black rockfish, & Oregon Black/Blue/Deacon rockfish**	300 lb/ month					
5	**Whiting**						
6	midwater trawl	During the Primary whiting season: allowed seaward of the trawl RCA. Prohibited within and shoreward of the trawl RCA.					
7	large & small footrope gear	Before the primary whiting season: 20,000 lb/trip. -- During the primary season: 10,000 lb/trip. -- After the primary whiting season: 10,000 lb/trip.					
8	**Cabezon**	50 lb/ month					
9	**Shortbelly rockfish**	Unlimited					
10	**Spiny dogfish**	60,000 lb/ month					
11	**Big skate**	Unlimited					
12	**Longnose skate**	Unlimited					
13	**California scorpionfish**	Unlimited					
14	**Blackgill rockfish**	Unlimited					
15	**Other Fish** [3/]	Unlimited					

TABLE 1 (South)

1/ The Rockfish Conservation Area is an area closed to fishing by particular gear types, bounded by lines specifically defined by latitude and longitude coordinates set out at §§ 660.71-660.74. This RCA is not defined by depth contours, and the boundary lines that define the RCA may close areas that are deeper or shallower than the depth contour. Vessels that are subject to the RCA restrictions may not fish in the RCA, or operate in the RCA for any purpose other than transiting.

2/ South of 34°27' N. lat., the RCA is 100 fm line - 150 fm line along the mainland coast; shoreline - 150 fm line around islands.

3/ "Other Fish" are defined at § 660.11 and include kelp greenling off California and leopard shark.

To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

4.2.1.6 Limited Entry and Open Access Fixed Gear Management Measures

The Preferred ACLs and non-trawl allocations are the same as No Action except for Oregon black rockfish, cowcod, sablefish, shortbelly rockfish, and petrale sole. As such, these non-trawl allocation amounts which impact the nearshore and non-nearshore fisheries differ from No Action. Impacts of these ACLs and resulting allocations are discussed below in Section 4.2.2.6.

The principle management measures for the LEFG and OA fisheries under the Preferred Alternative are the same as described under No Action (Section 4.3.6), except for proposed changes to the non-trawl RCA (described in Section 4.3.6.6). However, the Preferred Alternative reflects a vast number of new proposals that change allocations, trip limits, and elimination of a flatfish gear restriction off California. The impacts of each individual proposal are the same as discussed under No Action (Section 4.3.6.1) or in Agenda Item G.6, Supplemental Attachment 4, April 2020 in regards to expected mortality, landings, and ex-vessel revenue. An overarching list of all the proposals to the Council in the Appendix of Agenda Item G.6.a, Supplemental GMT Report 2, April 2020. The Council selected Option 2 for all the proposals as the Preferred Alternative since the analyses demonstrated this would optimize opportunity for target stocks while not causing any conservation concerns. Table 4-26 and Table 4-27 described the preferred trip limits for the LEFG fisheries and Table 4-28 and Table 4-29 describe the Preferred Alternative trip limits for the OA fisheries for 2021-2022.

Other Flatfish Complex Gear Restrictions.

Additionally, the Council recommends removal of gear restrictions associated with the 'Other Flatfish complex" as specified at 50 CFR §660.11 as their Preferred Alternative. As detailed in Section 4.2.2.6 , this management measure was originally put in place in 2003 to protect overfished groundfish and was thought to provide protections to other overfished groundfish stocks in following years (e.g. petrale sole). All groundfish species, except yelloweye rockfish have been rebuilt, leading to *de minimus* bycatch concerns should this gear restriction be removed.

Open Access Retention of thornyheads between 40° 10' N. lat. and 34° 27' N. lat.

Of note, the Preferred Alternative also establishes an OA trip limit for shortspine and longspine thornyheads in the area between 40° 10' N. lat. and 34° 27' N. lat. As described in Section 4.2.2.6, the Council established a trip limit for north of 40° 10' N. lat. in 2019-2020where retention was previously prohibited but the Central California area was inadvertently not included and retention remained prohibited. The Preferred Alternative for this area therefore matches the trip limit the Council adopted for the area north of 40° 10' N. lat., which is separate 50 lb monthly limits for shortspine thornyhead and longspine thornyhead.

Table 4-26. Preferred alternative trip limits for 2021-2022 for LEFG north of 40° 10' N. lat.

	Table 2 (North) to Part 660, Subpart E -- Non-Trawl Rockfish Conservation Areas and Trip Limits for Limited Entry Fixed Gear North of 40°10' N. lat.						
	Other limits and requirements apply -- Read §§660.10 through 660.399 before using this table						
		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[1/]:						
1	North of 46°16' N. lat.	shoreline - 100 fm line[1/]					
2	46°16' N. lat. - 40°10' N. lat.	40 fm line[1/] - 100 fm line[1/]					
	See §§660.60 and 660.230 for additional gear, trip limit and conservation area requirements and restrictions. See §§660.70-660.74 and §§660.76-660.79 for						
	State trip limits and seasons may be more restrictive than Federal trip limits or seasons, particularly in waters off Oregon and California.						
4	**Minor Slope Rockfish[2/] & Darkblotched rockfish**	8,000 lb/ 2 month					
5	**Pacific ocean perch**	3,600 lb/ 2 months					
6	**Sablefish**	1,700 lb week, not to exceed 5,100 lbs / 2 months					
7	**Longspine thornyhead**	10,000 lb/ 2 months					
8	**Shortspine thornyhead**	2,000 lb/ 2 months			2,500 lb/ 2 months		
9	**Dover sole, arrowtooth flounder, petrale sole, English sole, starry flounder, Other Flatfish[3/]**	10,000 lbs/ month					
10							
11							
12	**Whiting**	10,000 lb/ trip					
13	**Minor Shelf Rockfish[2/]**	800 lbs / month					
14	**Shortbelly Rockfish**	200 lbs / month					
15	**Widow rockfish**	4,000 lb/ 2 month					
16	**Yellowtail rockfish**	3,000 lb/ month					
17	**Canary rockfish**	3,000 lb/ 2 months					
18	**Yelloweye rockfish**	CLOSED					
19	**Minor Nearshore Rockfish, Oregon black/blue/deacon rockfish & CA black rockfish**						
20	North of 42°00' N. lat.	5,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black rockfish or blue/deacon rockfish[4/]					
21	42°00' N. lat. - 40°10' N. lat.	7,000 lb/ 2 months, no more than 2,000 lb of which may be species other than black rockfish					
22	**Lingcod[5/]**						
23	North of 42°00' N. lat.	4,000 lb/ 2 months					
24	42°00' N. lat. - 40°10' N. lat.	2,000 lb/2 months					
25	**Pacific cod**	1,000 lb/ 2 months					
26	**Spiny dogfish**	200,000 lb / 2months		150,000 lb /	100,000 lb / 2months		
27	**Longnose skate**	Unlimited					
28	**Other Fish[6/] & Cabezon in California**	Unlimited					
29	**Oregon Cabezon/Kelp Greenling**	Unlimited					
30	**Big skate**	Unlimited					

TABLE 2 (North)

1/ The Rockfish Conservation Area is an area closed to fishing by particular gear types, bounded by lines specifically defined by latitude and longitude coordinates set out at §§ 660.71-660.74. This RCA is not defined by depth contours (with the exception of the 20-fm depth contour boundary south of 42° N. lat.), and the boundary lines that define the RCA may close areas that are deeper or shallower than the depth contour. Vessels that are subject to RCA restrictions may not fish in the RCA, or operate in the RCA for any purpose other than transiting.

2/ Bocaccio, chilipepper and cowcod are included in the trip limits for Minor Shelf Rockfish and splitnose rockfish is included in the trip limits for Minor Slope Rockfish.

3/ "Other flatfish" are defined at § 660.11 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, and sand sole.

4/ For black rockfish north of Cape Alava (48°09.50' N. lat.), and between Destruction Is. (47°40' N. lat.) and Leadbetter Pnt. (46°38.17' N. lat.), there is an additional limit of 100 lb or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.

5/ The minimum size limit for lingcod is 22 inches (56 cm) total length North of 42° N. lat. and 24 inches (61 cm) total length South of 42° N. lat.

6/ "Other Fish" are defined at § 660.11 and include kelp greenling off California and leopard shark.

To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 4-27. Preferred alternative trip limits for 2021-2022 for LEFG south of 40° 10’ N. lat.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
Table 2 (South) to Part 660, Subpart E -- Non-Trawl Rockfish Conservation Areas and Trip Limits for Limited Entry Fixed Gear South of 40°10' N. lat.							
	Other limits and requirements apply -- Read §§660.10 through 660.399 before using this table						
Rockfish Conservation Area (RCA)[1/]:							
1	40°10' N. lat. - 38°57.5' N. lat.	40 fm line[1/] - 125 fm line[1/]					
2	38°57.5' N. lat. - 34°27' N. lat.	50 fm line[1/] - 125 fm line[1/]					
3	South of 34°27' N. lat.	75 fm line[1/] - 150 fm line[1/] (also applies around islands)					
See §§660.60 and 660.230 for additional gear, trip limit and conservation area requirements and restrictions. See §§660.70-660.74 and §§660.76-660.79 for							
State trip limits and seasons may be more restrictive than Federal trip limits or seasons, particularly in waters off Oregon and California.							
3	**Minor Slope rockfish[2/] & Darkblotched**	40,000 lb/ 2 months, of which no more than 6,000 lb may be blackgill rockfish					
4	**Splitnose rockfish**	40,000 lb/ 2 months					
5	**Sablefish**						
6	40°10' N. lat. - 36°00' N. lat.	1,700 lb week, not to exceed 5,100 lbs / 2 months					
7	South of 36°00' N. lat.	2,000 lb/ week					
8	**Longspine thornyhead**	10,000 lb/ 2 months					
9	**Shortspine thornyhead**						
10	40°10' N. lat. - 34°27' N. lat.	2,000 lb/ 2 months			2,500 lb/ 2 months		
11	South of 34°27' N. lat.	3,000 lb/ 2 months					
12 13 14	**Dover sole, arrowtooth flounder, petrale sole, English sole, starry flounder, Other Flatfish[3/]**	10,000 lb/ month					
18	**Whiting**	10,000 lb/ trip					
	Minor Shelf Rockfish[2/]						
	40°10' N. lat. - 34°27' N. lat.	8,000 lbs. / 2 months, of which no more than 500 lbs. may be vermilion					
	South of 34°27' N. lat.	5,000 lbs. / 2 months, of which no more than 3,000lbs. may be vermilion					
	Widow						
	40°10' N. lat. - 34°27' N. lat.	10,000 lbs. / 2 months					
	South of 34°27' N. lat.	8,000 lbs. / 2 months					
21	**Chilipepper**						
	40°10' N. lat. - 34°27' N. lat.	10,000 lbs. / 2 months					
	South of 34°27' N. lat.	8,000 lbs. / 2 months					
	Shortbelly Rockfish						
	South of 40°10' N. lat.	200 lb/ month					
22	**Canary rockfish**	3,500 lbs/ 2 months					
23	**Yelloweye rockfish**	CLOSED					
24	**Cowcod**	CLOSED					
25	**Bronzespotted rockfish**	CLOSED					
26	**Bocaccio**	6,000 lbs/ 2 months					
27	**Minor Nearshore Rockfish**						
	Shallow nearshore[4/]	2,000 lbs/ 2 months					
	Deeper nearshore[5/]	2,000 lbs/ 2 months					
30	**California Scorpionfish**	3,500 lbs/ 2 months					
	Lingcod[6/]	1,200 lbs / 2 months					
32	**Pacific cod**	1,000 lb/ 2 months					
33	**Spiny dogfish**	200,000 lb/ 2 months		150,000 lb/ 2	100,000 lb/ 2 months		
34	**Longnose skate**	Unlimited					
35	**Other Fish[7/] & Cabezon in California**	Unlimited					
36	**Big Skate**	Unlimited					

TABLE 2 (South)

1/ The Rockfish Conservation Area is an area closed to fishing by particular gear types, bounded by lines specifically defined by latitude and longitude coordinates set out at §§ 660.71-660.74. This RCA is not defined by depth contours (with the exception of the 20-fm depth contour boundary south of 42° N. lat.), and the boundary lines that define the RCA may close areas that are deeper or shallower than the depth contour. Vessels that are subject to RCA restrictions may not fish in the RCA, or operate in the RCA for any purpose other than transiting.

2/ POP is included in the trip limits for Minor Slope Rockfish. Blackgill rockfish have a species specific trip sub-limit within the Minor Slope Rockfish cumulative limit. Yellowtail rockfish are included in the trip limits for Minor Shelf Rockfish. Bronzespotted rockfish have a species specific trip limit.

3/ "Other Flatfish" are defined at § 660.11 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, and sand sole.

4/ "Shallow Nearshore" are defined at § 660.11 under "Groundfish" (7)(i)(B)(1).

5/ "Deeper Nearshore" are defined at § 660.11 under "Groundfish" (7)(i)(B)(2).

6/ The commercial mimimum size limit for lingcod is 24 inches (61 cm) total length South of 42° N. lat.

7/ "Other Fish" are defined at § 660.11 and include kelp greenling off California and leopard shark.

To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 4-28. Preferred alternative trip limits for 2021-2022 for OA north of 40° 10' N. lat.

Table 3 (North) to Part 660, Subpart F -- Non-Trawl Rockfish Conservation Areas and Trip Limits for Open Access Gears North of 40°10' N. lat.

Other limits and requirements apply -- Read §§660.10 through 660.399 before using this table

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC	
	Rockfish Conservation Area (RCA)[1/]:							TABLE 3 (North)
1	North of 46°16' N. lat.	shoreline - 100 fm line[1/]						
2	46°16' N. lat. - 40°10' N. lat.	40 fm line[1/] - 100 fm line[1/]						
	See §§660.60, 660.330 and 660.333 for additional gear, trip limit and conservation area requirements and restrictions. See §§660.70-660.74 and §§660.76-660.79 for conservation area descriptions and coordinates (including RCAs, YRCAs, CCAs, Farallon Islands, Cordell Bank, and EFHCAs).							
	State trip limits and seasons may be more restrictive than Federal trip limits or seasons, particularly in waters off Oregon and California.							
4	**Minor Slope Rockfish[2/] & Darkblotched rockfish**	1,000 lbs / months						
5	**Pacific ocean perch**	100 lbs/ month						
6	**Sablefish**	300 lbs. daily, or 1 landing per week up to 1,400 lbs., not to exceed 2,800 lbs. bimonthly						
7	**Shortpine thornyheads**	50 lb/month						
8	**Longspine thornyheads**	50 lb/month						
9 10 11	**Dover sole, arrowtooth flounder, petrale sole, English sole, starry flounder, Other Flatfish[3/]**	5,000 lbs/ month						
12	**Whiting**	300 lbs/ month						
13	**Minor Shelf Rockfish[2/]**	800 lbs / month						
14	**Widow rockfish**	2,000 lb/ month						
15	**Shortbelly Rockfish**	200 lbs / month						
16	**Yellowtail rockfish**	1,500 lbs/ month						
17	**Canary rockfish**	1,000 lbs/ 2 months						
18	**Yelloweye rockfish**	CLOSED						
19	**Minor Nearshore Rockfish, Oregon black/blue/deacon rockfish & CA black rockfish**							
20	North of 42°00' N. lat.	5,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black rockfish or blue/deacon rockfish[4/]						
21	42°00' N. lat. - 40°10' N. lat.	7,000 lb/ 2 months, no more than 2,000 lb of which may be species other than black rockfish						
22	**Lingcod[5/]**							
23	North of 42°00' N. lat.	2,000 lbs/ month						
24	42°00' N. lat. - 40°10' N. lat.	1,000 lbs / month						
25	**Pacific cod**	1,000 lbs/ 2 months						
26	**Spiny dogfish**	200,000 lbs/ 2 months		150,000 lbs/ 2 months	100,000 lbs/ 2 months			
27	**Longnose skate**	Unlimited						
28	**Big skate**	Unlimited						
29	**Other Fish[6/] & Cabezon in California**	Unlimited						
30	**Oregon Cabezon/Kelp Greenling**	Unlimited						
1	**SALMON TROLL** *(subject to RCAs when retaining all species of groundfish, except for yellowtail rockfish and lingcod, as described below)*							TABLE 3 (North) cont'd
2	North	Salmon trollers may retain and land up to 500 lbs of yellowtail rockfish per month as long as salmon is on board, both within and outside of the RCA. Salmon trollers may retain and land up to 1 lingcod per 5 Chinook per trip, plus 1 lingcod per trip, up to a trip limit of 10 lingcod, on a trip where any fishing occurs within the RCA. The limit only applies during times when lingcod retention is allowed, and is not "CLOSED." The limit is within the per month limit for lingcod described in the table above, and not in addition to that limit. All groundfish species are subject to the open access limits, seasons, size limits and RCA restrictions listed in the table above, unless otherwise stated here.						
3	**PINK SHRIMP NON-GROUNDFISH TRAWL** *(not subject to RCAs)*							
4	North	Effective April 1 - October 31: Groundfish: 500 lbs/day, multiplied by the number of days of the trip, not to exceed 1,500 lbs/trip. The following sublimits also apply and are counted toward the overall 500 lbs/day and 1,500 lbs/trip groundfish limits: lingcod 300 lbs/month (minimum 24 inch size limit); sablefish 2,000 lbs/month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lbs/day and 1,500 lbs/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.						

1/ The Rockfish Conservation Area is an area closed to fishing by particular gear types, bounded by lines specifically defined by latitude and longitude coordinates set out at §§ 660.71-660.74. This RCA is not defined by depth contours (with the exception of the 20-fm depth contour boundary south of 42° N. lat.), and the boundary lines that define the RCA may close areas that are deeper or shallower than the depth contour. Vessels that are subject to RCA restrictions may not fish in the RCA, or operate in the RCA for any purpose other than transiting.

2/ Bocaccio, chilipepper and cowcod rockfishes are included in the trip limits for Minor Shelf Rockfish. Splitnose rockfish is included in the trip limits for Minor Slope Rockfish.

3/ "Other flatfish" are defined at § 660.11 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, and sand sole.

4/ For black rockfish north of Cape Alava (48°09.50' N. lat.), and between Destruction Is. (47°40' N. lat.) and Leadbetter Pnt. (46°38.17' N. lat.), there is an additional limit of 100 lbss or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.

5/ The minimum size limit for lingcod is 22 inches (56 cm) total length North of 42° N. lat. and 24 inches (61 cm) total length South of 42° N. lat.

6/ "Other fish" are defined at § 660.11 and include kelp greenling off California and leopard shark.

To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 4-29. Preferred alternative trip limits for 2021-2022 for OA south of 40° 10' N. lat.

Table 3 (South) to Part 660, Subpart F -- Non-Trawl Rockfish Conservation Areas and Trip Limits for Open Access Gears South of 40°10' N. lat.

Other limits and requirements apply -- Read §§660.10 through 660.399 before using this table

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[1/]:						
1	40°10' N. lat. - 38°57.5' N. lat.	40 fm line[1/] - 125 fm line[1/]					
2	38°57.5' N. lat. -34°27' N. lat.	50 fm line[1/] - 125 fm line[1/]					
3	South of 34°27' N. lat.	100 fm line[1/] - 150 fm line[1/] (also applies around islands)					
	See §§660.60 and 660.230 for additional gear, trip limit and conservation area requirements and restrictions. See §§660.70-660.74 and §§660.76-660.79 for conservation area						
	State trip limits and seasons may be more restrictive than Federal trip limits or seasons, particularly in waters off Oregon and California.						
4	**Minor Slope Rockfish[2/] & Darkblotched rockfish**	10,000 lbs/ 2 months, of which no more than 2,500 lbs may be blackgill rockfish					
5	**Splitnose rockfish**	200 lbs/ month					
6	**Sablefish**						
7	40°10' N. lat. - 36°00' N. lat.	300 lbs. daily, or 1 landing per week up to 1,400 lbs., not to exceed 2,800 lbs. bimonthly					
8	South of 36°00' N. lat.	1,600 lbs. per week, not to exceed 4,800 lbs bimonthly					
9	**Shortpine thornyheads**						
10	40°10' N. lat. - 34°27' N. lat.	50lb/ month					
11	**Longspine thornyheads**						
12	40°10' N. lat. - 34°27' N. lat.	50 lb/ month					
13	**Shortpine thornyheads and longspine**						
14	South of 34°27' N. lat.	50 lbs/ day, no more than 1,000 lbs/ 2 months					
15 16 17	**Dover sole, arrowtooth flounder, petrale sole, English sole, starry flounder, Other Flatfish[3/]**	5,000 lbs/ month					
18	**Whiting**	300 lbs/ month					
19	**Minor Shelf Rockfish[2/]**						
20	40°10' N. lat. - 34°27' N. lat.	4,000 lbs. / 2 months, of which no more than 400 lbs. may be vermilion					
21	South of 34°27' N. lat.	3,000 lbs. / 2 months, of which no more than 1,200lbs. may be vermilion					
22	**Widow**						
23	40°10' N. lat. - 34°27' N. lat.	6,000 lbs. / 2 months					
24	South of 34°27' N. lat.	4,000 lbs. / 2 months					
25	**Chilipepper**						
26	40°10' N. lat. - 34°27' N. lat.	6,000 lbs. / 2 months					
27	South of 34°27' N. lat.	4,000 lbs. / 2 months					
28	**Shortbelly Rockfish**						
29	South of 40°10' N. lat.	200 lb/ month					
22	**Canary rockfish**	1,500 lbs/ 2 months					
23	**Yelloweye rockfish**	CLOSED					
24	**Cowcod**	CLOSED					
25	**Bronzespotted rockfish**	CLOSED					
26	**Bocaccio**	4,000 lbs/ 2 months					
30	**Minor Nearshore Rockfish**						
31	Shallow nearshore[4/]	2,000 lbs/ 2 months					
32	Deeper nearshore[5/]	2,000 lbs/ 2 months					
33	**California Scorpionfish**	3,500 lbs/ 2 months					
34	**Lingcod[6/]**	500 lbs / months					
35	**Pacific cod**	1,000 lbs/ 2 months					
36	**Spiny dogfish**	200,000 lbs/ 2 months		150,000 lbs/ 2 months		100,000 lbs/ 2 months	
37	**Longnose skate**	Unlimited					
38	**Big skate**	Unlimited					
39	**Other Fish[7/] & Cabezon in California**	Unlimited					

TABLE 3 (South)

Table 3 (South) Continued

Other limits and requirements apply -- Read §§660.10 through 660.399 before using this table

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[1/]:						
1	40°10' N. lat. - 38°57.5' N. lat.	40 fm line[1/] - 125 fm line[1/]					
2	38°57.5' N. lat. -34°27' N. lat.	50 fm line[1/] - 125 fm line[1/]					
3	South of 34°27' N. lat.	100 fm line[1/] - 150 fm line[1/] (also applies around islands)					
	See §§660.60 and 660.230 for additional gear, trip limit and conservation area requirements and restrictions. See §§660.70-660.74 and §§660.76-660.79 for conservation area						
40	**SALMON TROLL** *(subject to RCAs when retaining all species of groundfish, except for yellowtail rockfish and lingcod, as described below)*						
41	South of 40°10' N. lat.	Salmon trollers may retain and land up to 1 lbs of yellowtail rockfish for every 2 lbs of Chinook salmon landed, with a cumulative limit of 200 lbs/month, both within and outside of the RCA. This limit is within the 4,000 lbs per 2 month limit for minor shelf rockfish between 40°10' and 24°27' N lat., and not in addition to that limit. All groundfish species are subject to the open access limits, seasons, size limits and RCA restrictions listed in the table above, unless otherwise stated here.					
42	**RIDGEBACK PRAWN AND, SOUTH OF 38°57.50' N. LAT., CA HALIBUT AND SEA CUCUMBER NON-GROUNDFISH TRAWL**						
43	**NON-GROUNDFISH TRAWL Rockfish Conservation Area (RCA) for CA Halibut, Sea Cucumber & Ridgeback Prawn:**						
44	*40°10' N. lat. - 38°00' N. lat.*	*100 fm line[1/] - 200 fm*		*100 fm line[1/] - 150 fm line[1/]*			*100 fm line[1/] - 200 fm*
45	*38°00' N. lat. - 34°27' N. lat.*	*100 fm line[1/] - 150 fm line[1/]*					
46	*South of 34°27' N. lat.*	*100 fm line[1/] - 150 fm line[1/] along the mainland coast; shoreline - 150 fm line[1/] around islands*					
47		Groundfish: 300 lbs/trip. Species-specific limits described in the table above also apply and are counted toward the 300 lbs groundfish per trip					
48	**PINK SHRIMP NON-GROUNDFISH TRAWL GEAR** *(not subject to RCAs)*						
49	South	Effective April 1 - October 31: Groundfish: 500 lbs/day, multiplied by the number of days of the trip, not to exceed 1,500 lbs/trip. The following					

1/ The Rockfish Conservation Area is an area closed to fishing by particular gear types, bounded by lines specifically defined by latitude and longitude coordinates set out at §§ 660.71-660.74. This RCA is not defined by depth contours (with the exception of the 20-fm depth contour boundary south of 42° N. lat.), and the boundary lines that define the RCA may close areas that are deeper or shallower than the depth contour. Vessels that are subject to RCA restrictions may not fish in the RCA, or operate in the RCA for any purpose other than transiting.

2/ POP is included in the trip limits for minor slope rockfish. Blackgill rockfish have a species specific trip sub-limit within the minor slope rockfish cumulative limits. Yellowtail rockfish is included in the trip limits for minor shelf rockfish. Bronzespotted rockfish have a species specific trip limit.

3/ "Other flatfish" are defined at § 660.11 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, and sand sole.

4/ "Shallow Nearshore" are defined at § 660.11 under "Groundfish" (7)(i)(B)(*1*).

5/ "Deeper Nearshore" are defined at § 660.11 under "Groundfish" (7)(i)(B)(*2*).

6/ The commercial mimimum size limit for lingcod is 24 inches (61 cm) total length South of 42° N. lat.

7/ "Other fish" are defined at § 660.11 and includes kelp greenling off California and leopard shark.

To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Groundfish Impacts

Based on the Preferred Alternative non-trawl trip limits, Table 4-30 shows the projected mortality for all targeted species within the nearshore and non-nearshore fisheries. The vast majority of species are expected to see increases in projected mortality, leading to additional ex-vessel revenue (shown in the far right hand column). .

Of note, the selection of Alternative 1, Method 2 for sablefish, which is the driving force of the non-nearshore fishery, allocates an additional 340 mt on average compared to No Action (Method 1), resulting in an increase in ex-vessel revenue of $1.7 million on average (Table 4-162). Compared to the baseline, it is projected to result in over $2.6 million in additional ex-vessel revenue north of 36° N. lat. while not impacting southern sablefish fisheries. For cowcod, while retention is to remain prohibited in the non-trawl fishery, impacts are difficult to gauge as this species has been under a rebuilding plan through 2019, where the ACLs were nearly five times lower than the ACT (Table 4-29). The range under the Preferred Alternative is based on the historical maximum from all sectors south of 40° 10' N. lat. On the other harvest specification changes from No Action, the increase in the Oregon black rockfish ACL is not expected to provide more opportunity, but limit the risk of needing to reduce trip limits inseason. Shortbelly rockfish is rarely caught in the non-trawl fisheries (projected at <0.1 mt as shown in Table 4-28 below).

For the preferred allocation structures adopted by the Council (Section 4.2.1.3), the decrease in allocations to non-trawl for widow rockfish and petrale sole compared to No Action are not expected to constrain the LEFG or OA fisheries even with proposed increases in trip limits. For lingcod south of 40° 10' N. lat., the increase in the non-trawl allocation from 55 percent to 60 percent is expected to provide additional opportunity for the non-trawl fisheries, which have been constrained and exceeded allocations in recent years (see Table 4-61 in Section 0). Finally, for slope rockfish south of 40° 10' N. lat., the Option 2 allocation structure with custom blackgill rockfish and other slope rockfish HGs allows for increased trip limits for blackgill rockfish (a non-trawl dominant species).

Finally, as described under Section 4.2.1.3, the Council adopted to combine the nearshore and non-nearshore HGs for yelloweye (along with ACTs), canary rockfish and bocaccio within the non-trawl allocations. All three species are expected to be within the new HGs (Table 4-30 for canary rockfish and bocaccio, Table 4-32 for yelloweye rockfish). By combining the HGs into a single amount, it increases the flexibility of the resource as the fishery could be constrained by having specific allocations for non-nearshore and nearshore.

Table 4-30. Projected landings based on the Preferred Alternative trip limit adjustment compared to the Preferred Alternative non-trawl allocation with associated projected economic gains. Weights in mt. Ex-vessel revenue in 2020 dollars.

Stock	Preferred Alternative (mt)	2021 Non-Trawl Allocation (mt)	Increase in Ex-Vessel Revenue from Baseline
Arrowtooth flounder N of 40°10' N. lat.	29.0	391.9	$8,221
Arrowtooth flounder S of 40°10' N. lat.	0.2		$293
Blackgill rockfish S of 40°10' N. lat.	46.2	104.2	$231,872
Bocaccio S of 40°10' N. lat.	103.6	1,036.40	$493,413
California scorpionfish	3.1	287.1	$38,923
Canary rockfish N of 40°10' N. lat.	10.9	352.4	$37,508
Canary rockfish S of 40°10' N. lat.	58.0		$399,551
Chilipepper rockfish S of 40°10' N. lat.	37.1	567.4	$187,740
Darkblotched rockfish N of 40°10' N. lat.	3.9	42.4	$8,453
Dover sole N of 40°10' N. lat.	4.9	2,420.10	$5,515
Dover sole S of 40°10' N. lat.	2.2		$6,179
English sole N of 40°10' N. lat.	<0.1	446.2	$0
English sole S of 40°10' N. lat.	<0.1		$0
Lingcod N of 42° N. lat.	96.5	2,799.80	$487,573
Lingcod N of 40°10' N. lat.	15.1		$67,837
Lingcod S of 40°10' N. lat.	49.6	653.4	$340,550
Longspine thornyhead N of 34°27' N. lat.	0.1	129	$151
Nearshore rockfish 42°- 40°10' N. lat.	12.3	75.9	$39,447
Nearshore rockfish S of 40°10' N. lat.	208.0	1,011.60	$2,810,719
Shelf rockfish N of 40°10' N. lat.	17.1	571.4	$75,389
Shelf rockfish S of 40°10' N. lat.	210.3	1,163.60	$1,472,044
Slope rockfish N of 40°10' N. lat.	40.7	290.3	$80,435

Stock	Preferred Alternative (mt)	2021 Non-Trawl Allocation (mt)	Increase in Ex-Vessel Revenue from Baseline
Other flatfish N of 40°10' N. lat.	0.1	458.1	$358
Other flatfish S of 40°10' N. lat.	18.5		$155,826
Pacific ocean perch N of 40°10' N. lat.	1.3	191.5	$2,345
Petrale sole N of 40°10' N. lat.	14.5	30	$35,659
Petrale sole S of 40°10' N. lat.	4.2		$25,027
Sablefish N of 36° N. lat.	2,791	2825	$2,647,000
Sablefish S of 36° N. lat.	474	1,080	$1,350,997
Shortbelly rockfish N of 40°10' N. lat.	<0.1	--	NA
Shortbelly rockfish S of 40°10' N. lat.	<0.1		NA
Shortspine thornyhead N of 34°27' N. lat.	4.60	67.5	$43,522
Starry flounder N of 40°10' N. lat.	<0.1	171.8	$0
Starry flounder S of 40°10' N. lat.	0.2		$911
Widow rockfish N of 40°10' N. lat.	0.3	400	$915
Widow rockfish S of 40°10' N. lat.	41.1		$279,137
Yellowtail rockfish N of 40°10' N. lat.	2.9	36.9	$9,733

Table 4-31. Cowcod south of 40° 10’ N. lat projected mortality under the Preferred Alternative compared to the ACT, non-trawl allocation, and non-trawl HG.

Alternative	Projected Mortality	ACT	Non-Trawl Allocation	Non-Trawl Commercial HG
Preferred	1-3	50	32	16

Table 4-32. Yelloweye rockfish projected mortalities for 2021-2022 under the Preferred Alternative compared to No Action.

Option	Projected mortality (mt)	ACT (mt)	HG (mt)
No Action	3.2	6.2 = 2021 6.4 = 2022	7.9 = 2021 8.1 = 2022
Preferred	3.9		

a/ *Includes 0.9 mt CA nearshore, 1.4 mt non-nearshore (Agenda Item G.6 Supplemental Attachment 4 April 2020 + 1.6 mt Oregon nearshore (Agenda Item G.6 Attachment 2 (Electronic Only) April 2020*

4.2.1.7 Non-trawl Rockfish Conservation Area Adjustments

South of 40°10 N. lat.

The Council adopted the Rockfish Conservation Areas (RCA) adjustments and updates off of California consistent with Agenda Item H.8.a, Supplemental CDFW Report 1, November 2019 and adopted the proposed corrections[16] to the 100 fathom RCA line south of 34°27' N. lat as described in Agenda Item H.4.a, Supplemental CDFW Report 1, March 2020 as Preferred Alternative. The Preferred Alternative RCA adjustments are summarized below and impacts are described in Section 4.3.6.6. The Council's Preferred Alternative for adjustments to recreational RCAs are also discussed below at 4.2.1.12.

RCA Coordinate Updates

1. RCA waypoint additions to the 40-fathom line off central CA
2. RCA waypoint additions and corrections to the 100-fathom line south of Pt. Conception

Recreational :

1. Mendocino Groundfish Management Area (Cape Mendocino to Point Arena): Increase the allowable depth during the open season (May through October) from 20 to 30 fathoms.
2. San Francisco Groundfish Management Area (Point Arena to Pigeon Point): Increase the allowable depth during the open season (April through December) from 40 to 50 fathoms.
3. Southern Groundfish Management Area (Point Conception to the U.S.-Mexico border): Increase the allowable depth during the open season (March through December) from 75 to 100 fathoms.

Commercial (Described in Action Item 2 – Area Management):

1. Implement a new management line at 38°57.5′ N. lat., (Point Arena) for purposes of defining RCA boundaries.
2. In the area between 38°57.5′ and 34°27′ N. lat., (Point Arena to Point Conception): Increase the depth of the shoreward RCA boundary from 40 to 50 fathoms. [NOTE: The shoreward RCA depth between 40°10′ N. lat. and 38°57.5′N. lat. would remain unchanged; at 40 fathoms.]
3. From 34°27′ N. lat. (Point Conception) to the U.S.-Mexico border: Increase the depth of the shoreward RCA boundary from 75 fathoms to 100 fathoms.

[16] These corrections were discussed the Groundfish Advisory Subpanel and the Groundfish Management Team April 2020 reports and the Council recommended these corrections as Preferred Alternative however, they were inadvertently edited out of the April Agenda Item G.6, Attachment 2, April 2020 analytical document under No Action. The corrections are restored to No Action below.

North of 40°10 N. lat.

The Council also adopted the following change to the commercial non-trawl RCA between 40°10 N. lat and 46°16 N.' N. lat (Oregon/Washington border), whereby between the 30 fathom and 40 fathom management lines to allow fishing with hook-and-line gear except bottom longline and dinglebar, as defined in federal regulations at 50 CFR §660.11.

The purpose of opening this depth range north of 40°10' N. lat. I to provide access to underutilized target groundfish stocks that occur on the shelf (Agenda Item H.8.a, Supplemental ODFW/CDFW Report 1, April 2020). Higher trip limits are helpful, but the status quo non-trawl RCA boundaries continue to prevent access to the core depth range of the target species. Previous analyses demonstrate that total catch of target stocks (e.g., lingcod, and canary, widow, yellowtail, and shelf rockfishes) are expected to be within the non-trawl sector allocation, even with higher trip limits and under opening 30-40 fathoms (Agenda Item H.8.a, Supplemental ODFW/CDFW Report 1, April 2020; Agenda Item F.1, Attachment 8, June 2020). The projected ex-vessel gains of mixed target stocks for Option B-2 is ~$135,000-$150,000 per year.

As detailed in Agenda Item F.1.a, Supplemental GMT Report 4, June 2020, yelloweye rockfish bycatch concerns are low with this proposals. The projected yelloweye rockfish bycatch if all non-trawl RCA proposals are opened is 4.5-5.0 mt of the 6.2-6.4 mt ACTs for the coastwide commercial non-trawl fisheries. The projected yelloweye rockfish bycatch is ~3 mt less than the HGs, which provides a buffer for uncertainty in bycatch projections. Commercial non-trawl projections of yelloweye rockfish are uncertain due to high variability in bycatch rates, low observer coverage, and bycatch estimates not being available until August of the following year. Bycatch of yelloweye rockfish could be higher than anticipated, but would need to be almost twice as high as projected to result in an exceedance of the HG. In the unlikely event that bycatch does exceed the yelloweye rockfish HG, total mortality from all sectors would still only be 30-35 mt of the 50 and 51 mt annual catch limits (ACLs) for 2021 and 2022, respectively (Agenda Item G.6 Attachment 2, April 2020). There are minimal bycatch concerns for other groundfish or non-groundfish stocks with the opening of this depth bin. Specifically, for salmon, non-trawl gears historically have minimal bycatch of salmon compared to trawl gears and therefore there is no additional risk to the salmon threshold.

4.2.1.8 Tribal Fisheries

The Council adopted the No Action treaty tribes preferred management measures are detailed in Agenda Item G.6.a, Supplemental Tribal Report 1, April 2020 as Preferred Alternative.

The tribal set-asides are the same as the 2019-2020 biennium, with the exception of the following: petrale sole from 290 mt to 350 mt (an increase of 70 mt), longnose skate from 130 mt to 220 mt (an increase of 90 mt), yelloweye rockfish from 2.3 mt to 5.0 mt (increase of 1.7 mt), and establishment of a 2.0 mt of WA cabezon/greenling complex (Table 4-33). With the selection of the Alternative 1 ABC with the Method 2 apportionment for sablefish, the tribal allocation of sablefish north of 36° N. lat. for 2021 and 2022 is the same as shown in Table 4-171 under Method 2. As described under Tribal Fisheries No Action Section., based on new data, the estimated discard mortality used by the treaty tribes for 2021-22 will be 1.7 percent instead of the 1.5 percent used in the 2019-20 biennium.

Table 4-33. Preferred Alternative - Treaty harvest guidelines and set-asides for 2021-2022 in metric tons(mt).

Species	Treaty harvest guidelines, set-asides, and allocations (mt)
Arrowtooth flounder	2,041
Big skate	15
Black rockfish (WA) a/	18.14
Cabezon (WA)	2
Canary rockfish	50
Darkblotched rockfish	0.2
Dover sole	1,497
English sole	200
Lingcod	250
Longnose skate	220
Longspine thornyheads	30
Other flatfish	60
Pacific cod	500
Pacific ocean perch	9.2
Pacific whiting	17.5% of TAC
Petrale sole	350
Sablefish north of 36° N. lat.	689.2 (2021) / 656.6 (2022)
Shortspine thornyheads	50
Spiny dogfish	275
Widow rockfish	200
Yellowtail rockfish	1,000
Yelloweye rockfish	5

a/ The treaty harvest guideline of black rockfish is set at 30,000 lbs north of Cape Alava and 10,000 lbs between Destruction Island and Leadbetter Point (50 CFR 660.50(f)(1))

4.2.1.9 Washington Recreational Management Measures

The Council adopted as the Preferred Alternative the No Action Alternative harvest specifications for all stocks for which the Washington recreational fishery receives a state share. In addition, the Council also adopted, as their Preferred Alternative, the Washington recreational management measures recommended in Agenda Item F.1.a, Supplemental WDFW Report 1 June 2020

Under the No Action Alternative for yelloweye rockfish, which uses the ACLs based off the DHCR for 2021 and 2022 and includes a 50 and 51 mt ACL, respectively, the Washington recreational yelloweye rockfish HGs would be 9.7 and 9.9 mt and the Washington recreational fishery would be managed to yelloweye rockfish ACTs of 7.5 and 7.8 mt for 2021 and 2022, respectively (Table 4-34).

Table 4-34. Preferred Alternative – HGs for the Washington recreational fishery.

Species	HG (mt)	
	2021	2022
Canary Rockfish	43.3	42.2
YELLOWEYE ROCKFISH	9.7 (ACT = 7.5)	9.9 (ACT = 7.8)
Black Rockfish	274.9	272.9
Nearshore Rockfish North of 40°10´ N. lat.	18.4	17.7
WA Cabezon/Kelp Greenling	18.0	15.0

Groundfish Season and Area Restrictions

Season Structure

Marine Area	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
3 & 4 (N. Coast)	BF Closed		BF Open		BF Open < 20 fm June 1 – July 31 OR Aug 15 a/ b/			BF Open		BF Closed		
2 (S. Coast)	BF Closed		BF Open c/d/			BF Open d/				BF Closed		
1 (Col. River)	BF Closed		BF Open e/ f/							BF Closed		

a/ Retention of Pacific cod, sablefish, lingcod, bocaccio, silvergray rockfish, canary rockfish, widow rockfish, and yellowtail rockfish allowed > 20 fm on days when Pacific halibut is open.
b/Retention of yellowtail and widow rockfish is allowed > 20 fm in July and August.
c/ From May 1 through May 31 lingcod retention prohibited > 30 fathoms except on days that the primary halibut season is open.
d/When lingcod is open, retention is prohibited seaward of line drawn from Queets River (47°31.70' N. Lat. 124°45.00' W. Lon.) to Leadbetter Point (46° 38.17' N. Lat. 124°30.00' W. Lon.), except on days open to the primary halibut fishery and, June 1 – 15 and September 1 - 30.
e/Retention of groundfish allowed during the all-depth Pacific halibut fishery. Lingcod retention is only allowed north of the WA-OR border with halibut on board.
f/Retention of lingcod is prohibited seaward of a line drawn from Leadbetter Point (46° 38.17' N. Lat. 124°21.00' W. Lon.) to 46° 33.00' N. Lat. 124°21.00' W. Lon. year round except lingcod retention is allowed from June 1 - June 15 and Sept 1 - Sept 30.

Figure 4-20. Preferred season structure for Washington in the 2021-2022 biennium.

Management Measures Specific to Washington Marine Areas

Marine Areas 3 and 4 (North Coast)

- Revise dates the 20-fathom depth restriction is in place from June 1 through July 31
- Retention of the following species seaward of 20 fathoms would be allowed on days open to the recreational halibut fishery: Pacific cod, sablefish, lingcod, bocaccio, silvergray rockfish, canary rockfish, widow rockfish, and yellowtail rockfish. These fish would fall under the 9 fish recreational groundfish daily aggregate limit.
- Retention of yellowtail and widow rockfish would be allowed seaward of 20 fathoms in July and August.

Marine Area 2 (South Coast)

- The 30 fathom depth restriction is to be in place from May 1 through May 31.

- Deepwater lingcod closure area would open during the following periods: June 1 through June 15 and September 1 through September 30.
- The Washington South Coast and Westport YRCAs would be open for recreational fishing.

Marine Area 1 (Columbia River)

- Deepwater lingcod closure area would open during the following periods: June 1 through June 15 and September 1 through September 30.
- In addition to the species already permissible to retain, allow the retention of yellowtail rockfish, widow rockfish, canary rockfish, redstriped rockfish, greenstriped rockfish, slivergray rockfish, chilipepper, bocaccio, and blue/deacon rockfish on all depth halibut days.

Bag Limits and Sub-bag Limits

The aggregate daily groundfish limit would be nine fish per day which can include up to, seven rockfish, two lingcod and one cabezon. Further, anglers would be allowed to retain five flatfish in addition to the nine fish daily aggregate groundfish limit. There are no size limits for any species and the retention of yelloweye rockfish would continue to be prohibited in all areas (Marine Areas 1 – 4).

Lingcod Season and Size Limits

Same as No Action

Pacific Halibut Seasons.

Same as described under No Action.

Impact (Groundfish Mortality)

Projected mortality for rebuilding and non-overfished species under the Preferred Alternative are summarized in Table 4-35.

Table 4-35. Projected Mortality (in mt) for the Washington Recreational fishery under the preferred alternative.

Stock	2021-2022 Projected Mortality (mt)
Canary Rockfish	15.34
YELLOWEYE ROCKFISH	5.72
Black Rockfish	234.5
Bocaccio	3.6
Lingcod	183.89
Nearshore Rockfish	10.05
Blue Rockfish	*1.24*
Quillback Rockfish	*3.16*
Copper Rockfish	*3.09*
China Rockfish	*2.56*
Brown Rockfish	--
Grass Rockfish	--
Yellowtail Rockfish	60.46
Vermilion Rockfish	3.24

Stock	2021-2022 Projected Mortality (mt)
Cabezon	*9.01*
Kelp Greenling	*1.63*

4.2.1.10 Oregon Recreational Management Measures

The Council adopted the Alternative 1 season structure and depth restrictions as shown in Figure 4-17 as their Preferred Alternative for the Oregon recreational fishery, consistent with, Agenda Item, F.1.a, ODFW Report 1, June 2020. The Oregon recreational harvest HGs or presumed state quotas for 2021-2022 are shown in Table 4-36

Table 4-36. Preferred Alternative - Oregon recreational Federal harvest guidelines (HG),/state quotas (mt).

Stock	2021 HG [a/]	2022 HG [a/]
Black Rockfish	389.1	389.1
Blue/Deacon Rockfish	73.7	71.2
Canary Rockfish b/	65.1	63.5
Cabezon	19.4	18.6
Greenlings c/	35.8	34.4
Nearshore Rockfish North of 40°10' N. Lat.	10.8	10.5
YELLOWEYE ROCKFISH (ACT/HG values)	6.9/8.8	7.1/9.0

a/ The state process in Oregon establishes the commercial and recreational quotas for black, blue, and deacon rockfish, cabezon, greenling, and nearshore rockfish. The values are the presumed recreational share based on the 2020 recreational and commercial sharing percentages in Oregon state regulations.
b/ Federal HGs are established for canary and yelloweye rockfish and should be included in Federal regulation.
c/ Includes kelp and other greenlings. Kelp greenling accounts for over 99 percent of the landings.

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Bottomfish Season	Open all depths											
Marine Bag Limit [a/]	Ten (10)											
Lingcod Bag Limit	Three (3)											
Flatfish Bag Limit [b/]	Twenty Five (25)											

a/ Marine bag limit is 10 fish per day and includes all species other than lingcod, salmon, steelhead, Pacific halibut, flatfish, surfperch, sturgeon, striped bass, pelagic tuna and mackerel species, and bait fish such as herring, anchovy, sardine, and smelt; of which no more than one may be cabezon.
b/ Flounders, soles, sanddabs, turbots, and halibuts except Pacific halibut

Figure 4-21. ODFW recommended Oregon recreational groundfish season structure and bag limits for 2021 and 2022 under the Preferred Alternative.

Size Limits

Same as No Action, which are 16 inches for cabezon and 22 inches for lingcod.

Pacific Halibut Seasons.

Same as described under No Action. Additionally, under the Preferred Alternative, longleader gear and all-depth Pacific halibut fishing would be allowed on the same trip. Groundfish species that will allowed to be retained are the same as those allowed for longleader gear: yellowtail rockfish, widow rockfish, canary rockfish, redstriped rockfish, greenstriped rockfish, silvergrey rockfish, chilipepper, bocaccio, and blue/deacon rockfish (Agenda Item G.6.a, ODFW Report 1, April 2020).

Impact (Groundfish Mortality)

Under the Preferred Alternative, the projected groundfish mortality is the same as shown in Table 4-37, which is the same as No Action.

Table 4-37. Projected Mortality (mt) of species with Oregon recreational specific allocations under the Preferred Alternative.

Stock	Projected Mortality (mt)
Canary Rockfish	38.4
YELLOWEYE ROCKFISH	4.5
Black/Blue/Deacon Rockfish OR	322.4
Cabezon/Greenlings a/	18.2
Nearshore Rockfish North of 40° 10' N. lat.	17.3
Yellowtail Rockfish	26.8
Widow Rockfish	4.0

a/ Includes kelp and other greenlings

4.2.1.11 California Recreational Management Measures

The Council adopted California recreational fishery management measures consistent with Agenda Item G.6.a, Supplemental CDFW Report 1, April 2020. The California recreational fishery will be managed to the following HGs or within the combined non-trawl harvest specifications shown in Table 4-38.

Table 4-38. Preferred Alternative - California Recreational: Allocations (mt) to the non-trawl sector and shares (mt) for the California recreational fisheries for 2021 and 2022.

Stock	Non-Trawl Allocation (mt)	California Recreational HG (mt)
Bocaccio	1036.4/1021.8	716.2/706.1
Canary rockfish	351.6/343.1	116.7/113.9
Cowcod	36	18
Darkblotched	42.4/39.9	
Nearshore rockfish North of 40°10´ N lat.	78.6/73.9	
POP	191.5/184.3	
Petrale sole	186.4/163.6	
Yelloweye Rockfish	37.9/38.8	11.4/11.7

Cowcod

The Council adopted the Alternative 1 harvest specification for cowcod, with ACLs of 87 mt and 85 mt for 2021-2022, respectively and a 50 mt ACT. The 50 mt ACT is further divided into the trawl/non-trawl allocation shares (36 percent trawl, 64 percent non trawl) followed by a 50:50 split of the within non-trawl fishery between recreational and commercial (Figure 4-22). The California recreational HG is 18 mt.

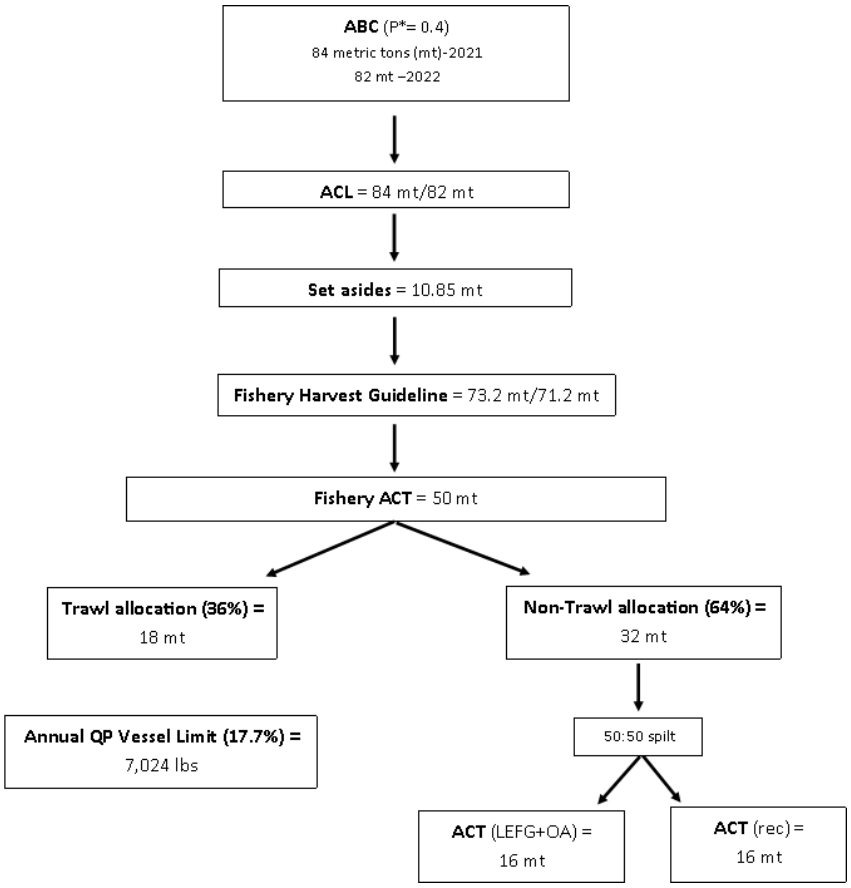


Figure 4-22. Preferred allocations and shares for cowcod for 2021-2022.

Season Structure

The Council selected the season structure and management measures as described in Agenda Item G.6.a, Supplemental CDFW Report 2, April 2020 as their Preferred Alternative (Table 4-39).

Table 4-39. Preferred Alternative - California recreational season structure and RCA depth boundaries by management area and month.

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	Closed				May 1 – Oct 31 <30fm						All Depth	
Mendocino	Closed				May 1 – Oct 31 <30fm						All Depth	
San Francisco	Closed			April 1 – Dec 31 <50fm								
Central	Closed			April 1 – Dec 31 <50fm								
Southern	Closed		Mar 1 – Dec 31 <100 fm									

Area Management

The Council recommended modifying the seaward depth boundaries for the Mendocino, San Francisco, and Southern Recreational Management Areas. As described under No Action, the seaward depth boundary of the RCA would increase by 10 fathoms for the Mendocino (from 20 fm to 30 fm) and San Francisco (from 40 fm to 50 fm) Management Areas and increase by 25 fathoms from 75 fm to 100 fm for the Southern Management Area. The season structures for these management areas are shown above in Table 4-39. All

other depth restrictions (e.g., CCA, YRCAs, etc.), including the RCA depth boundaries for the Northern and Monterey Management Areas, would remain the same as described under No Action.

Recreational (Described in Action Item 2 - Area Management; and Action Item 16 – CA Recreational):

1. Mendocino Groundfish Management Area (Cape Mendocino to Point Arena): Increase the allowable depth during the open season (May through October) from 20 to 30 fathoms.
2. San Francisco Groundfish Management Area (Point Arena to Pigeon Point): Increase the allowable depth during the open season (April through December) from 40 to 50 fathoms.
3. Southern Groundfish Management Area (Point Conception to the U.S.-Mexico border): Increase the allowable depth during the open season (March through December) from 75 to 100 fathoms.

Groundfish Bag Limits, Gear Limits, and Size Limits

The Council adopted the No Action bag limits, gear limits, and size limits except for black rockfish, canary rockfish, vermilion rockfish and cabezon as their Preferred Alternative. Under the Preferred Alternative, black rockfish, canary rockfish, and cabezon the sub-bag limits for these species are removed and would be subject to the aggregate Rockfish/Cabezon/Greenling (RCG) 10-fish daily bag limit as described under Alternative 1. The Council recommended a vermilion rockfish sub bag-limit of five (5) fish within the overall 10-fish RCG aggregate bag limit. These modifications are summarized in Table 4-40.

Table 4-40. Preferred Alternative - Bag limits for black rockfish, canary rockfish, cabezon and sub-bag limit for vermilion rockfish

Species	Preferred Bag Limit a/
Black rockfish	Up to 10
Canary rockfish	Up to 10
Cabezon	Up to 10
Vermilion rockfish	5

a/ subject to aggregate RCG daily bag limit of 10 fish

Lingcod Seasons, Bag Limits, Hook Limits, and Size Limits

Same as described under No Action

California Scorpionfish Seasons, Bag Limits, and Size Limits

Same as described under No Action.

Pacific Halibut Seasons.

Same as described under No Action.

Impact (Groundfish Mortality)

The projected mortality under the Preferred Alternative is presented in Table 4-41. Under the Preferred Alternative, and as described under Option 2 in Alternative 1 for the California recreational fishery, there are projected increases in mortality for bocaccio, canary rockfish, cowcod, yelloweye rockfish, black rockfish, widow rockfish, lingcod south of 40°10’ N. lat., and nearshore rockfish south of 40°10’ N. lat. compared to No Action. The increased depths of the Mendocino, San Francisco, and Southern Management Areas are expected to increase mortality of these species; however, they are still projected to remain under

HGs. Yelloweye rockfish mortality is expected to increase to 8.5 mt; however, the ACT of 8.9 mt for 2021 and 9.2 mt for 2022 are still below the HG of 11.4 in 2021 and 11.7 mt in 2022.

Table 4-41. Preferred Alternative- Projected mortality for select species in the California recreational fishery in 2021-2022.

Stock	Projected Recreational Mortality	California Recreational HG 2020/21	Non-Trawl Allocation 2021/22
Bocaccio	179.9	716.2/706.1	1036.4/1021.8
Canary Rockfish	117.4	116.7/113.8	351.6/343.1
Cowcod	4.1	16	32
Yelloweye Rockfish	8.5	11.4/11.7	37.9/38.8
Black Rockfish	197.8	-	346.7/339.7
Cabezon	25.6	-	208.7/193.7
California Scorpionfish	157.1	-	287.1/271.1
Greenlings b/	5.1	-	b/
Lingcod N. of 40°10' N. lat. c/	48.9	-	2799.8/2573.8
Lingcod S. of 40°10' N. lat.	419.5	-	653.4/695.4
Widow Rockfish	30.2	-	1302.9/1218.6
Nearshore Rockfish N. of 40°10' N. lat. d/	20.0	-	78.6/73.9
Nearshore Rockfish S. of 40°10' N. lat.	548.3	-	1011.6/1005.6
Petrale sole	6.1	-	186.4/163.6
Starry flounder	3.5	-	171.8

a/ Includes non-nearshore, nearshore, and recreational.
b/ Greenling is managed within the Other Fish Complex
c/ Projected impacts include only the area between 42° N latitude and 40°10' N latitude, while the non-trawl allocation is applicable for the entire area North of 40°10' N latitude.
d/not an official non-trawl allocation in regulation, but rather the sum of the WA, OR, CA state HGs that are managed to by the states as to not exceed the ACL when also factoring in minor IOA, tribal, EFP, research, and trawl impacts

4.2.2 No Action – Default Harvest Control Rule

4.2.2.1 Deductions from the ACL

Table 4-49 and Table 4-50 the deductions from the ACLs in 2021 and 2022, respectively, under No Action necessary to calculate the harvest guideline (HG). The analyses for deductions from the ACL are detailed below.

Tribal Fishery: Under No Action, the Council recommended ACL deductions for tribal fisheries to be the same as in 2019, except petrale sole, longnose skate, yelloweye rockfish, and cabezon. The values for the set-aside for petrale sole is increased from 290 mt to 350 mt (70 mt), longnose skate is increased from 130 to 220 mt (90 mt), yelloweye rockfish is increased from 2.3 to 5.0 mt, and a 2 mt set-aside for cabezon was established (Agenda Item H.8.a, Supplemental Revised Tribal Report 3, November 2019) to better accommodate tribal fisheries.

Research: The Council recommended the research ACL deductions be equal to the maximum historical scientific research catch from 2005 to 2018, except for cowcod and yelloweye rockfish, as detailed in Agenda Item H.8.a, Supplemental GMT Report 1, November 2019. For cowcod, the Council recommended increasing the research set-aside to 10 mt to account for research needs off the coast of California, as described in Agenda Item H.8.a, Supplemental CDFW Report 2, November 2019. For yelloweye rockfish, the GMT recommended the Council adopt an amount different than the historical high (1.8 mt in 2007) that would be based on the anticipated needs of the specific research project. The Council adopted a research set-aside of 2.92 mt.

Incidental Open Access (IOA): The Council recommended that IOA ACL deductions to be set at the maximum historical values[17] (2007-2018)[18], with the exception of petrale sole, sablefish south of 36° N. lat., and darkblotched rockfish (described below). The Council is considering changing the IOA set-aside for yellowtail rockfish north of 40°10' N. lat. to accommodate proposed yellowtail rockfish trip limit adjustments for salmon trollers in the non-trawl RCA. Additionally, the Council is considering establishing a yellowtail rockfish trip limit for salmon trollers in the non-trawl RCA south of 40°10' N. lat. In that area, yellowtail rockfish are managed as part of the Shelf Rockfish Complex south of 40°10'N. lat.; therefore, a trip limit this species may require adjustments to the Shelf rockfish Complex south of 40°10' N. lat. to accommodate this proposal. These proposal are discussed below.

Petrale Sole

For petrale sole, the Council recommended using the 2005-2018 average IOA mortality of 13.3 mt instead of the historical maximum of 34.3 mt. This average value is expected to accommodate annual IOA bycatch as this fleet has attained less than this amount since the IFQ program was implemented. This reduction will increase the HG by 19.95 mt, which may provide additional opportunity and benefits to the groundfish fishery.

Sablefish South of 36° N. lat.

For sablefish south of 36° N. lat., the Council recommended an IOA set-aside of 25 mt. instead of the historical maximum of 11.8 mt. This recommendation was made based 1) indications of a strong year class entering the fishery and 2) current market conditions are resulting in lower than normal IFQ attainments.

[17] Historical values are derived from the. WCGOP groundfish mortality reports and the GEMM data product

[18] Longnose and big skate were managed within complexes until 2009 and 2015, respectively, and therefore, the maximums are from only those years where sorting was required.

This set-aside amount is not expected to constrain groundfish fisheries in south of 36° N. lat. and may allow non-groundfish fisheries to continue operation should they encounter unexpectedly high sablefish bycatch

Darkblotched Rockfish

The Council is considering three options to adjust the darkblotched rockfish IOA set-aside, the historical maximum, historical average, and historical median for 2005-2018. Table 4-42 shows the historical total mortality and the IOA set-aside from 2005-2018. Since the implementation of set-aside management in 2011, the IOA sector has taken less than 40 percent of the darkblotched rockfish set-aside except for 2014. The 2014 mortality is approximately 3.6 to 6.8 times higher than the years from 2005-2018 (Table 4-42) and the majority is from the pink shrimp fishery. As described in Agenda Item I.9.a., Supplemental GMT Report 3, November 2015, the 24.6 mt is anomalous compared to all other years and may, instead, represent a high recruitment year.

Table 4-42. Total mortality (mt), annual set-aside (mt)e, and percent attainment of darkblotched rockfish from IOA sector, 2005-2018. (source: GEMM). Values in metric tons (mt)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Mortality	13.6	0.1	18.5	12.4	18.6	12.5	5.5	5.0	3.8	24.6	5.3	6.4	6.7	3.6
Set-aside	-	-	-	-	-	-	15	15	18.4	18.4	18.4	18.4	24.5	24.5
% Attainment	-	-	-	-	-	-	37%	33%	21%	134%	29%	35%	28%	15%

Table 4-43 shows the three options, resulting trawl allocations, annual vessel limits (6.8 percent), and at-sea set-aside values based on the A-21 formula. Other options for the at-sea set-asides for darkblotched rockfish are being considered and may change the IFQ allocations and resulting annual vessel limit (AVL).

Table 4-43. Set-aside options and resulting trawl allocation, CP and MS set-asides (using Amendment 21 formula), IFQ allocation, AVL (lbs.), and non-trawl allocation for 2021. All values in mt, except AVL.

Option	Set-aside	HG	Trawl All	CP	MS	IFQ	AVL lbs.	Non-Trawl Alloc.
Option 1: Historical Maximum	24.6	848.1	805.7	24.7	17.4	763.6	116,348	42.4
Option 2: Average	9.8	862.9	819.8	25.1	17.7	777.0	118,379	43.1
Option 3: Median	6.6	866.1	822.8	25.2	17.8	779.8	118,818	43.3

The historical maximum would address the highest observed annual catch. The five-year median would account for three of the most recent five years' bycatch levels, while the mean would account for four years.

If the Council adopted an Option other than the historical maximum, the resulting impact would be less than 1 mt combined to the at-sea sectors (under status quo) and between approximately 2,000 and 2,500 additional pounds for the individual fishing quota AVL (13.4 mt-16.2 mt to the sector overall). Given that darkblotched has been noted to be a constraining species at the individual level, this could provide some additional opportunity to individuals. Overall attainment in the IFQ sector of darkblotched has averaged 50 percent in 2018-2019.

In terms of the risk of the IOA sector exceeding its set-aside and the risk to the ACL, even if the Council were to choose the average option, the non-trawl sector has only taken between 3.7-5.7 mt in the last five

years. That, on average, is only approximately 11 percent of the proposed non-trawl allocation in 2021 for any of the proposed options in Table 4-43. Therefore, even if the IOA fisheries were to take the 24.6 mt historical maximum, there would be little risk to the ACL.

Yellowtail Rockfish Retention within the Non-trawl RCA in the Salmon Troll Fishery North of 40°10' N. lat.

The Council adopted the historical IOA maximum of 7.0 mt for the for yellowtail north of 40°10' N. lat. set-aside. However, the Council is considering adjusting IOA trip limits for the salmon troll fishery in this area. A change to the trip limit warrants reanalysis of the IOA set-aside.

As part of the 2017-2018 management cycle, yellowtail rockfish was removed from the open access multi-stock trip limit and set at 500 lbs. per month; however, the salmon troll yellowtail rockfish trip limit did not reflect this change. Therefore, in addition to providing additional opportunity to salmon troll participants for a stock with moderate attainment, adjusting the salmon troll trip limit may be warranted to reflect the changes in the OA groundfish sector. The proposed trip limits for 2021-2022 are to remain status quo (Option 1), remain status quo on the ratio but increase the monthly limit (Option 2), adjust the ratio to a 1:1 and increase the monthly limit (Option 3), or eliminate the ratio so that trollers would fish subject only to a monthly limit (Table 4-44). Note, the adjusted 2021-2022 salmon troll monthly limit would continue to be within the general OA monthly limit for yellowtail rockfish north of 40°10' N. lat. of 500 lbs., not in addition to the OA trip limit. All of the alternative options would remove yellowtail rockfish from the current complex management. All other regulations regarding groundfish retention in the commercial salmon fishery would still apply as noted in the 50 CFR 660 Subpart H.

Table 4-44. Status quo and proposed adjustments to the yellowtail rockfish trip limit in the Salmon Troll fishery north of 40°10' N. lat.

Option	Ratio (per trip)	Monthly Limit
1 (SQ)	1 lb. yellowtail per 2 lbs. of salmon	200 lbs.
2	1 lb. yellowtail per 2 lbs. of salmon	500 lbs.
3	1 lb. yellowtail per 1 lb. salmon	500 lbs.
4	No ratio – any salmon on board	500 lbs.

The first and only analysis of the current limit was by the GMT in 2001 at the request of Washington salmon trollers (Agenda Item F.5.b Supplemental GMT Report, April 2001) and has been the trip limit since 2002. There are three main elements of current salmon troll yellowtail rockfish allowance: (1) the allowable ratio of yellowtail rockfish to salmon per trip, (2) the cumulative monthly limit for yellowtail rockfish; and (3) the additional species included in the OA monthly limit. The ratio is the main mechanism for limiting opportunity for the targeting of yellowtail rockfish, another is the monthly cumulative limit within the minor shelf rockfish, widow rockfish, and yellowtail rockfish OA trip limit. The intent of the original language was to not allow trollers to fish over and above what they could land when operating in the OA fishery outside of the salmon troll fishery.

Although this trip limit is to allow for the incidental take of yellowtail rockfish in the salmon troll fishery, the incidental rate of encounter of yellowtail rockfish is difficult to evaluate because the salmon troll fishery is not observed by WCGOP and so discards are unknown. Just as in 2001, landings information is the best available data to evaluate the trip limit change. However, interpretation of landings information is complicated because only a portion of the troll fleet chooses to retain groundfish and therefore it is difficult to determine if there is additional incidental catch not being retained.

The following summarizes the findings of the trip limit and economic analysis that can be found in Agenda Item G.6, Attachment 4, Yellowtail Rockfish Retention: Salmon Troll N. of 40°10 N. lat., April 2020

1. During the non-trawl RCA era, annual yellowtail rockfish landings from the salmon troll fishery north of 40° 10' N lat. have been 2 - 4 mt.
2. Current trip limits are rarely constrained by the ratio or the poundage.
3. Minimal mortality expected with any option in.
4. Doubling landings to 4 - 8 mt would take extreme behavioral changes.
5. Targeting is unlikely due to the low price per pound for yellowtail rockfish.

The proposed IOA set aside for yellowtail rockfish north of 40° 10' N. lat. is 7 mt based on the historical maximum catch (sourced from GEMM product, Somers et al. 2019)--the Council's preference for setting off-the-top deductions for IOA fisheries. Table 4-45 shows the maximum catch was in 2005, yet the catch has since been less than 4.5 mt and averaging only 2.7 mt overall. Therefore, the GMT believes there is no need to increase the IOA set aside as additional impacts from the trip limit adjustment would likely be within the 7 mt set aside.

Table 4-45. Annual and average mortality (mt) of yellowtail rockfish north of 40° 10' N. lat. from the IOA fisheries, 2005-2018.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg
Mortality	7.0	3.6	2.8	0.2	0.8	1.7	1.3	3.3	1.5	3.3	4.5	3.2	1.7	2.9	2.7

Yellowtail Rockfish Retention within the Non-trawl RCA in the Salmon Troll Fishery South of 40°10' N lat.

The Council is considering establishing a trip limit for yellowtail rockfish in the salmon troll fishery south of 40°10' N. lat. of 1 lb. yellowtail rockfish per 2 lbs of Chinook salmon, with a monthly trip limit of 200 lb. As this species is managed as part of the Shelf Rockfish Complex south of 40°10'N. lat., the Council considered modifying the IOA set-aside, as necessary, to accommodate this new trip limit.

The analysis in Agenda Item G.6.a, Attachment 2, April 2020 (*included in Section 4.2.5.4 below*) indicated the projected mortality would be within the historical maximum IOA set-aside for the Shelf Rockfish Complex south of 40°10' N. lat. of 67.7 mt. If IOA mortality exceeds the set-aside, there is little risk to the ACL as the projected trawl/non-trawl mortality for the complex is well below their respective allocations. Therefore, the Council did not recommend changing the Shelf Rockfish Complex south of 40°10' N. lat. set-aside amount of 67.7 mt

Although yellowtail rockfish is managed with stock specific harvest specifications north of 40° 10' N. lat., south of 40°10' N. lat., it is managed as part of the shelf rockfish complex. The projected impacts could be up to 22 mt based on a landings scenario discussed with industry in which vessels that caught 50 percent of the salmon (80 vessels in 2019) landed the maximum amount of yellowtail rockfish based on the Chinook salmon landed. However, it is likely that the actual estimates would be much lower as only 53 salmon permitted vessels landed yellowtail rockfish in 2019 and Vessel Monitoring System (VMS) is only required in the EEZ (i.e. outside of state waters for open access vessels). With the additional cost of VMS to fish within the RCA and retain groundfish, the number of participants may likely be lower. While the price per pound of yellowtail rockfish is higher in the south than the north, the lack of yellowtail rockfish landings north of 40° 10' N. lat, that have access to the RCA for retention suggests that the mortality may be closer to that in Table 4-45.

Exempted Fishing Permits: The Council forwarded EFPs for analysis and are summarized in Table 4-44. The set-aside amounts, by applicant, are shown in Table 4-44. The cumulative requested set-asides, by species and complex, are shown in Table 4-47 and Table 4-48:

Table 4-46. Table summarizing EFPs recommended by Council for further analysis.

Title and Sponsor	Short Description
Recreational Cowcod Retention in California – California Department of Fish and Wildlife	The purpose of this EFP is to provide an exemption to allow for retention of cowcod for biological data collection for use in future stock assessments. No set-aside requested.
Midwater Jig Fishing in California – San Francisco Community Fishing Association & Dan Platt (Platt)	Commercial jig fishing targeting yellowtail rockfish in the non-trawl RCA off California, which is a renewal of the 2019-2020 EFP
Midwater Hook and Line Rockfish Fishing in Oregon – Scott Cook (cook)	Commercial Midwater Hook & Line Rockfish Fishing in the RCA off the Oregon Coast
Monterey Bay Regional EFP Targeting Chilipepper Rockfish- Real Good Fish (Lovewell)	Commercial fishery to targeting chilipepper rockfish in the non-trawl RCA in the Monterey Bay region.
Recreational Yelloweye Sampling in Washington – Washington Department of Fish and Wildlife	The purpose of this EFP is to allow retention of yelloweye rockfish from a select group of charter and private fishing vessels during the recreational Pacific halibut fishery in Washington. No set-aside requested.

Table 4-47. Set-aside amounts (in mt) requested by Dan Platt (Platt), Scott Cook (Cook), and Real Good Fish (Lovewell) for their EFP for each species.

Species	Area	Platt	Cook	Lovewell
Arrowtooth flounder	Coastwide	-	0.10	-
Big skate	Coastwide	-	0.10	-
Bocaccio	S of 40°10' N. lat.	10.00	-	30.00
Cabezon (CA)	S of 42° N. lat.	1.00	-	-
Canary rockfish	Coastwide	2.00	5.00	1.00
Chilipepper	S of 40°10' N. lat.	30.00	-	40.00
Cowcod	S of 40°10' N. lat.	0.15	0.00	0.5
Darkblotched rockfish	Coastwide	0.10	0.10	0.40
Dover sole	Coastwide	-	0.10	-
English sole	Coastwide	-	0.10	-
Lingcod	N of 40'10° N. lat.	-	0.10	-
Lingcod	S of 40'10° N. lat.	1.50	-	-
Longnose skate	Coastwide	-	0.10	-
Pacific cod	Coastwide	-	0.10	-
Pacific whiting	Coastwide	1.00	0.10	-
Petrale sole	Coastwide		0.10	-

Species	Area	Platt	Cook	Lovewell
Pacific ocean perch	N of 40º10' N. lat.	-	0.10	-
Sablefish	N of 36º N. lat.	1.00	0.10	-
Shortbelly rockfish	Coastwide	-	0.10	-
Shortspine thornyhead	N of 34º27' N. lat.	-	0.10	-
Spiny dogfish	Coastwide	1.00	0.10	-
Splitnose rockfish	S of 40º10' N. lat.	1.50	-	-
Starry flounder	Coastwide	-	0.10	-
Widow rockfish	Coastwide	9.00	10.00	-
Yelloweye Rockfish	Coastwide	0.06	0.12	0.06
Yellowtail rockfish	N of 40º10' N. lat.	10.00	10.00	20.00
Stock Complexes				
Nearshore rockfish N.	N of 40º10' N. lat.	-	0.50	-
Nearshore rockfish S.	S of 40º10' N. lat.	-	-	-
Shelf rockfish north	N of 40º10' N. lat.	3.00	1.50	-
Shelf rockfish south	S of 40º10' N. lat.	30.00	-	-
Slope rockfish north	N of 40º10' N. lat.	1.00	0.50	-
Slope rockfish south	S of 40º10' N. lat.	1.00	-	-
Other fish	Coastwide	-	0.10	-
Other flatfish	Coastwide	-	0.10	-
Oregon black/blue/deacon	Oregon	-	0.50	-
Oregon cabezon/kelp greenling	Oregon	-	0.10	-

Recreational (sablefish north of 36° N. lat. only): Under No Action, the Council adopted the historical maximum of 6.0 mt for the recreational set-aside for sablefish north of 36° N lat. As this stock is the only one with an off-the-top deduction for recreational fishery, it displayed separately for reference (Table 4-48).

Table 4-48. No Action. Estimates of tribal, research, recreational (Rec), and EFP mortality (in mt), used to calculate the fishery sablefish commercial harvest guideline north of 36° N. lat. for 2021 and 2022 under the status quo apportionment methodology.

Year	ACL	Tribal Share	Research	Rec.	EFP	Commercial HG
2021	6,049.3	604.0	30.7	6.0	1.1	5,407.5
2022	5,756.7	575	30.7	6.0	1.1	5,143.9

Table 4-49. No Action 2021. Estimates of tribal, EFP, research, and IOA groundfish mortality (in mt) used to calculate the fishery HG in 2021.

Stock/Complex	Area	ACL	Tribal	EFP	Research	OA	Sum	Fishery HG
Arrowtooth flounder	Coastwide	9,933.0	2,041.0	0.1	13.0	41.0	2,095.1	7,837.9
Big skate	Coastwide	1,477.0	15.0	0.1	5.5	36.7	57.3	1,419.7
Black rockfish	Washington	293.0	18.0	-	0.1	0.0	18.1	274.9
Black rockfish	California	348.0	-	-	0.1	1.2	1.3	346.7
Blue/Deacon/Black rockfish	Oregon	570.0	-	0.5	0.1	1.7	2.3	567.7
Bocaccio	S of 40°10' N. lat.	1,748.0	-	40.0	5.6	2.2	47.8	1,700.2
Cabezon	California	210.0	-	1.0	0.0	0.3	1.3	208.7
Cabezon/Kelp greenling	Oregon	198.0	-	0.1	0.1	0.1	0.2	197.8
Cabezon/Kelp greenling	Washington	20	2.0	-	-	-	2.0	18.0
California scorpionfish	Coastwide	291.0	-	-	0.2	3.7	3.9	287.1
Canary rockfish	Coastwide	1,338.0	50.0	8.0	10.1	1.3	69.4	1,268.6
Chilipepper	S of 40°10' N. lat.	2,358.0	-	70.0	14.0	13.7	97.7	2,260.3
Cowcod	S of 40°10' N. lat.	98.0	-	0.65	10.0	0.2	10.85	87.2
Darkblotched rockfish	Coastwide	882.0	0.2	0.6	8.5	24.6	33.9	848.1
Dover sole	Coastwide	50,000.0	1,497.0	0.1	50.8	49.3	1,597.2	48,402.8
English sole	Coastwide	9,175.0	200.0	0.1	8.0	42.5	250.6	8,924.1
Lingcod	N of 40°10' N. lat.	5,369.0	250.0	0.1	16.6	11.7	278.4	5,090.6
Lingcod	S of 40°10' N. lat.	1,102.0		1.5	3.2	8.3	13.0	1,089.0
Longnose skate	Coastwide	1,823.0	220.0	0.1	12.5	18.8	251.4	1,571.6
Longspine thornyhead	N of 34°27' N. lat.	2,634.0	30.0	-	17.5	6.2	53.7	2,580.3
Longspine thornyhead	S of 34°27' N. lat.	832.0	-	-	1.4	0.8	2.2	829.8
Nearshore Rockfish North	N of 40°10' N. lat.	79	1.5	0.5	0.5	0.6	3.1	75.9
Nearshore Rockfish South	S of 40°10' N. lat.	1,016.0	-	0.0	2.7	1.7	4.4	1,011.6
Other Fish	Coastwide	223.0	-	0.1	6.3	15.0	21.3	201.7
Other Flatfish	Coastwide	4,802.0	60.0	0.1	23.6	137.2	220.9	4,581.1
Pacific cod	Coastwide	1,600.0	500.0	0.1	5.5	0.5	506.1	1,093.9

Stock/Complex	Area	ACL	Tribal	EFP	Research	OA	Sum	Fishery HG
Pacific ocean perch	N of 40°10' N. lat.	3,854.0	9.2	0.1	5.4	10.0	24.7	3,829.3
Pacific whiting	Coastwide	TBD	TBD	1.1	TBD	1,500.0	1,501.1	TBD
Petrale sole	Coastwide	4,115.0	350.0	0.1	24.1	13.3	387.5	3,727.5
Sablefish	N of 36º N lat.	6049.3	**Table 4-48**					
Sablefish	S of 36° N. lat.	2,159.0	-	-	2.4	25.0	27.4	2,131.3
Shelf Rockfish North	N of 40°10' N. lat.	1,511.0	30.0	4.5	15.3	25.6	75.4	1,435.6
Shelf Rockfish South	S of 40°10' N. lat.	1,438.0	-	30.0	15.1	67.7	112.8	1,325.2
Shortbelly rockfish	Coastwide	500.0	-	0.1	8.2	21.6	29.9	470.1
Shortspine thornyhead	N of 34°27' N. lat.	1,428.0	50.0	0.1	10.5	17.8	78.4	1,349.6
Shortspine thornyhead	S of 34°27' N. lat.	756.0	-	-	0.7	6.0	6.7	749.3
Slope Rockfish North	N of 40°10' N. lat.	1,595.0	36.0	1.5	10.5	18.9	66.9	1,528.1
Slope Rockfish South	S of 40°10' N. lat.	709.0		1.0	18.2	19.7	38.9	670.1
Spiny dogfish	Coastwide	1,621.0	275.0	1.1	34.3	33.6	344.0	1,277.0
Splitnose rockfish	S of 40°10' N. lat.	1,666.0		1.5	11.2	5.8	18.4	1,647.6
Starry flounder	Coastwide	392.0	2.0	0.1	0.6	45.7	48.4	343.6
Widow rockfish	Coastwide	14,725.0	200.0	28.0	17.3	3.1	248.3	14,476.7
Yelloweye rockfish	Coastwide	50.0	5.0	0.24	2.92	0.7	8.9	41.2
Yellowtail rockfish	N of 40°10' N. lat.	6,050.0	1,000.0	40.0	20.6	7.0	1,067.5	4,982.5

Table 4-50. No Action 2022. Estimates of tribal, EFP, research, and IOA groundfish mortality in metric tons, used to calculate the fishery HG in 2022.

Stock/Complex	Area	ACL	Tribal	EFP	Research	OA	Sum	Fishery HG
Arrowtooth flounder	Coastwide	8,458.0	2,041.0	0.1	13.0	41.0	2,095.1	6,362.9
Big skate	Coastwide	1,389.0	15.0	0.1	5.5	36.7	57.3	1,331.7
Black rockfish	Washington	291.0	18.0	-	0.1	-	18.1	272.9
Black rockfish	California	341.0	-	-	0.1	1.2	1.3	339.7
Blue/Deacon/Black rockfish	Oregon	562.0	-	0.5	0.1	1.7	2.3	559.7
Bocaccio	S of 40°10' N. lat.	1,724.0	-	40.0	5.6	2.2	47.8	1,676.2

Stock/Complex	Area	ACL	Tribal	EFP	Research	OA	Sum	Fishery HG
Cabezon	California	195.0	-	1.0	0.0	0.3	1.3	193.7
Cabezon/Kelp greenling	Oregon	190.0	-	0.1	0.1	0.1	0.2	189.8
Cabezon/Kelp greenling	Washington	17.0	2.0				2.0	15.0
California scorpionfish	Coastwide	275.0	-	-	0.2	3.7	3.9	271.1
Canary rockfish	Coastwide	1,307.0	50.0	8.0	10.1	1.3	69.4	1,237.6
Chilipepper	S of 40°10' N. lat.	2,259.0	-	70.0	14.0	13.7	97.7	2,161.3
Cowcod	S of 40°10' N. lat.	96.0	-	0.65	10.0	0.2	10.85	85.2
Darkblotched rockfish	Coastwide	831.0	0.2	0.6	8.5	24.6	33.9	797.1
Dover sole	Coastwide	50,000.0	1,497.0	0.1	50.8	49.3	1,597.2	48,402.8
English sole	Coastwide	9,101.0	200.0	0.1	8.0	42.5	250.6	8,850.8
Lingcod	N of 40°10' N. lat.	4,958.0	250.0	0.1	16.6	11.7	278.4	4,679.6
Lingcod	S of 40°10' N. lat.	1,172.0	-	1.5	3.2	8.3	13.0	1,159.0
Longnose skate	Coastwide	1,761.0	220.0	0.1	12.5	18.8	251.4	1,509.6
Longspine thornyhead	N of 34°27' N. lat.	2,452.0	30.0	-	17.5	6.2	53.7	2,398.3
Longspine thornyhead	S of 34°27' N. lat.	774.0	-	-	1.4	0.8	2.2	771.8
Nearshore Rockfish North	N of 40°10' N. lat.	77.0	1.5	0.5	0.5	0.6	3.1	73.9
Nearshore Rockfish South	S of 40°10' N. lat.	1,010.0	-	0.0	2.7	1.7	4.4	1,005.6
Other Fish	Coastwide	223.0	-	0.1	6.3	15.0	21.3	201.7
Other Flatfish	Coastwide	4,838.0	60.0	0.1	23.6	137.2	220.9	4,617.1
Pacific cod	Coastwide	1,600.0	500.0	0.1	5.5	0.5	506.1	1,093.9
Pacific ocean perch	N of 40°10' N. lat.	3,711.0	9.2	0.1	5.4	10.0	24.7	3,686.3
Pacific whiting	Coastwide	TBD	TBD	1.1	TBD	1,500.0	1,501.1	TBD
Petrale sole	Coastwide	3,660.0	350.0	0.1	24.1	13.3	387.5	3272.5
Sablefish	N of 36º N lat.	5,756.7	**Table 4-48**					
Sablefish	S of 36° N. lat.	2,054.0	-	-	2.4	25.0	27.4	2,026.9
Shelf Rockfish North	N of 40°10' N. lat.	1,450.0	30.0	4.5	15.3	25.6	75.4	1,374.6
Shelf Rockfish South	S of 40°10' N. lat.	1,428.0	-	30.0	15.1	67.7	112.8	1,315.2

Stock/Complex	Area	ACL	Tribal	EFP	Research	OA	Sum	Fishery HG
Shortbelly rockfish	Coastwide	500.0	-	0.1	8.2	21.6	29.9	470.1
Shortspine thornyhead	N of 34°27' N. lat.	1,393.0	50.0	0.1	10.5	17.8	78.4	1,314.6
Shortspine thornyhead	S of 34°27' N. lat.	737.0	-	-	0.7	6.0	6.7	730.3
Slope Rockfish North	N of 40°10' N. lat.	1,568.0	36.0	1.5	10.5	18.9	66.9	1,501.1
Slope Rockfish South	S of 40°10' N. lat.	705.0	-	1.0	18.2	19.7	38.9	666.1
Spiny dogfish	Coastwide	1,585.0	275.0	1.1	34.3	33.6	344.0	1,241.0
Splitnose rockfish	S of 40°10' N. lat.	1,630.0	-	1.5	11.2	5.8	18.4	1,611.6
Starry flounder	Coastwide	392.0	2.0	0.1	0.6	45.7	48.4	343.6
Widow rockfish	Coastwide	13,788.0	200.0	28.0	17.3	3.1	248.3	13,539.7
Yelloweye rockfish	Coastwide	51.0	5.0	0.24	2.92	0.69	8.85	41.2
Yellowtail rockfish	N of 40°10' N. lat.	5,831.0	1,000.0	40.0	20.6	7.0	1,067.5	4,763.5

4.2.2.2 Allocating the Fishery HG

The fishery HGs for most species are further allocated between the trawl and non-trawl fisheries based on percentages adopted under A- 21 to the PCGFMP or decided during the biennium. Sablefish north of 36° N. lat. is allocated under the Amendment 6 framework, which allocates the commercial HG between the limited entry (trawl and fixed gear) and open access sectors. Additionally, some species (e.g., nearshore species) are managed and allocated by West Coast states.

The Council reviewed the performance of the trawl and non-trawl fisheries in recent years to determine two-year allocations for the 2021-2022 biennium (Agenda Item H.8.a, Supplemental GMT Report 2, November 2019) and recommended to maintain the 2020 trawl and non-trawl allocations (Table 4-51 and Table 4-52) with the exception of canary rockfish, slope rockfish south of 40°10' N. lat, lingcod south of 40°10' N. lat., widow rockfish, and petrale sole. Those species are discussed below in Section 4.2.2.3

The No Action within trawl and within non-trawl allocations are noted in the following fishery sector descriptions as appropriate. Table 4-53 describes the limited entry and open access allocations and the trawl and non-trawl allocations within the limited entry HG for sablefish north of 36° N. lat. assuming the status quo at-sea set aside of 50 mt.[19] Furthermore, the Council is considering three different ACT options for cowcod under the status quo allocation percentages (36 percent trawl, 64 percent non-trawl) as shown in Table 4-54. Allocations for yelloweye rockfish, the only remaining rebuilding species, for 2021-22 can be found in Table 4-65.

Table 4-51. No Action 2021. Stock-specific fishery HGs or ACTs and allocations for 2021 (in mt).

STOCK	AREA	Fishery HG or ACT	Alloc. Type	Trawl		Non-Trawl	
				%	mt	%	mt
Arrowtooth flounder	Coastwide	7,837.9	A-21	95	7,446.0	5	391.9
Big skate	Coastwide	1,419.7	Biennial	95	1,348.7	5	71.0
Black rockfish	Washington	274.9	None	-	-	-	-
Black rockfish	California	346.7	None	-	-	-	-
Blue/Deacon/Black rockfish	Oregon	567.7	None	-	-	-	-
Bocaccio	S of 40°10' N. lat.	1,700.2	Biennial	39.04	663.8	60.96	1,036.4
Cabezon	California	208.7	None	-	-	-	-
Cabezon/Kelp greenling	Oregon	197.8	None	-	-	-	-
Cabezon/Kelp greenling	Washington	18.0	None	-	-	-	-
California scorpionfish	Coastwide	287.1	None	-	-	-	-
Canary rockfish	Coastwide	1,268.6	Biennial	72.281	917.0	27.719	351.6
Chilipepper	S of 40°10' N. lat.	2,260.3	A-21	75	1,695.2	25	565.1
Cowcod	S of 40°10' N. lat.	87.2	Biennial	36	31.4	64	55.8
Darkblotched rockfish	Coastwide	848.1	A-21	95	805.7	5	42.4
Dover sole	Coastwide	48,402.8	A-21	95	45,982.7	5	2,420.1

[19] The Council is considering changing the at-sea set aside for 2021-22, see Chapters 2.3. and 2.4

STOCK	AREA	Fishery HG or ACT	Alloc. Type	Trawl		Non-Trawl	
				%	mt	%	mt
English sole	Coastwide	8,924.1	A-21	95	8,477.9	5	446.2
Lingcod	N of 40°10' N. lat.	5,090.6	A-21	45	2,290.8	55	2,799.8
Lingcod	S of 40°10' N. lat.	1,089.0	A-21	45	490.1	55	599.0
Longnose skate	Coastwide	1,571.6	Biennial	90	1,414.4	10	157.2
Longspine thornyhead	N of 34°27' N. lat.	2,580.3	A-21	95	2,451.3	5	129.0
Longspine thornyhead	S of 34°27' N. lat.	829.8	None	-	-	-	-
Nearshore Rockfish N.	N of 40°10' N. lat.	75.9	None	-	-	-	-
Nearshore Rockfish S.	S of 40°10' N. lat.	1,011.6	None	-	-	-	-
Other Fish	Coastwide	201.7	None	-	-	-	-
Other Flatfish	Coastwide	4,581.1	A-21	90	4,123.0	10	458.1
Pacific cod	Coastwide	1,093.9	A-21	95	1,039.2	5	54.7
Pacific ocean perch	N of 40°10' N. lat.	3,829.3	A-21	95	3,637.8	5	191.5
Pacific whiting	Coastwide	TBD	A-21	100	TBD	-	-
Petrale sole	Coastwide	3,727.5	A-21	95	3,541.1	5	186.4
Sablefish	N of 36° N lat.	5,406.9	See Table 4-51				
Sablefish	S of 36° N lat.	2,131.3	A-21	42	895.1	58	1,236.2
Shelf Rockfish North	N of 40°10' N. lat.	1,435.6	Biennial	60.2	864.2	39.8	571.4
Shelf Rockfish South	S of 40°10' N. lat.	1,325.2	Biennial	12.2	161.7	87.8	1,163.6
Shortbelly rockfish	Coastwide	470.1	None	-	-	-	-
Shortspine thornyhead	N of 34°27' N. lat.	1,349.6	A-21	0.067	50.0	99.933	706.0
Shortspine thornyhead	S of 34°27' N. lat.	749.3	A-21	95	1,282.1	5	67.5
Slope Rockfish North	N of 40°10' N. lat.	1,528.1	A-21	81	1,237.8	19	290.3
Slope Rockfish South	S of 40°10' N. lat.	670.1	A-21	63	422.1	37	247.9
Spiny dogfish	Coastwide	1,277.0	None	-	-	-	-
Splitnose rockfish	S of 40°10' N. lat.	1,647.6	A-21	95	1,565.2	5	82.4
Starry flounder	Coastwide	343.6	A-21	50	171.8	50	171.8
Widow rockfish	Coastwide	14,476.7	A-21	91	13,173.8	9	1,302.9
Yelloweye rockfish	Coastwide	41.2	Biennial	8	3.3	92	37.9
Yellowtail rockfish	N of 40°10' N. lat.	4,982.5	A-21	88	4,384.6	12	597.9

Table 4-52. No Action 2022. Stock-specific fishery HGs or ACTs and allocations for 2022 (in mt).

STOCK	AREA	Fishery HG or ACT	Allocat. Type	Trawl		Non-Trawl	
				%	mt	%	mt
Arrowtooth flounder	Coastwide	6,362.9	A-21	95	6,044.8	5	318.1
Big skate	Coastwide	1,331.7	Biennial	95	1,265.1	5	66.6
Black rockfish	Washington	272.9	None	-	-	-	-
Black rockfish	California	339.7	None	-	-	-	-
Blue/Deacon/Black rockfish	Oregon	559.7	None	-	-	-	-
Bocaccio	S of 40°10' N. lat.	1,676.2	Biennial	39.04	654.4	60.96	1,021.8
Cabezon	California	193.7	None	-	-	-	-
Cabezon/Kelp greenling	Oregon	189.8	None	-	-	-	-
Cabezon/Kelp greenling	Washington	15.0	None	-	-	-	-
California scorpionfish	Coastwide	271.1	None	-	-	-	-
Canary rockfish	Coastwide	1,237.6	Biennial	72.281	894.6	27.719	343.1
Chilipepper	S of 40°10' N. lat.	2,161.3	A-21	75	1,621.0	25	540.3
Cowcod	S of 40°10' N. lat.	85.2	Biennial	36	30.7	64	54.5
Darkblotched rockfish	Coastwide	797.1	A-21	95	757.3	5	39.9
Dover sole	Coastwide	48,402.8	A- 21	95	45,982.7	5	2,420.1
English sole	Coastwide	8,850.8	A- 21	95	8,408.3	5	442.5
Lingcod	N of 40°10' N. lat.	4,679.6	A- 21	45	2,105.8	55	2,573.8
Lingcod	S of 40°10' N. lat.	1,159.0	A-21	45	521.6	55	637.5
Longnose skate	Coastwide	1,509.6	Biennial	90	1,358.6	10	151.0
Longspine thornyhead	N of 34°27' N. lat.	2,398.3	A-21	95	2,278.4	5	119.9
Longspine thornyhead	S of 34°27' N. lat.	771.8	None	-	-	-	-
Nearshore Rockfish N.	N of 40°10' N. lat.	73.9	None	-	-	-	-
Nearshore Rockfish S.	S of 40°10' N. lat.	1,005.6	None	-	-	-	-
Other Fish	Coastwide	201.7	None	-	-	-	-
Other Flatfish	Coastwide	4,617.1	A- 21	90	4,155.4	10	461.7
Pacific cod	Coastwide	1,093.9	A- 21	95	1,039.2	5	54.7
Pacific ocean perch	N of 40°10' N. lat.	3,686.3	A- 21	95	3,502.0	5	184.3
Pacific whiting	Coastwide	TBD	A- 21	100	TBD	-	
Petrale sole	Coastwide	3,272.5	A- 21	95	3,108.8	5	163.6
Sablefish	N of 36° N lat.	5,143.9	See Table 4-51				
Sablefish	S of 36° N lat.	2,026.9	A- 21	42	851.3	58	1,175.6

STOCK	AREA	Fishery HG or ACT	Allocat. Type	Trawl		Non-Trawl	
				%	mt	%	mt
Shelf Rockfish North	N of 40°10' N. lat.	1,374.6	Biennial	60.2	827.5	39.8	547.1
Shelf Rockfish South	S of 40°10' N. lat.	1,315.2	Biennial	12.2	160.5	87.8	1,154.8
Shortbelly rockfish	Coastwide	470.1	None	-	-	-	-
Shortspine thornyhead	N of 34°27' N. lat.	1,314.6	A- 21	95	1,248.9	5	65.7
Shortspine thornyhead	S of 34°27' N. lat.	730.3	A- 21	0.067	50.0	99.933	687.0
Slope Rockfish North	N of 40°10' N. lat.	1,501.1	A- 21	81	1,215.9	19	285.2
Slope Rockfish South	S of 40°10' N. lat.	666.1	A- 21	63	419.6	37	246.4
Spiny dogfish	Coastwide	1,241.0	None	-	-	-	-
Splitnose rockfish	S of 40°10' N. lat.	1,611.6	A- 21	95	1,531.0	5	80.6
Starry flounder	Coastwide	343.6	A- 21	50	171.8	50	171.8
Widow rockfish	Coastwide	13,539.7	A- 21	91	12,321.1	9	1,218.6
Yelloweye rockfish	Coastwide	41.2	Biennial	8	3.3	92	37.9
Yellowtail rockfish	N of 40°10' N. lat.	4,763.5	A- 21	88	4,191.9	12	571.6

Table 4-53. No Action Alternative sablefish north of 36° N. lat. allocations under both apportionment methods for 2021-22.

Apportionment Method	Year	Commercial HG	Limited Entry HG		Limited Entry Trawl		Limited Entry FG		Open Access HG	
			%	MT	%	MT	%	MT	%	MT
Method 1 (Long Term Avg.)	2021	5,399	90.6	4,892	58	2,837	42	2,054	9.4	508
	2022	5,136		4,654		2,699		1,954		483
Method 2 (5 Year Avg.)	2021	5,754		5,213		3,023		2,189		541
	2022	5,474		4,959		2,876		2,083		515

Table 4-54. Cowcod ACT options for 2021-22 and associated trawl and non-trawl allocations under status quo proportions.

ACT (mt)	Trawl		Non-Trawl	
	%	MT	%	MT
60	36	21.6	64	38.4
40		14.4		25.6

4.2.2.3 Allocation Alternatives

The Council is considering revising the two-year allocations of canary rockfish and the A-21 allocations of petrale sole, widow rockfish, lingcod south of 40°10’ N. lat., and the slope rockfish complex south of 40°10’ N. lat. to provide additional opportunities to fishery participants and increase overall attainments of the

stocks. A holistic overview of the integrated effects of the allocation options and the at-sea set-aside options for IFQ, non-trawl, and at-sea whiting are presented in Chapters 0 and 4.3.5.

An extension of the Intersector Allocation Review analysis is provided below for the proposals to revise the A-21 allocations of lingcod south of 40°10' N. lat., petrale sole, and widow rockfish which require a FMP amendment as these are formalized allocations. Further details on the historical attainment and allocations for southern slope rockfish can be found in the draft EA for Amendment 26 and therefore are not incorporated in this document; although the Council rescinded their FPA on A-26, the analysis from the draft EA is still relevant since the new allocation proposal uses the same FPA allocations, but just in different manners (i.e., formal allocations for A-26, informal shares for the allocation proposal). As canary rockfish is a two year allocated species and therefore does not require a FMP amendment, the additional analysis is provided within the analytical document (see below). Note that the tables only show allocations starting in 2011 for petrale sole and widow rockfish as the A-21 allocations were first implemented with the start of the IFQ program. However, for lingcod south of 40°10' N. lat., the allocations start in 2013 since the stock was managed north and south of 42° N. lat. in 2011-12. Mortality for the IFQ section prior to 2011 was from the limited entry trawl fleet.

Two-year Allocation: Canary Rockfish

The Council considered four options to revise the two year allocation of canary rockfish. Options one and four provide the same allocation at the trawl/non trawl level, 917.2 mt and 351.4, respectively: 894.8 mt and 342.8 mt for 2022. Options two and three also provide the same trawl/non-trawl allocations, 862.1 mt and 406.5 mt, respectively for 2021; 831.1 mt and 406.5 mt for 2022. These options are consolidated in Table 4-55

Table 4-55. Alternative allocation options considered under No Action for 2021-2022.

Species	Area	Year	Option	Fishery HG	Allocation Type	Trawl		Non-Trawl	
						%	mt	%	Mt
Canary Rockfish	Coastwide	2021	1 and 4	1268.6	Biennial	-	917.2	-	351.4
		2022		1237.6		-	894.8	-	342.8
		2021	2 and 3	1268.6	Biennial	-	862.1	-	406.5
		2022		1237.6		-	831.1	-	406.5

These options differ, however, as the allocations are distributed to the fisheries within those sectors. As shown in Table 4-56, Option 1 maintains the status quo 16 mt CP to 30 mt MS distribution; whereas, Options three through four set a combined 36 mt for both whiting sectors. Non-trawl distributions remain divided for nearshore and non-nearshore fixed gear under Options one and two; however, under Options 3 and 4, these amounts are consolidated into one allocation shared by both sectors.

Table 4-56. Canary rockfish two-year allocations in relation to 2019 estimated mortality (mt) and 2021-2022 projected mortality (mt).

Option	Option 1	Option 2	Option 3	Option 4	2019 estimated mort.	2021-2022 projected mort*
Fishery HG	1,268.6				575.3	649.4
Trawl	917.2	862.1	862.1	917.2	427.7	385
--IFQ	871.2	826.1	826.1	881.2	422.2	380
--CP	16	36**	36**	36**	5.0	5.0
--MS	30					
Non-trawl	351.4	406.5	406.5	351.4	147.6	269.4
--Non-nearshore	40.1	46.5	146.5	126.5	5.8	37.8
--Nearshore	86.4	100			17.0	37.2
--WA Rec.	43.2	50	50	43.2	13.5	15.34
--OR Rec	65.0	75	75	65.0	40.1	61.7
--CA Rec.	116.7	135	135	116.7	71.2	117.4

Petrale sole

Petrale sole are a trawl dominant stock that has considerable economic importance to the IFQ fishery. Option 1 uses the status quo A-21 trawl (95 percent) and non-trawl (5 percent) and Option 2 would provide non-trawl 30 mt with the remainder to trawl (Table 4-57). These apply to all alternatives and would increase the average 2021-22 trawl allocation by 145 mt for No Action (P*0.45), 133 mt for Alternative 1 1 (P*0.40;), and 131 mt for Alternative 2 as shown in (Table 4-57). As will be discussed in the IFQ Section 4.2.2.4, the average expected ex-vessel revenue gains per year with Option 2 are $400,000 for No Action, and approximately $360,000 for Alternatives 1 and 2. Option 1 is projected to strand 120-130 mt of non-trawl allocation depending on the ACL Alternative even when assuming their 2021-22 catch will be equal to their 5-year maximum (14 mt vs 8 mt average; see Table 4-57). Option 2 is not expected to negatively impact the non-trawl sectors since their maximum mortality is still less than half their allocations for all alternatives.

Table 4-57. Petrale sole allocation options considered under No Acton for 2021-2022.

Year	Option	Fishery HG	Allocation Type	Trawl		Non-Trawl	
				%	mt	%	mt
2021	1	3727.5	A-21	95	3541.1	5	186.4
2022		3272.5		95	3108.9	5	163.6
2021	2	3727.5	Biennial	-	3687.5	-	30
2022		3272.5		-	3232.5	-	30

Table 4-58. Historical mortality for petrale sole in the trawl and non-trawl sectors in regard to their A-21 allocations (95%, 5%) and predicted mortality in relation their average 2021-22 allocations (NA = No Action; A1 = Alt. 1; A2 = Alt. 2; O1 = Option 1; O2 = Option 2).

Year	Trawl			Non-Trawl			Sector-specific mortality			
	Alloc.	Catch	%	Alloc.	Catch	%	IFQ	At-sea	Rec	FG
2002		1,753			1		1753	0	1	1
2003		1,692			1		1692	0	1	1
2004		1,806			1		1806	0	1	1
2005		2,741			1		2741	0	0	0
2006		2,659			1		2659	0	1	1
2007		2,296			2		2296	0	1	0
2008		2,181			6		2181	0	1	5
2009		1,891			1		1891	0	1	0
2010		849			1		849	0	0	0
2011	865	812	94%	46	1	3%	812	0	1	1
2012	1,040	1,057	102%	55	2	3%	1057	0	1	1
2013	2,240	2,126	95%	118	3	3%	2,126	0	1	2
2014	2,297	2,319	101%	121	2	1%	2,319	0	1	0
2015	2,450	2,500	102%	129	4	3%	2,500	0	2	2
2016	2,539	2,475	97%	134	5	4%	2,475	0	3	2
2017	2,750	2,733	99%	145	8	5%	2,733	0	6	2
2018	2,633	2,649	101%	139	9	7%	2,649	0	5	4
2019	2,458	2,392	97%	129	14	11%	2,392	0	9	5
NA O1	3,325	3,287	99%	175		8%	3,303	0		5
NA O2	3,470	3,430	99%	30		47%	3,448	0		
A1 O1	3,098	3,062	99%	163	14	9%	3,078	0	9	
A1 O2	3,232	3,194	99%	30		47%	3,210	0		
A2 O1	3,052	3,016	99%	161		9%	3,032	0		
A2 O2	3,183	3,146	99%	30		47%	3162	0		

Widow rockfish

Widow rockfish are one of the most abundant and economically important groundfish stocks on the West Coast. The vast majority (97.8 percent) of mortality in 2019 was attributed to the IFQ sector, of which they are the main target stock of the mid-water rockfish trawl fishery that re-emerged in 2017. They are also encountered as bycatch in the at-sea (and shoreside) whiting fisheries and are a relatively minor target stock in the recreational and fixed gear fisheries (2002-2019 average = 10 mt; maximum = 31 mt).

Although non-trawl fisheries have been constrained by the non-trawl RCA since 2002 and seasonal depth restrictions for recreational fisheries, widow rockfish have always been a trawl dominant stock. Prior to the depth restrictions, the maximum non-trawl catch was 195 mt catch in the 1980's-90's Table 1 from 2019 Update Assessment) compared to trawl landings that were oftentimes higher than 10,000 mt per year with a maximum of 30,000 mt (Figure 4-23).

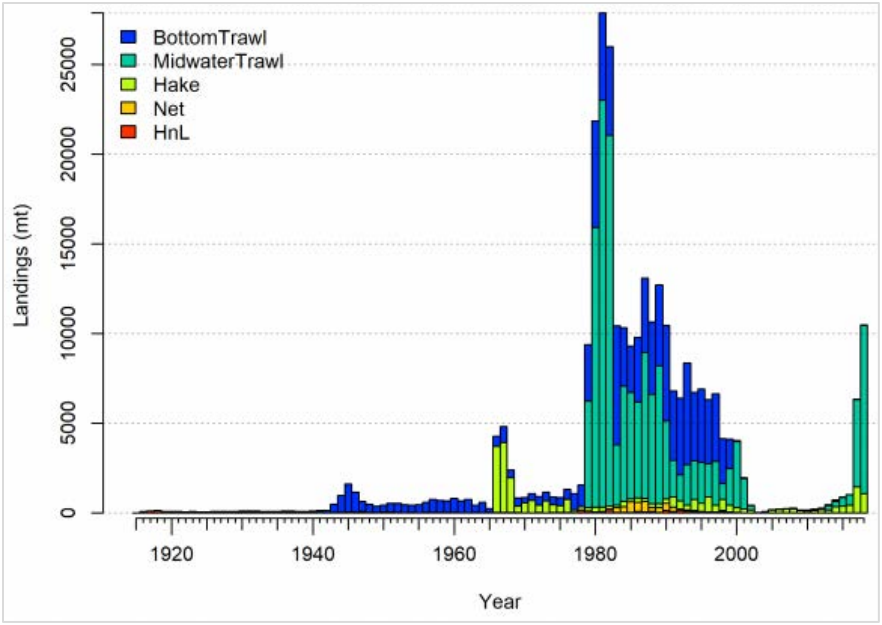


Figure 4-23. Historical attainments of widow rockfish by gear to demonstrate they have always been a trawl dominant stock even before the overfished era and non-trawl depth restrictions in the 1980s'-1990's. The hook-and-line (HnL) fleet includes recreational and commercial FG.

There are two allocation options for widow rockfish (Table 4-59). Option 1 would use the A-21 allocations (91 percent trawl; 9 percent non-trawl) and result in an average 12,747 mt trawl allocation and 1,261 mt non-trawl allocation for 2021-22. Option 2 would make widow rockfish a two year allocation species, and would allocate 300 mt for non-trawl and the remainder to trawl. The Council specifically proposed Option 2 as a means to buffer non-trawl impacts (~10x higher than their 2002-2019 max) while providing an extra ~961 mt on average to the trawl sectors in order to increase economic benefits for IFQ. .

Table 4-59. Widow rockfish allocation options considered under No Action for 2021-2022.

Year	Option	Fishery HG	Allocation Type	Trawl		Non-Trawl	
				%	mt	%	Mt
2021	1 (Status Quo)	3727.5	Amendment 21	91	13173.8	9	1302.9
2022		3272.5		91	12321.1	9	1218.6
2021	2	3727.5	Biennial	-	14176.7	-	300
2022		3272.5		-	13239.7	-	300

Option 2 is projected to increase IFQ ex-vessel revenue by $0.5 million per year on average noting that additional revenue could result from additional proposals to modify the at-sea set asides (see IFQ Section 4.2.2.4 for further details). The projected non-trawl attainment for 2021-22 is ~80 mt which is an average 6 percent attainment for 2021-22 under Option 1 and 27 percent for Option 2 (Table 4-60). Note that the 80 mt projection is based on proposals to raise the LEFG and OA trip limits along with allowing combination halibut and longleader trips in the Oregon recreational fishery and is uncertain. This projection is more than double the 2002-2019 maximum (33 mt) and is therefore the Option 2 allocation of 300 mt is unlikely to be constraining.

Table 4-60. Historical mortality for widow rockfish in the trawl and non-trawl sectors in regard to their A-21 allocations (91%, 9%) and predicted mortality in relation to their average 2021-22 allocations (O1 = Option 1; O2= Option 2).

Year	Trawl			Non-Trawl			Sector-specific mortality			
	Alloc.	Catch	%	Alloc.	Catch	%	IFQ	At-sea	Rec	FG
2002		396			7		260	136	6	0
2003		28			7		15	12	6	1
2004		61			7		41	20	6	0
2005		163			7		260	136	6	0
2006		197			5		15	12	6	1
2007		242			11		41	20	6	0
2008		220			6		84	79	7	0
2009		159			2		56	141	4	1
2010		122			1		95	146	9	2
2011	490	175	36%	49	2	4%	138	37	2	0
2012	490	234	48%	49	7	13%	155	79	6	0
2013	1,284	443	34%	127	20	15%	412	31	19	1
2014	1,284	711	55%	127	19	15%	654	56	18	1
2015	1,711	850	50%	169	8	5%	815	35	7	1
2016	1,711	985	58%	169	4	2%	798	187	2	1
2017	12,292	6,340	52%	1,216	9	1%	5,864	476	7	2
2018	11,350	10,521	93%	1,123	33	3%	10,314	207	31	2
2019	10,541	9,518	90%	1,042	25	2%	9,319	199	25	2
O1	12,747	11,461	90%	1,261	80	6%	11,168	294	44	36
O2	13,708	12,354	90%	300	80	27%	12,061	294	44	36

Lingcod south of 40°10’ N. lat.

Lingcod are a valuable target stock for non-trawl and trawl fisheries, but have been subject to low IFQ attainments whereas non-trawl sectors have been constrained via reduced bag and trip limits. The Council requested analysis of three different allocations (Table 4-61) with the intent of increasing non-trawl opportunity while not constraining the IFQ fishery. Option 1 would use the status quo A-21 allocations (45 percent trawl/55 percent non-trawl), Option 2 would shift two percentage points from the trawl allocation over to non-trawl (47 percent trawl/57 percent non-trawl), and Option 2 would shift twenty percent points from trawl (25 percent trawl/75 percent non-trawl).

Table 4-61. Lingcod South of 40 10' N. lat. allocation options considered under No Action for 2021-2022.

Year	Option	Fishery HG	Allocation Type	Trawl		Non-trawl	
				%	mt	%	mt
2021	1 (Status Quo)	1089	Amendment 21	45	490.05	55	598.95
2022		1159		45	521.55	55	637.45
2021	2	1089	Biennial	43	468.27	57	620.73
2022		1159		43	498.37	57	660.63
2021	3	1089	Biennial	25	272.25	75	816.75
2022		1159		25	289.75	75	869.25

Between 2013-2019, the trawl sector has averaged seven percent per year with an 18 percent maximum in 2019 (Table 4-62). The non-trawl sector exceeded their allocations in 2015-2016, but have averaged 63 percent in the last three years. Although the non-trawl attainment has declined to 52 percent in 2019, it was mainly due to conservative management to prevent further overages. The projected mortality in relation to the 2021-2022 allocation options is shown in Table 4-73.

None of the allocation options are expected to negatively impact the IFQ fishery as whole, but Option 3 could constrain an individual whose 2019 catches were right below the AVL associated with Option 3 (see the IFQ section 4.2.2.4 for more detail). The IFQ fishery is projected to catch 87.3 mt for all three options since it is a low attainment stock of which catch is not projected to increase or decrease with the three proposed options. The projected average attainments for the IFQ fishery are 17 percent for Option 1, 18 percent for Option 2, and 31 percent for Option 3. Higher than projected IFQ attainments could occur due to removal of the trawl RCA off California, but it would have been too speculative to model potential increases since there have been vast reductions in fleet size off California compared to the 1980's and 1990's before the RCAs. In addition, there may not be much additional increases associated with reopening the RCA because trawlers have had access to some of the prime lingcod grounds on the shelf seaward of the RCA while it was in place, but still had low attainments. Bycatch constraints of yelloweye rockfish have also been a constraint, but the 82 mt lingcod projection for 2021-22 accounts for a threefold increase in IFQ yelloweye rockfish allocations from 2018 (1.1 mt) to 2021-22 (3.4 mt average).

The main benefit to the non-trawl sector would be to provide flexibility and stability for the commercial LE and OA fixed gear and recreational fisheries by reducing the need for inseason action. The adjustments in the allocations would allow the non-trawl sector to plan for and prosecute their fishing activities with a reduced risk of a decrease in opportunity being implemented inseason, thereby increasing efficiency in the sector. Furthermore, the communities that depend upon the non-trawl sector (e.g. charter operators, fixed gear commercial fisheries, docks, and tackle shops) would have the ability to plan fishing activities for the biennium given the regulatory measure put in place prior to the fishing season commencing.

The average 2021-2022 non-trawl allocation under Option 1 would be 618 mt, under Option 2, 641 mt, and under Option 3, 843 mt (Table 4-62). In the subsequent sections of the document, there are proposals to make minor adjustments to the shoreward boundary to both the commercial and recreational RCAs as well as to remove the period 2 (Mar-Apr) closure for both the LE and OA fisheries south of 40o10' N. lat. The table below contains the impact projections that are based on the commercial fishery proposal to remove the period 2 closure (70 mt from LE and OA No Action Option 2) and the recreational fishery proposal for minor depth adjustments in the recreational fishery (419.5 mt from CA Recreational Alternative 1 Option 2). Currently, there is no depth-based projection model for the commercial LE and OA fisheries to project the impacts of the proposed minor adjustments to the commercial RCA. The non-trawl projection of 489.5

mt would be 76 percent of the lingcod allocation Option 1, 73 percent of Option 2, and 58 percent of Option 3.

Table 4-62. Historical mortality of lingcod south of 40°10' N. lat. for the trawl and non-trawl sectors in regard to their A-21 allocations (45%, 55%) and predicted mortality in relation their average 2021-22 allocations (O1 = Option 1; O2= Option 2; O3 = Option 3).

Year	Trawl			Non-Trawl			Sector-specific mortality			
	Alloc.	Catch	%	Alloc.	Catch	%	IFQ	At-sea	Rec	FG
2002		29			274		28.6326	0	247	27
2003		25			274		24.7396	0	247	27
2004		27			284		27.0662	0	247	37
2005		21			360		20.8397	0	333	27
2006		11			297		11.1977	0	270	28
2007		38			161		37.7371	0	138	23
2008		28			106		28.4264	0	85	21
2009		31			116		31.1778	0	98	18
2010		22			97		22.3937	0	80	17
2011		7			209		6.61858	0	188	22
2012		13			262		13.4725	0	235	27
2013	496	14	3%	606	418	69%	13.8	0	382	37
2014	474	16	3%	580	551	95%	16.2	0	426	59
2015	448	29	6%	547	688	126%	29.1	0	597	83
2016	422	21	5%	515	643	125%	21.1	0	593	60
2017	559	23	4%	683	507	74%	22.6	0	453	60
2018	511	49	10%	624	400	64%	48.9	0	346	54
2019	463	82	18%	565	295	52%	81.5	0	252	43
O1	506	87	17%	618	489.5	79%	87.2	0	419.5	70
O2	483	87	18%	641	489.5	76%	87.2	0	419.5	70
O3	281	87	31%	843	489.5	58%	87.2	0	419.5	70

Slope Rockfish Complex South of 40°10' N. lat. and Blackgill Rockfish

The Council considered two options for the allocation of Slope Rockfish Complex South of 40°10' N. lat. and Blackgill Rockfish. Under Option one the stock complex would remain under the same A-21 allocation structure, 63 percent trawl and 27 percent non trawl; whereas under Option two, the stock become a two-year allocation and includes custom trawl/non-trawl shares of blackgill rockfish, "other slope rockfish", and the complex as a whole. On the whole, the allocation under Option 2 increases for trawl by approximately 100 mt for trawl – decreasing by the same amount for non-trawl. (Table 4-61)

Table 4-63. Alternative allocation options considered under No Action for 2021-2022.

Species	Area	Year	Option	Fishery HG	Allocation Type	Trawl		Non-Trawl	
						%	mt	%	Mt
Slope rockfish complex	South of 40 10 N. lat	2021	1 (Status Quo)	670.1	Amendment 21	63	422.16	37	247.94
		2022		666.1		63	419.64	37	246.46
		2021	2 a/	670.1	Biennial		526.4		143.7
		2022		666.1			515.6		142.1

a/ This option has specific blackgill and "other slope" species shares for trawl and non-trawl that combine to make the trawl and non-trawl allocations shown in this table. Please see Chapter 0 for further details on the within trawl and non-trawl shares of blackgill and other slope species.

The distribution of the proposed Option 2 is shown in Table 4-64 The impacts of this newly proposed configuration are described at Chapter 1.3.2.2.

Table 4-64. Customized Option 2 sharing approach for the slope rockfish south of 40o 10' N. lat. complex that includes trawl/non-trawl shares of blackgill rockfish, "other slope" rockfish, and the complex as a whole.

Category	**2021 allocations (mt)**	
	Trawl	Non-Trawl
Blackgill rockfish shares (of component ACL)	72.4 (41%)	104.2 (59%)
"Other slope" rockfish share (of sum of component ACLs)	484.5 (91%)	47.9 (9%)
Total share	556.9	152.1
% of total share	80%	20%
Off-top for complex	38.9	
Apportioned off-top based on % of total share	30.5	8.4
Option 2 slope complex allocations	526.4	113.2

Rebuilding Species Allocation.

As of the 2021-2022 biennium, yelloweye rockfish will be the only species remaining on the rebuilding list. Table 4-65 details the allocation structure under No Action. Note that the non-trawl sector is managed with both HGs and ACTs at the sector level.

Table 4-65. Yelloweye rockfish allocations, HGs, and ACTs for 2021-22 under the No Action Alternative.

Year	2021		2022	
ACL	50		51	
Fishery HG	41.2		42.2	
Trawl (8%)	3.3		3.4	
At-Sea	0		0	
IFQ	3.3		3.4	
Non-trawl (92%)	HG	ACT	HG	ACT
	37.9	29.5	38.8	30.4
Non-nearshore (5.4%)	2.0	1.6	2.1	1.6
Nearshore (15.5%)	5.9	4.6	6.0	4.7
---OR (72.7%)	4.3	3.3	4.4	3.4
---CA (27.3%)	1.6	1.2	1.6	1.3
WA Rec (25.6%)	9.7	7.5	9.9	7.8
OR Rec (23.3%)	8.8	6.9	9.0	7.1
CA Rec (30.2%)	11.4	8.9	11.7	9.2

Shortbelly Rockfish

Shortbelly rockfish are managed coastwide with constant 6,950 mt OFL and a 4,184 mt ABC (P*0.40) for both 2021-22. Shortbelly rockfish are a stock of concern in the 2021-22 biennium since the 500 mt ACL was exceeded in both 2018 (508 mt; source = GEMM) and 2019 (655 mt projection; source = PacFIN). Under No Action, they would be managed with a constant 500 mt ACL and a 470.1 mt fishery HG, under which all groundfish fisheries would be managed together (i.e. no sector allocations)

This ACL/HG would likely constrain fisheries as 40 percent of bootstrap simulations exceeded 500 mt with some projections as high as 1,000 mt. This alternative would provide the most protections for shortbelly rockfish as a forage stock; however, indications are the shortbelly rockfish stock is thriving and would likely provide a robust forage base even if the full ABC were taken (4,184 mt). The majority of impacts have been attributed to the whiting fisheries, to lesser degrees by the non-whiting trawl fisheries, and with negligible non-trawl impacts (< 1 mt)

Extensive impact analyses of the shortbelly rockfish harvest specifications have already been completed (Agenda Item H.4, Supplemental REVISED Attachment 1, November 2019; Agenda Item H.4.a, Supplemental GMT Report 1, November 2019, and Agenda Item H.6.a, GMT Report 2, November 2019).

Harvest Guidelines

This section describes HGs that are implemented for stocks managed in complexes or HGs that apply across multiple sectors under No Action.

Oregon Black/Blue/Deacon and Cabezon/Kelp Greenling Complexes

The Council did not recommend any federally-specified component stock HGs for these stocks.

Blackgill Rockfish South of 40°10' N. lat.

The Council recommended HGs for blackgill rockfish of 176.5 mt and 174.0 mt for 2021-2022, respectively. The blackgill rockfish south of 40°10' N. lat. HG is established within the harvest specifications process, which is the blackgill contribution to the Slope Rockfish Complex (ACL=ABC, P*0.45). The blackgill rockfish HG is subject to trawl and non-trawl allocations as specified under Amendment 21 (63 percent trawl, 27 percent non-trawl).

Nearshore Rockfish

The Council adopted the recommendations of the GMT as described in Agenda Item H.8.a, Supplemental GMT Report 2, November 2019 for nearshore rockfish HGs (Table 4-66) for consideration.

Table 4-66. No Action: State specific HGs for the Nearshore Rockfish Complex north of 40°10' N. lat. in 2021 and 2022 in mt.

State	2021	2022
Washington	18.4	17.7
Oregon	22.7	22.2
California	37.6	37.4

4.2.2.4 Shorebased IFQ

Management Measures

Under No Action the shorebased IFQ fishery will apply the default HCR ACLs and associated status quo allocations (Table 4-49 and Table 4-50). Under No Action, the IFQ fishery is affected by the integrated effects of the harvest specifications and the alternative management measures (i.e., trawl and non-trawl allocations, cowcod ACT, at-sea set-asides, and trip limits).

There are also numerous proposals to change the at-sea set-asides (discussed further at Chapter 4.2.2.5). As at-sea set-asides are deducted from the trawl allocation prior to setting the IFQ allocation, the potential impacts are discussed below for select species.

Under No Action, the IFQ fishery is affected by the integrated effects of the harvest specifications and the alternative management measures (i.e., trawl and non-trawl allocations, cowcod ACT, at-sea set-asides, and trip limits). As such, the IFQ section is structured into the following sections:

1. Analysis of the No Action harvest specifications under status quo management measures
2. Stock-specific integrated impacts sections that include new management measures:
   a) Pacific halibut north of 40°10' N. lat.
   b) Cowcod south of 40°10' N. lat.
   c) Sablefish
   d) Big skate
   e) Canary rockfish
   f) Lingcod south of 40°10' N. lat.
   g) Slope rockfish complex south of 40°10' N. lat. and blackgill rockfish
   h) Petrale sole
   i) Widow rockfish
   j) Other stocks

Impact (Groundfish Mortality)

Table 4-67 shows the proposed IFQ allocations and attainments for 2021-2022. Note that for sablefish, there are two different methods being proposed that affect how the coastwide ABC is apportioned to the ACLs for management areas north and south of 36° N. lat. Table 4-67 shows the Method 1 apportionment results (long-term average survey distributions) since that is the status quo approach. Chapter 0 below compares the impacts under both apportionment methods (noting that the ACLs derived from method 2 were selected as the PPA in November) and alternative at-sea set-asides.

Projections were made based on input (catch) data from the IFQ fishery from 2016-2019. Particularly notable changes in allocations would occur under the No Action Alternative for three IFQ species categories, compared with 2019 levels. Those include darkblotched rockfish (+13 percent on average), petrale sole (+35 percent on average), and widow rockfish (+21 percent on average).

Under No Action, projected catch for petrale sole and sablefish North of 36° N. lat. closely follow the allocation values themselves (Table 4-67). Their projected attainment levels for 2021 are 99.7 and 98.6 percent respectively; for 2022, they are 99.7 and 98.9 percent. In contrast, projected attainment rates for sablefish south of 36° N. latitude continue to be low (~9 percent) which has been attributed to a lack of processing infrastructure, lack of markets, and closed areas (i.e., Western CCA).

The remaining IFQ species vary in their expected response to change in allocations in the non-whiting IFQ sector. For instance, widow rockfish has increased in catch and attainment, and has established a very close relationship between catch and allocation since harvest specifications rose sharply after the stock was declared rebuilt in 2015. As such, projected catch closely follows the change in allocation from 2019, to that of 2021 and 2022. By contrast, species like arrowtooth flounder, English sole, and Dover sole show little evidence of a causal relationship between catch and allocation. As such, their projected catch reflects their predominant method of prediction in the model, weighted average historical catch. Catch of arrowtooth flounder for example, is not expected to respond significantly to reduction in the allocation from 2019 levels to 2021 and 2022, but rather resemble average catch of the most recent three years. Note that there are no projections provided for cowcod south of 40° 10’ N. lat. Given the range of ACT values, projections will be provided in June under the Council’s Preferred Alternative. In the interim, please see the discussion of cowcod found below (Table 4-67).

Although the model has the ability to project selected species as bycatch, it is not currently informed by catch composition within complexes, such as Dover sole-Thornyhead-Sablefish (DTS), and any potential upswing in thornyheads or Dover sole concurrent with projected increased sablefish catch is not reflected here. It is possible that the otherwise declining Dover sole catch trend over the past few years could be balanced somewhat by coincidental catch due to an increase in sablefish catch, because of their relationship within the complex. In that case, the outcome for Dover sole is also not expected to be very different from the projections here since they are based predominantly on weighted average annual catch. Fishers also have some control over their catch composition, and could potentially focus more intensively on the high-value sablefish without catching much additional comparatively low-value Dover.

Table 4-67. No Action-Shorebased IFQ. 2021-22 Allocations, Projected Catch and Attainment under No Action, Method 1.

Species	2021 No Action			2022 No Action		
	Allocation	Proj. Catch	% Attain	Allocation	Proj. Catch	% Attain
Arrowtooth flounder	7,446.00	870.41	11.69%	5,974.75	842.99	14.11%
Bocaccio rockfish South of 40°10' N.	663.76	268.56	40.46%	654.39	264.79	40.46%
Canary rockfish	871.2	379.68	43.58%	848.78	372.22	43.85%
Chilipepper rockfish South of 40°10' N.	1,695.23	540.4	31.88%	1,620.97	516.76	31.88%
Cowcod South of 40°10' N.						
Darkblotched rockfish	763.6	401.07	52.52%	717.74	381.36	53.13%
Dover sole	45,977.66	5,947.98	12.94%	45,977.66	5,947.98	12.94%
English sole	8,473.18	210.79	2.49%	8,409.53	210.6	2.50%
Lingcod North of 40°10' N.	2,275.77	526.46	23.13%	2,090.82	487.23	23.30%
Lingcod South of 40°10' N.	490.05	87.15	17.78%	521.55	92.65	17.76%
Longspine thornyheads North of 34°27' N.	2,446.29	311.94	12.75%	2,273.77	293.16	12.89%
Minor shelf rockfish North of 40°10' N.	829.23	397.14	47.89%	792.51	384.97	48.58%
Minor shelf rockfish South of 40°10' N.	161.67	8.08	5.00%	160.45	8.06	5.02%
Minor slope rockfish North of 40°10' N.	937.76	229.68	24.49%	915.89	228.8	24.98%
Minor slope rockfish South of 40°10' N.	422.16	42.17	9.99%	419.64	42.15	10.04%
Other flatfish	4,087.99	462.72	11.32%	4,120.39	463.29	11.24%
Pacific cod	1,034.21	14.17	1.37%	1,034.21	14.17	1.37%
Pacific halibut (IBQ) North of 40°10' N.	69.58	32.88	47.25%	69.58	32.24	46.34%
Pacific ocean perch North of 40°10' N.	3,268.69	474.82	14.53%	2,937.49	428.96	14.60%
Pacific whiting	169,126.03	144,851.68	85.65%	169,126.03	144,851.68	85.65%
Petrale sole	3,536.12	3,524.74	99.68%	3,103.88	3,094.25	99.69%
Sablefish North of 36° N.	2,787.13	2,762.52	99.12%	2,826.38	2,634.94	93.23%
Sablefish South of 36° N.	898.63	79.66	8.86%	693.67	78.32	11.29%
Shortspine thornyheads North of 34°27' N.	1,212.12	458.79	37.85%	1,178.87	446.26	37.85%
Shortspine thornyheads South of 34°27' N.	50	0	0.00%	50	0	0.00%

Species	2021 No Action			2022 No Action		
	Allocation	Proj. Catch	% Attain	Allocation	Proj. Catch	% Attain
Splitnose rockfish South of 40°10' N.	1,565.22	20.11	1.28%	1,531.02	20.11	1.31%
Starry flounder	166.8	0.48	0.29%	166.8	0.48	0.29%
Widow rockfish	12,409.70	11,435.82	92.15%	11,606.53	10,754.43	92.66%
Yelloweye rockfish	3.29	0.62	18.84%	3.37	0.58	17.21%
Yellowtail rockfish North of 40°10' N.	4,064.60	3,146.18	77.40%	3,871.88	3,059.43	79.02%

a/ Historical estimates of mortality were generated using the NMFS Pacific Coast IFQ Program Database (January 2020). Pacific whiting values include inseason allocation reapportionments.
b/ Pacific halibut is managed using IBQ, see regulations at §660.140. The 2021 Pacific halibut TAC was unavailable during the preparation of the analysis; therefore, the 2019 values were used.
c/ The 2021/2022 Pacific whiting TAC was unavailable during the preparation of the analysis; therefore the 2019 values were used (post-reapportionment).

Stock-specific impacts under alternative management measures

a) Pacific Halibut north of 40°10' N. lat.

The halibut IBQ amount is expected to remain at a similar level in 2021-22, given that the IPHC stated in their November 2019 interim meeting that "*a fixed TCEY for IPHC Regulatory Area 2A of 1.65 m lbs. is intended to apply for a period from 2019-2022, subject to any substantive conservation concerns.*" (IPHC–2019–AM095–R, Report of the 95th Session of the IPHC Annual Meeting, Item 69 c, page 19)

The current trawl bycatch mortality limit (cap) is 15 percent of the Area 2A TCEY for legal size halibut (net weight), not to exceed 100,000 pounds annually (beginning in 2015) for legal size halibut (net weight). This is also not expected to change in 2021-2022. The term "legal sized" halibut refers to halibut with a total length of 32 inches and above, or O32. The projected IBQ attainment is 47.9 percent in 2021 and 48.6 percent in 2022 (Table 4-67).

b) Cowcod south of 40°10' N. lat.

Under No Action, cowcod would be managed with an ACL = ABC (P*=0.45) that would result in a 98 mt ACL in 2021 and a 96 mt ACL in 2022. The trawl allocation would continue to be set at 36 percent of the fishery HG, and would be 31.4 mt in 2021 and 30.7 mt in 2022 . The entire trawl allocation is allocated to the IFQ fishery since there are no at-sea set-asides for cowcod due to the prohibition on processing at-sea south of 42° N. lat.

The Council recommended an ACT set below the ACL due to assessment uncertainty and because the stock was just declared rebuilt from being overfished in 2019. A 40 mt to 60 mt range of ACTs were proposed by the Council using the status quo 36 percent trawl and 64 percent non-trawl allocations. The numerical trawl allocations and annual vessel limits are shown in Table 4-68.

Table 4-68. No Action- Cowcod south of 40° 10'N. lat. ACLs, ACT range at ten mt increments between 40 and 60 mt, trawl allocation, and annual vessel limits under No Action.

Year	ACL (mt)	ACT (mt)	Trawl allocation (mt; 36%)	AVL (lbs.; 17.7%)
2021-22	98 = 2021 96 = 2022	0	31.1*	12,136*
		40	14.4	5,619
		50	18	7,024
		60	21.6	8,429

*Uses the 2021-22 average based on the fishery HG accounting for off-the-top set-asides

These higher AVLs are expected to greatly reduce individual vessel constraints. Even the lowest ACT of 40 mt provides an annual vessel limit that is six times higher than any boat caught in 2019. As such, no vessels are expected to be constrained with the proposed range of ACTs.

It is difficult to project the expected benefits of the No Action ACLs and range of ACTs being considered for 2021-2022 for the IFQ fishery. As this species has not been targeted since it being declared overfished (2003-2019), there is significant uncertainty around what the future state of the fishery will look like regarding cowcod retention. Trawl effort is predicted to remain low in the species center of abundance, the Southern California Bight, where average trawl mortality while the stock was overfished was less than 1 mt per year (Agenda Item H.4 Supplemental REVISED Attachment 1 November 2019). However, historical trawl landings were oftentimes as high as 40-60 mt per year during the 1960's-1980's in the Southern California Bight, where cowcod are most common (see Figure 5 of the 2019 full assessment).

Future IFQ attainments may continue to be at lower levels similar to the overfished era due to the reduction in the fleet and the 2020 closure of the California Bight to bottom trawl as a new EFHCA area during Amendment 28; however, it is important to consider that the higher cowcod allocations and AVLs could provide more opportunity within the biogeographical range of cowcod, especially with the removal of the trawl RCA. Additional IFQ cowcod impacts would be expected in 2021-22, but by what degree is uncertain, and would not cause risk to the ACL since cowcod are managed with IFQ. As this fishery is monitored at 100% with timely data updates, the Council could act inseason to mitigate potential overages.

c) Sablefish

In addition to the ABC alternatives for sablefish under a P* of 0.4 (No Action) and 0.45 (Alternative 1), the Council is considering different methods of apportioning the coastwide ABC to the ACLs for north and south of 36 N. lat. (Agenda Item H.6.a Supplemental GMT Report 3, November 2019). Method 1 uses the long-term (2002-2018) average bottom trawl survey biomass distributions to apportion the coastwide ABC. Method 2 (Preferred Alternative) uses the rolling 5-year average survey biomass distributions (2014-2018).

Methods 1 and 2 are considered Sub-Options to the No Action and Alternative 1 harvest specifications. There are therefore four different sablefish ACL Options being considered for 2021-22 that are shown in Table 4-69 for the northern and southern management areas, respectively. Table 4-67 above describes the No Action allocations under Method 1, which is based on the long-term average bottom trawl survey distributions since that is the status quo approach.

In addition to considering these ACL apportionment methods, the Council is also considering a change to the at-sea set aside of sablefish north of 36° N. lat. At-sea set asides are taken off the top of the trawl allocation prior to setting the IFQ allocation. For three consecutive years (2017-2019), the at-sea sector has exceeded its set aside of 50 mt, which was one of the causes of the fishery exceeding the northern ACL in 2017. However, as the likelihood of the at-sea sector exceeding the set aside at the time of developing the 2019-20 harvest specifications was low, the Council chose to maintain the 50 mt set aside value in 2019 so to limit the risk of stranding unused set aside in the at-sea sector that could be used in the IFQ sector. Based on the suite of Options forwarded for consideration by the Council in November, set-asides values for the at-sea sector range from 50 mt to 178 mt (combined) for sablefish north of 36° N. lat.

Table 4-69. The four sablefish harvest specification alternatives being considered for 2021-22 and the resulting north and south of 36° N. lat. ACLs, compared to 2019 and 2020 values.

Year	Coastwide ABC		North of 36° N. lat. ACLs				South of 36° N. lat. ACLs			
	No Action P*0.40	Alt 1 P*0.45	No Action Method 1 (P*0.40 + 73.6% long-term avg.)	No Action Method 2 (P*0.40 and 78.4% 5-year avg.)	Alt 1 Method 1 (P*0.45 + 73.6% long-term avg.)	Alt 1 Method 2 (P*0.45 + 78.4% 5-year avg.)	No Action Method 1 (P*0.40 + 26.4% long-term avg.)	No Action Method 2 (P*0.40 and 21.5% 5-year avg.)	Alt 1 Method 1 (P*0.45 + 26.4% long-term avg.)	Alt 1 Method 2 (P*0.45 + 21.5% 5-year avg.)
2019	7,750	---	5,606	---	---	---	1,990	---	---	---
2020	7,896	---	5,723	---	---	---	2,032	---	---	---
2021	8,208	8,791	6,041	6,435	6,470	6,892	2,167	1,765	2,321	1,890
2022	7,811	8,375	5,749	6,124	6,164	6,566	2,062	1,679	2,211	1,801

Table 4-70 shows the 2021-22 allocations and projected catch under No Action ACLs for methods 1 and 2. Both IFQ allocations are based on the status quo set aside of 50 mt for the at-sea sector. As shown, Method 2 results in a 6.7 and 5.2 percent increase to the 2021-22 allocations respectively with a resulting 6.2 percent increase in the catch of northern sablefish. While the southern sablefish allocations are in turn decreased under Method 2, there is a projected 14 percent reduction in the catch. If the Council were to increase the set aside from 50 mt to 100 mt (Option c for combined, Option e for sector specific) for the at-sea sector, the overall impacts to the IFQ sector in terms of the allocation would be less under Method 2 compared to Method 1. Option d for the at-sea sectors would result in a set aside of 178 mt, which would cover the recent historical maximum (status quo methodology) at the sector specific level; however, it would be likely to strand quota in the at-sea sectors given the recent five-year average of approximately 76 mt. If the Council chose Option d for at-sea set asides (i.e. max of 178 mt), the result would be that the Method 2 allocation would be only 8 mt higher than the proposed Method 1 allocation under status quo (i.e. 50 mt set aside).

Table 4-71 shows that with the increase in allocation under Method 2 compared to Method 1, there is a corresponding projected increase in ex-vessel revenue for sablefish north of 36° N. lat. of $481,965 in 2021 and $458,754 in 2022. This is attributed to the shift of IFQ allocation between from the South to the North. In the South, attainment of the allocation is quite low (2012-2019, mean = 21.3 percent, S.D. = 12.6; 2011 was an outlier at 86 percent); while in the North, attainment is consistently very high (2011-2019, mean = 96.8 percent, S.D. = 4.68). With the allocation shift between methods, there are projected decreases for the IFQ fishery south of 36° N. lat. of $29,958 in 2021 and $34,511 in 2022. It is important to note these projected results are based on a model assumption that catch in the South covaries to some degree with allocation, albeit much less so than in the North. It is however plausible that catch levels may remain similar to low matter which alternative and apportionment method is selected, given that sablefish catch has been low in the south for many years; it could remain static due to processing limitations in the area, and not be constrained by any of the Alternatives.

Both catch and attainment of southern IFQ sablefish have shown a clear decreasing trend since early in the IFQ program, considering data from 2012 through 2019, (from 44 to 10 percent attainment respectively, discounting the high outlier year of 2011); this decreasing trend was particularly steep during 2016-2018 (26, 15, and 6 percent attainment, respectively). It is difficult to say whether the small uptick in catch and attainment in 2019 will represent the beginning of a new trend, or if the longer standing negative trend will continue, or whether the decline in catch and attainment in the South has presently bottomed out and will become static.

For the coastwide IFQ fishery, Method 2 for No Action is projected to increase coastwide sablefish ex-vessel revenues by $452,007 in 2021 and $424,243 in 2022 compared to Method 1. This takes into account the gains in the North, which are ~11 times greater than the reductions to the south (Table 4-70). These gains are conservative since the attainment rate to the south may remain static rather than decrease as the IFQ model projects.

Table 4-70. 2021-2022 No Action sablefish IFQ allocations and projected catch under Method 1 (long term average) and Method 2 (five year average) for apportioning sablefish north and south of 36 N. lat.

Species	2021				2022			
	Method 1		Method 2		Method 1		Method 2	
	Allocation	Proj. Catch	Allocation	Proj. Catch	Allocation	Proj. Catch	Allocation	Proj. Catch
Sablefish North of 36° N.	2,787.13	2,762.52	2,973.46	2,934.66	2,649.03	2,634.94	2,826.38	2,798.79
Sablefish South of 36° N.	898.63	79.66	729.79	68.76	854.53	78.32	693.67	65.78

Table 4-71. 2021-22 No Action IFQ allocations, projected catch, projected ex-vessel revenue (based on 2019 average prices), and resulting difference in ex-vessel revenue from Method 1 to Method 2 for both sablefish apportionment Methods 1 and 2 for north and south areas and total coastwide impacts.

Method	Year	North				South				Coastwide	
		Allocation	Projected Catch	Projected IFQ $ ex-vessel revenue		Allocation	Projected Catch	Projected IFQ $ ex-vessel revenue		Projected IFQ $ ex-vessel revenue	
				Total $	$ difference with Method 2			Total $	$ difference with Method 2	Total $	$ difference with Method 2
1	2021	2,787.13	2,762.52	$7,734,620	NA	899	79.7	$219,062	NA	$7,953,682	NA
	2022	2,649.03	2,634.94	$7,377,416	NA	855	78.3	$215,395	NA	$7,592,811	NA
2	2021	2,973.46	2,934.66	$8,216,584	$481,965	723	68.76	$189,105	-$29,958	$8,405,689	$452,007
	2022	2,826.38	2,798.79	$7,836,170	$458,754	694	65.78	$180,884	-$34,511	$8,017,054	$424,243

d) *Big skate*

Under No Action, the ACLs for big skate are 1,477 mt in 2021 and 1,389 mt in 2022 and IFQ landings targets are nearly three to eight times higher than historical big skate total mortality during the eras before and after trip limits were adopted (Agenda Item H.8.a, Supplement GMT Report 3, November 2019). Big skate trip limits have been used to manage mortality since 2015, due to concerns that additional targeting could risk exceeding the constant 494 mt ACL. Since 2014 attainment of big skate has decreased from a high of 431.8 mt in 2014 to only 148.5 mt in 2018, and with only 135 mt of landings estimated in 2019 (i.e., 35% of ACL).

Catch of big skate in the IFQ fishery is expected to increase with an unlimited trip limit, but to what degree is uncertain because vessels are rarely catching the lower Baseline trip limits in 2019. An unlimited trip limit would allow IFQ participants more opportunity to target big skate when there is market demand, which the GAPs indicates can be intermittent. If attainment rates were to unexpectedly increase by high amounts, then the trip limit could be reduced inseason.

e) *Canary rockfish*

Canary rockfish are managed with two-year allocations that the Council can adjust each biennium (Table 4-70). There are two allocation Options being considered for 2021-22 which are detailed on page 15 of Agenda Item H.8.a Supplemental GMT Report 2 November 2019 and summarized in Table 4-61.

In summary, Option 1 (status quo) uses the allocation framework that was established in the 2019-2020 biennium: 72.3 percent trawl and 27.7 percent non-trawl. The IFQ allocation is set by deducting a fixed 46 mt at-sea set-aside from the trawl allocation (30 mt for MS sector, 16 mt for CP), and each non-trawl fishery HG is set using status quo proportions on the non-trawl allocation. Since the ACL decreases under No Action, all fisheries receive the same proportional decreases to their allocations and HGs except at-sea which is fixed at 46 mt. A potential concern raised by the GMT is that Option 1 results in the non-trawl sectors getting less than the fixed amounts they received in the 2017-2018 biennium that were based on the needs of each fishery.

Option 2 sets the non-trawl HGs at the same needs-based levels established in 2017-2018 and follows the same framework where the remainder of the fishery HG is allocated to the trawl fisheries, and with a fixed at-sea deduction and the remainder to IFQ. Note that the at-sea set-aside is reduced from 46 mt under No Action/Option 1 to 20 mt under Option 2, which was recommended by the Council as it is expected to accommodate at-sea bycatch (less than 7 mt per year since 2011) and provides a means to prevent IFQ from absorbing the full 31 mt ACL reduction from 2021-22. By reducing at-sea by 26 mt, IFQ only absorbs 5 mt of the ACL reduction. Note that other Options for setting the canary rockfish at-sea set-aside are discussed in Chapter 4.2.2.5, along with assessments of likelihood for exceeding the set-aside.

Neither allocation Option is expected to constrain or negatively impact the IFQ fishery in 2021-22. The projected IFQ total mortality is ~380 mt (Table 2-21) and 2021-22 allocations that range from 811 mt to 871 mt (Table 4-72). Canary rockfish are a moderately attained stock (< 40 percent) that trawlers report they actively avoid as to not constrain opportunity for more abundant mid-water shelf stocks that can co-occur (e.g., widow and yellowtail rockfishes).

Table 4-72. Canary rockfish two-year allocation options for 2021-22 under No Action.

	% SQ	2021		2022	
		Option 1 (SQ)	Option 2	Option 1 (SQ)	Option 2
ACL	---	1,338	1,338	1,307	1,307
Off-top	---	69.4	69.4	69.4	69.4
Fishery HG	---	1,268.6	1,268.6	1,237.6	1,237.6
Trawl Allocation	72.3%	917.2	862.1	894.8	831.1
--IFQ	---	871.2	842.1	848.8	811.1
--CP	---	16	20	16	20
--MS	---	30		30	
Non-trawl	27.7%	351.4	406.5	342.8	406.5
--Non-nearshore	11.4%	40.1	46.5	39.1	46.5
--Nearshore	24.6%	86.4	100	84.3	100
--WA Rec.	12.3%	43.2	50	42.2	50
--OR Rec	18.5%	65.0	75	63.4	75
--CA Rec.	33.2%	116.7	135	113.8	135

f) *Lingcod south of 40°10' N. lat.*

Under No Action, the current Option 1 (A- 21) allocations are 45 percent trawl and 55 percent non-trawl (Table 4-73). As detailed in pages 27-30 of Agenda Item H.8.a Supplemental GMT Report 2 November 2019, the trawl attainments have been less than 20 percent per year of the allocation during the IFQ era (2011-2019) whereas non-trawl attainments have been greater than 90 percent during that time frame. To stay within the non-trawl allocations, low trip limits and bag limits have been required in the non-trawl fisheries.

To provide more opportunity in the non-trawl fisheries, the Council requested additional allocation Options for 2021-22 (Table 4-73) that would revise the A- 21 allocations and make them two-year allocations (similar to canary rockfish above). Option 2 would shift two percentage points of the trawl allocation to non-trawl (43 percent trawl; 47 percent non-trawl). Option 3 would shift up to 20 percentage points of the non-trawl allocation to non-trawl (25 percent trawl; 75 percent trawl).

None of the allocation Options are expected to negatively impact the IFQ fishery as a whole in 2021-22. As shown in (Table 1-32), the actual 2011-2019 total mortality has been less than 52 mt per year and the predicted 2021-22 mortality is 87.2 mt for both years. The predicted 2021-22 attainments are approximately 17 percent for Option 1, 18 percent for Option 2, and 31 percent for Option 3.

It is also important to consider potential constraints to individual IFQ participants with different allocation Options, which is best examined by comparing vessel-level catches to AVL for each Option. AVLs s are the best measure of potential constraint because they cap vessels at 13.3 percent of the trawl allocation even if unused QP are available for lease. The AVL for 2021, the lower allocation of the two years, would be 143,635 lbs. for Option 1, 137,223 lbs. for Option 2, and 80,880 lbs. for Option 3. The maximum vessel catch in 2019 was 78,371 lbs., three boats were between 40,000 lbs. and 78,371 lbs., and the remainder caught less than 10,000 lbs. As such, Options 1 and 2 are not expected to result in any vessel constraints, but Option 3 may be constraining as one of the vessels in 2019 was within 2,509 lbs. of the proposed 2021 annual vessel limit.

Table 4-73. Lingcod south of 40°10' N. lat. Options for setting the trawl and non-trawl allocations in 2021-22.

Option	Year	ACL	Fishery HG	Trawl allocation		Non-trawl allocation	
				%	mt	%	mt
1 (SQ)	2021	1,102	1,089	45%	490.1	55%	599.0
	2022	1,172	1,159	45%	521.6	55%	637.5
2	2021	1,102	1,089	43%	468.3	57%	620.7
	2022	1,172	1,159	43%	498.4	57%	660.6
3	2021	1,102	1,089	25%	275.5	75%	816.8
	2022	1,172	1,159	25%	293.0	75%	869.3

Table 4-74. Actual (2013-2019) and projected (2021-2022) total mortality of lingcod south of 40° 10' N. lat. in the IFQ sector.

Year	2013	2014	2015	2016	2017	2018	2019	2021	2022
Mortality (mt)	13.8	16.2	29.1	21.1	22.6	48.9	81.5	87.2	87.2
Allocation	496	474	448	422	559	511	463	See Table 4-71	
% Attainment	2.8%	3.4%	6.5%	5.0%	4.0%	9.6%	17.6%		

g) Slope rockfish complex south of 40°10' N. lat. and blackgill rockfish

Under No Action, the southern slope rockfish complex including blackgill rockfish would be managed with status quo Option 1 A- 21 trawl (63 percent) and non-trawl allocations (37 percent). The projected IFQ impacts are shown in Table 4-67 and have the IFQ sector attaining ~10 percent of their No Action allocation.

Option 2 uses a customized approach to establish separate trawl and non-trawl shares of blackgill rockfish, the other southern slope rockfish species, and the complex as a whole (Agenda Item H.8.a, Supplemental GMT Report 2, November 2019). The objective of Option 2 would be to meet the same objectives of Amendment 26 (A-26), which the Council rescinded taking action on. The main components of the rescinded FPA for A-26 were to remove blackgill rockfish from the complex, shift more of the blackgill rockfish allocation to non-trawl (41 percent trawl; 59 percent non-trawl), and shift more of the other southern slope complex allocation to trawl (91 percent trawl; 9 percent non-trawl). These allocation shifts were designed to optimize benefits in each sector given that blackgill rockfish is an important non-trawl species and the other slope species are trawl dominant. The Council however rescinded their FPA based on public comment that removing blackgill rockfish could constrain the IFQ fishery if managed on their own; however, there was still universal support for finding a future mechanism to obtain the FPA allocation shifts for both blackgill rockfish and other slope species while keeping blackgill rockfish in the complex.

Option 2 accomplishes the A-26 allocation objectives while keeping blackgill rockfish in the complex (Agenda Item H.8.a, Supplemental GMT Report 2, November 2019). A short summary of the background of Option 2 and the five tasks used in developing Option 2 is provided here. For more background, please review the GMT report and the draft environmental assessment (EA) for A-26 (Agenda Item G.4 Attachment 1 April 2019). The A-26 draft EA analysis is applicable here, although the FPA was rescinded, because Option 2 accomplishes the same A-26 allocations and management measures, without removing blackgill rockfish from the complex. Instead, it uses informal shares to manage amongst sectors.

The five main tasks of Option 2 are as follows:

1. Set an HG for blackgill rockfish equal to the component ACL
2. Establish trawl/non-trawl shares of the blackgill rockfish HG
3. Set trip limits for non-trawl to stay within their share of blackgill rockfish
4. Implement IFQ trip limits to keep them to their share of blackgill rockfish
5. Create customized two year allocations based on the sum of the blackgill and other slope shares minus deductions for off-the-top deductions

A main issue of Option 2 however was developing a mechanism to keep the trawl sector to their share of blackgill rockfish, which is a stock of concern since they were previously in the precautionary zone and are characterized by slow growth and late maturation. If blackgill rockfish had been removed from the complex under A-26, this could have been accomplished with blackgill-specific QP. Since blackgill rockfish were not removed from the complex, this created an issue because trawlers receive southern slope QP that can be used to take any complex species, including blackgill rockfish. Therefore, IFQ vessels theoretically could take only blackgill rockfish with their southern slope QPs and exceed the entire blackgill rockfish ACL contribution.

The GMT therefore proposed analyzing the effect of a blackgill rockfish trip limit for IFQ vessels. While the year could begin with an unlimited IFQ blackgill rockfish trip limit in regulation, it could then be adjusted downward if needed inseason to keep them to their share (e.g., 100 lbs. bimonthly) or to the ACL contribution if non-trawl attainments are low. Although there is not a legal requirement to manage stocks in complexes to their component ACLs or shares, a main focus of Option 2 was to manage blackgill rockfish to the component ACL for conservation reasons described above. As described in detail below, the GMT concluded that a trip limit could effectively mitigate additional total mortality of blackgill rockfish by the IFQ sector given that the majority of impacts are attributed to landings from just a few vessels.

The Option 2 proposed blackgill rockfish shares, other slope rockfish shares, and southern slope rockfish complex trawl and non-trawl allocations are shown in Table 4-75. Each share is based on the A-26 framework applied to the component ACL(s) level; however, to account for off-the-top deductions taken at the complex level under status quo proportions and prevent exceedance of the complex ACL, the GMT recommended apportioning the off-the-top deductions on a pro-rata basis to the "total share" percentage. For more detail, please see Agenda Item H.8.a., Supplemental GMT Report 2, November 2019.

Table 4-75. Proposed two-year allocations for southern slope rockfish complex in 2021-22 under Option 1 and 2 and the proposed shares used to manage blackgill and the other slope species within Option 2.

Option	Category	2021		2022	
		Trawl	Non-trawl	Trawl	Non-trawl
Option 1	Blackgill share	72.4	104.2	71.4	102.7
	Other slope share	484.5	47.9	483.2	47.8
	Total share	556.9	152.1	554.5	150.5
	% of total share	78.5%	21.5%	78.6%	21.4%
	Total off-top deductions for southern slope complex	38.9		38.9	
	Apportioned off-the-top deductions based on % of total share	30.5	8.4	30.5	8.4

Option	Category	2021		2022	
		Trawl	Non-trawl	Trawl	Non-trawl
	Allocation	526.4	113.2	515.6	142.1
Option 1	Allocation*	422.2	247.9	419.6	246.5

*Option 1 uses the status quo A-26 trawl (63 percent) and non-trawl (37 percent) allocations for the complex as a whole without shares of blackgill rockfish and "other slope"

The IFQ fishery is projected to be within the Option 2 blackgill rockfish shares since the 5-year-average (2014-2018) total mortality has been 24.7 mt with a 38.5 mt maximum (Table 4-76). The IFQ fishery is also projected to be within their Option 2 share of "other slope species" as the 5-year-average is 42 mt with a maximum of 61.7 mt. Lastly, the IFQ sector is projected to be within the total southern slope rockfish two year allocations based on IFQ model projections of 47 mt and 42 mt (Table 4-67). There has not yet been enough time to customize the IFQ model to provide separate blackgill rockfish and other slope rockfish projections, which is why averages and the maximum were used.

As described above, given recent mortality, it may be unlikely than an lower inseason trip limit (e.g., 100 lbs. bimonthly) would be needed. However, if total IFQ mortality did approach the blackgill rockfish IFQ shares, then a 100 lb bimonthly trip limit as proposed by the GMT would be expected to reduce landings by 90-98 percent and total mortality by similar amounts. This is based on a retrospective analysis that compared their actual landings without a trip limit to their projected landings had a 100 lb bimonthly limit been in place for all periods. The trip limit analysis capped vessels at 100 lbs. bimonthly if they caught more than that and assumed there would not be an increase in discards since the majority of landings are attributed to a few vessels that appear to target blackgill rockfishes. It is uncertain when a trip limit would be needed, but this analysis demonstrates that a trip limit would be a highly effective mitigation measure for managing the IFQ fishery to their blackgill rockfish shares. To prevent confusion, it would be beneficial to add a line to the trip limit tables for the IFQ fishery that would start out unlimited at first and could be adjusted downward inseason.

Table 4-76: 2011-2018 blackgill rockfish discard mortality and landings (mt) 2011-2018, percent attainment of the proposed 2021 blackgill rockfish share under Option 2, and retrospective projected landings (mt) and corresponding percent reductions under a 100 lb. bimonthly trip limit for the entire year.

Year	Discard mortality (mt)	Actual landings (mt)	Percent Attainment of 2021 Blackgill Share (72.4 mt) under Option 2	Retrospective projected landings (mt) with 100 lb. bi-mo. trip limit	% reduction in landings with trip limit
2011	0.1	16.4	22.8%	1.7	89.9%
2012	0.4	79.3	110.1%	1.9	97.6%
2013	0.4	54.5	75.8%	1.7	96.9%
2014	1.0	37.5	53.2%	1.6	95.7%
2015	1.2	18.3	26.9%	1.3	92.7%
2016	0.9	10.8	16.2%	1.0	90.6%
2017	0.2	38.9	54.0%	0.9	97.6%
2018	0.2	33.9	47.1%	0.7	97.8%

h) *Petrale sole*

Under No Action, petrale sole would continue to be managed with the ACL = ABC and a P*=0.45. The Council's Preferred Alternative however is to use a more precautionary ACL = ABC with a P*=0.40 (Alternative 1).

That being said, the No Action petrale sole harvest specifications must still be analyzed since they use the default harvest control rule. As shown in Table 4-67, the IFQ sector is projected to catch 99.7 percent of their No Action IFQ allocations of 3,536.1 mt in 2021 and 3,103.9 mt in 2022. The reason for the decline in IFQ allocation from 2021 to 2022 is because petrale sole are above the management target, which results in the long-term OFLs being designed to "fish down" the stock toward the management target to better meet MSY goals.

There are however two allocation alternatives being considered for petrale sole in 2021-22 that apply to all harvest specification alternatives. Option 1 uses the status quo A-21 formulas of 95 percent to trawl and 5 percent to non-trawl (Table 4-77). Option 2 would make petrale sole a two year allocation stock with a fixed 30 mt non-trawl allocation for 2021-22 with the remainder being allocated to the trawl sector. Option 2 was requested for analysis based on a GMT analysis that showed that historical (2005-2018) non-trawl mortality averaged 3.6 mt per year with a high of 9.2 mt in 2018 (Agenda Item H.8.a, Supplemental GMT Report 1, November 2019). A fixed amount of 30 mt for non-trawl is not expected to constrain the non-trawl fisheries.

Table 4-77. Petrale sole allocations under No Action ACL and allocation options and projected increases in IFQ ex-vessel revenue associated with Option 2.

Option	Allocations (mt)						Projected IFQ ex-vessel revenue	
	Year	ACL	Fishery HG	Non-trawl	Trawl	IFQ	Total $	$ gain with Option 2
1* (SQ)	2021	4,115	3,727.5	186.4	3,541.1	3,536.1	9,230,482	NA
	2022	3,660	3,272.5	163.6	3,108.9	3,103.9	8,102,286	NA
2	2021	4,115	3,727.5	30	3,692.5	3,687.5	9,638,742	$408,260
	2022	3,660	3,272.5	30	3,237.5	3,232.5	8,451,030	$348,744

**Option 1 uses SQ A-21 trawl (95 percent) and non-trawl (5 percent) allocations whereas Option 2 fixes non-trawl at 30 mt and with the remainder to trawl*

i) *Widow rockfish*

Allocations for widow rockfish were set up during A- 21, which allocates 91 percent to trawl and 9 percent to the non-trawl. In addition, allocations for the at-sea sectors were determined by a formula in which the greater of 10 percent or 500 mt were allocated to the whiting sectors (shoreside, CP, and MS), and then that amount was allocated pro-rata to the sector's whiting allocation (42 percent, 34 percent, and 24 percent respectively). With the implementation of Amendment 21-4, the whiting sector's allocations for canary and widow rockfish are now managed as set-asides; however, the Council chose to use the A- 21 formulas as a starting point for determining set-aside values.

The Council is considering not only changes to the trawl-non trawl apportionment of the widow rockfish HG, but also the method for setting the at-sea set-aside value. Table 4-67 above uses the A- 21 formulas for 2021-22 for widow rockfish. As shown, the projected attainment of widow rockfish under No Action is just over 92 percent in both years. With the stock being declared rebuilt in 2015 followed by the trawl gear EFP (and subsequent implementation of the trawl gear rule), widow rockfish attainment in the IFQ sector has averaged 95 percent in 2018-2019 compared to 56 percent from 2015-2017.

Given these trends, the IFQ sector would likely be able to utilize any additional quota available. Under allocation Option 2 (i.e., 300 mt fixed for non-trawl and remainder to trawl), the trawl sector would increase their allocations by ~1000 mt each year, assuming status quo at-sea set-asides, as shown in Table 4-78. The at-sea sectors combined maximum mortality in a single year from 2015-2019 is only 476 mt and individual combined mortality (i.e. sector specific maximum from 2015-2019 combined) of 592.2 mt, with an average sector mortality of 220.6 mt (see Chapter 4.2.3.6) therefore, the proposed set asides under status quo of 764.1 and 714.6 mt for 2021-2022 would likely strand between 200-500 mt in the at-sea sector that could also be used in the IFQ fishery. At the most liberal allocation to the IFQ sector being considered (Option 2 for trawl-non trawl allocations and Option b for at-sea, based on the recent average), the IFQ's allocation could be up to 1546.4 mt higher in 2021 or 1412.6 in 2022 compared to No Action.

Table 4-78. Comparison of widow rockfish allocations/set-asides for 2021-22 under No Action ACLs for Option 1 (based on Amendment 21 formula, including option for an at-sea set-asides) and Option 2 (300 mt to non-trawl, with remainder to trawl and at-sea set-aside based on recent five year average or Option b).

Option	Year	Harvest Specifications and Allocations (mt)					Projected IFQ $ ex-vessel revenue	
		ACL	Fishery HG	IFQ	At-Sea	Non-Trawl	Total $	$ gain with Option 2
Option 1	2021	14,725	14,476.7	12409.7	764.1	1302.9	$7,113,190	NA
	2022	13,788	13,539.7	11606.5	714.6	1218.6	$6,652,799	NA
Option 2	2021	14,725	14,476.7	13956.1	220.6	300	$7,999,581	$886,390
	2022	13,788	13,539.7	13019.1	220.6	300	$7,462,496	$809,697

j) *Other Groundfish Stocks*

The majority of other IFQ species would see little impact on potential utilization under any of the proposed at-sea set-asides discussed below. The largest proposed relative change from 2019 to set-asides under status quo methodology (i.e. recent maximum) would be for slope rockfish north of 40° 10' N. lat. (three times 2019 value in regulation) and shortspine thornyhead north of 34° 27' N. lat. (2.3 times greater). However, as shown in Table 4-67 above, the IFQ sector is expected to take less than 25 percent of the slope rockfish north complex and less than 40 percent of the shortspine thornyhead allocation in 2021-22. Given that, the status quo (i.e. Option a) values are likely to account for the recent mortalities seen in 2018-2019 in the at-sea sector without constraining the IFQ fishery.

4.2.2.5 At-Sea

Impact (Groundfish Mortality) –At-Sea.

Under No Action, the 2019-20 ACLs for non-whiting species would be established using defaults harvest control rules. For Pacific whiting, the 2019 post-apportionment TAC and the allocations were used as a proxy for analysis since the 2021 and 2022 TACs are established in another process and are not yet available. See Table 4-67 above for Pacific whiting allocations and recent mortality.

Historically, set-asides for species other than darkblotched rockfish, widow rockfish, and POP have been set to account for the recent historic maximum. In general, if the previous biennium's set aside amount covered the recent maximums, then the value was maintained in the next biennium. For example, yellowtail rockfish north of 40° 10 N. lat. has been 300 mt since 2011 although bycatch has varied each year. The Council adopted a range of options for considering the method by which to determine the set asides amounts

for all species (November 2019 Council Motions). Additionally, there is consideration for setting all species as sector specific set-asides or combined. Options for determining amounts are as follows:

- Option a: Status Quo methodology- Recent five year maximum (2015-2019) for setting set-aside amounts except for:
    - A-21 formula for darkblotched rockfish, widow rockfish, and POP
    - 2019 set asides for canary rockfish and sablefish
- Option b: Five year average- Recent five year average (2015-2019) for setting set aside amounts for all species with less than 90 percent attainment except for:
    - 100 mt for sablefish
    - 20 mt for canary
- Option c: Five year average with 1.2 multiplier for all species with less than 90 percent attainment except for:
    - 100 mt for sablefish
    - 20 mt for canary

In addition to the consideration for all species to have a combined set aside, the Council also forwarded for consideration an option in which each sector would have a sector specific set aside. Values were to be based on the status quo methodology (including the A-21 formula for select species), pro-rata to the whiting allocations, and a "needs based" approach. This analysis will provide an examination of the following options:

- Option d: Status Quo methodology- Recent five year maximum (2015-2019) for setting set-aside amounts except for:
- A-21 formula for darkblotched rockfish, widow rockfish, and POP
    - Baseline amounts for canary rockfish
- Option e: Option b values allocated pro-rata to sectors based on whiting allocations
- Option f: Option b approach (recent five year average) applied to sector level- all species

Combined Set Asides

Table 2-33 below shows the set asides under each of the options discussed above with the assumption that all species have a single combined set aside. For the action alternatives (options b and c), there is no proposed set aside for English sole, longspine thornyhead, Pacific cod, petrale sole, and starry flounder (Agenda Item H.8.a, Supplemental GMT Report 2, November 2019). These species have had less than 0.1 mt of mortality historically. In addition, the recent five year maximum, average, and the mortality for 2018 and 2019 is provided for reference. Each option is discussed below.

Option a: Status Quo Methodology

Widow rockfish, darkblotched rockfish, and POP set asides are set via the A-21 formula in the FMP. Although Amendment 21-4 removed the formulas from the FMP, the Council in their final action stated that the formulas should be used to determine the set-aside amounts unless the Council takes action to change the amounts (November 2018 Council Motion). The resulting set aside values from A-21 for darkblotched rockfish for 2021-22 do not cover the recent mortality seen in 2018 and 2019, but do account for the average. While darkblotched is not a highly attained species in the IFQ fishery (~50 percent in recent two years), additional increases to the set aside in the at-sea fishery could impact the IFQ fishery at the vessel level. Overall, there is little risk to the ACL for darkblotched though even if the at-sea sectors were to exceed the proposed set asides. For widow rockfish and POP, the values proposed under A-21 are likely to strand quota in the at-sea sectors. While POP is under attained in the IFQ fishery and therefore the option a values are not expected to impact the IFQ fleet, the use of option a for widow rockfish could result in lost IFQ revenue as described above.

For all other species, the combined set aside amounts in below are the baseline amounts from 2019 unless increased to cover the five year maximum mortality (shown with grey shading), except sablefish and canary rockfish. Sablefish north of 36° N. lat. has had a set aside of 50 mt since 2011. There has been significant discussion surrounding whether to increase the sablefish set aside from 50 mt given that at-sea sector has exceeded the set aside in 2017-2019. The GMT outlined in their November report that the sectors have been encountering a large amount of the 2016 year class in recent years, which resulted in voluntary avoidance measures taken by each fleet. Increasing the amount of sablefish to the at-sea sectors to cover incidental bycatch and thereby decreasing the overall allocation to the IFQ sector, where it is one of the most valuable species, is something the Council will need to consider. Prior to the recent interactions, sablefish bycatch in the at-sea sector has ranged from only 0.2 mt in 2009 to 27.7 in 2016. Impacts to the IFQ sector based on the at-sea set aside options are discussed in Section 4.2.2.4. As discussed in Agenda Item H.8.a, Supplemental GMT Report 2, November 2019, canary rockfish is part of a broader discussion of trawl/non-trawl allocations. Under Option a (coinciding with allocation option 1), the set asides remain at the current values of 30 mt for MS, 16 mt for CP for a total of 46 mt.

Option b: Five year average for species with less than 90 percent attainment except for sablefish and canary rockfish

Under option b, the recent five year average mortality (2015-2019) for species with less than 90 percent ACL attainment is the proposed set aside based on the GMT recommendation in November 2019. For sablefish, the Council recommended alternative of 100 mt is used as the proposed set aside. As shown, if the Council were to choose the five year average for sablefish north of 36° N. lat., the set aside would be 76.1 mt. For canary rockfish, a proposed 20 mt combined set aside is considered under this option (corresponding to allocation option 2 discussed above). This would be over a 56 percent reduction in the status quo set aside but would be 13.4-16.4 mt over the recent five year combined maximum and average, respectively.

As shown, for those species with a proposed set aside, only the canary rockfish set aside of 20 mt would cover the recent five year historical maximum mortality. When examining the two most recent years of mortality, in addition to canary rockfish, proposed set asides for longnose skate and sablefish north would cover 2019 mortality and the five year average for widow rockfish would be over both the 2018 and2019 mortality.

Option c: Option b with a 1.2 multiplier for species with less than 90 percent attainment

Under option c, sablefish north and canary rockfish set asides are the same as option b. For all other species, a 1.2 multiplier is used on the recent five year average mortality to determine proposed set asides. In addition to those species discussed under option b where the proposed set asides would cover the recent years mortality, the proposed set aside values for arrowtooth flounder and lingcod north would cover mortality in 2019 and shelf rockfish north, POP, and yellowtail rockfish north for 2018.

Table 4-79. No Action- At-Sea Set-Asides Option for 2019-2020, Historical Maximum Mortality (2015-2019), 2018 and 2019 mortality, and average 2015-2019 mortality (mt).

Species	Area	Value in 2019 Regulations	Option a (SQ)	Option b (5 year average)	Option c (5 year average with 1.2 multiplier)	Historical Mortality for CPs/MS			
						Maximum (2015-2019)	2018 (mt)	2019 (mt)	Average 2015-2019 (mt)
Yelloweye rockfish	Coastwide	0	0	0	0	0	0	0	0
Arrowtooth flounder	Coastwide	70	70	38.6	46.3	66.4	55.4	43.6	38.6
Canary rockfish	Coastwide	46	46	20	20	6.6	5.5	5	3.6
Darkblotched rockfish	Coastwide	36.3	42.1	38.8	46.6	76.4	65.1	76.4	38.8
Dover sole	Coastwide	5	10	2.1	2.5	6.3	2.7	6.3	2.1
English sole	Coastwide	5	5			0.2	0.2	0.1	0.1
Lingcod	N. of 40°10' N. lat.	15	15	1.4	1.7	3.4	3.4	1.7	1.4
Longnose skate	Coastwide	5	5	1	1.2	1.9	1.9	0.8	1
Longspine thornyhead	N. of 34°27’ N. lat.	5	5			0	0	0	0
Minor Shelf Rockfish	N. of 40°10' N. lat.	35	35	9.4	11.3	15.5	10.8	15.5	9.4
Minor Slope Rockfish	N. of 40°10' N. lat.	100	300	147.1	176.5	295	295	207.3	147.1
Other flatfish	Coastwide	20	35	16.5	19.8	33.1	31.6	33.1	16.5
Pacific cod	Coastwide	5	5			0.2	0	0	0
Pacific halibut a/	Coastwide	10	10	10	10	0.66	0.66		0.36
Pacific ocean perch	N. of 40°10' N. lat.	404.5	358.7	48.5	58.2	141.7	55.6	141.7	48.5
Petrale sole	Coastwide	5	5			0	0	0	0
Sablefish	N. of 36° N. lat.	50	50	100	100	153.3	116.8	71.2	76.1
Shortspine thornyhead	N. of 34°27’ N. lat.	30	70	35.2	42.2	69.4	69.4	57.4	35.2
Starry flounder	Coastwide	5	5			0	0	0	0
Widow rockfish	Coastwide	611.4	764.1	220.6	264.7	476	206.9	199	220.6
Yellowtail rockfish	N. of 40°10’ N. lat.	300	320	194.9	233.9	317.6	229.9	317.6	194.9

a/ Set-asides for Pacific halibut are set in an international process and are not proposed to change. 2019 values were not available at the time of the document development.

Sector Specific Set Asides

The only species in which there are sector specific set asides are darkblotched rockfish, widow rockfish, canary rockfish, and POP. All remaining species are managed as combined set asides. Under the following options shown in Table 4-80, each at-sea sector would have a sector specific set aside for each species. The 2018-2019 mortality by sector are shown for reference. All the below options include the removal of a set aside value for English sole, longpsine thornyhead, Pacific cod, petrale sole, and starry flounder of which there has been less than 0.1 mt caught in the last five years. Additionally, Pacific halibut is not listed as the 10 mt set aside is for the combined fisheries and is determined in another process.

Option d: Status quo methodology applied to sector level

As described above for option a, historically, set asides are generally carried over from the previous biennium (which was based on the historic maximum) unless the amounts are increased to account for recent higher mortality. Option d in Table 4-80 below sets the set aside as the five year maximum mortality from 2015-2019 except for the four species of which there are already sector specific values for in 2019. These values are maintained. As shown, the resulting set aside values for darkblotched rockfish from A-21 would not cover mortality for either sector in 2018 or 2019.

While option d looks at the maximum take in each sector in the last five years, it is important to consider that the decision on whether to set at the overall or sector level can impact the total deduction from the trawl allocation and thereby impact the IFQ sectors. The maximum take over all of a set aside species by the at-sea sector as a whole does not necessarily come from the year in which the CP or MS sector had the maximum amount of bycatch for their sector. For example, the total set aside under option d for yellowtail rockfish is 342.4 mt (163.7 mt for CP and 178.7 mt for MS). The maximum for CP occurred in 2019 while the maximum for MS occurred in 2018. The overall maximum in a single year was 317.6 mt which occurred in 2019. The difference between these two maximums is 24.8 mt. While only 0.6 percent of the proposed 2021 trawl allocation, it would impact the individual vessel limit by over 4,000 pounds. Other species where there is over a 1 mt difference between option a (where the combined maximum was used) and option d (sector specific maximum) are arrowtooth flounder (9.1 mt), other flatfish (3.3 mt), and shelf rockfish north (1.1 mt).

Option e: Pro-rata

Under option e, proposed set asides for the both sectors would not cover recent mortality for over 60 percent of the set aside species proposed for 2021-22 (i.e. excluding those species with recommended removal of set asides). A common method of apportioning quotas among the whiting sector is by using a pro-rata formula. That is, basing the proportions to each sector on the proportion of the whiting allocation that they are allocated. For example, A-21 formulas for darkblotched rockfish, widow rockfish, and POP allocated a specific amount to the whiting sectors (shoreside, CP, and MS) and then allocate the amounts pro-rata to the whiting allocation (42, 34, and 24 percent respectively). The values proposed under Option e below use the combined values under Option b (five year average except for sablefish and canary rockfish) and apply the pro-rata values of 58.6 and 41.4 percent for the CP and MS sectors, respectively.

Option f: Option b applied to sector level

One of the alternatives forwarded by the Council was to look at the sector specific set asides in terms of the needs of the sectors. Therefore, option f provides the set aside values with the five year average mortality for all species, including sablefish and canary rockfish. The vast majority of the species with proposed set asides for 2021-22 under this option would have set asides that would not cover recent mortality in 2018 and 2019.

Table 4-80. No Action- Sector Specific Set-aside Options with 2018 and 2019 sector mortality for reference (mt).

Stock/Species	Area	Option d		Option e.		Option f		2018 Mortality		2019 Mortality	
		CP	MS	CP	MS	CP	MS	CP	MS	CP	MS
Yelloweye rockfish	Coastwide	0	0	0.0	0.0	0	0	0	0	0	0
Arrowtooth flounder	Coastwide	65.5	10.0	22.6	16.0	34.6	4	45.4	10.0	40.9	2.7
Canary rockfish	Coastwide	16	30	11.7	8.3	1	2.6	0.9	4.7	1.7	3.3
Darkblotched rockfish	Coastwide	24.7	17.4	22.7	16.1	25.7	13.2	41.8	23.2	45.5	30.9
Dover sole	Coastwide	6.2	0.6	1.2	0.9	1.9	0.2	2.1	0.6	6.2	0.1
English sole	Coastwide	--	--	--	--	--	--	0.1	0.0	0.1	0
Lingcod	N. of 40°10' N. lat.	0.3	3.2	0.8	0.6	0.1	1.3	0.1	3.2	0.3	1.4
Longnose skate	Coastwide	0.9	1	0.6	0.4	0.5	0.5	0.9	1.0	0.7	0
Longspine thornyhead	N. of 34°27’ N. lat.	--	--	--	--	--	--	0.0	--	0	0
Minor Shelf Rockfish	N. of 40°10' N. lat.	4.2	12.3	5.5	3.9	2.4	7	1.1	9.7	4.2	11.3
Minor Slope Rockfish	N. of 40°10' N. lat.	219.3	75.7	86.2	60.9	112.6	34.5	219.3	75.7	161.4	45.9
Other flatfish	Coastwide	31.6	4.8	9.7	6.8	14.7	1.7	26.9	4.8	31.6	1.5
Pacific cod	Coastwide	--	--	--	--	--	--	0.0	0.0	0	0
Pacific ocean perch	N. of 40°10' N. lat.	210.3	148.4	28.4	20.1	31.1	17.4	30.8	24.8	94.4	47.3
Petrale Sole	Coastwide	--	--	--	--	--	--	0.0	0.0	0	0
Sablefish	N. of 36° N. lat.	92.2	85.8	58.6	41.4	48.1	28	92.2	24.6	53.1	18.1
Shortspine thornyhead	N. of 34°27’ N. lat.	59.6	9.8	20.6	14.6	30.5	4.7	59.6	9.8	52	5.4
Starry flounder	Coastwide	--	--	--	--	--	--	0.0	0.0	0	0
Widow rockfish	Coastwide	447.9	144.3	129.3	91.3	139	81.7	62.6	144.3	92.6	106.4
Yellowtail rockfish	N. of 40°10’ N. lat.	163.7	178.7	114.2	80.7	71.4	123.5	51.1	178.7	163.7	153.9

4.2.2.6 Limited Entry and Open Access Fixed Gear

The No Action Alternative analyzes the LEFG and OA fisheries under the default HCR ACLs (Table 4-49 and Table 4-50) and associated management measures. Under No Action, the economic impacts of the non-nearshore fisheries are mainly driven by sablefish ACLs of which the default harvest control rule (ACL = ABC, P*0.40) is the basis of the allocations and trip limit alternatives for 2021-2022. In this biennium, the 40:10 adjustment, which set the ACL below the ABC is no longer applicable since the stock is no longer in the precautionary zone in 2021-2022.

Non-Nearshore Trip Limit Analysis

The trip limit sections (and tier limits) for the non-nearshore fishery are organized as follows:

1) sablefish using ACL apportionment Method 1;
2) sablefish using ACL apportionment Method 2;
3) shortspine and longspine thornyhead north of 34°27' N. lat.;
4) non-sablefish south of 42° N. lat.;
5) non-sablefish north of 40°10' N. lat.;
6) non-sablefish south of 40°10' N. lat.

Sablefish allocations and trip and tier limits for No Action Method 1

No Action for sablefish is highly affected by the Method the Council will select to apportion the coastwide ABC to the ACLs for the north and south of 36° N lat. management areas as described in Agenda Item H.6.a Supplemental GMT Report 3, November 2019. A detailed overview of the background of these ACL apportionment Methods is included in the IFQ Section 4.2.2.4 above. Method 1 uses the long-term (2002-2018) average survey biomass distributions to apportion the coastwide ABC. Method 2 uses the rolling 5-year average survey biomass distributions (2014-2018). No Action and Alternative 1 are considered the main ACL alternatives, and Methods 1 and 2 are considered sub-Options that affect the ACLs for both management areas.

There are therefore four different sablefish ACL Options being considered for 2021-22

1. No Action Method 1;
2. No Action Method 2;
3. Alternative 1 Method 1;
4. Alternative 1 Method 2.

The sablefish allocations and tier limits for 2021-22 are shown in Table 4-81 - Table 4-83. The landings targets and proposed trip limits for the LEN and OAN DTL fisheries north of 36° N. lat. are shown in Table 4-84; the proposed trip limits were designed to fully attain the landings targets. As is always done for DTL trip limit projections, a range of high and low projected attainments was provided to account for model uncertainty. Trip limit projections are uncertain since price and participation can vary considerably from year to year even when there are constant trip limits. Although the upper end of the range of predicted landings is above the landings targets, this is not expected to be a problem as the model overestimated LEN and OAN landings by 25-45 percent in 2019, because processors indicate prices will continue to be low in the future and cause lower than expected effort, and most importantly, because inseason actions can be used to reduce trip limits if landings are higher than projected.

The trip limits for the LES DTL fishery (Table 4-80) continue to be set at a constant 2,000 lbs. weekly year-round despite low projected attainment because lack of processing infrastructure and closed areas are considered the main hindrance to attainment.

There are however two trip limit Options for the southern open access (OAS) DTL fishery (Table 4-80). OAS Option 1 maintains the 2019 daily (300 lbs.) and weekly limits (1,600 lbs.) but uses a year-round 4,800 lbs. bi-monthly limit to be consistent the Council's inseason action for 2020 trip limits. The projected attainment for OAS Option 1 is less than 13 percent of the landings target. OAS Option 2 maintains the weekly and bi-monthly trip limits but eliminates the daily limit (Table 4-80). Option 2 was requested by the Council and the GAP because the daily trip limit can reduce profit margins (more trips needed to catch weekly limits) and removing it could create greater incentive for participation. It was a challenge to model OAS Option 2 trip limits because daily trip limits have been utilized as far back as trip limit regulation histories could be found dating back to the 1990s. It would also be highly speculative to try to precisely model the projected impacts of removing the daily limit because removing it could increase incentive for participants to catch more of the weekly limit, but by what degree is unknown at this time. It is possible that removing the daily limit could result in more vessels catching the full bi-monthly limits, which is the maximum limit for the fishery.

The current DTL model is unequipped to model removing the daily limit and thus a new custom analysis was needed. Therefore, a maximum retrospective landings scenario was conducted to evaluate what the fishery could have landed under the OAS Option 2 bi-monthly limit of 4,800 lbs., based on the 2019-2020 biennium amounts. This maximum landings scenario assumes that every single active sablefish vessel would have landed the full 4,800 lbs. limit each period. This maximum landing scenario, while unlikely, demonstrates that is unlikely that OAS would exceed their 364 mt landings target in 2021. For instance, actual landings since 2012 have been less than 75 mt per year. Even under the maximum catch scenario, the fleet would have caught less than 100 mt per year since 2014 (Table 4-86).

There was however a spike in actual OAS landings in 2009 and 2010 where the actual and maximum scenario landings would have been over the landings target, but that was when the bi-monthly trip limit was nearly double the proposed 4,800 lbs. bimonthly limit for 2021-22. Future OAS landings would not be expected to be as high now that there are lower bi-monthly limits. If landings were to unexpectedly raise to similar levels in 2021-2022 with removal of the daily trip limit, then inseason action could be taken to add the daily limit back in. The daily limit could be considered inseason since it has been analyzed under Option 1. Having actual data on the effects of removing the daily trip limit can better inform future impacts for both OAS and OAN where there has also been interest in removing the daily limit.

Table 4-81. No Action Method 1 - Limited entry sablefish FMP allocations of sablefish north of 36° N. lat., based on the default harvest control rule of a P* of 0.4 and Method 1.

Year	Sablefish Com. HG	LE Share	LE FG Share (mt)				Estimated Tier Limits (lbs.) a/		
			LE FG Total Catch Share	Landed Catch Share a/	Primary Season Share b/	LE FG DTL Share b/	Tier 1	Tier 2	Tier 3
2021	5,399	4,892	2,054	1,960	1,746	308	51,363	23,347	13,341
2022	5,136	4,654	1,954	1,865	1,661	293	48,863	22,211	12,692

a/ The limited entry fixed gear total catch share is reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2018. In 2021-2022, 23 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

b/ Shares do not include anticipated discard mortality

Table 4-82. No Action Method 1. Open access FMP allocations of sablefish north of 36° N. lat., based on the default harvest control rule of a P* of 0.4 and apportionment Method 1.

Year	OA Total Catch Share (mt)	Directed OA Landed Catch Share (mt) a/
2021	508	484
2022	483	461

a/ The open access total catch share is reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2018. In 2021-2022, 23 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

T**able 4-83. No Action Method 1- Short-term sablefish allocations south of 36° N. lat. for the non-trawl sector, based on the default harvest control rule of a P* of 0.4 and a long-term average ACL apportionment Method 1. Limited entry and open access catch shares.**

Year	Commercial HG	Non-Trawl Allocation	LE FG Total Catch Share	Directed OA Total Catch Share	LE FG Landed Catch Share a/	Directed OA Landed Catch Share a/
2021	2,140	1,241	869	372	850	364
2022	2,035	1,180	826	354	808	346

a/ The limited entry and open access fixed gear total catch shares are reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2018. In 2021-2022, 23 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

Table 4-84. No Action Method 1. Sablefish trip limits (lbs.) north of 36° N. lat. for limited entry and open access fixed gears, with landed share and projected attainment for 2021. Catch shares are based on the default harvest control rule of a P* of 0.4 and a long-term average ACL apportionment Method 1.

Fishery	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sept-Oct	Nov-Dec	Landed Catch Share	Projected Landings
LEFG	1,500 lbs./ week, not to exceed 4,500 lbs. / 2 months						294	252-308
OA	300 lbs. daily, or 1 landing / week up to 1,200 lbs., not to exceed 2,400 lbs./ 2 months						484	397-497

Table 4-85. No Action Method 1. Sablefish trip limits (lbs.) south of 36° N. lat. for limited entry and open access fixed gears, with landed share and projected attainment for 2021. Catch shares are based on the default harvest control rule of a P* of 0.4 and a long-term apportionment Method 1.

Fishery	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sept-Oct	Nov-Dec	Landed Catch Share	Projected Landings
LEFG	2,000 lbs./week						850	336-411
OA Option 1	300 lbs. daily, or 1 landing /week up to 1,600 lbs., not to exceed 4,800 lbs./2 months						364	26-39
OA Option 2	1,600 lbs. per week, not to exceed 4,800 lbs. bimonthly						364	< 100 a/

a/ Based on the maximum catch scenario in Table 4-84 of <100 mt from 2014-2019.

Table 4-86. No Action Method 1. Retrospective analysis of the Option 2 trip limit that would remove the daily trip limit in the open access south of 36° N lat. DTL fishery in relation to the 364 mt landings target. A dash indicates confidential data.

Year	Count of unique boats						Avg. bi-monthly limit lbs. a/	Actual landings (mt)	Option 2 max catch scenario w/ 4,800 bimonthly limit (mt) b/
	P1	P2	P3	P4	P5	P6			
2007	16	13	16	12	31	29	7,000	114	255
2008	17	18	22	20	23	13	3,833	120	246
2009	15	23	31	33	43	53	11,600	514	431
2010	37	42	54	57	69	19	9,733	783	605
2011	37	26	22	16	23	22	3,433	167	318
2012	20	23	18	18	14	12	2,700	73	229
2013	16	13	13	8	11	11	3,067	61	157
2014	9	12	7	7	4	6	3,200	35	98
2015	11	12	5	8	4	4	3,200	33	96
2016	7	8	4	-	5	10	3,200	25	76
2017	8	7	7	6	5	7	3,200	26	87
2018	10	9	9	5	4	4	3,600	22	89
2019	3	3	3	-	3	-	4,000	12	35

a/ For earlier years without a bimonthly limit, the weekly limit was multiplied by 8 as proxy of a max bimonthly limit

b/ Retrospective model that assumes every vessel would have caught the maximum proposed 4,800 lbs. bimonthly limit for 2021-22 instead of actual bimonthly limit.

The Council also forwarded a proposal that would also remove the daily limit for the northern OA sablefish fishery. Although this proposal could make the fishery more economically profitable (i.e., fewer trips to catch the weekly and bimonthly limits), it would also be expected to increase effort and potentially cause a mid-season closure. This would be counter to one of the GAP's main objectives to use conservative trip limits to maintain a year-round fishery. Reducing the weekly and bimonthly limits could potentially facilitate removal of the daily trip limit, but there is no data to inform the impacts of such since the daily trip limit has been in place as far back as regulation histories can be found dating back to mid-1990's. Evaluating the effects of removing the daily trip limit for OAS, where there is more room for experimentation due to low attainments, could provide a useful proxy dataset for considering future removal of the daily trip limit to the north.

Sablefish allocations and trip and tier limits for No Action Method 2

No Action Method 2 uses the DHCR of a P*0.40 to set the coastwide ABC and the 5-year-rolling-average trawl survey biomass distributions to apportion the ABC to the ACLs of north and south of 36° N. lat. The sablefish allocations and tier limits for 2021-22 are shown in Table 4-87 –Table 4-89 Higher DTL trip limit can be considered to the north (Table 4-90) since Method 2 apportions 4.8 percent more of the coastwide ABC to the ACL north of 36° N. lat. The same trip limits for the south are being considered for Method 2 (Table 1-50) as for Method 1 (Table 4-80) under No Action, which includes the Option 2 proposal to remove the daily trip limit for OAS.

Table 4-87. No Action Method 2 - Limited entry sablefish FMP allocations north of 36° N. lat., based on the default harvest control rule of a P* of 0.4 and a rolling 5-year average ACL apportionment Method 2.

Year	Sablefish Com. HG	LE Share	LE FG Share (mt)				Estimated Tier Limits (lbs.) a/		
			LE FG Total Catch Share	Landed Catch Share a/	Primary Season Share b/	LE FG DTL Share b/	Tier 1	Tier 2	Tier 3
2021	5,754	5,213	2,189	2,089	1,775	328	54,737	24,880	14,217
2022	5,474	4,959	2,083	1,987	1,689	312	52,074	23,670	13,526

a/ The limited entry fixed gear total catch share is reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2018. In 2021-2022, 23 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

b/ Shares do not include anticipated discard mortality.

Table 4-88. No Action Method 2. Open access FMP allocations north of 36° N. lat., based on the default harvest control rule of a P* of 0.4 and a rolling 5-year average ACL apportionment Method 2.

Year	OA Total Catch Share (mt)	Directed OA Landed Catch Share (mt) a/
2021	541	516
2022	515	419

a/ The open access total catch share is reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2018. In 2021-2022, 23 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

Table 4-89. No Action Method 2- Short-term sablefish allocations south of 36° N. lat. for the non-trawl sector, based on the default harvest control rule of a P* of 0.4 and a rolling 5-year average ACL apportionment Method 2. Limited entry and open access shares under the No Action sharing alternative (70 percent limited entery:30 percent open access).

Year	Commercial HG	Non-Trawl Allocation	LEFG Total Catch Share	Directed OA Total Catch Share	LEFG Landed Catch Share a/	Directed OA Landed Catch Share a/
2021	1,737	1,008	705	302	690	296
2022	1,652	958	671	287	656	281

a/ The limited entry and open access fixed gear total catch shares are reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2018. In 2021-2022, 23 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

Table 4-90. No Action Method 2- Sablefish trip limits (lbs.) north of 36° N. lat. for limited entry and open access fixed gears, with landed share and projected attainment for 2021. Catch shares are based on the default harvest control rule of a P* 0.4 and a rolling 5-year average ACL apportionment Method 2.

Fishery	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sept-Oct	Nov-Dec	Landed Catch Share	Projected Landings
LEFG	1,600 lb week, not to exceed 4,800 lbs. / 2 months						313	276-337
OA	300 lbs. daily, or 1 landing per week up to 1,300 lbs., not to exceed 2,600 lbs. bimonthly						516	454-567

Table 4-91. Action Method 2. Sablefish trip limits (lbs.) south of 36° N. lat. for limited entry and open access fixed gears, with landed share and projected attainment for 2021. Catch shares are based on the default harvest control rule of a P* of 0.4 and rolling 5-year average ACL apportionment Method 2.

Fishery	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sept-Oct	Nov-Dec	Landed Catch Share	Projected Landings
LEFG	2,000 lbs./week						690	336-411
OA Option 1	300 lbs. daily, or 1 landing per week up to 1,600 lbs., not to exceed 4,800 lbs. bimonthly						296	26-39
OA Option 2	1,600 lbs. per week, not to exceed 4,800 lbs. bimonthly						296	< 100 a/

a/ Based on maximum catch scenario from Table 4-84

Shortspine and Longspine Thornyhead North of 34°27' N. lat. allocations and trip limits under No Action

Similar to sablefish, shortspine and longspine thornyheads are assessed coastwide, and the coastwide ABC is apportioned as ACLs for north and south of 34°27' N. lat. based on trawl survey biomass distributions. Retention has been allowed for both LEFG and OA in the southern management zone; however, retention was only allowed for LEFG in the northern management zone prior to 2019. The reason for the prohibition for the OA is somewhat uncertain, but is believed to be a relic from a bygone era when the fisheries were managed with separate LE and OA allocations, there was no catch history for OA, and thus no allocation or opportunity for landings (Agenda Item E.4 Supplemental REVISED Attachment 4 June 2018). This appears to be the case since there was a set-aside for OA to account for their projected discard mortality prior to setting landings limits for LEFG.

The Council did allow OA retention in the northern management zone starting in 2019, but only for the area north of 40°10' N. lat. since that was the only area requested by fishermen in November 2018. It was later realized that allowing retention to the north of 40°10' N. lat. would result in an oversight where OA retention would be allowed throughout the entire coast except for in central California (34°27' N. lat. to 40°10' N. lat.). The GAP and the GMT therefore proposed allowing OA retention in Central California to the Council at the June 2019 Meeting, but the Council elected to defer that proposal until this biennium as it came too late in the 2019-20 biennial process.

For 2021-2022, the following OA thornyhead trip limit proposals have been made for the northern management area (Table 4-92). Under Option 1 (status quo), there would be separate 50 lb monthly limits for shortspine and longspine thornyheads to the north of 40°10' N. lat., but retention would continue to be prohibited off Central California. Option 2 for the north of 40°10' N. lat. would maintain separate shortspine and longspine thornyhead limits, but would raise the shortspine monthly limit from 50 to 1,000 lbs. Option 3 would apply the OA trip limit from the south of 34°27' N latitude to 50 lbs. daily, no more than 1,000 lbs. bimonthly for both species combined.

For the central management area (34°27' to 40°10' N. lat.), Option 1 is status quo and retention of thornyheads would be prohibited (Table 4-92). Option 2 would allow 50 lbs. per month of both to be consistent with north of 40°10' N. lat. Option 3 would apply the OA trip limit from the south of 34°27' N. lat. and be consistent with Option 3 for north of 40° 10' N. lat.

Table 4-92. Shortspine and longspine thornyhead OA trip limit proposals by area for the management area north of 34°27' N. lat.

Area	Option	Trip limit	Comment
North of 40°10'	1 (SQ)	50 lbs. shortspine / month and 50 lbs. longspine / month	-
	2	1,000 lbs. shortspine / month and 50 lbs. longspine / month	Separate trip limits for shortspine and longspine
	3	50 lbs. / day, no more than 1,000 lbs. / 2 months of shortspine and longspine combined	Consistent with S 34°27 OA limit for both shortspine and longspine combined
Central California (34°27' - 40°10'	1 (SQ)	Prohibited (shortspine and longspine)	-
	2	50 lbs. shortspine / month and 50 lbs. longspine / month	Consistent with Option 1 (SQ) for N 40°10'
	3	50 lbs. / day, no more than 1,000 lbs. / 2 months of shortspine and longspine combined	Consistent with S 34°27 OA limit for both shortspine and longspine combined

Allowing 50 lbs. of shortspine thornyhead and 50 lbs. of longspine thornyhead per month for OA in the entire management area north of 34°27' N. lat. appears to be the only viable option for allowing retention off Central California while staying within the non-trawl allocations. This is Option 1 for north of 40°10' N. lat. and Option 2 for Central California.

The total mortality of shortspine thornyhead by the non-trawl sectors has been close to the 2021-22 non-trawl allocations of 67.5 and 65.6 mt. in both 2017-2018 (Table 4-93). The recent high attainment and the lower non-trawl allocation of shortspine thornyhead north of 34°27' N. lat. reduces the opportunity to increase limits for LE and OA. The higher trip limit proposals of 1,000 per month (Option 2 north of 40°10' N lat.) or 50 lbs. per day and up to 2,000 lbs. per month (Option 3 for both areas) are several times higher than a 50 lb. monthly limit (Option 1 north of 40°10' N lat.; Option 2 34°27' - 40°10' N. lat.), could increase targeting, and thus cause the non-trawl allocation to be exceeded.

The non-trawl fisheries would be expected to remain within the non-trawl allocation with a 50 lb. monthly OA limit for shortspine thornyhead in the whole northern management area. Although this would allow retention of Central California, minimal increases to total mortality would be expected (<1 mt). As shown in Table 4-93, allowing retention for the first time in 2019 to the north of 40°10' N. lat. did not cause total mortality to change by measurable amounts compared to previous five years when retention was prohibited.

This is however based on landing and an assumption that discard rates would remain the same as prior years, and official discard mortality estimates for 2019 will not be available until August 2020.

Table 4-93. Shortspine thornyhead historical non-trawl catches for the management area north of 34°27' N lat. in relation to the 67.5 mt and 65.6 mt non-trawl allocations for 2021-22.

Year	Limited entry			Open Access			Non-trawl total (mt)
	Landings (mt)	Discard (mt)	Total (mt)	Landings (mt)	Discard (mt)	Total (mt)	
2003	40.1	1	41.1	1	13.7	14.7	55.8
2004	29.5	1.3	30.8	0.3	14.9	15.2	46
2005	18	0.9	18.9	0.2	7.6	7.9	26.8
2006	25.8	1.6	27.4	0.4	14.2	14.5	42
2007	21.4	4.7	26.1	0.3	0.7	1.1	27.2
2008	19.7	1.6	21.3	0.2	3.8	4	25.3
2009	33.3	1.6	35	0.8	4.8	5.6	40.5
2010	43.4	4.8	48.2	1.1	36.2	37.2	85.4
2011	59.8	2.2	62	1.4	7.8	9.1	71.1
2012	55.3	4.7	60	1.3	3.3	4.6	64.6
2013	52.9	4.3	57.1	0.2	4	4.2	61.3
2014	47.2	3.5	50.7	0.4	2.1	2.4	53.1
2015	41.9	3.1	44.9	0.2	3.3	3.5	48.4
2016	38.6	5.1	43.7	0.5	4.4	4.9	48.6
2017	55.7	3.9	59.6	0.4	1.3	1.7	61.3
2018	55.4	5.1	60.5	0.4	4.3	4.8	65.3
2019	44.9	3.9	48.7	0.8	3.1	3.8	52.6

*2019 discard mortality is a projection and will not be available until 2020

It appears that the main effect of allowing OA retention north of 40°10' N. lat. in 2019 was a conversion of regulatory discards to retained landings which does not affect total mortality. This was validated upon investigation of 2019 landings patterns of north of 40°10' N. lat. boats. Of the 180 non-nearshore OA boats, fewer than three appeared to target shortspine thornyhead as defined as catching at least 80+ percent of the trip limit in at least two months (Table 4-94). It also appears that fewer than 3 of the 59 OA boats south of 34°27' N. lat. appeared to target shortspine thornyhead in 2019 but based on a more conservative targeting assumption of catching over 200 lbs. in a period more than twice during the year.

Low participation from the OA sector is expected in Central California if thornyhead retention is allowed, as effort levels remain low even in adjacent areas where retention is currently allowed (as described above). The low 50 lb. monthly limit minimizes the amounts that could be taken in a year and could likely curtail increased fleet activity for these species. For example, if two boats caught the full 50 lb. monthly limit every single month, then that would only be an extra 1,200 pounds (0.5 mt) of landings. If the extra 0.5 mt were added to the historical total non-trawl mortality (Table 4-93), then the non-trawl sector would still remain within the 2021-22 non-trawl allocations.

Table 4-94. Count of OA non-nearshore vessels by area in 2019 and the number that appear to target shortspine thornyhead in the areas where retention is allowed.

Area	# OA non-nearshore boats	# targeting shortspine thornyhead
Coastwide	450	
N 40°10’	180	<3
34°27’ - 40°10’	213	To be determined if retention allowed
S 34°27’	59	<3

*”Targeting” criteria discussed in text above

*Retention is allowed north of 40°10’ and south of 34°27’ N. lats.

Allowing separate OA 50 lb. monthly limits of both shortspine and longspine north of 34°27’ N. lat. is not expected to cause any concerns for longspine thornyhead. Total non-trawl mortality has been less than 15 mt per year since 2002 compared to the 2021-22 non-trawl allocations of 129.0 mt and 120.0 mt, respectively. Longspine thornyhead are less valuable to fishermen than shortspine thornyhead since they are smaller in size and fetch lower prices.

In summary, separate OA trip limits of 50 lbs. of shortspine and longspine thornyhead per month for the entire northern management area appears to be the only viable option at this time due to shortspine thornyhead constraints. If adopted, this action would be beneficial for Central California as it would allow fishermen to retain their incidental catches, likely reduce waste dead discard, and provide some minor targeting opportunities.

There are several options that the Council could take in the future to provide more shortspine thornyhead opportunity in the non-trawl fisheries. These Options include new full or update assessments, which would reduce the OFL to ABC deduction that is relatively high for shortspine thornyhead with the new time-varying sigmas since it is an older Category II assessment and/or to increase the P* from the current 0.40 to 0.45 maximum. Another Option would be to consider apportionment of the coastwide ABC (as is being considered for sablefish) to the north and south ACLs based on trawl survey biomass distributions could be revisited and can include economic considerations. Finally, the Council could also consider revising the A-21 trawl and non-trawl allocations since trawl is expected to take half their ~1,275 mt allocations whereas non-trawl is expected to fully take theirs.

Non-sablefish south of 42° N lat. allocations and trip limits under No Action

Other flatfish gear restriction removal south of 42° N lat.

Regulatory language within the trip limit tables currently state:

> *South of 42° N. lat., when fishing for ‘other flatfish’, vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than ‘Number 2’ hooks, which measure 0.44 (11 mm) point to shank, and up to two 1 lb. (0.45kg) weights per line are not subject to the RCAs.” ‘Other flatfish’ are specified in regulation to include butter sole, curlfin sole, Pacific sanddab, rex sole, rock sole, and sand sole (CFR§660.11).*

The proposed management measure forwarded by the Council would remove the gear restriction while fishing for ‘other flatfish’ inside the RCAs south of 42° N. lat. This management measure was originally put in place in 2003 to protect bocaccio rockfish--now rebuilt-- and was thought to provide protections to other overfished groundfish stocks in following years (e.g. petrale sole). The intent was to permit an artisanal sanddab fishery off California while still providing protections to overfished stocks. During the 2009-2010 management cycle, the flatfish gear restrictions were removed from recreational fishery,

because it was not effective in preventing bycatch of overfished species (2009-2010 Harvest Specifications and Management Measure, Final Environmental Impact Statement). For the 2015-2016 management cycle, a similar measure was contemplated for the commercial fixed gear sector; however, it was removed from further consideration due to bycatch concerns (e.g. petrale sole, which was declared rebuilt in 2016) and the application of recreational gear bycatch rates as a proxy for commercial longline gears. This analysis can be found in Appendix B (2015-2016 Harvest Specifications and Management Measures, Final Environmental Impact Statement).

Since removal of this management measure was first considered for the commercial fixed gear sector, all overfished stocks of groundfish have been declared rebuilt, except for yelloweye rockfish—projected to be rebuild in 2029. However, habitat preferences of yelloweye rockfish (hard substrate, pinnacles) and the species comprising the other flatfish (sandy, soft bottom) complex are vastly different (Stock Assessment and Fishery Evaluation, November 2018). In addition to the differential habitat preferences between other flatfish and yelloweye rockfish, other overfished species which may have been encountered incidentally have rebuilt, leading to de minimus bycatch concerns should this gear restriction be removed.

Further, the other flatfish complex ACL has been under attained in recent years with 835 mt total fishing mortality of the 7,281 mt ACL in 2018 (or 11 percent of the ACL). The ACL for other flatfish is managed coastwide with an A-21 allocation of 90 percent trawl and 10 percent non-trawl and attainment of the non-trawl allocation has been low. In 2018, this equated to a non-trawl allocation of 707.7 mt and the sector only attained 5 percent of its allocation (non-trawl total mortality was 37.7 mt in 2018). Given this low attainment, there is little risk to other sectors or of overfishing to other flatfish.

Anecdotal information from stakeholders suggests that the current gear restriction does not allow for effective targeting of other flatfish, which may be contributing to the low attainment and resulting in forgone economic opportunity to California's coastal communities. California's groundfish fleet is comprised of many small vessels which were negatively impacted when the non-trawl RCAs were implemented, effectively closing large portions of historic fishing grounds. Removal of the other flatfish restriction would restore access to grounds with little risk of bycatch or overfishing, while providing economic benefit. However, the economic impact of the proposed management measure cannot be quantified at this time, though the result is likely to be beneficial and could, therefore, provide some relief to affected communities.

Removal of the flatfish gear restriction would also be consistent with the following National Standards: (1) result in more optimal yield without overfishing; (2) based on the best scientific information; and (8) take into account/benefit fishing communities. National Standard 1 is met by allowing increased access to an underutilized stock complex with little risk of overfishing or increase of bycatch. This action is also consistent with National Standard 2 by utilizing the best available scientific information, which indicates that many stocks have rebuilt and little risk of increased yelloweye rockfish encounters. Removal of the other flatfish gear restriction is also consistent with conservation requirements of National Standard 8, accounting for the importance of fishery resources to fishing communities. Many coastal communities in California are comprised of non-trawl fishermen who depend on income from fixed gear fisheries. This measure will allow access to the underutilized other flatfish complex, resulting in beneficial impacts to local economies.

Non-sablefish north of 40°10' N. lat. allocations and trip limits under No Action

Limited Entry and Open Access - Minor Slope and Darkblotched Rockfish North of 40°10' N. lat.

Currently, the LEFG trip limits for slope rockfish north and darkblotched rockfish are 4,000 lbs. bimonthly and 500 lbs. per month for OA (Table 4-95) The Council is considering doubling the trip limits to 8,000 lbs. bimonthly for LEFG and 1,000 lbs. monthly for OA (Option 2). The main rationale for raising the

LEFG trip limits is that the current trip limits are causing sablefish fishermen to have to discard some of their incidental catches of darkblotched and slope rockfishes. For OA, the primary rationale is that higher trip limits could make it more economical to target darkblotched and slope rockfishes. However, none of the OA vessels appeared to be constrained by the current Option 1 trip limits in 2019.

The proposed trip limits affect the non-trawl fisheries that have separate non-trawl allocations for the slope rockfish complex north of 40°10' N. lat. and for darkblotched rockfish coastwide. The projected non-trawl attainment for both is projected to be low for both Options 1 and 2 for slope rockfish (Table 4-95) and for darkblotched rockfish (Table 4-96). For the slope rockfish complex north of 40°10' N. lat, Option 2 is projected to increase landings and total mortality by 1.2 mt with an associated increase in ex-vessel revenue of $2,910. For darkblotched rockfish coastwide, Option 2 is projected to increase landings and total mortality by 0.2 mt and increase ex-vessel revenue by $439. The projected increases for landings and total mortality are the same because the main expected effect of the higher trip limits is to convert discarded dead fish to landed catch.

Table 4-95. No Action. Projected non-trawl attainment of the slope rockfish complex north of 40°10' N. lat. for LEFG and OA trip limit options for slope and darkblotched rockfish north of 40°10' N. lat. (in mt)

Option	Trip limit	Projected mortality (mt)	Non-trawl projected mortality* (mt)	Non-trawl allocation (mt)
LEFG 1 (SQ)	4,000 lbs./ 2 months slope and darkblotched	32.4	39.6	290.3
OA 1 (SQ)	500 lbs./ month slope and darkblotched	7.1		
Total for Option 1		39.5		
LEFG 2	8,000 lbs./ 2 months slope and darkblotched	33.6	40.8	
OA 2	1,000 lbs./ month slope and darkblotched	7.1		
Total for Option 2		40.7		

*Projected mortality and allocations are for the entire non-trawl sector including recreational.

Table 4-96. Projected non-trawl attainment of darkblotched rockfish coastwide for LEFG and OA trip limit options for slope and darkblotched rockfishes north of 40°10' N. lat.

Option	Trip limit	Projected mortality (mt)	Non-trawl projected mortality (mt)	Non-trawl allocation (mt)
LEFG 1 (SQ)	4,000 lbs./ 2 months slope and darkblotched	4.5	6.0	42.4
OA 1 (SQ)	500 lbs./ month slope and darkblotched	1.5		
Total for Option 1		6.0		
LEFG 2	8,000 lbs./ 2 months slope and darkblotched	4.7	6.2	
OA 2	1,000 lbs./ month slope and darkblotched	1.5		
Total for Option 2		6.2		

Limited Entry and Open Access - Widow Rockfish North of 40°10' N lat.

The Council requested analysis of a proposal to manage widow rockfish with their own trip limits north of 40°10' N. lat., but continuing to manage total mortality at the coastwide level. They are currently managed in a trip limit category that also includes shelf rockfish and shortbelly rockfish (Table 4-97) of which the current combined limit is 200 lbs. per month for both LE and OA (Option 1). Under Option 2, widow

rockfish would be managed with a 4,000 lbs. bimonthly limit for LE and 2,000 lbs. monthly for OA; the trip limit for shelf rockfish and shortbelly rockfish would remain at 200 lbs. per month for both.

Option 2 is not projected to increase LEFG or OA widow rockfish landings or total mortality to the north of 40°10' N. lat.; widow rockfish are so infrequently encountered that total LEFG/ OA mortality is only expected to be 0.29 mt (Table 4-97). Since no vessels appeared constrained by the current trip limits, a potential rationale for Option 2 may have been to create higher limits that could make it more cost effective to target widow rockfish. Attainments for widow rockfish are constrained by the non-trawl RCA, but there are some open areas where schools can be encountered.

Total coastwide non-trawl mortality of widow rockfish is projected to be ~96 mt when also factoring in the coastwide recreational fisheries and the LEFG and OA fisheries south of 40°10' N lat. See Table 4-106 below in Section . As such, the non-trawl fisheries are projected to be within both widow rockfish allocations being proposed for 2021-22 (see Chapter 4.2.2.3 and Table 4-63 for more details).

Removing widow rockfish from the trip limit category is not projected to affect the attainments of shelf rockfish north complex nor shortbelly rockfish. For shelf rockfish north of 40°10' N. lat., the projected non-trawl attainment (60.5 mt) is less than ten percent of the non-trawl allocation in 2021 (571.4 mt). For shortbelly, the projected LEFG and OA mortality is <0.1 mt of the No Action 500 mt ACL and the Alt 1 ACL of 3,000 mt; there are no trawl and non-trawl allocations for shortbelly rockfish.

Table 4-97. Projected mortality (mt) and allocation (mt) of widow rockfish in 2021 given proposed LEFG and OA trip limits.

Option	Trip limit	Projected LEFG and OA mortality N 40°10' (mt)	Non-trawl projected mortality coastwide (mt)*	Non-trawl Option 1 (A-21) allocation (mt)	Non-trawl Option 2 allocation (mt)
LEFG 1 (SQ)	200 lbs. / month shelf, shortbelly, and widow rockfishes	0.03	95.9	1,302.9	300
OA 1 (SQ)	200 lbs. / month shelf, shortbelly, and widow rockfishes	0.26			
Totals for Option 1		0.29			
LEFG 2	4,000 lbs./2 months widow rockfish (shelf and shortbelly remain at 200 lbs.)	0.03	95.9		
OA 2	2,000 lbs./month widow rockfish (shelf and shortbelly remain at 200 lbs.)	0.26			
Totals for Option 2		0.29			

*Includes projection of 44.2 mt for recreational (accounting for increases to CA and OR projections) and 30 mt for LEFG OA south of 40°10' N lat.

Limited Entry and Open Access - Yellowtail Rockfish North of 40°10' N lat.

The Council forwarded a request made by a nearshore fisherman (Table 4-98) to triple the OA limit for yellowtail rockfish from 500 lbs. monthly (status quo; Option 1) to 1,500 lbs. monthly (Option 2). The Council also requested analysis of a proposal to triple the LE trip limit from 1,000 lbs. monthly to 3,000 lbs. monthly in order for it to remain higher than the OA limit.

Option 2 is expected to increase total mortality by 0.4 mt (Table 4-98), landings by 0.38 mt, and ex-vessel revenue by $1,860 from status quo. The projected non-trawl attainment is projected to be low for both trip limits options. Attainments could increase if more targeting occurs with the higher trip limits, but this would not be expected to be problematic given the low non-trawl attainment, mainly due to the non-trawl RCA

Table 4-98. No Action. Yellowtail rockfish north of 40°10' N. lat. LEFG and OA trip limits and projected non-trawl attainments compared to the 2021 non-trawl allocation.

Option	Trip limit	Projected LEFG OA mortality (mt)	Non-trawl projected mortality (mt) *	Non-trawl Allocation (mt)
LEFG 1 (SQ)	1,000 lbs. / month	1	108.6	597.9
OA 1 (SQ)	500 lbs. / month	2.3		
Total for Option 1		*3.3*		
LEFG 2	3,000 lbs. / month	1	109	
OA 2	1,500 lbs. / month	2.7		
Total for Option 2		*3.7*		

*Projected mortality and allocations are for the entire non-trawl sector including 43 mt for WA, 61 mt for OR, and 1.3 from Ca recreational fisheries.

Limited Entry and Open Access - Canary Rockfish North of 40°10' N. lat.

Canary rockfish is managed with separate HGs and shares for the coastwide non-nearshore fishery, the Oregon nearshore fishery, and the California nearshore fishery. Projections, therefore, have to be specific to each and must also include expected mortality for each fishery where applicable. Specific projections for each fishery are provided in Table 4-99 and Table 4-108. There are also two different canary rockfish allocations being proposed by the Council in 2021-22 that must be considered and that are more fully detailed in Section 4.2.1.2. In summary, the first allocation option is the status quo approach from the 2019-20 biennium that applies the pro rata allocation percentages to establish the non-trawl HGs. The second allocation option uses fixed allocation amounts for each non-trawl sector as was done in the 2017-18 biennium.

The status quo trip limits are 300 lbs. bimonthly for both LEFG and OA sectors. The Council forwarded a request to raise the trip limits to 3,000 lbs. bimonthly for LE and 1,000 lbs. monthly for OA (Option 2; Table 4-99). Canary rockfish are similar to yellowtail rockfish in that they are a desirable, but low attainment, stock due to the non-trawl RCA closing their primary shelf habitat. The request for the higher Option 2 canary rockfish trip limits appears to also be mainly about raising the trip limits in order for it to become more economically viable to target canary rockfish.

Option 2 is projected to increase landings by 4.9 mt and ex-vessel revenue by $24,200 from status quo. (Table 4-99). The majority of the projected increases are attributed to LEFG because none of the OA vessels were close to the lower Option 1 trip limits in 2019 that was the base year used in the model. The non-nearshore, Oregon nearshore, and California nearshore fisheries are projected to be well within their 2021-22 harvest guidelines and shares for both allocation options being considered by the Council.

Table 4-99. No Action. Canary rockfish trip limit Options for LEFG and OA North of 40°10' N. lat. and projected total mortality, coastwide, in relation to the non-nearshore and nearshore HGs and shares for both allocation Options being considered. Non-nearshore projected mortality from both north and south of 40°10' N lat. are shown in parentheses (N + S).

Option	Trip limit	Non-nearshore coastwide (mt)	Oregon nearshore (mt)	CA nearshore coastwide (mt)
LEFG 1 (SQ)	300 lbs. / 2 months	1.0 (0.8 + 0.2)	0.8	0.5 (0.1 + 0.4)
OA 1 (SQ)	300 lbs. / 2 months	9.3 (4.5 + 4.8)	0.3	4.1 (0.1 + 4.0)
Total for Option 1		*10.3*	*1.1*	*4.6 (0.2 + 4.4)*
LEFG 2	3,000 lbs. / 2 months	5.3 (2.3 + 3)	3.9	5.0 (1.8 + 3.2)
OA 2	1,000 lbs. / 2 months	32.5 (4.5 + 28)	0.3	28.0 (0.1 + 27.9)
Total for Option 2		*37.8*	*4.2*	*33.0 (1.9 + 31.1)*
Canary rockfish HG allocation Option 1		40.1	23.1	63.4
Canary rockfish HG allocation Option 2		46.5	26.7	73.3

Limited Entry - Pacific Ocean Perch North of 40°10' N. lat.

The Council forwarded a request to double the current 1,800 lb. bimonthly limit (Option 1) to 3,600 lbs. bimonthly (Option 2) for POP based on a proposal from a non-nearshore fisherman (Table 4-100). No increases to LEFG landings or total mortality are projected for Option 2. POP are infrequently encountered in any of the non-trawl sectors as the projected non-trawl mortality of 1.3 mt is minor relative to the 190.5 mt non-trawl allocation for 2021. The primary purpose of the higher trip limit request could be to make it more economically viable to target POP as none of these vessels appear constrained with the lower Option 1 trip limits.

Table 4-100. No Action. Pacific Ocean perch north of 40°10' N. lat. limited entry fixed gear trip limits and projected non-trawl attainments compared to the 2021 non-trawl allocation.

Option	Trip Limit	Projected LEFG mortality (mt)	Non-trawl projected mortality* (mt)	Non-trawl allocation (mt)
1 (SQ)	1,800 lbs. / 2 months	0.2	1.3	190.5
2	3,600 lbs. / 2 months	0.2	1.3	

*Includes recreational and OA projections

Limited Entry and Open Access - Lingcod North of 42° N. Lat.

Lingcod are managed north and south of 40°10' N lat. with stock-specific harvest specifications and non-trawl allocations. In the northern management area, the Council does however use more conservative LEFG and OA trip limits from 40°10′ - 42° N. lat. than north of 42° N lat. to reflect stock assessment differences in the area. The northern lingcod harvest specifications and allocations are based on the more optimistic north of 42° N. lat. stock assessment (66 percent depletion in 2019 reflected in the 2019 catch-only projection) and a portion of the less optimistic stock assessment for the entire area south of 42° N. lat. (33.7 percent depletion in 2019 reflected in the 2019 catch-only projection).

Commercial fixed gear fisheries value lingcod for their high price, but attainments have been low in recent years. Due to concerns with bycatch of yelloweye rockfish associated with lingcod catch, the Council has

recommended, and NMFS has implemented, several catch controls for lingcod (e.g., the non-trawl RCA and low lingcod trip limits).

However, the Council has been able to gradually reduce these controls and increase lingcod trip limits each year since 2016, due to the improving yelloweye rockfish status and by utilizing more accurate discard mortality rates. The GAP has supported a gradual phasing-in of a higher lingcod trip limit to avoid sudden increases in OA effort, flooding the lingcod markets, and potentially increasing yelloweye bycatch

Option 1 lingcod trip limits north of 42° N. lat. are 2,000 lbs. bimonthly for LE and 900 lbs. monthly for OA (Table 4-101). The Council did however adopt even higher trip limits in 2020 to be consistent with their policy to gradually increase limits over time. The 2020 trip limits are 2,600 lbs. bimonthly for LE and 1,200 lbs. monthly for OA.

The Council also requested analysis of even higher Option 2 trip limits in 2021-22 than 2020 to further continue the gradual yearly increases (Table 4-101). The Option 2 trip limits would be 4,000 lbs. bimonthly for LE and 2,000 lbs. monthly for OA. Option 2 is expected to increase the LEFG and OA lingcod ex-vessel revenue by $172,825, landings by 26.4 mt per year and total mortality by 28.4 mt compared to 2019 (Table 4-101). The projected non-trawl attainment for lingcod north of 40°10' N. lat. is less than 580 mt of the 2021 non-trawl allocation of 2,799.8 mt for both Options.

Regarding yelloweye rockfish bycatch, Option 2 is projected to increase non-nearshore mortality by less than 0.1 mt and Oregon nearshore mortality by 0.1 mt. This causes the non-nearshore projected mortality to increase from 1.3 mt to 1.4 mt of their 1.6 mt ACT. The Oregon nearshore fishery increases from 1.5 mt to 1.6 mt of their 3.3 mt share of the nearshore ACT.

Table 4-101. No Action. Proposed lingcod north of 42° N. lat. trip limits for LEFG and OA and projected mortality from the non-trawl sectors for the lingcod management area north of 40°10' N lat. compared to the 2021 non-trawl allocation.

Option	Trip limit (North for 42° only)	Non-nearshore N 42° (mt)	Oregon nearshore (mt)	Total projected mortality N of 40°10' (mt)*	Non-trawl alloc. N of 40°10' (mt)
LEFG 1 (SQ)	2,000 lbs. / 2 months	14.2	4.9	549.2	2,799.8
OA 1 (SQ)	900 lbs. / month	28.3	61.5		
Total for Option 1 (SQ)		*42.5*			
LEFG 2	4,000 lbs. / 2 months	14.2	5.9	577.6	
OA 2	2,000 lbs. / month	36.2	81		
Total for Option 2		50.4	86.9		

* Includes 424 mt of projected recreational impacts + 16.3 mt for CA LEFG and OA 40°10'-42° N lat.

In conclusion, the non-trawl fisheries are projected to be well within the lingcod allocation and under the yelloweye rockfish ACTs under Option 2 for LEFG and OA lingcod trip limits north of 42° N lat. However, a potential concern could be that the Option 2 trip limits represent a larger increase than the Council has typically adopted during the gradual phase-in period from 2016-2020. The Council could therefore consider adopting a more gradual phased-in approach consistent with the past and outlined in Table 4-100. In short, the Council would have the 2021-22 limits start out slightly higher than the 2020 limits and could raise the 2021 limits via the inseason process if new data is supportive. This is the same approach adopted for 2019-20 as they started out with lower limits for both years but raised the 2020 limits. No further analysis would

be needed to adopt the lower phased-in 2021-22 trip limits because they are within the range analyzed for the higher Option 2.

Table 4-102. No Action. Potential approach to continue a gradual approach of higher phased-in lingcod N. 42° N. lat. trip limits for LEFG and OA as has been done from 2016-2020.

Year	Limited entry	Open access	Comment
2019	2,000 lbs. / 2 months	900 lbs. / month	Lower limit established for both 2019-20
2020	2,600 lbs. / 2 months	1,200 lbs. / month	GMT provides Council for increased limits via inseason action in 2020
2021	3,200 lbs. / 2 months	1,500 lbs. / month	Like 2019-20, could start off with lower limit for both years
2022	4,000 lbs. / 2 months	2,000 lbs. / month	Then consider raising to the full Option 2 limits via inseason based on new data

Non-sablefish south of 40°10' N lat. allocations and trip limits for No Action

LE and OA Other - Slope Rockfish and Blackgill Rockfish South of 40°10' N. lat.

As described above in the IFQ section (4.2.2.4), the Council requested further analysis of the use of custom Option 2 trawl and non-trawl shares of blackgill rockfish, other southern slope rockfish, and the complex as a whole (to match the allocations from the rescinded FPA on A-26). As part of this Option 2 proposal, the Council requested analysis of higher LE and OA trip limits to reflect the proposed increase to the non-trawl share of blackgill rockfish. Under the status quo (Option 1) A-21 allocation proportions, the 2021 blackgill rockfish HG of 176.5 mt would be spilt 63 percent to trawl (111.2 mt) and 37 percent to non-trawl (65.3 mt). Under the A-26 proportions, the 2021 HG would be split 41 percent to trawl (72.4 mt) and 59 percent to non-trawl (104.2 mt).

Blackgill rockfish south of 40°10' N. lat. status quo and proposed trip limits are in Table 4-101 with the associated projections compared to both allocation options being considered for 2021-2022 in Table 4-102. During the April 2019 inseason agenda item, the Council adopted the action to increase the bimonthly LE and OA trip limits for blackgill rockfish south of 40°10' N. lat. for periods 3 – 6 from 1,375 lbs. per 2 months to 4,000 lbs. per 2 months for LE and from 550 lbs. per 2 months to 800 lbs. per 2 months for OA (Agenda Item G.9.a., Supplemental GMT Report 1, April 2019).

Option 1 (Status quo) is a differential trip limit that increases greatly between Periods 2 and 3, potentially affecting the industry's ability to create sufficient demand and to stabilize markets. Option 2 purposes to make the trip limits consistent year-round and an increase for both LE and OA. Landings are projected to increase by 25.8 mt and ex-vessel revenue by $127,665. Similarly, Options 3 proposes consistency and increases; however, it is only allowable if the Amendment 26 allocation proportions are adopted for blackgill rockfish. Under Option 4 landings are projected to increase by 55.1 mt and ex-vessel revenue by $272,707.

Table 4-103. No Action. Status quo and proposed limited entry and open access for the blackgill rockfish sub trip limit in the Minor slope rockfish and darkblotched south of 40°10 N. lat. trip limit.

Option	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Oct-Sep	Nov-Dec
LEFG 1 (SQ)	40,000 lb./ 2 months, of which no more than 1,375 lb. may be blackgill rockfish		40,000 lb./ 2 months, of which no more than 4,000 lb. may be blackgill rockfish			
OA 1 (SQ)	10,000 lb./ 2 months, of which no more than 475 lb. may be blackgill rockfish		10,000 lb./ 2 months, of which no more than 800 lb may be blackgill rockfish			
LE 2	40,000 lb./ 2 months, of which no more than 6,000 lb. may be blackgill rockfish					
OA 2	10,000 lb./ 2 months, of which no more than 2,500 lb. may be blackgill rockfish					
LE 3	40,000 lb./ 2 months, of which no more than 10,000 lb. may be blackgill rockfish					
OA 3	10,000 lb./ 2 months, of which no more than 4,000 lb. may be blackgill rockfish					

Table 4-104. No Action. Projected blackgill rockfish, other slope rockfish, and darkblotched rockfish mortality compared to the 2021 non-trawl allocations based on A- 21 (SQ) and Amendment 26 allocation proportions.

Option	Blackgill rockfish non-trawl Projected mortality (mt)	Blackgill rockfish non-trawl share based on A-21 proportions (mt)	Blackgill rockfish non-trawl share based on A-26 proportions (mt)	Slope Rockfish Projected mortality (mt)*	Slope rockfish non-trawl share based on A-21 proportions (mt)	Slope rockfish non-trawl share based on A-26 proportions (mt)
LEFG 1 (SQ)	18.9	65.3	104.2	23.9	262.3	152.1
OA 1 (SQ)	2.0			2.4		
Total for Option 1	*20.9*			*26.3*		
LE 2	44.7			49.7		
OA 2	7.8			8.2		
Total for Option 2	*52.5*			*57.9*		
LE 3	*74.0*			*79.0*		
OA 3	*12.4*			*12.8*		
Total for Option 3	*86.4*			*91.8*		

*Slope rockfish projected mortality includes blackgill rockfish and other slope rockfish.

Limited Entry and Open Access - Minor Shelf Rockfish Complex and Vermilion South of 40°10' N. lat.

Since 2003, trip limits for the shelf rockfish complex have included landings of shelf rockfish south, shortbelly, widow rockfish, and chilipepper rockfish with a closure in period 2 (Mar-Apr). This combination as well as the seasonal closure south of 40°10' N lat. were established to reduce take of overfished species (i.e., bocaccio, canary rockfish, widow rockfish). Since the mid to late 1990s, widow rockfish, shortbelly rockfish, and chilipepper rockfish have had individual stock harvest specifications

separate from the shelf rockfish complex. As of 2019, all groundfish species except yelloweye rockfish have been declared rebuilt.

The separate, higher harvest specifications and the healthy stock status of shortbelly rockfish, widow rockfish, and chilipepper suggest that removing these individual stocks from the shelf rockfish trip limit is warranted. The seasonal closure also appears no longer necessary given the healthy status of the once overfished species previously protected by the closure. Moreover, creating separate year-round trip limits for the minor shelf rockfish complex south of 40°10' N lat. could provide more opportunity and stability for the commercial non-trawl fishery and flexibility for managers considering future modifications to the non-trawl RCA. However, a sub-limit for the highly attained vermilion rockfish, a stock within the Minor Shelf Rockfish complex, is proposed to reduce take until a stock assessment is conducted.

Table 4-105 provides the status quo and proposed trip limits and impacts for the minor shelf rockfish complex south of 40°10' N lat.

Table 4-105. No Action. Status quo and proposed limited entry and open access for Minor shelf rockfish south of 40°10 N lat. Options and associated projected mortality compared to the 2021 non-trawl allocation.

	Area	**Trip limit**	**Projected mortality (mt)**	**Non-trawl projected mortality (mt) ***	**Non-trawl alloc. (mt)**
LEFG 1 (SQ)	40° 10' to 34° 27' N. lat.	500 lbs. / 2 months	1.7	710.7	1,154.6
	South of 34° 27' N. lat.	4,000 lbs. / 2 months, closed Period 2	22.1		
OA 1 (SQ)	40° 10' to 34° 27' N. lat.	400 lbs. / 2 months, closed Period 2	15.5		
	South of 34° 27' N. lat.	1,500 lbs. / 2 months, closed Period 2	23.3		
Total for Option 1			*62.6*		
LEFG 2	40° 10' to 34° 27' N. lat.	8,000 lbs. / 2 months, of which no more than 500 lbs. may be vermilion	69.5	836.1	
	South of 34° 27' N. lat.	5,000 lbs. / 2 months, of which no more than 3,000 lbs. may be vermilion	38.8		
OA 2	40° 10' to 34° 27' N. lat.	4,000 lbs. / 2 months, of which no more than 400 lbs. may be vermilion	50.2		
	South of 34° 27' N. lat.	3,000 lbs. / 2 months, of which no more than 1,200 lbs. may be vermilion	29.5		
Total for Option 2			*188*		

	Area	Trip limit	Projected mortality (mt)	Non-trawl projected mortality (mt) *	Non-trawl alloc. (mt)
LEFG 3	South of 40° 10' N. lat.	4,000 lbs. / 2 months, of which no more than 500 lbs. may be vermilion	51.9	766.6	
OA 3	South of 40° 10' N. lat.	3,000 lbs. / 2 months, of which no more than 300 lbs. may be vermilion	66.6		
Total for Option 3			*118.5*		

*Includes CA recreational maximum impact of 648.1 mt.

The projected mortality shown for these Options include only minor shelf rockfish to better compare to the non-trawl allocation, although the status quo trip limit includes widow rockfish, shortbelly rockfish, and chilipepper. For Option 2, which would maintain area specific trip limits, landings for the area between 40°10' and 34°27' N. lat. are projected to increase by 102.5 mt and ex-vessel revenue by $673,402 and for south of 34°27' N. lat. landings are projected to increase by 22.9 mt and ex-vessel revenue by $138,839. Under the Option 3 trip limits, mortality of minor shelf rockfish, including vermilion rockfish, is also projected to remain below the minor shelf rockfish complex non-trawl allocation, although landings are projected to increase by 55.9 mt and ex-vessel revenue by $332,744.

Limited Entry and Open Access - Widow Rockfish South of 40°10' N lat.

As discussed above, widow rockfish has been combined with minor shelf rockfish, shortbelly rockfish, and chilipepper since 2003 in a single trip limit to reduce the take of overfished species even though it has its own coastwide harvest specification. The 2015 stock assessment of widow rockfish estimated a less depleted stock status (a relative biomass that was well above the target) compared to previous assessments, leading to the Council's adoption of significantly higher widow rockfish ACLs in the 2017-2018 harvest specifications and management measures cycle. With a healthy stock status and individual harvest specification, creating a separate, year-round trip limit (i.e. removing period 2 [March-April] closure) for widow rockfish will provide more opportunity and stability for the commercial non-trawl fishery. Furthermore, the proposed higher trip limits for widow rockfish south of 40°10' N. lat. could provide opportunities for the non-trawl sector to attain more of the midwater rockfish.

The LE and OA status quo and proposed trip limit for widow rockfish south of 40°10' N. lat. with their respective projected mortality are in Table 4-106. The projected coastwide mortality for the proposed widow rockfish trip limits north and south of 40°10' N. lat. are projected below the coastwide non-trawl allocations for both allocation options (Option 1= status quo A-21 allocation; Option 2 =300 mt allocation for the non-trawl sector. Under trip limit Option 2, landings for the area between 40°10' and 34°27' N latitude are projected to increase by 27.5 mt and ex-vessel revenue by $155,169 and for south of 34°27; N latitude landings are projected to increase by 11.71 mt and ex-vessel revenue by $68,681. Under Option 3, landings are projected to increase by 50.3 mt and ex-vessel revenue by $268,287.

Table 4-106. No Action. Status quo and proposed trip limits Options for widow rockfish south of 40°10' N. lat. with the projected mortality compared to the 2021 non-trawl allocations.

Option	Area	Trip limit	Projected mortality (mt)	Non-trawl projected mortality (mt) *	Non-trawl alloc. Option 1 (A-21) (mt)	Non-trawl alloc. Option 2 (mt)
LEFG 1 (SQ)	40° 10' to 34° 27' N. lat.	Minor shelf, shortbelly, widow and chilipepper rockfishes: 2,500 lb./ 2months, of which no more than 500 lbs. /2 month may be any species other than chilipepper	0.2	36.2	1,302.9	300
	S of 34° 27' N. lat.	4,000 lbs. / 2 months, closed Period 2	2.0			
OA 1 (SQ)	40° 10' to 34° 27' N. lat.	400 lbs. / 2 months, closed Period 2	0.4			
	S of 34° 27' N. lat.	1,500 lbs. / 2 months, closed Period 2	0.1			
Totals for Option 1			*1.4*			
LEFG 2	40° 10' to 34° 27' N. lat.	10,000 lbs / 2 months	6.1	75.1		
LEFG 2	S of 34° 27' N. lat.	8,000 lbs / 2 months	12.5			
OA 2	40° 10' to 34° 27' N. lat.	6,000 lbs / 2 months	21.9			
OA 2	S of 34° 27' N. lat.	4,000 lbs / 2 months	0.2			
Total for Option 2			*43.5*			
LEFG 3	S of 40° 10' N. lat.	10,000 lbs. / 2 months	25.6	86.2		
OA 3	S of 40° 10' N. lat.	6,000 lbs. / 2 months	25.8			
Totals for Option 3			*51.4*			

**Includes 0.3 mt for non-trawl commercial fisheries north of 40°10' N. lat, an OR recreational impact of 13.2 mt, and a CA recreational impact of 30.2, and < 1 mt for WA recreational.*

Limited Entry and Open Access - Chilipepper Rockfish South of 40°10' N. lat.

Like shortbelly and widow rockfish, chilipepper rockfish was grouped with the minor shelf rockfish complex in 2003 into a single trip limit with a seasonal closure to help reduce the take of overfished species. Chilipepper south of 40°10' N. lat. also has its own harvest specifications, much like widow rockfish and shortbelly rockfish. Creating separate and year-round trip limits would reduce regulatory complexity, and provide more flexibility, opportunity to diversify catch, and stability for the commercial non-trawl fishery. Projected mortality of chilipepper south of 40°10' N. lat. under LE and OA status quo and proposed trip limits were below the non-trawl allocation for the stock (Table 4-107). Under Option 1 landings are projected to increase by 10.9 mt and ex-vessel revenue by $48,717). Under trip limit Option 2, landings

for the area between 40°10' and 34°27' N latitude are projected to increase by 22.7 mt and ex-vessel revenue by $101,607 and for south of 34°27; N latitude landings are projected to increase by 0.4 mt and ex-vessel revenue by $1,874. Under Option 3, landings are projected to increase by 10.9 mt and ex-vessel revenue by $66,433.

Table 4-107. No Action. Status quo and proposed trip limits for chilipepper south of 40°10' N. lat. with the projected mortality compared to the 2021 non-trawl allocation.

Option	Area	Trip limit	Projected impact (mt)	Non-trawl projected impact (mt) *	Non-trawl alloc. (mt)
LEFG 1 (SQ)	40° 10' to 34° 27' N. lat.	Minor shelf, shortbelly, widow and chilipepper rockfishes: 2,500 lb/ 2 months, of which no more than 500 lbs. /2 month may be any species other than chilipepper	4.9	11.5	540.3
	S of 34° 27' N. lat.	2,000 lbs. / 2 months, this opportunity only available seaward of the non-trawl RCA	0.1		
OA 1 (SQ)	40° 10' to 34° 27' N. lat.	400 lbs. / 2 months, closed Period 2	0.2		
	S of 34° 27' N. lat.	1,500 lbs. / 2 months, closed Period 2	0.2		
Total for Option 1			*5.6*		
LEFG 2	40° 10' to 34° 27' N. lat.	10,000 lbs / 2 months	19.8	38.9	
	S of 34° 27' N. lat.	8,000 lbs / 2 months	0.2		
OA 2	40° 10' to 34° 27' N. lat.	6,000 lbs / 2 months	12.2		
	S of 34° 27' N. lat.	4,000 lbs / 2 months	0.6		
Total for Option 2			*38.8*		
LEFG 3	S of 40° 10' N. lat.	10,000 lbs. / 2 months chilipepper	20.1	47.1	
OA 3	S of 40° 10' N. lat.	6,000 lbs. / 2 months chilipepper	21.2		
Total for Option 3			*41.2*		

* Includes a CA recreational maximum impact of 50 mt based on No Action Sub-Option 3.

Limited Entry and Open Access - Canary Rockfish South of 40°10' N. lat.

As mentioned above in Section 4.2.1.2, canary rockfish is managed with separate HGs and shares to each fishery within the non-trawl sector under a coastwide ACL. Given the separate HGs and shares, impact projections must be specific to each fishery and must also include expected mortality for each fishery where applicable. Specific projections for each fishery are provided in Table 4-108 and above in Table 4-99. Furthermore, there are the two different canary rockfish allocations being proposed by the Council in 2021-22 that must be considered and are provided for reference in Table 4-108 below.

Since the 2017-18 biennium, when retention of canary rockfish was once again permitted, the Council has taken a precautionary approach to managing the stock by implementing low coastwide trip limits to reduce

regulatory discarding and to prevent targeting. Given the re-emergence of midwater rockfish fishery in the trawl sector and the anticipated major modifications to the non-trawl RCA in the near future, providing more and equitable opportunities to attain midwater rockfish in the non-trawl sectors may be warranted for the 2021-22 biennium. The coastwide projected mortality for canary rockfish is within the HGs and shares for each fishery. The projected mortality for canary rockfish south of 40°10' N. lat. are projected to increase landings by 50.8 mt and ex-vessel revenue by $310,305.

Table 4-108. No Action. Canary rockfish trip limit Options for LE and OA south of 40°10' N. lat. and coastwide projected total mortality in relation to the non-nearshore and nearshore HGs and shares for both allocation Options being considered. Non-nearshore projected mortality from both north and south of 40°10' N. lat. are shown in parentheses (N + S).

Option	Trip limit	Non-nearshore coastwide	OR nearshore	CA nearshore coastwide
LEFG 1 (SQ)	300 lbs. / 2 months, closed Period 2	1.0 (0.8 + 0.2)	0.8	0.5 (0.1 + 0.4)
OA 1 (SQ)	300 lbs. / 2 months, closed Period 2	9.3 (4.5 + 4.8)	0.3	4.1 (0.1 + 0.4)
Total for Option 1		*10.3*	*1.1*	*4.6 (0.2 + 4.4)*
LEFG 2	3,500 lbs. / 2 months	5.3 (2.3 + 3)	3.9	5.0 (1.8 + 3.2)
OA 2	1,500 lbs. / 2 months	32.5 (4.5 + 28)	0.3	28.0 (0.1 + 27.9)
Total for Option 2		*37.8*	*4.2*	*33.0 (1.9 + 31.1)*
Canary rockfish HG allocation Option 1		40.1	23.1	63.4
Canary rockfish HG allocation Option 2		46.5	26.7	73.3

Limited Entry and Open Access - Bocaccio South of 40°10' N. Lat.

In 1999, bocaccio south of 40°10' N lat. was declared overfished, and major trip limit reductions as well as seasonal closures began in 2000 to reduce take of the stock. In 2017, the stock was declared rebuilt, so LEFG trip limits were increased to more fully attain the higher harvest specifications and OA trip limits were increased to reduce discards. During the 2019-2020 biennium, the ACLs for bocaccio increased significantly compared to the 2017-2018 biennium, from 790 mt in 2017 to 2,011 mt in 2020. These higher ACLs allowed the Council to increase non-trawl fishery opportunities with greater LE trip limits and recreational bag limits. Although the 2021-2022 ACLs are less than in 2019-2020, the stock remains healthy and the ACLs continue to provide greater opportunity to the commercial non-trawl fishery.

Table 4-109 shows the proposed trip limits and the projected mortality compared to the 2021 non-trawl allocation. The proposed trip limits include increases for both LE and OA sectors and remove the period 2 (Mar-Apr) closure, which could increase flexibility and stability for the fixed gear fleet and reduce management complexity. The projected mortality for bocaccio south of 40°10' N lat. is below the commercial share and the non-trawl allocation for all three options. Projected landings would increase from status quo under Option 2 by 85.4 mt and ex-vessel revenue by $397,321 and under Option 3, landings increase by 227.7 mt and ex-vessel by $ 1,059,176.

Table 4-109. No Action. Status quo and proposed trip limits for bocaccio south of 40°10' N. lat. with the projected mortality compared to the 2021 non-trawl allocation.

Option	Trip limit	Projected mortality (mt)	Commercial share (mt)	Non-trawl projected mortality (mt) *	Non-trawl share (mt)
LEFG 1 (SQ)	1,500 lbs./2 months, closed Period 2	11.0	315.7	732.0	1,021.80
OA 1 (SQ)	500 lbs./ 2 months, closed Period 2	4.9			
Total for Option 1		*15.8*			
LEFG 2	6,000 lbs./ 2 months	56.8		817.4	
OA 2	4,000 lbs./ 2 months	44.4			
Total for Option 2		*101.2*			
LEFG 2	14,000 lbs./ 2 months	*132.4*		*959.7*	
OA 2	10,000 lbs./ 2 months	*111.1*			
Total for Option 3		*243.5*			

* Includes a CA recreational maximum impact of 716.2 mt based on No Action Sub-Option 3.

Limited Entry and Open Access - Lingcod South of 40°10' N. Lat.

Under the No Action Alternative for lingcod south of 40° 10' N. lat. there is a proposal to remove the Period 2 (Mar-Apr) closure along with three sector allocation proportion options: Option 1 (status quo) - 45 percent trawl / 55 percent non-trawl, Option 2 - 43 percent trawl / 57 percent non-trawl, and Option 3 - 25 percent trawl / 75 percent non-trawl. See Chapter 4.2.2.3 and Chapter 0 for more detail on these proposed allocation changes. The 2021 non-trawl allocations under each option is provided in Table

In 1999, the coastwide lingcod stock was declared overfished and seasonal closures began in 2000 for lingcod south of 40°10' N. lat. to help reduce the harvesting of the overfished stock. In 2005, the coastwide stock was declared rebuilt. However, the 2017 stock assessment suggested a less optimistic outlook for the stock south of 42° N lat. resulting in reduced harvest limits for 2019. A catch-only update of the 2017 lingcod stock assessment in 2019 resulted in slight increase to the 2021-22 harvest specifications compared to the results of the stock assessment. The increase translates into approximately 34 mt more in the non-trawl sector for 2021 and approximately 73 mt in 2021 compared to 2019, under status quo allocation proportions, allowing for the removal of the period 2 (Mar-Apr) closure. Proposed trip limits and projected mortality for lingcod south of 40°10 N. lat. compared to the 2021 sector allocation Options are in

Table 4-110. The projected mortality for lingcod south of 40°10' N. lat. fall within the non-trawl allocation for all three allocation options. Non-nearshore landings are projected to increase landings by 5.1 mt and ex-vessel revenue by $35,783 and overall (non-nearshore and nearshore) landings are projected to increase landings by 10 mt and ex-vessel revenue by $61,862.

Table 4-110. No Action. Status quo and proposed trip limits for lingcod south of 40°10' N. lat. with the projected mortality compared to the 2021 non-trawl allocation

Option	Trip limit	Non-nearshore (mt)	Nearshore (mt)	Total projected Non-trawl mortality (mt)*	Non-trawl alloc. Option 1 (A-21) (mt)	Non-trawl alloc. Option 2 (mt)	Non-trawl alloc. Option 3 (mt)
LEFG 1 (SQ)	1,200 lbs. / 2 months, closed period 2	3.0	3.9	480.3	599	620.7	816.8
OA 1 (SQ)	500 lbs. / month, closed period 2	29.9	24.0				
Total for Option 1 (SQ)		*32.9*	*27.9*				
LEFG 2	1,200 lbs. / 2 months	3.4	4.4	489.5			
OA 2	500 lbs. / month	34.6	28.5				
Total for Option 2		*38*	*32*				

* Includes a CA recreational maximum impact of 419.5 mt.

Impact (Groundfish Mortality) – Non-Nearshore North of 36° N. lat.

The non-nearshore model projects mortality of overfished and non-overfished species for the LEFG and the OA sectors north of 36° N. lat. and seaward of the non-trawl RCA, based on the northern sablefish ACLs. The sablefish north stock is the primary target and provides the main source of revenue in both sectors. The bycatch projections are based on the assumption that the LE and OA allocations for sablefish are completely harvested. The projected species mortality, as a result of harvesting the sablefish allocations, was evaluated using 2002-2018 WCGOP data in the non-nearshore model under both apportionment Methods, long-term average (Method 1;Table 4-111 and Table 4-107) and rolling 5-year average (Method 2 Table 4-113 and Table 4-114). Additionally, the non-nearshore sector is projected to be within their yelloweye rockfish ACTs of 1.6 mt in 2021-2022 under No Action (Table 4-115).

Table 4-111. No Action. Projected non-nearshore groundfish mortality for the limited entry and open access fixed gear fisheries north of 36° N. lat. (in mt) for 2021 compared to the non-trawl allocation (excluding proposed routine adjustments). Projections are based on a sablefish default harvest control rule of P* of 0.4 and Method 1.

Stock/Stock Complex	Management Area	LE (mt)	OA (mt)	Total (mt)	Non-Trawl Alloc. (mt) [a/]
Arrowtooth flounder	Coastwide	51.91	8.73	60.63	391.9
Big skate	Coastwide	7.88	1.34	9.23	71.0
Black rockfish	California	0.02	0.00	0.02	339.7
Bocaccio	S. of 40° 10' N. lat.	0.28	0.08	0.36	1,036.4
Canary rockfish [b/]	Coastwide	1.22	0.21	1.42	351.6
Chilipepper rockfish	S. of 40° 10' N. lat.	0.38	0.11	0.49	565.1
Darkblotched rockfish	Coastwide	5.24	0.98	6.22	42.4

Stock/Stock Complex	Management Area	LE (mt)	OA (mt)	Total (mt)	Non-Trawl Alloc. (mt) [a/]
Dover sole	Coastwide	5.53	1.16	6.68	2420.1
English sole	Coastwide	0.03	0.01	0.04	446.2
Lingcod	N. of 40° 10’ N. lat.	13.83	1.93	15.76	2799.8
Lingcod	S. of 40° 10’ N. lat.	1.71	1.74	3.44	599
Longnose skate	Coastwide	64.15	11.71	75.87	157.2
Longspine thornyhead	N. of 34° 27’ N. lat.	1.75	0.43	2.18	129
Mixed thornyheads		0.86	0.23	1.08	--
Pacific cod	Coastwide	2.19	0.37	2.56	54.7
Pacific hake	Coastwide	0.78	0.14	0.92	0.0
Pacific ocean perch	N. of 40° 10’ N. lat.	0.65	0.11	0.76	191.5
Petrale sole	Coastwide	1.23	0.22	1.45	186.4
Shortbelly rockfish	Coastwide	0.00	0.00	0.01	0.0
Shortspine thornyhead	N. of 34° 27’ N. lat.	28.71	6.19	34.90	67.5
Spiny dogfish	Coastwide	121.82	20.93	142.75	--
Splitnose rockfish	S. of 40° 10’ N. lat.	0.05	0.02	0.07	82.4
Starry flounder	Coastwide	0.01	0.00	0.01	171.8
Widow rockfish	Coastwide	0.20	0.03	0.24	1,302.9
Yellowtail rockfish	N. of 40° 10’ N. lat.	0.95	0.16	1.11	597.9
Black/Blue/Deacon rockfish/	Oregon	0.01	0.00	0.01	559.3
Minor nearshore rockfish	N. of 40° 10’ N. lat.	0.12	0.02	0.14	73.9
Minor nearshore rockfish	S. of 40° 10’ N. lat.	0.00	0.00	0.00	1,005.5
Minor shelf rockfish	N. of 40° 10’ N. lat.	5.18	0.87	6.05	571.4
Minor shelf rockfish	S. of 40° 10’ N. lat.	0.10	0.03	0.13	1163.6
Minor slope rockfish	N. of 40° 10’ N. lat.	93.73	15.61	109.34	290.3
Minor slope rockfish	S. of 40° 10’ N. lat.	19.50	6.87	26.37	247.9
Cabezon/Kelp greenling c/	Oregon	0.01	0.00	0.01	189.7
Other flatfish	Coastwide	0.26	0.04	0.31	458.1
Other groundfish		0.00	0.00	0.00	--
Other rockfish		0.11	0.03	0.14	--
Ecosystem component species		71.99	18.40	90.38	--

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.

b/ The non-nearshore share for canary rockfish in 2021 is 40.1 mt.

c/ In 2019, new complexes were formed for OR black/blue/deacon rockfish and OR cabezon and kelp greenling

Table 4-112. No Action. Projected groundfish mortality for the limited entry and open access fixed gear fisheries north of 36° N. lat. (in mt) for 2022 compared to the non-trawl allocation. Projections are based on a sablefish default harvest control rule of P* of 0.4 and Method 1.

Stock/Stock Complex	Management Area	LE (mt)	OA (mt)	Total (mt)	Non-Trawl Alloc. (mt) [a/]
Arrowtooth flounder	Coastwide	49.38	8.72	58.10	318.1
Big skate	Coastwide	7.50	1.34	8.84	66.6
Black rockfish	California	0.01	0.00	0.02	339.7
Bocaccio	S. of 40° 10’ N. lat.	0.26	0.07	0.34	1,021.8
Canary rockfish [b/]	Coastwide	1.16	0.21	1.36	344.0
Chilipepper rockfish	S. of 40° 10’ N. lat.	0.36	0.10	0.46	542.7
Darkblotched rockfish	Coastwide	4.98	0.98	5.96	39.9
Dover sole	Coastwide	5.26	1.14	6.40	2,420.1
English sole	Coastwide	0.03	0.01	0.04	442.5
Lingcod	N. of 40° 10’ N. lat.	13.15	1.93	15.09	2,573.0
Lingcod	S. of 40° 10’ N. lat.	1.62	1.72	3.34	638.3
Longnose skate	Coastwide	61.03	11.61	72.64	151.0
Longspine thornyhead	N. of 34° 27’ N. lat.	1.67	0.41	2.08	119.9
Mixed thornyheads		0.82	0.21	1.03	--
Pacific cod	Coastwide	2.08	0.37	2.46	54.7
Pacific hake	Coastwide	0.74	0.14	0.88	0.0
Pacific ocean perch	N. of 40° 10’ N. lat.	0.62	0.11	0.72	184.3
Petrale sole	Coastwide	1.17	0.22	1.39	162.5
Shortbelly rockfish	Coastwide	0.00	0.00	0.00	0.0
Shortspine thornyhead	N. of 34° 27’ N. lat.	27.31	6.03	33.34	67.5
Spiny dogfish	Coastwide	115.89	20.90	136.80	--
Splitnose rockfish	S. of 40° 10’ N. lat.	0.04	0.02	0.06	82.4
Starry flounder	Coastwide	0.01	0.00	0.01	171.8
Widow rockfish	Coastwide	0.19	0.03	0.23	1,302.9
Yellowtail rockfish	N. of 40° 10’ N. lat.	0.90	0.16	1.06	596.6
Black/Blue/Deacon rockfish [c/]	Oregon	0.01	0.00	0.01	559.3
Minor nearshore rockfish	N. of 40° 10’ N. lat.	0.12	0.02	0.14	73.9
Minor nearshore rockfish	S. of 40° 10’ N. lat.	0.00	0.00	0.00	1,005.5
Minor shelf rockfish	N. of 40° 10’ N. lat.	4.93	0.87	5.80	547.1
Minor shelf rockfish	S. of 40° 10’ N. lat.	0.09	0.03	0.12	1,154.7
Minor slope rockfish	N. of 40° 10’ N. lat.	89.16	15.61	104.77	285.2
Minor slope rockfish	S. of 40° 10’ N. lat.	18.55	6.61	25.16	246.5
Cabezon/Kelp greenling	Oregon	0.01	0.00	0.01	189.7
Other flatfish	Coastwide	0.25	0.04	0.30	461.7
Other groundfish		0.00	0.00	0.00	--
Other rockfish		0.10	0.03	0.13	--
Ecosystem component species		68.48	17.64	86.12	--

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.

b/ The non-nearshore share for canary rockfish in 2022 is 39.1 mt.

c/ In 2019, new complexes were formed for OR black/blue/deacon rockfish and OR cabezon and kelp greenling

Table 4-113. No Action. Projected non-nearshore groundfish mortality for the limited entry and open access fixed gear fisheries north of 36° N. lat. (in mt) for 2021 compared to the non-trawl allocation (excluding proposed routine adjustments). Projections are based on a sablefish default harvest control rule of P* of 0.45 and Method 2.

Stock/Stock Complex	Management Area	LE (mt)	OA (mt)	Total (mt)	Non-Trawl Alloc. (mt) [a/]
Arrowtooth flounder	Coastwide	55.32	9.30	64.62	391.9
Big skate	Coastwide	8.40	1.43	9.83	71.0
Black rockfish	California	0.02	0.00	0.02	346.7
Bocaccio	S. of 40° 10' N. lat.	0.30	0.08	0.38	1,036.4
Canary rockfish [b/]	Coastwide	1.30	0.22	1.52	352.4
Chilipepper rockfish	S. of 40° 10' N. lat.	0.41	0.11	0.52	567.4
Darkblotched rockfish	Coastwide	5.58	1.05	6.63	42.4
Dover sole	Coastwide	5.89	1.23	7.12	2,420.1
English sole	Coastwide	0.03	0.01	0.04	446.2
Lingcod	N. of 40° 10' N. lat.	14.73	2.06	16.79	2,799.8
Lingcod	S. of 40° 10' N. lat.	1.82	1.85	3.67	599.0
Longnose skate	Coastwide	68.37	12.48	80.85	157.2
Longspine thornyhead	N. of 34° 27' N. lat.	1.87	0.45	2.32	129.0
Mixed thornyheads		0.91	0.24	1.15	--
Pacific cod	Coastwide	2.33	0.40	2.73	54.7
Pacific hake	Coastwide	0.83	0.15	0.98	0.0
Pacific ocean perch	N. of 40° 10' N. lat.	0.69	0.12	0.80	191.5
Petrale sole	Coastwide	1.31	0.23	1.55	129.4
Shortbelly rockfish	Coastwide	0.00	0.00	0.01	0.0
Shortspine thornyhead	N. of 34° 27' N. lat.	30.59	6.59	37.19	67.5
Spiny dogfish	Coastwide	129.82	22.31	152.13	--
Splitnose rockfish	S. of 40° 10' N. lat.	0.05	0.02	0.07	82.4
Starry flounder	Coastwide	0.01	0.00	0.01	171.8
Widow rockfish	Coastwide	0.22	0.04	0.25	1,302.9
Yellowtail rockfish	N. of 40° 10' N. lat.	1.01	0.17	1.18	596.6
Black/Blue/Deacon rockfish [c/]	Oregon	0.01	0.00	0.01	567.3
Minor nearshore rockfish	N. of 40° 10' N. lat.	0.13	0.02	0.15	75.9
Minor nearshore rockfish	S. of 40° 10' N. lat.	0.00	0.00	0.00	1,011.5
Minor shelf rockfish	N. of 40° 10' N. lat.	5.52	0.93	6.45	571.4
Minor shelf rockfish	S. of 40° 10' N. lat.	0.10	0.03	0.14	1,163.5
Minor slope rockfish	N. of 40° 10' N. lat.	99.88	16.64	116.52	290.3
Minor slope rockfish	S. of 40° 10' N. lat.	20.78	7.32	28.10	247.9
Cabezon/Kelp greenling	Oregon	0.01	0.00	0.01	197.7
Other flatfish	Coastwide	0.28	0.05	0.33	458.1
Other groundfish		0.00	0.00	0.00	--
Other rockfish		0.12	0.03	0.15	--
Ecosystem component species		76.71	19.61	96.32	--

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.

b/ The non-nearshore share for canary rockfish in 2021 is 40.1 mt.

c/ In 2019, new complexes were formed for OR black/blue/deacon rockfish and OR cabezon and kelp greenling

Table 4-114. No Action. Projected groundfish mortality for the limited entry and open access fixed gear fisheries north of 36° N. lat. (in mt) for 2022 compared to the non-trawl allocation. Projections are based on a sablefish default harvest control rule of P* of 0.45 and a long-term average ACL apportionment method (Method 2).

Stock/Stock Complex	Management Area	LE (mt)	OA (mt)	Total (mt)	Non-Trawl Alloc. [a/] (mt)
Arrowtooth flounder	Coastwide	52.63	9.30	61.92	318.1
Big skate	Coastwide	7.99	1.43	9.42	66.6
Black rockfish	California	0.02	0.00	0.02	339.7
Bocaccio	S. of 40° 10’ N. lat.	0.28	0.08	0.36	1,021.8
Canary rockfish [b/]	Coastwide	1.23	0.22	1.45	344.0
Chilipepper rockfish	S. of 40° 10’ N. lat.	0.39	0.11	0.50	542.7
Darkblotched rockfish	Coastwide	5.31	1.04	6.35	39.9
Dover sole	Coastwide	5.60	1.22	6.82	2,420.1
English sole	Coastwide	0.03	0.01	0.04	442.5
Lingcod	N. of 40° 10’ N. lat.	14.02	2.06	16.08	2,573.0
Lingcod	S. of 40° 10’ N. lat.	1.73	1.83	3.56	638.3
Longnose skate	Coastwide	65.04	12.38	77.42	151.0
Longspine thornyhead	N. of 34° 27’ N. lat.	1.78	0.44	2.21	119.9
Mixed thornyheads		0.87	0.23	1.10	--
Pacific cod	Coastwide	2.22	0.40	2.62	54.7
Pacific hake	Coastwide	0.79	0.15	0.94	0.0
Pacific ocean perch	N. of 40° 10’ N. lat.	0.66	0.12	0.77	184.3
Petrale sole	Coastwide	1.25	0.23	1.48	162.5
Shortbelly rockfish	Coastwide	0.00	0.00	0.01	0.0
Shortspine thornyhead	N. of 34° 27’ N. lat.	29.11	6.42	35.53	67.5
Spiny dogfish	Coastwide	123.51	22.28	145.78	--
Splitnose rockfish	S. of 40° 10’ N. lat.	0.05	0.02	0.07	82.4
Starry flounder	Coastwide	0.01	0.00	0.01	171.8
Widow rockfish	Coastwide	0.20	0.04	0.24	1,302.9
Yellowtail rockfish	N. of 40° 10’ N. lat.	0.96	0.17	1.13	596.6
Black/Blue/Deacon rockfish[c/]	Oregon	0.01	0.00	0.01	559.3
Minor nearshore rockfish	N. of 40° 10’ N. lat.	0.13	0.02	0.15	73.9
Minor nearshore rockfish	S. of 40° 10’ N. lat.	0.00	0.00	0.00	1,005.5
Minor shelf rockfish	N. of 40° 10’ N. lat.	5.25	0.93	6.18	547.1
Minor shelf rockfish	S. of 40° 10’ N. lat.	0.10	0.03	0.13	1,154.7
Minor slope rockfish	N. of 40° 10’ N. lat.	95.02	16.64	111.66	285.2
Minor slope rockfish	S. of 40° 10’ N. lat.	19.77	7.05	26.82	246.5
Cabezon/Kelp greenling	Oregon	0.01	0.00	0.01	189.7
Other flatfish	Coastwide	0.27	0.05	0.31	461.7
Other groundfish		0.00	0.00	0.00	--
Other rockfish		0.11	0.03	0.14	--
Ecosystem component species		72.98	18.80	91.78	--

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.

b/ The non-nearshore share for canary rockfish in 2022 is 39.1 mt.

c/ In 2019, new complexes were formed for OR black/blue/deacon rockfish and OR cabezon and kelp greenling

Table 4-115. No Action. Non-nearshore yelloweye rockfish projected mortality, harvest guideline, and annual catch target in 2021-2022.

Year	Projected mortality estimate (mt)	HG (mt)	ACT (mt)	Non-Trawl Allocation 2021 (mt)
2021	1.3	2.0	1.6	37.9
2022	1.3	2.1	1.6	38.8

Impact (Groundfish Mortality) – Non-Nearshore South of 36° N. lat.

Due to a lack of a projection model, mortality is expected to be the same as in 2019, shown below in Table 4-114

Table 4-116. Non-nearshore groundfish landings for the limited entry and open access fixed gear fisheries north of 36° N. lat. (in mt) in 2019 compared to the non-trawl allocation.

Stock/Stock Complex	Management Area	LE (mt)	OA (mt)	Total (mt)	Non-Trawl Alloc. [a/] (mt)
Arrowtooth flounder	Coastwide	1.4	2	3.4	674
Big skate	Coastwide	4.6	3.2	7.8	22.6
Bocaccio	S. of 40° 10’ N. lat.	2.7	0.3	3	1,250.2
Canary rockfish [b/]	Coastwide	0.9	0.4	1.3	383.3
Chilipepper rockfish	S. of 40° 10’ N. lat.	3.9	0.5	4.4	612.8
Darkblotched rockfish	Coastwide	2.7	1	3.7	36.6
Dover sole	Coastwide	1.5	0.3	1.8	2,420.2
English sole	Coastwide	< 0.1	--	< 0.1	493.7
Lingcod	N. of 40° 10’ N. lat.	16.8	4.8	21.6	2,526.2
Lingcod	S. of 40° 10’ N. lat.	1	0.5	1.5	565.2
Longnose skate	Coastwide	24.3	8.4	32.7	185.2
Longspine thornyhead	N. of 34° 27’ N. lat.	0.8	< 0.1	0.8	127.6
Mixed thornyheads	--	0.3	--	0.3	--
Pacific cod	Coastwide	0.7	< 0.1	0.7	54.7
Pacific hake	Coastwide	0.1	< 0.1	0.1	--
Pacific ocean perch	N. of 40° 10’ N. lat.	0.1	< 0.1	0.1	215.9
Petrale sole	Coastwide	2.6	0.9	3.5	129.4
Sablefish	N of 36° N lat.	1,523.5	345.9	1,869.4	--
Shortbelly rockfish	Coastwide	--	--	--	--
Shortspine thornyhead	N. of 34° 27’ N. lat.	36.4	0.8	37.2	80.9
Spiny dogfish	Coastwide	0.8	0.2	1	--
Splitnose rockfish	S. of 40° 10’ N. lat.	< 0.1	--	< 0.1	86.7
Starry flounder	Coastwide	--	--	< 0.1	216.6
Widow rockfish	Coastwide	< 0.1	< 0.1	< 0.1	1,042.4
Yellowtail rockfish	N. of 40° 10’ N. lat.	0.4	0	0.4	628.1
Minor shelf rockfish	N. of 40° 10’ N. lat.	1.2	0.4	1.6	547.1
Minor shelf rockfish	S. of 40° 10’ N. lat.	0.4	0.1	0.5	1,357.3

Stock/Stock Complex	Management Area	LE (mt)	OA (mt)	Total (mt)	Non-Trawl Alloc. [a/] (mt)
Minor slope rockfish	N. of 40° 10' N. lat.	33.7	5.8	39.5	316.4
Minor slope rockfish	S. of 40° 10' N. lat.	12.5	4.1	16.6	267.8
Other flatfish	Coastwide	--	< 0.1	< 0.1	624.9
Other groundfish	--	--	--	< 0.1	--
Other rockfish	--	0.1	--	0.1	--
Ecosystem component species	--	1.5	6.7	8.2	--

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.

b/ The non-nearshore share for canary rockfish in 2019 was 144.3 mt.

Nearshore Trip Limit Analysis

The following trip limit adjustments are proposed for the nearshore fishery under No Action: increases for lingcod north 42° N. lat. and the removal of the period 2 (Mar-Apr) closure south of 40°10' N. lat. for nearshore rockfish (shallow and deeper), lingcod, and California scorpionfish. In the event the projected yelloweye rockfish mortality is expected to exceed the nearshore share or non-trawl allocation, routine adjustments of the shoreward non-trawl RCA or reduced trip limits for nearshore species could occur. Other proposed trip limit changes will have little to no impact on the nearshore fishery, as these species are not encountered often in the nearshore. These include the following: increases to shortspine thornyhead, darkblotched and slope rockfish, yellowtail rockfish, canary rockfish, POP, and shelf rockfishes. The background for these trip limit increases are described in greater detail in Chapter 0 since the same trip limits pertain to both the nearshore and non-nearshore.

Limited Entry and Open Access - Lingcod North of 40°10´ N. Latitude

As described in the non-nearshore below, there are proposals to increase the LEFG and OA trip limits for lingcod to the north of 42° and for the area between 42° - 40°10′ N. lat. Lingcod are managed with separate harvest specifications and allocations to the north and south of 40°10' N. lat. The trip limits north of 42° N. lat. only affect the Oregon nearshore fishery. The status quo Option 1 trip limits would be 2,000 lbs. bimonthly for LEFG and 900 lbs. monthly for OA (Table 4-110). The higher Option 2 trip limits would be 4,000 lbs. bimonthly for LEFG and 2,000 lbs. bimonthly for OA. Option 2 is expected to increase Oregon nearshore landings by 20.5 mt and is projected to increase yelloweye rockfish by 0.1 mt from 1.5 mt (Table 4-120) to 1.6 mt, which remains well within the Oregon share of the ACT. Total lingcod mortality for the non-trawl fisheries is projected to be less than 600 mt for both Options when also accounting for recreational impacts, which is well within the 2,799.8 mt non-trawl allocation for 2021.

Limited Entry and Open Access - Lingcod South of 40°10´ N. Lat.

Also described in the non-nearshore section below, there is a proposal to remove the period 2 (Mar-Apr) closure for the LEFG and OA sectors for lingcod to the south of 40°10′ N. latitude. Table 4-110 provides the status quo (Option 1) and proposed (Option 2) trip limits and projected mortality compared to the non-trawl allocation. Option 1 would be 1,200 lbs. bimonthly, closed period 2, for LEFG and 500lbs. monthly, closed period 2, for OA. Option 2 proposed 1,200 lbs. bimonthly for LEFG and 500lbs. monthly for OA. Option 2 is expected to increase California nearshore landings by 3.8 mt and ex-vessel revenue by $21,388 and increase total (non-nearshore and nearshore) landings by 10 mt and ex-vessel revenue by $61,862. Yelloweye rockfish impacts are projected to increase by 0.1 mt from 0.5 mt (Table 4-120) to 0.6 mt, which remains within the ACT and HG. Total mortality for the non-trawl fisheries is projected to be less than 32 mt for both Options, which is well within the 599 mt status quo (A- 21) non-trawl allocation for 2021.

Limited Entry and Open access – Shallow and Deeper Nearshore Rockfish South of 40°10´ N. Latitude

Seasonal closures south of 40°10' N. lat. were first implemented in the groundfish fishery in 2000 to help reduce the harvest of overfished species. Between 2000 and 2004, there were various seasonal closures throughout the year in the area between 40°10' and 34°27' N. lat. and south of 34°27' N. lat. Since 2005, the nearshore fishery has had period 2 (Mar-Apr) closure. Similarly, to the south of 40°10' N. lat. rockfish and lingcod trip limit proposal in the non-nearshore section, there is a proposal to remove the period 2 closure for the Shallow and Deeper Nearshore rockfish trip limits. The modifications to the trip limits could provide flexibly and stability for the fixed gear fleet by creating a year-round fishery as well as reduce management complexity.

Table 4-117 shows the proposed trip limits and the projected mortality compared to the 2021 non-trawl allocation for nearshore rockfish south of 40°10' N. lat. The proposed trip limits (Option 2) removes the period 2 closure. While the nearshore fishery is considered a federal OA fishery, it is a state restricted access fishery, and therefore the table breaks down the projected mortality for shallow and deeper trip limits opposed to LE and OA. The projected mortality for shallow and deeper nearshore rockfish fall within the nearshore rockfish south of 40°10' N. lat. non-trawl allocation. The adjustment to the shallow nearshore trip limit is projected to increase landings by 8.8 mt and ex-vessel revenue ranging from $77,829 to $144,345 depending on the live-fish market. The adjustment to the shallow nearshore trip limit is projected to increase landings by 54 mt and ex-vessel revenue ranging from $475,000to $880,958 depending on the live-fish market. The adjustment to the deeper nearshore trip limit is projected to increase landings by 54 mt and ex-vessel revenue ranging from $219,245 to $1,054,568 depending on the live-fish market.

Table 4-117. No Action. Status quo and proposed trip limits for nearshore rockfish south of 40°10' N. lat. with shallow and deeper nearshore projected mortalities compared to the 2021 non-trawl allocation.

Option	Trip limit	Projected mortality (mt)	Non-trawl projected mortality (mt)*	Non-trawl alloc. (mt)
Shallow 1 (SQ)	1,200 lbs. / 2 months, closed period 2	57.6	664.0	1011.6
Deeper 1 (SQ)	1,200 lbs. / 2 months, closed period 2	58.1		
Total nearshore Option 1 (SQ)		*115.7*		
Nearshore 2	2,000 lbs/ 2 months	66.5	797.1	
Deeper 2	2,000 lbs/ 2 months	62.8		
Total nearshore Option 2		*212.8*		

*Include a CA recreational mortality projection of 584.3 mt.

Limited Entry and Open Access – California Scorpionfish South of 40°10´ N. Latitude

Similar to nearshore rockfish and lingcod, the seasonal closures for California scorpionfish began in 2000. The seasonal closures were intended to keep harvesting within the recalculated optimal yield (OY) under the newly implemented Marine Life Management Act (MLMA) and Nearshore Fishery Management Plan (FMP). Since 2005, the season closure has been period 2 (Mar-Apr). In 2017, the stock was assessed, and the results indicated the stock was healthy, in an upward trajectory, and well above the management target. The positive outcome of the assessment led to significant increases in the harvest specifications which allowed for year-round opportunity in the recreational fishery for the 2019- 2020 biennium.

During the March 2019 meeting, the Council received an inseason action request from a southern California Nearshore Fishery participant to remove the period 2 closure for California scorpionfish. At that time, it was determined the request did not meet the requirements of the Administrative Procedures Act to waive

notice and comment through inseason action but it could be evaluated as part of the 2021-2022 biennial cycle.

Table 4-118 provides the proposed trip limit and projected mortality compared to the 2021 non-trawl allocation for California scorpionfish. The proposed trip limit (Option 2) removes the period 2 closure and increase the bimonthly limit from 1,500 lbs. to 3,500 lbs. As noted above, the nearshore fishery is considered a federal OA fishery yet a state restricted access fishery, therefore the table only provides projected mortality for Option 1 (status quo) and Option 2 trip limits opposed to LE and OA. Projected mortality from removing the period 2 closure and increasing the trip limit falls within non-trawl allocation. The adjustment is projected to increase landings by 1.9 mt and ex-vessel revenue by $23,224.

Table 4-118. No Action. Status quo and proposed trip limits for California scorpionfish and projected mortality compared to the 2021 non-trawl allocation.

Option	Trip limit	Projected mortality (mt)	Non-trawl projected mortality (mt) *	Non-trawl alloc.
Option 1 (status quo)	1,500 lbs. / 2 months, closed Period 2	1.23	158.3	287.10
Option 2	3,500 lbs. / 2 months	3.30	160.4	

*Include a CA recreational mortality projection of 157.1 mt.

Impact (Groundfish Mortality) - Nearshore – No Action DHCR

The non-trawl fisheries, including the nearshore fishery, are projected to be within the 2021-22 non-trawl allocations, ACTs, HGs, and shares Projections in Table 4-119 are based on full attainment of the state landings targets, except for lingcod and canary rockfish.

Oregon lingcod landings are expected to be between 66 mt and 86 mt, depending on which trip limit is adopted in 2021-22. Oregon canary rockfish landings are projected to be 4.8 mt for both trip limit Options described above. No other federal trip limit proposals are projected to alter Oregon nearshore attainments of which state LE permits and state trip limits are used to manage the other stocks.

Projected landings for shelf stocks other than canary rockfish are not shown since non-trawl landings and removals are minor in relation to non-trawl allocations. Although increased nearshore allocations of yelloweye rockfish could prompt more targeting of shelf stocks, impacts are expected to remain similar to the past low levels since no trip limit changes are being proposed. Access to shelf stocks is greatly hindered by the non-trawl RCA, causing low attainment of the current trip limits of canary rockfish or other shelf stocks.

Projected total mortality of yelloweye rockfish is shown in Table 4-120. The nearshore fisheries are projected to be well within their No Action shares of the yelloweye rockfish ACT: Oregon is projected to take 1.5 mt of their 2.3-2.4 mt shares for 2021-2022 and California is projected to take 0.5-0.6 mt of their 0.9 mt shares for 2021-2022. Finally, the projected total mortality of cowcod is only 1.3 mt in both 2021-22 (Table 4-121).

Table 4-119. No Action. 2021-2022 projected nearshore landings for the No Action Alternative. State-specific nearshore HGs or state-specific nearshore shares are shown in parentheses for 2019.

Stock	Area	Total (mt)	By Area for 2021-2022			
			OR (mt)	CA (mt)	40°10'-42° N. lat. (mt)	S. of 40°10' N. lat. (mt)
Black/blue/deacon rockfish	OR	120.5	120.5	--	--	--
--*Black rockfish*		113	113	--	--	--
--*Blue/deacon rockfish*		7.5	7.5	--	--	--
Black rockfish	CA	100	--	100	95	5
Bocaccio	S. 40°10' N. lat.	1.0 (4.9)	--	1.0 (4.9)	--	--
Cabezon/Kelp greenling	OR	44.5	44.5	--	--	--
--*Cabezon*		34.9	34.9	--	--	--
--*Kelp greenling*		9.6	9.6	--	--	--
Cabezon	CA	65	N/A	65	3.5	62
Canary Rockfish	OR & CA	37.8 (97)	4.8 (27)	33 (69)	1.9	31.1
Kelp greenling	CA	9.3	N/A	9.3	0.3	9
Lingcod	N. 40°10' N. lat.	73	66	7	7	--
Lingcod	S. 40°10' N. lat.	38	N/A	38	--	38
California scorpionfish	S. 40°10' N. lat.	3.3	--	3.3	--	3.3
Nearshore Rockfish N. a/	N. 40°10' N. lat.	19.6	11	8.6	8.6	--
Nearshore Rockfish S. a/	S. 40°10' N. lat.	129.3	--	129.3	--	129.3
--*Shallow Nearshore Rockfish b/*		66.5	--	66.5	--	66.5
--*Deeper Nearshore Rockfish c/d/*		62.8	--	62.8	--	62.8

a/ Nearshore Rockfish totals consists of black-and-yellow, CA and WA blue/deacon, China, gopher, grass, kelp, brown, olive, copper, treefish, calico, and quillback rockfish south of 42° N. lat. North of 42° N. lat. (OR blue and deacon rockfish are in a complex with Oregon black rockfish).

b/ Shallow Nearshore Rockfish consists of black-and-yellow rockfish, China rockfish, gopher rockfish, grass rockfish, and kelp rockfish south of 40°10' N. lat. These species are part of the Nearshore Rockfish complex south of 40°10' N. lat.

c/ In this table, Deeper Nearshore Rockfish consists of blue rockfish, brown rockfish, calico rockfish, copper rockfish, olive rockfish, quillback rockfish, and treefish south of 40°10' N. latitude. These species are part of the Nearshore Rockfish complex south of 40°10' N. lat. However, for trip limits, black rockfish is included in Deeper Nearshore Rockfish.

Table 4-120. No Action. Nearshore shares, state shares, and projections under No Action for the 2021-2022 nearshore ACT of yelloweye rockfish. There are no other overfished stocks impacted by the nearshore fisheries.

Stock	Nearshore Total			Oregon			California				
	'21-'22 ACT		Proj.	'21-'22 Share		Proj.	'21-'22 Share		Total Proj.	40°10' – 42° Proj.	S. 40°10' Proj.
YELLOWEYE ROCKFISH	4.6	4.7	2.2	3.3	3.4	1.5	1.2	1.3	0.7	0.5	0.2

a/ ACT is shared 73% to Oregon and 27% to California; the HG is 5.9 mt and 6.0 mt and shared the same.

Table 4-121. No Action. Cowcod south of 40°10' ACLs for 2021-2022 including projected mortality and the non-trawl allocation amounts. All values in metric tons (mt)

Year	No Action ACL (mt)	Projected mortality estimate (mt)	Non-trawl allocation (64%)
2021	98	1.0	55.8
2022	96	1.0	54.5

Non-trawl Rockfish Conservation Area Adjustments in California.

There three management measures to implement minor adjustments to shoreward boundary of the commercial non-trawl Rockfish Conservation Area (RCA) in California: 1) Updates to Rockfish Conservation Coordinates in California (*supplemental analyses at Section 4.2.5.1*) and 2) Minor Adjustments to the Commercial Non-Trawl Rockfish Conservation Area's off California, south of 40° 10' N. lat. (supplemental analyses *at Section 4.2.5.2*), and 3)

Updates to Rockfish Conservation Coordinates in Central California

Modification of the 40-fathom depth contour offshore of San Mateo in central California to better align the 40 fathom RCA boundary line to the corresponding isobath[20] (public comment received in April 2019). The measure proposes two additional waypoints to the 40 fathom RCA line (Table 4-122), thereby increasing the allowable fishing area shoreward of the RCA line by 6.3 square miles.

These changes are not expected to result in changes in catch of target groundfish stocks compared to past catches or any of the harvest specifications approved for 2021-2022. Further, this modification is not expected to increase the risk of overfishing and managed species are expected to remain within the annual catch limits (ACL) through the use of cumulative trip limits. Any changes to the harvest patterns of the fishing community are expected to be very minor due to the fact that only small changes are being proposed for the boundary lines. There are likely little to no impacts to nongroundfish species, ESA-listed, or marine mammals given the small area of change. Furthermore, all EFH closures will remain in effect and will not be affected by this action.

[20] This issue was brought to the attention of the Council via public comment received in April 2019

Table 4-122. Coordinates for proposed modifications at San Mateo to the "40 fathom (73 m) depth contour between 46°16' N. lat. and the U.S. border with Mexico" RCA line south of 40°10' N. latitude.

Waypoint Number	Action	Latitude Degree	Latitude Minute	Longitude Degree	Longitude Minute
132	No Change	37	35.67	122	49.47
New # 1	Add	37	25	122	38.66
New # 2	Add	37	20.68	122	36.79
133	No change	37	20.24	122	33.82

Minor Adjustments to the Commercial Non-Trawl Rockfish Conservation Area's off California, south of 40° 10' N. lat.

The management measure for minor adjustments south of 40°10' N. lat. stems from the CDFW proposal presented in November 2019. This measure would require the use of two management lines already found in CFR §660.310: 37° 11' N. lat. and 38° 57.50' N. lat. This action would:

1) For the area from Point Conception (34° 27' N lat.) to the CA/Mexico border, modify the shoreward non-trawl RCA boundary from 75 fm to 100 fm, resulting in RCA configuration of 100 fm to 150 fm. This modification would only apply to non-trawl commercial fisheries.

This management measure will increase mortality of groundfish species found in the Southern Management Region. Despite the rebuilt status of cowcod, the uncertainty in the outcome of the assessment does not allow for considering fishery retention for the 2021-2022 cycle. As retention of cowcod will remain prohibited, allowing additional depth will provide access to healthy and abundant shelf species with minimum risk to cowcod impacts. This measure is expected to increase discard mortality of cowcod; however, this increase not projected to exceed the proposed Fishery HG as proposed under the higher Cowcod ACLs and ACTs being considered for 2021-22. Yelloweye rockfish are uncommon in this area, as this management measure would modify the non-trawl RCA in the southern most extent of the species' range. This management measure is expected to have little to no impact on yelloweye rockfish. Finally, state managed trawl fisheries (California halibut, ridgeback prawn and sea cucumber) are permitted to fish shoreward of the 100 fm depth line. This management measure would allow for a slight increase in opportunity for the fixed gear sector, in depths in which bottom trawling is currently permitted.

1) For the area between 37° 11' N latitude and 34° 27' N. lat., add a management line at Pigeon Point (37°11' N lat.; as specified in CFR 660.310) and modify the shoreward non-trawl RCA boundary between 37° 11' N. lat. and 34° 27' N lat. from 40 fm to 50 fm, resulting in an RCA configuration of 50 fm to 125 fm.

The use of this management line will allow for additional partitioning of management areas with the intent to provide increased depth access using a stepwise and precautionary approach without risking exceeding yelloweye rockfish impacts. The additional management lines provide maximum flexibility to make inseason changes as needed to mitigate yelloweye rockfish impacts or modify other trip and sub trip limits (i.e. vermilion rockfish). This measure would allow increases in opportunity to access groundfish stocks and some increase to mortality of shelf rockfish. Yelloweye rockfish are encountered in this area, however less frequently than in more northerly latitudes. This management measure may have slight impact on yelloweye rockfish, though, allowable harvest is likely to increase and with the addition of the management line at 37° 11' N latitude, regulatory modifications can be made to ensure mortality remains within allowable limits. Note, the 2018 estimated mortality from the coastwide non-nearshore fisher was 1.34 mt, the 2021 coastwide non-nearshore ACT is 2.0 mt.

2) For the area between 38° 57.50 N latitude and 37° 11' N. lat., add a management line at Point Arena (38°57.50' N lat.; as specified in CFR 660.310) and modify the shoreward non-trawl RCA boundary between 38° 57.50 N. lat. and 37° 11' N. lat. from 40 fm to 50 fm, resulting in an RCA configuration of 50 fm to 125 fm.

This proposed change has similar impacts as described under 2. Given that the increase in allowable mortality resulting from the latest assessments for cowcod and yelloweye rockfish, increased opportunity may be afforded. While yelloweye rockfish are more common in this area than those considered under non-trawl RCA modification priority 1 or 2, the opening of this area may increase yelloweye rockfish impacts. However, allowable harvest is likely to increase and with the addition of the management line at 38°57.50' N. lat., regulatory modifications can be made to ensure mortality remains in allowable limits. Note, the 2018 estimated mortality from the coastwide non-nearshore fisher was 1.34 mt, the 2021 coastwide non-nearshore ACT is 2.0 mt.

Overall, the shoreward boundary modification would provide more opportunity to target healthy stocks of shelf species, such as widow, canary, yellowtail, chilipepper, and bocaccio rockfishes by allowing access to depths in which they are most prevalent. The targeting of such stocks will increase catch, but because non-trawl fisheries are currently managed with cumulative trip limits, any increases in catch are expected to remain within allowable harvest limits. The non-trawl RCA adjustment could also provide opportunity to participants of non-groundfish fisheries seeking relief from truncated seasons or early closures in their primary fisheries. Although it is anticipated that these minor adjustments to the shoreward boundary of the RCA will increase attainment of shelf rockfish species, the non-nearshore and California nearshore sectors are projected to be within their yelloweye rockfish ACTs of 1.6 mt and 1.2/1.3 mt respectively in 2021-2022.

These measures are expected to increase catch opportunities in California ports south of 38° 57.50' N lat. in the management area the proposal is adopted. California's groundfish fleet is unique and comprised of many more non-trawl fixed gear fishermen compared to other states and many of these fishermen relied on shelf rockfish species such as yellowtail rockfish and widow rockfish as a staple in their fishery portfolios. Restoring access to areas where yellowtail, widow and shelf rockfishes, non-trawl fishermen will have positive social and economic effects on these ports. The scale of these positive impacts cannot yet be quantified. Additionally, it is difficult to project if the proposed non-trawl RCA modifications will provide enough economic incentive for fishermen to install a VMS to take advantage of this proposed opportunity in federal waters. This measure is not expected to negatively impact any user groups. This measure would not have any effect on allocations so it would not affect any other sector's allowable harvest levels or ability to harvest those fish.

Updates to RCA coordinates in Southern California

These corrections were discussed the Groundfish Advisory Subpanel and the Groundfish Management Team April 2020 reports. The following summarizes the detail provided in Agenda Item H.4.a Supplemental CDFW Report 2, March 2020. The proposal for the Southern Management Area (south of 34° 27' N. latitude) RCA, is to extend the current shoreward 75 fm line out to 100 fm. Current federal waypoints defining the 100 fm boundary line in this area create boundary line crossovers with the current 75 fm boundary line. If the 100 fm boundary line were utilized as currently listed in regulation these crossovers would create new closed areas in locations that are currently open to fishing activity utilizing the 75 fm line. The proposed waypoints and corrections to existing waypoints below will better define the 100 fm line in this area (Table 4-123).

Additionally, oral public comment from the November 2019 Council meeting identified that federal waypoints for the 100 fm boundary line south of 34° 27' N. lat. do not exist around the northern Channel Islands, whereas the 75 fm and 150 fm lines do. As part of the 2021-2022 biennial specification and

management measures process, California Department of Fish and Wildlife (CDFW) has already analyzed the expected impact of moving the Southern Management Area shoreward RCA line to both target catch and expected bycatch, and concluded the change could be accommodated within allowable limits and harvest guidelines (see Sections 4.2.5). While the 100 fm boundary line is defined in the federal regulations and available for use in management, it has not been previously implemented as a shoreward boundary for non-trawl fisheries, though in previous years it has been utilized for non-groundfish open access trawl fisheries. Table 4-122 identify CDFW's proposed waypoint corrections and proposed coordinates for the new 100 fm line around the northern Channel Islands.

Table 4-123. Coordinates for proposed modifications to the 100-fm (183-m) depth contour used between the U.S. border with Canada and the U.S. border with Mexico RCA line south of 34°27' N. latitude.

Waypoint Number	Action	LatDeg Old	LatMin Old	LongDeg Old	LongMin Old	LatDeg New	LatMin New	LongDeg New	LongMin New
La Jolla									
308	No change	33	7.06	117	22.71				
New #1	Add					33	2.81	117	21.17
New #2	Add					33	1.76	117	20.51
309	Move	32	59.28	117	19.69	32	59.90	117	19.38
New #3	Add					32	57.29	117	18.94
New #4	Add					32	56.15	117	19.54
310	Move	32	55.36	117	19.54	32	55.30	117	19.38
New #5	Add					32	54.27	117	17.17
311	Move	32	53.35	117	17.05	32	52.94	117	17.11
312	Move	32	53.36	117	19.97	32	52.66	117	19.67
New #6	Add					32	50.95	117	21.17
New #7	Add					32	47.11	117	22.98
313	Move	32	46.39	117	23.45	32	45.60	117	22.64
314	No change	32	42.79	117	21.16				

Table 4-124. Coordinates for proposed modifications to Santa Catalina, San Clemente, and Northern Channel Islands RCA line south of 34°27' N. latitude.

Waypoint Number	Action	LatDeg Old	LatMin Old	LongDeg Old	LongMin Old	LatDeg New	LatMin New	LongDeg New	LongMin New
Santa Catalina Island									
9	No change	33	16.09	118	15.46				
10	Move	33	18.1	118	27.95	33	18.14	118	27.94
11	Move	33	19.84	118	32.16	33	19.84	118	32.22
12	Move	33	20.83	118	32.83	33	20.81	118	32.91
13	Move	33	21.91	118	31.98	33	21.94	118	32.03
14	Move	33	23.05	118	30.11	33	23.14	118	30.12
15	No change	33	24.87	118	32.45				

Waypoint Number	Action	LatDeg Old	LatMin Old	LongDeg Old	LongMin Old	LatDeg New	LatMin New	LongDeg New	LongMin New
San Clemente Island									
1	Move	33	4.73	118	37.98	33	4.80	118	37.90
2	Move	33	2.67	118	34.06	33	2.65	118	34.08
3	No change	32	55.8	118	28.92				
New A	Add					32	55.04	118	27.68
4	Move	32	49.78	118	20.88	32	49.79	118	20.87
5	Move	32	48.01	118	19.49	32	48.05	118	19.62
6	Move	32	47.53	118	21.76	32	47.41	118	21.86
7	No change	32	44.03	118	24.7				
New B	Add					32	47.81	118	30.20
8	Move	32	49.75	118	32.1	32	49.79	118	32.00
9	No change	32	53.36	118	33.23				
10	Remove	32	55.17	118	34.64				
11	No change	32	55.13	118	35.31				
12	No change	33	0.22	118	38.68				
13	No change	33	3.13	118	39.59				
14	Move	33	4.73	118	37.98	33	4.80	118	37.90
Northern Channel Islands									
1	Add					34	12.89	120	29.31
2	Add					34	10.96	120	25.19
3	Add					34	8.74	120	18.00
4	Add					34	7.02	120	10.45
5	Add					34	6.75	120	5.09
6	Add					34	8.15	119	54.96
7	Add					34	7.17	119	48.54
8	Add					34	5.66	119	37.58
9	Add					34	4.76	119	26.28
10	Add					34	2.93	119	18.06
11	Add					34	0.97	119	18.78
12	Add					33	59.38	119	21.71
13	Add					33	58.62	119	32.05
14	Add					33	57.69	119	33.38
15	Add					33	57.40	119	35.84
16	Add					33	56.07	119	41.10
17	Add					33	55.54	119	47.99
18	Add					33	56.60	119	51.40
19	Add					33	55.56	119	53.87
20	Add					33	54.40	119	53.74
21	Add					33	52.72	119	54.62
22	Add					33	47.95	119	53.50

Waypoint Number	Action	LatDeg Old	LatMin Old	LongDeg Old	LongMin Old	LatDeg New	LatMin New	LongDeg New	LongMin New
23	Add					33	45.75	119	51.04
24	Add					33	40.18	119	50.36
25	Add					33	38.19	119	57.85
26	Add					33	44.92	120	2.95
27	Add					33	48.90	120	5.34
28	Add					33	51.64	120	8.11
29	Add					33	58.31	120	27.99
30	Add					34	3.23	120	34.34
31	Add					34	9.42	120	37.64
32	Add					34	12.89	120	29.31

4.2.2.7 Tribal Fisheries

The ACLs for the tribal fisheries are identical to the 2019-2020 biennium for all fisheries with the exception of petrale sole, yelloweye rockfish, cabezon and longnose skate. Petrale sole and longnose skate are both highly utilized species within the treaty bottom trawl fishery. At the November 2019 Council meeting, the Quinault Indian Nation notified the council that they would begin bottom trawling in 2020. In order to accommodate new participants into the fishery, the tribes have requested an increase within the set-aside for petrale sole from 290 mt to 350 mt and longnose skate from 130 mt to 220 mt. The requested Treaty harvest guidelines and set-asides are shown in Table 4-125. The Tribes do not currently have a set-aside for cabezon but encounter this species within nearshore hook and line fisheries and are therefore requesting a set-aside of Washington cabezon of 2 mt. Finally, the Tribes have requested an increase in the treaty set-aside of yelloweye rockfish from 2.3 mt to 5.0 mt.

Table 4-125. No Action. Requested Treaty harvest guidelines and set-asides for 2021-2022.

Species	Requested Treaty harvest guidelines and set-asides (mt)
Arrowtooth flounder	2,041
Black rockfish (WA) a/	18.14
Cabezon (WA)	2
Canary rockfish	50
Dover sole	1,497
English sole	200
Lingcod	250
Longnose skate	220
Longspine thornyheads	30
Other flatfish	60
Pacific cod	500
Pacific whiting	17.5% of TAC
Petrale sole	350
Sablefish north of 36° N. lat.	See Table 4-124
Shortspine thornyheads	50
Spiny dogfish	275
Widow rockfish	200
Yellowtail rockfish	1,000
Yelloweye rockfish	5

a/ The treaty harvest guideline of black rockfish is set at 30,000 lbs north of Cape Alava and 10,000 lbs between Destruction Island and Leadbetter Point (50 CFR 660.50(f)(1))

Sablefish North of 40°10' N. lat.

The following tables detail the Tribal sablefish apportionments under the two methods being considered by the Council. These methods are described in detail in Section 4.2.1.2

Table 4-126. Potential Tribal allocations of sablefish under No Action based on apportionment Methods 1 and 2.

Year	No Action	
	Method 1	Method 2
2021	604	644
2022	575	612

4.2.2.8 Washington Recreational Management Measures

Recreational Management Measures

Under the No Action Alternative, the Washington recreational yelloweye rockfish HGs would be 9.7 and 9.9 mt and the Washington recreational yelloweye fishery would be managed to ACTs of 7.5 and 7.8 mt for 2021 and 2022, respectively (Table 4-127).

Washington recreational and all non-trawl fisheries are expected to be within both allocation options for canary rockfish (Table 4-127), petrale sole, and widow rockfish. Background on these allocation options are described Chapters above. Projected total non-trawl impacts are provided Chapter 4.2.2.6 above and including the other recreational fisheries and LEFG OA. These same findings for the canary rockfish, widow rockfish, and petrale sole allocation options apply to No Action, Alternative 1, and Alternative 2.

The management approach taken for the Washington recreational fishery in the 2019-2020 biennium was purposefully precautionary because it was difficult to project how encounters with yelloweye rockfish would change given that there have been restrictions to reduce the chance of encounters with yelloweye rockfish for close to fifteen years. Management measures for 2021-2022 are proposed to keep catch within current harvest limits and continue to build on reducing depth and area closures initiated in 2019 and 2020 with the benefit of having one year of recreational catch data under less restrictive management measures to inform projected yelloweye mortality under the No Action Alternative.

In addition to providing access to healthy groundfish resources that occur in deep or mid-water areas, the relaxation of depth restrictions takes some fishing pressure off black rockfish and other nearshore species like nearshore rockfish and cabezon. Under a rebuilt canary rockfish stock, regulations have progressively allowed the retention of canary rockfish beginning in 2017 for the first time since the early 2000's. At the time, it was unclear how angler behavior would affect canary rockfish mortality after many years of being a prohibited species. Based on canary rockfish catch in 2017, canary rockfish sub-limit were completely removed in all Marine Areas in 2019.

Table 4-127. No Action – Washington Recreational. HGs for the Washington recreational fisheries under the No Action Alternative.

Species	HG (mt)	
	2021	2022
Canary Rockfish (Option 1 SQ)	43.3	42.3
Canary Rockfish (Option 2)	50.0	50.0
YELLOWEYE ROCKFISH	9.7 (ACT = 7.5)	9.9 (ACT = 7.8)
Black Rockfish	274.9	272.9
Nearshore Rockfish North of 40°10´ N. lat.	18.4	17.7
WA Cabezon/Kelp Greenling	18.0	15.0

Groundfish Seasons and Area Restrictions

Season Structure

Under the No Action Alternative, the Washington recreational groundfish and lingcod seasons would be open from the second Saturday in March through the third Saturday in October (Table 4-129). Under No Action, the groundfish and lingcod season would be March 13 through October 16 in 2021 and, March 12 through October 15 in 2022.

Depth restrictions are the primary tool used to keep recreational mortality of yelloweye rockfish within specified ACTs. Restrictions that limit the depth where groundfish fisheries are allowed are more severe in the area north of the Queets River (Marine Areas 3 and 4) where yelloweye abundance is higher and therefore caught incidentally at a higher rate (Table 4-128). Depth restrictions are fewer in the south coast where incidental catch of yelloweye rockfish becomes progressively less. Washington coastal management areas are shown in Figure 4-24. Under the No Action Alternative, the Council can consider moderate changes to depth restrictions in Marine Areas 2, 3 and 4, and expand allowances to retain groundfish on halibut trips in Marine Areas 1, 3 and 4, as described below.

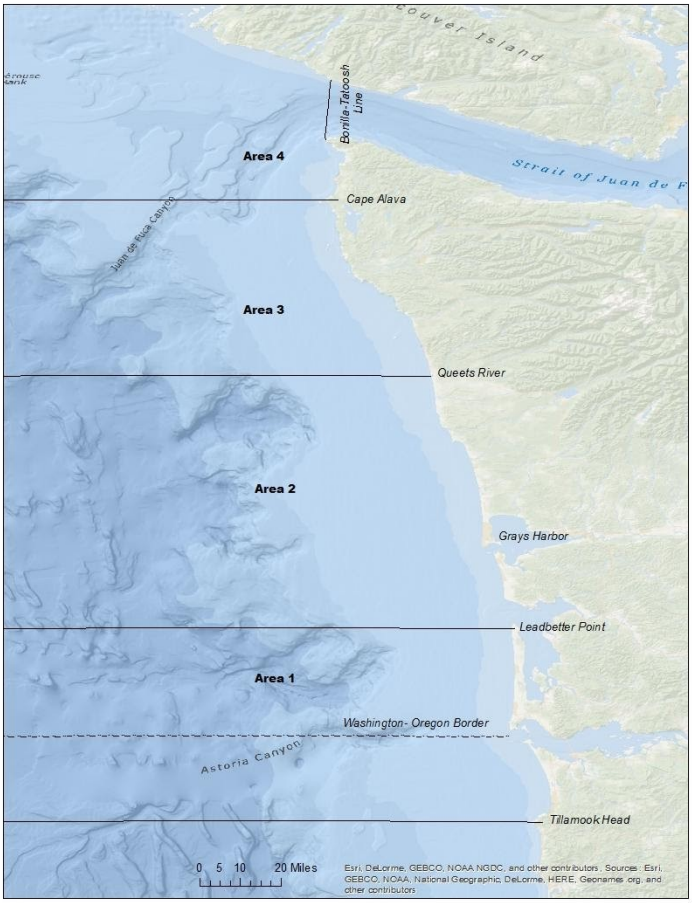


Figure 4-24. Washington Recreational Management Areas (2019)

Table 4-128. No Action - Washington recreational yelloweye catch (mt) by management area in 2019.

Marine Area	Yelloweye rockfish mortality (mt)	Proportion by area
3 & 4 (N. Coast)	2.63	70%
2 (S. Coast)	0.86	23%
1 (Col. River)	0.25	7%
Total	3.74	100%

Table 4-129. No Action - Washington Recreational seasons and groundfish retention restrictions.

Marine Area	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
3 & 4 (N. Coast)	BF Closed		BF Open		BF Open < 20 fm June 1 -Aug 31 a/ b/				BF Open		BF Closed	
2 (S. Coast)	BF Closed		BF Open c/d/			BF Open d/					BF Closed	
1 (Col. River)	BF Closed		BF Open e/ f/								BF Closed	

a/ Retention of lingcod, Pacific cod and sablefish allowed >20 fm on days when Pacific halibut is open.

b/ Retention of yellowtail and widow rockfish is allowed > 20 fm in July.

c/ From May 1 through May 31 lingcod retention prohibited > 30 fathoms except on days that the primary halibut season is open.

d/ When lingcod is open, retention is prohibited seaward of line drawn from Queets River (47°31.70' N. Lat. 124°45.00' W. Lon.) to Leadbetter Point (46° 38.17' N. Lat. 124°30.00' W. Lon.), except on days open to the primary halibut fishery and, June 1 – 15 and September 1 - 30.

e/ Retention of groundfish allowed during the all-depth Pacific halibut fishery. Lingcod retention is only allowed north of the WA-OR border with halibut on board.

f/ Retention of lingcod is prohibited seaward of a line drawn from Leadbetter Point (46° 38.17' N. Lat. 124°21.00' W. Lon.) to 46° 33.00' N. Lat. 124°21.00' W. Lon. year round except lingcod retention is allowed from June 1 - June 15 and Sept 1 - Sept 30.

North Coast (Marine Areas 3 and 4)

Under No Action, the retention of groundfish would be prohibited seaward of a line approximating 20 fathoms from June 1 through July 31, except bocaccio rockfish, silvergray rockfish, canary rockfish, widow rockfish, yellowtail rockfish, lingcod, Pacific cod and sablefish can be retained seaward of 20 fathoms on days that Pacific halibut fishing is open. Pacific halibut was open 10 days in this management area in 2019 and given the adoption of a consistent halibut quota through 2022, the recreational halibut season length is expected to be similar in 2021 and 2022. Under the No Action Alternative, the 20 fathom depth restriction would be in place approximately one month less than in 2019, and yellowtail and widow rockfish can be retained seaward of the 20 fathom depth restriction in July. Under No Action, retention of yellowtail and widow rockfish seaward of 20 fathoms would not be dependent on days open to salmon fishing as it was in 2019. In 2019, salmon was open for a total of 101 days in Marine Area 4, with limited opportunity available after July 14, when chinook retention closed after only 23 days. These changes would expand the opportunity to fish for groundfish seaward of 20 fathoms for an additional month compared to 2019 and would allow yellowtail rockfish and widow rockfish seaward of 20 fathoms during the entire month of July. Increasing access to areas that have been closed or had limited access (e.g., YRCAs and depth restrictions) are being considered incrementally to avoid exceeding yelloweye rockfish ACTs and HGs. Fishing for, retention, or possession of groundfish and Pacific halibut will continue to be prohibited in the C-shaped YRCA (Figure 4-25) until more data becomes available to inform projected impacts.

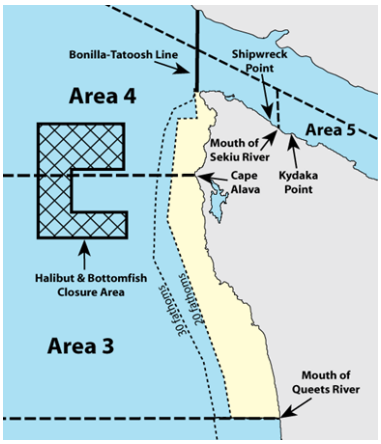


Figure 4-25. C-Shaped YRCA off of Cape Alava

South Coast (Marine Area 2)

Under the No Action Alternative, the groundfish fishery would be open at all depths, except for lingcod. Retention of lingcod would be prohibited seaward of 30 fathoms from May 1 through May 31, except lingcod retention would be allowed seaward of 30 fathoms on days open to the primary Pacific halibut season. Under No Action, the 30 fathom depth restriction would be in place 49 fewer days compared to the 2019 when it was in place from March 9 through May 31.

When lingcod is open (see Lingcod Seasons and Size Limits below), fishing for, retention, or possession of lingcod would be prohibited in deep-water areas seaward of a line extending from 47°31.70' N. lat., 124°45.00' W. long. to 46°38.17' N. lat., 124°30.00' W. long., except as allowed on days open to the Pacific halibut fishery (Figure 4-26) and from June 1 through 15 and September 1 through 30. Under No Action, this lingcod restriction would be in place two weeks less compared to the 2019 by opening the restricted area for the entire month of September compared to 2019 where it was only open the first two weeks of September.

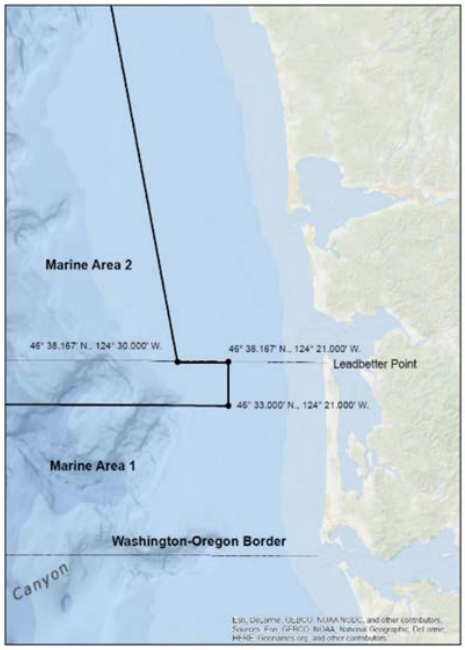


Figure 4-26. Lingcod Restricted Area of the southwestern Washington coast.

Under the No Action Alternative, the South Coast YRCA and Westport Offshore YRCA would be open to recreational fishing for groundfish and Pacific halibut. These areas were closed to fishing for, retention or possession of groundfish or Pacific halibut in 2019. (Figure 4-23).

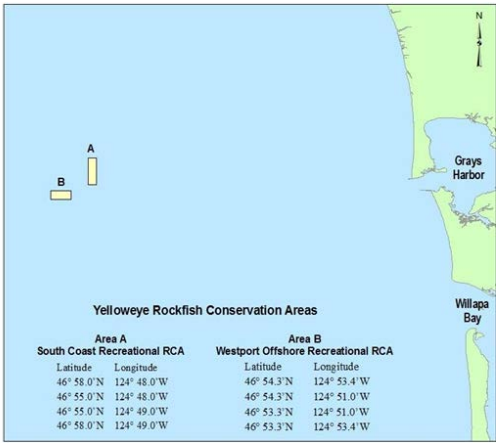


Figure 4-27. Washington South Coast and Westport YRCAs

Columbia River (Marine Area 1)

Under the No Action Alternative, the groundfish fishery is open in all depths, except for lingcod. Lingcod would be allowed to be retained north of the Washington-Oregon border on days open to the all depth Pacific halibut season. Lingcod retention in the deep-water area (seaward of a line extending from 46°38.17 N. lat., 124°21.00' W. lon. to 46°33.00' N. lat., 124°21.00' W. lon.) would be allowed from June 1 through June 15, and September 1 through September 30 (Figure 4-26). Retention of groundfish would be allowed with halibut onboard when the Pacific halibut fishery is open.

Area Restrictions

Under the No Action Alternative, fishing for, retention, or possession of groundfish and halibut during the Washington recreational groundfish and Pacific halibut fisheries will be prohibited in the C-shaped YRCA (Figure 4-25).

Under the No Action Alternative, the South Coast and Westport Offshore YRCA would be open to recreational groundfish and Pacific halibut fishing year-round (Figure 4-27).

Groundfish Bag Limits

Under the No Action Alternative, the aggregate daily groundfish limit would be 9 fish per day which can include up to, 7 rockfish, 2 lingcod and one cabezon. Further, anglers would be allowed to retain five flatfish in addition to the 9 fish daily aggregate groundfish limit. Under the No Action Alternative, there are no size limits for any species, and the retention of yelloweye rockfish would continue to be prohibited in all areas (Marine Areas 1 – 4).

Lingcod Seasons and Size Limits

Under the No Action Alternative, in all Marine Areas, the lingcod season would be March 13 through October 16 in 2021 and March 12 through October 15 in 2022.

Pacific Halibut Seasons

It is expected that the Pacific halibut seasons in 2021-2022 will be similar to the halibut seasons in 2019-2020. The IPHC adopted a consistent quota for Area 2A (Washington, Oregon, and California) for 2019 through 2022 barring significant conservation concerns. This consistent quota should allow for seasons that are similar during the 2019-2022 time period. Under No Action, groundfish retention would be allowed for select rockfish species, in addition to other groundfish already allowed under 2019 in the North Coast area (Marine Areas 3 and 4) and some groundfish retention would be allowed during the Pacific halibut fishery in the Columbia River area (Marine Area 1). Under No Action, groundfish retention in the halibut fishery in the North Coast area is proposed to include bocaccio, silvergray, yellowtail, widow, and canary rockfish in addition to Pacific cod, sablefish and lingcod which are already allowed under 2019. Under No Action, groundfish retention on halibut days in the Columbia River area is proposed to include all groundfish, except yelloweye rockfish, rather than just Pacific cod, sablefish, flatfish, and lingcod as is currently allowed.

Inseason Management Response

Projected mortality for Washington's recreational fishery is based upon the previous season's harvest estimated by the Ocean Sampling Program (OSP) and incorporated into the Recreational Fishery Information Network (RecFIN).

The precision of recreational groundfish catch estimates based upon previous seasons will continue to be influenced by factors such as the length and success of salmon and halibut seasons, weather, and any other unforeseen factors. For example, recreational bottomfish catch can increase if halibut or salmon seasons are short and recreational anglers shift effort to bottomfish. As described above, halibut seasons are expected to be less variable in the near-term given the consistent halibut quota that is expected to be in place through 2022. Salmon seasons have been reduced in recent years and may increase effort on recreational bottomfish. Most importantly, Washington's OSP can produce estimates of groundfish catch with a one-month lag time and Washington's management and regulatory processes can react quickly to the need for additional depth restrictions, area closures, groundfish retention restrictions, or changes to seasons through emergency changes to state regulations if inseason catch reports indicate that recreational harvests of overfished species or non-overfished species are exceeding pre-season projections to the point where HGs, ACTs, or ACLs are at risk of being exceeded.

Impact (Groundfish Mortality)

Projected mortality for overfished and non-overfished species under the No Action Alternative are summarized in Table 4-130. Under the No Action Alternative, the Washington yelloweye HG is 9.7 and 9.9 mt for 2021 and 2022 respectively, and the ACTs are 7.5 mt and 7.8 mt. With higher yelloweye rockfish HGs available to the recreational fishery as a result of yelloweye rockfish rebuilding, less restrictive management measures that reduce the time period where depth restrictions are in place and provide more access to species such as lingcod and mid-water rockfish for recreational anglers were implemented for 2019 and 2020.

Table 4-130. No Action – Projected Mortality (in mt) for the Washington Recreational fishery under No Action.

Stock	2021-2022 Projected Mortality (mt)
Canary Rockfish	15.34
YELLOWEYE ROCKFISH	5.72
Black Rockfish	234.5
Bocaccio	3.56

Stock	2021-2022 Projected Mortality (mt)
Lingcod	183.89
Nearshore Rockfish	10.05
Blue Rockfish	*1.24*
Quillback Rockfish	*3.16*
Copper Rockfish	*3.09*
China Rockfish	*2.56*
Brown Rockfish	--
Grass Rockfish	--
Yellowtail Rockfish	60.46
Vermilion Rockfish	3.24
Washington Cabezon/Kelp Greenling	10.64
Cabezon	*9.01*
Kelp Greenling	*1.63*

North Coast (Marine Areas 3 and 4)

Yelloweye rockfish catch per angler from May 2019, the most recent period when groundfish retention was allowed seaward of 20 fathoms, was used to estimate projected impacts under depth restrictions considered under the No Action Alternative for Marine Areas 3 and 4. Under the No Action Alternative, the 20 fathom depth restriction would be implemented in June, but would only be in place through the end of July which provides an additional 38 days of all depth fishing in 2021 and 2022 compared to 2019 Final yelloweye estimates from 2019 were used to estimate projected impacts in months where the depth restrictions are unchanged.

It was also assumed that angler effort would increase from 2019 if depth restrictions were removed so the 2019 effort estimate was increased by 35 percent for months where the 20-fathom depth restriction was removed. Angler effort in recent years was used to estimate the potential increase in effort that could be focused on recreational groundfish fisheries under less restrictive management measures. The 35 percent increase in projected angler trips was based on the general increase in angler effort per month seen from 2015 to 2016 as anglers shifted their effort to groundfish opportunities as a result of limited salmon fishing opportunities.

Under No Action, bocaccio rockfish, silvergray rockfish, yellowtail rockfish, widow rockfish, and canary rockfish retention would be allowed seaward of 20 fathoms on days open to the recreational Pacific halibut fishery in Marine Areas 3 and 4. This action will provide recreational anglers with access to underutilized and recreationally popular deep-water rockfish species such as canary rockfish and allow anglers to achieve more of their groundfish daily limit while fishing in deep-water, while potentially relieving some pressure from nearshore species. The analysis factored in all discards of these species while targeting halibut and assumed they would all be retained under the allowance, resulting in increases as shown in Table 2-81.

Under the No Action Alternative, yellowtail rockfish and widow rockfish retention would be allowed seaward of 20 fathoms in July but the link to salmon days would be removed, providing access to these mid-water rockfish species every day during July and August, when combined with the removal of the 20-fathom depth restriction beginning August 1. The rationale for allowing yellowtail rockfish and widow rockfish retention on salmon days in 2019 was to acknowledge that these two mid-water species are often encountered while anglers troll for salmon. However, the salmon season was so restricted in 2019 that there was very little opportunity for recreational anglers to retain yellowtail rockfish and widow rockfish.

Removing the provision that only allows anglers to retain yellowtail rockfish and widow rockfish seaward of 20 fathoms only on salmon days is open provides additional opportunity to access healthy mid-water rockfish species without being constrained if salmon seasons are short. Given that anglers would not need to be targeting salmon in order to retain yellowtail rockfish and widow rockfish seaward of 20 fathoms, a precautionary approach to estimating projected impacts to yelloweye rockfish was used by assuming complete removal of the 20-fathom line for both July and August. As such, the yelloweye rockfish per angler from halibut trips in May 2019 (when no 20-fathom depth restriction was in place) was used to project yelloweye rockfish impacts as this data reflects a current expectation of yelloweye encounters when no depth restriction is in place.

South Coast (Marine Area 2)

Under the No Action Alternative, the 30 fathom depth restriction in Marine Area 2 would be in place for 31 days, beginning May 1 through May 31, which is two months less than 2019. Yelloweye per angler from 2017 from the south coast management area was applied to an estimated increase in angler trips of 35 percent for the months where the 30 fathom depth restriction would be removed (March and April). Yelloweye rockfish catch per angler from 2017 was used because it was the highest encounter rate including as far back as 2005, when yelloweye rockfish retention was allowed (Table 4-131).

Table 4-131. No Action – Yelloweye rockfish per angler on bottomfish trips in the south coast management area (Marine Area 2) 2005 - 2019.

Year	Angler trips (bottomfish)	Yelloweye rockfish (ret. + rel.)	Yelloweye rockfish per angler
2004	12,535	80	0.01
2005	14,057	60	0.00
2006	17,052	89	0.01
2007	15,440	76	0.00
2008	14,638	44	0.00
2009	12,519	61	0.00
2010	11,271	57	0.01
2011	13,764	55	0.00
2012	15,349	111	0.01
2013	14,485	180	0.01
2014	13,589	165	0.01
2015	17,188	240	0.01
2016	21,506	286	0.01
2017	18,308	495	0.03
2018	21,046	456	0.02
2019	18,545	439	0.02

Using the high yelloweye per angler encounters from 2017, even though yelloweye rockfish retention was prohibited, may better reflect current yelloweye abundance compared to past years given its progress toward rebuilding. Final yelloweye estimates from 2019 were used to estimate projected impacts in months where depth restrictions remained unchanged.

Angler effort is expected to increase compared to 2019 as a result of more fishing opportunity under less restrictive management measures and in anticipation of continued poor recreational salmon opportunities

which has shown to shift more recreational effort to groundfish fisheries. Angler effort in recent years was used to estimate the potential increase in effort that could be focused on recreational groundfish fisheries under less restrictive management measures. For example, as a result of limited salmon fishing opportunities, angler effort has shifted to groundfish in recent years. This effort shift was apparent when an increase in angler effort of approximately 35 percent per month was seen from 2015 to 2016. Projected angler effort for 2021 and 2022 was estimated by assuming a similar 35 percent increase in angler effort continues in months where less prohibitive depth restrictions are in place. Angler effort from 2019 is used to project effort in months where depth restrictions remain unchanged. There was an exception to the 35 percent increase in angler effort in Marine Area 2 during the month of July when there was some salmon fishing opportunity.

Also following on management measures adopted for 2019 and 2020, the deep-water lingcod closure in Marine Area 2 would be open two additional weeks in September under the No Action Alternative compared to the previous biennium. Under the No Action Alternative, in addition to the two-week opening in June, the entire month of September would be open to lingcod fishing in the deep-water area. Projected impacts for yelloweye rockfish and angler effort assumes that catch and effort double in response to the doubling of the number of days anglers have access to deep-water fishing areas. The same analysis was applied to mid and deep-water species such as lingcod, vermilion rockfish, canary rockfish, and yellowtail rockfish, where this additional opportunity will result in additional impacts, as reflected in Table 2-81.

Under the No Action Alternative, the Westport Offshore YRCA and the South Coast YRCA would be open to recreational fishing for groundfish and halibut year-round. The South Coast YRCA, which is three by one nautical miles in size, was implemented during the 2007-2008 biennial harvest specification and management cycle (Final Environmental Impact Statement for 2007-2008 Groundfish Harvest Specifications and Management Measures) in response to higher yelloweye rockfish and canary rockfish encounters during 2006. WDFW added another small closure (two by one nautical mile) in the same general area in 2009 (Final Environmental Impact Statement for 2009-2010 Groundfish Harvest Specifications and Management Measures), referred to as the Westport Offshore YRCA. Both areas have remained closed to recreational groundfish and halibut fishing since their implementation in order to reduce encounters with yelloweye rockfish and canary rockfish. Commercial fishing is not prohibited in these areas.

At the time, WDFW worked with stakeholders to identify the specific boundaries for both of these areas. While there was no quantitative data to analyze and project a reduction in yelloweye rockfish and canary rockfish mortality resulting from these closures, anecdotal information from recreational charter anglers from the south coast management area suggested that there was enough fishing effort on a significant concentration of the rebuilding species in these areas that a closure would be a meaningful measure to help keep recreational catch below the HGs.

With canary rockfish rebuilt and higher recreational HGs for yelloweye rockfish in 2021-2022, the additional restrictions of these small closed areas are no longer necessary. Reopening both of these YRCAs can provide anglers with access to healthy lingcod and canary rockfish stocks. WDFW still does not collect spatial data at the level of detail needed to estimate increased yelloweye rockfish and canary rockfish encounters that might be expected as a result of opening these YRCAs and there will likely be additional mortality as a result of open these areas. However, given that recreational catch of yelloweye rockfish under the No Action Alternative is projected to be 5.72 mt, which is 1.78 mt and 2.08 mt lower than the 7.5 mt and 7.8 mt ACT in 2021 and 2022 respectively, and an even larger buffer between projected catch and the HG which is 3.98 mt in 2021 and 4.18 mt in 2022, there is sufficient room to consider opening these areas.

Given that these closed areas are a routine management tool similar to seasons and bag limit adjustments (Federal regulations at 50 CFR 660.60 (c) (3)), reinstating the closed area can be implemented rapidly through state emergency regulation followed by inseason action if necessary to keep catch within Washington's HGs or ACTs in 2021 and 2022.

Columbia River (Marine Area 1)

Under the No Action Alternative, groundfish retention would be allowed during all-depth halibut trips except that lingcod retention would only be permitted north of the Washington – Oregon border. Currently, groundfish retention on Pacific halibut trips is limited to Pacific cod, sablefish, flatfish (other than Pacific halibut), and lingcod north of the Washington-Oregon border. The groundfish species allowed to be retained on halibut trips was limited in order to reduce encounters with yelloweye rockfish which is higher when anglers are targeting halibut in deep water. To estimate projected mortality for yelloweye rockfish as a result of allowing groundfish retention on halibut trips, yelloweye rockfish per angler on groundfish trips in May and June was applied proportionally to encounters of yelloweye rockfish per angler on halibut trips in May and June. This approach considers current angler behavior on groundfish trips and assumes that anglers on halibut trips will encounter yelloweye rockfish similarly if allowed to target groundfish on halibut trips. While this change will likely increase catch of other groundfish species, the focus was on increased impacts for yelloweye rockfish to ensure that this measure does not risk yelloweye rockfish catch exceeding the ACT or HG. To evaluate the potential increased retention of other species, we looked at groundfish discards on Columbia River halibut trips from 2014-2019 (Figure 4-28). The predominant species discarded on halibut trips are flatfish and sharks and skates, followed by yelloweye rockfish, canary rockfish, black rockfish, and yellowtail rockfish.

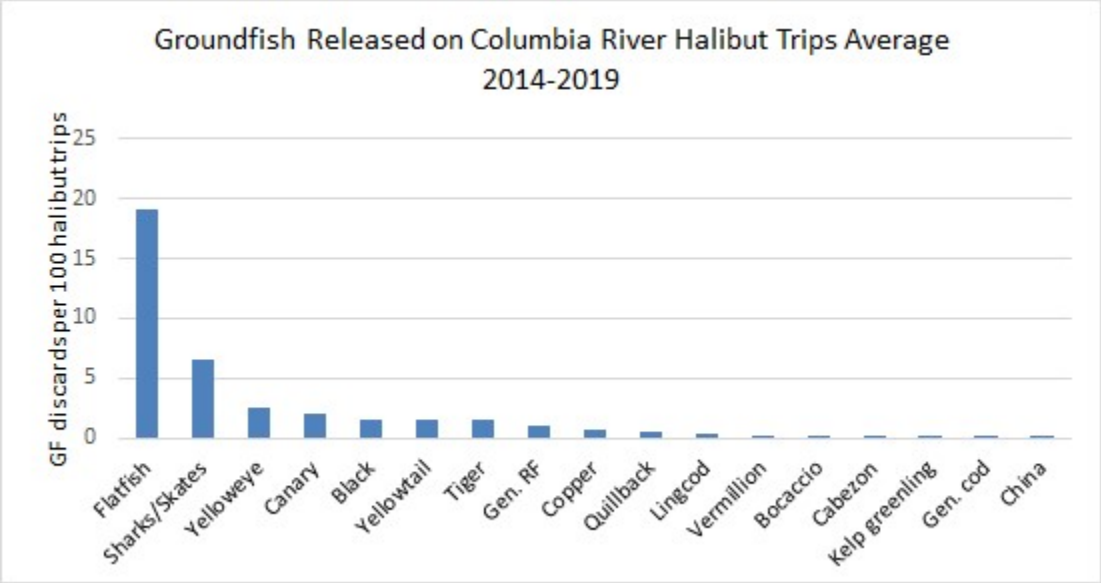


Figure 4-28. Average number of groundfish released on Columbia River Pacific halibut trips, 2014-2019.

The Columbia River area is co-managed with ODFW and this measure was analyzed to align WDFW regulations with ODFW's proposal to consider allowing longleader gear and limited groundfish retention during the Pacific halibut fishery. While the analysis considered the retention of all groundfish on halibut trips, the specific groundfish species to be retained could be restricted to just those species allowed under ODFW's longleader gear (yellowtail rockfish, widow rockfish, canary rockfish, redstriped rockfish, greenstriped rockfish, slivergray rockfish, chilipepper, boccaccio, and blue/deacon rockfish) to minimize increased mortality of black rockfish and other nearshore species such as copper rockfish and quillback rockfish where increased mortality could risk exceeding HGs for those species.

Under the No Action Alternative, the deep-water lingcod closure would be removed from June 1 through June 15 and September 1 through September 30 aligning the opening of the deep-water lingcod area in Marine Area 1 with the opening of the deep-water lingcod area in Marine Area 2. Similar to the approach used to consider reducing restrictions on the deep-water lingcod closure in Marine Area 2, access to the deep-water areas in Marine Area 1 would be considered in a precautionary fashion, allowing for relatively short openings in the spring and fall to better understand potential impacts to yelloweye rockfish as a way to consider removal of long standing depth restrictions under higher yelloweye rockfish ACLs. The analysis used to estimate projected yelloweye rockfish impacts in Marine Area 2 was replicated for Marine Area 1. The 2019 yelloweye rockfish encounters per angler rate was utilized and applied it to an assumed 35 percent increase in angler trips for the time period where the depth restriction is not in place. Similarly, the analysis for mid and deep-water species such as lingcod, vermilion rockfish, canary rockfish, and yellowtail rockfish applied the same increase in angler effort in order to estimate future impacts. For example, in 2019, there were 2,746 recreational angler trips (charter and private) targeting bottomfish, that number is expected to increase to 2,956 angler trips (charter and private) targeting bottomfish in 2021 and 2022 given this addition opportunity.

All Marine Areas (1 – 4)

Under the No Action Alternative, anglers would be allowed to retain five flatfish species (not including Pacific halibut) in addition to the 9 fish daily aggregate limit.

Inseason Response

As mentioned above, state emergency regulations and inseason action can be taken to address higher than anticipated yelloweye impacts if necessary.

4.2.2.9 Oregon Recreational Management Measures

Recreational Management Measures

The No Action Alternative analyzes the default HCR ACLs. Under those defaults, the Oregon recreational HGs or presumed state quotas are those presented in Table 4-132. The primary catch controls for the Oregon recreational fishery are season dates, depth closures, bag limits, and GCAs, including YRCAs. The west coast states will be responsible for tracking and managing catches of nearshore rockfish north of 40°10' N. lat. The black/blue/deacon rockfish OR complex ACL, and associated presumed state-specified HG for the recreational fishery decreases from 474.8 mt in 2019 to 438.2 and 431.4 mt in 2021 and 2022, respectively (). For yelloweye rockfish, the Federal HG remains similar to 2019, with the use of an ACT, or increases to 8.8 and 9.0 mt in 2021-2022, respectively. This will cause black/blue/deacon rockfish OR complex and nearshore rockfish complex species to be the primary driver of the Oregon recreational fishery in terms of the season structure and bag limits. The HGs for Oregon recreational fisheries for nearshore rockfish complex and black rockfish would be state-specified HGs and not established in Federal regulations (Table 4-132).

Table 4-132. No Action. Oregon recreational Federal harvest guidelines (HG), or state quotas under the No Action Alternative (mt)

Stock	2021 HG [a/]	2022 HG [a/]
Black/Blue/Deacon Rockfish Complex OR a/	438.2	431.4
Canary rockfish b/ (Option 1/ Option 2)	65/75	63.4/75
Cabezon/Greenling Complex OR c/	55.2	53.0
Nearshore Rockfish North of 40°10' N Lat d/	11.3	10.8
YELLOWEYE ROCKFISH (ACT/HG)	6.9/8.8	7.1/9.0

a/ The state process in Oregon establishes the commercial and recreational quotas for black, blue, and deacon rockfish. The values are the recreational share based on the 2019 recreational and commercial sharing percentages in Oregon state regulations.

b/ Federal HGs are established for canary and yelloweye rockfish and should be included in Federal regulation.

c/ Includes kelp and other greenlings. Kelp greenling accounts for over 99 percent of the landings. The state process in Oregon establishes the commercial and recreational shares for the cabezon/greenling OR Complex. The values are the recreational share based on the 2019 recreational and commercial sharing percentages in Oregon state regulations.

d/ Blue and deacon rockfish are not part of the nearshore rockfish north complex in Oregon, they are part of a complex with black rockfish. The state process in Oregon establishes commercial and recreational quotas for nearshore rockfish complex species. The values are the recreational share based on the 2019 recreational and commercial sharing percentages in Oregon state regulations.

Groundfish Seasons and Area Restrictions

Season Structure

Under the No Action Alternative, the Oregon recreational groundfish fishery would be open offshore year-round. In 2019, it was open year round except from May 1 to September 6 and in 2020 except for June 1 through August 31 (in state regulations) when fishing was only allowed shoreward of 40 fathoms, as defined by waypoints in regulation at 50 CFR §660.71. Closing the fishery deeper than 40 fathoms from June through August, the period of highest angler effort and yelloweye rockfish encounters, mitigated mortality of yelloweye rockfish. However, shallow depth restrictions increased encounters, and associated mortality impacts, with black rockfish and nearshore rockfish complex species. Given the stable or higher yelloweye rockfish HG, the season structure and bag limit presented in Figure 4-29 for 2021-2022 are designed to balance impacts to black and nearshore rockfish species while staying within their respective HGs, along with the yelloweye rockfish HG. Projected mortality of yelloweye rockfish in 2021 and 2020 are within the Federal HGs, therefore the shore-based fishery would also be open year-round

	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec
Bottomfish Season	Open All Depths											
Marine Bag Limit a/	Ten (10)											
Lingcod Bag Limit	Three (3)											
Flatfish Bag Limit b/	Twenty Five (25)											

a/ Marine bag limit is 10 fish per day and includes all species other than lingcod, salmon, steelhead, Pacific halibut, flatfish, surfperch, sturgeon, striped bass, pelagic tuna and mackerel species, and bait fish such as herring, anchovy, sardine, and smelt; of which no more than one may be cabezon.

b/ Flounders, soles, sanddabs, turbots, and halibuts except Pacific halibut

Figure 4-29. Oregon recreational groundfish season structure and bag limits under the No Action Alternative.

Groundfish Bag Limits and Size Limits

Under the No Action Alternative, bag and size limits are shown in Oregon recreational groundfish season structure and bag limits under the No Action Alternative.

Pacific Halibut Seasons

In 2019, the IPHC adopted a constant Total Allowable Catch for Area 2A which includes the areas off Washington, Oregon, and California, which will be in place through 2022 barring any conservation concerns which will reinforce the stability of halibut seasons on the west coast. The 2019 recreational halibut season was open for fifteen days in the north coast (Marine Areas 3 and 4) and nine days in the south coast (Marine Area 2). The halibut seasons in these areas were structured to have the same season dates as much as possible but were managed to area specific quotas. The Columbia River subarea is co-managed with ODFW to keep catch within the subarea limit and the season was also structured to align with the halibut dates in the north coast and south coast subareas and was open for eight days. In the north coast (Marine Areas 3 and 4), groundfish retention was restricted to the area inside 20 fathoms with exceptions that allowed lingcod, sablefish, and Pacific cod retention on days open to the halibut fishery in that area. In the south coast (Marine Area 2), groundfish retention was also restricted when the halibut fishery is underway, but exceptions allow the retention of lingcod, Pacific cod, and sablefish when halibut are on board. In the Columbia River area (Marine Area 1), groundfish is prohibited with a halibut on board except for Pacific cod, sablefish, flatfish (except halibut) and lingcod north of the Washington-Oregon border. Groundfish impacts from the recreational halibut fishery are included in the estimates for the recreational groundfish fishery.

Additional Considerations

Midwater rockfish longleader gear would be available outside of the 40 fathom regulatory line year round. Estimated mortality from longleader gear trips are included in the total mortality estimates below.

Inseason Management Response

In the event inseason action is needed to keep mortality within the values in Table 4-130, the state of Oregon would take action through state regulation (OAR 635-039-0090 (2)). Inseason updates would be provided to the Council at the September and November meetings to provide information on how the fishery is progressing and impacts are tracking compared to the state specific HGs.

Impact (Groundfish Mortality)

The annual projected mortality is presented in Table 4-133, given the season structure and bag limits detailed above, with the exception of canary rockfish. The projected impacts for canary rockfish remain somewhat uncertain. Some of the data that is used in the model is for time periods when anglers were encouraged to avoid canary rockfish, there was a 1-fish sub-bag limit, or were required to discard when encountered. Beginning in 2017, canary rockfish was part of the regular bag limit, there was no sub-bag limit. Inseason tracking through October 2019 has the estimated impacts to canary rockfish at 37.0 mt, which is approximately 10 mt under what was projected for 2019 (47.1 mt). The current projected year-end impacts are 38.4 mt. Even with 2017-2019 data, the model still does not have enough retention data to provide a certain estimate for canary rockfish. Similarly, for yelloweye rockfish, times and areas will be open that have not been open since 2004. Therefore, there is uncertainty in what impacts might be, which is the reason the State of Oregon has given for being more precautionary in state regulations on reopening months to all-depth. Black/blue/deacon rockfish complex and nearshore rockfish north complex impacts will be the most constraining in terms of setting the season structure under No Action. Given recent high bottomfish effort trends, and the stable or decreasing HGs for those complex, and recent years catch rates

(fish/per angler trip), the modeling shows that those species HG would be met before any other species. Yelloweye rockfish HG used to be the most constraining for the OR rec fishery and bag limits, season structures, etc. were set up around limiting bycatch mortality to that species. Now black rockfish and the other nearshore rockfish complex species are the HGs that are reached first in all modeling. Therefore, the season structure is set around staying within the HG for those specie

At the March 2016 meeting, the Council approved an alternative that would allow midwater long-leader recreational groundfish fishing seaward of a line approximating the 40 fathom depth curve exclusively off the coast of Oregon (42°00' N. lat.to 46°18' N. lat.) from April-September to target abundant and healthy midwater species (yellowtail and widow rockfish) while avoiding or minimizing interactions with overfished rockfish species. Table 4-133 includes estimates of projected mortality from all bottomfish trips, including the longleader trips.

Table 4-133. No Action – Oregon Recreational. Projected Mortality (mt) of species with Oregon recreational specific allocations under the No-Action Alternative.

Stock	Projected Mortality (mt)
Canary rockfish	61.7
YELLOWEYE ROCKFISH	5.9
Black/Blue/Deacon Rockfish OR	354.0
Cabezon/Greenlings a/	32.9
Nearshore Rockfish North of 40° 10' N. lat.	20.3
Yellowtail rockfish	60.5
Widow rockfish	13.2

a/ Includes kelp and other greenlings

Additional Management Measure

The Council recommended one additional management measure for the Oregon recreational fisheries: allowing longleader gear fishing and all-depth halibut on the same trip.

During the 2019 Pacific halibut Catch Sharing Plan process, Oregon anglers put in a request to be allowed to fish in the longleader gear fishery and all-depth Pacific halibut on the same trip. Currently, the combination of those two trip types is prohibited in both the sport bottomfish and sport Pacific halibut regulations.

The longleader gear (Holloway Gear) was approved for use in the Oregon recreational fishery by the Council in 2016 and implemented in federal regulations in 2018[21] (660.351, 660.360(c)(2)(1)(B), and 660.360(c)(2)(iii)(B)). The new regulation allowed the use of the gear (description below) outside of the 40-fathom regulatory line April through September. The gear is legal gear in areas and times open to sport bottomfish in Oregon. It also prohibited to combine a longleader gear trip with a "regular" bottomfish trip and Pacific halibut trips. Retention was also limited to 10 species of midwater rockfish in state regulation;

[21] https://www.govinfo.gov/content/pkg/FR-2018-03-29/pdf/2018-06316.pdf

and retention of lingcod was specifically prohibited. All of these regulations were put into place to limit interactions with yelloweye rockfish.

Long Leader Gear Description

Longleader, or Holloway Gear, is designed to fish off the bottom, in the water column to target prolific midwater rockfish stocks, while avoiding yelloweye rockfish, a rebuilding stock. The gear requires no more than three hooks, at least 30 feet between the sinker on the bottom and the lowest hook, and a non-compressible float above the hooks (NMFS 2017). The term "longleader" denotes the unusual lengths of line (< 30 feet) between the lowest hook and the weight (Figure 4-30) deployed on rod and reel sportfishing gear.

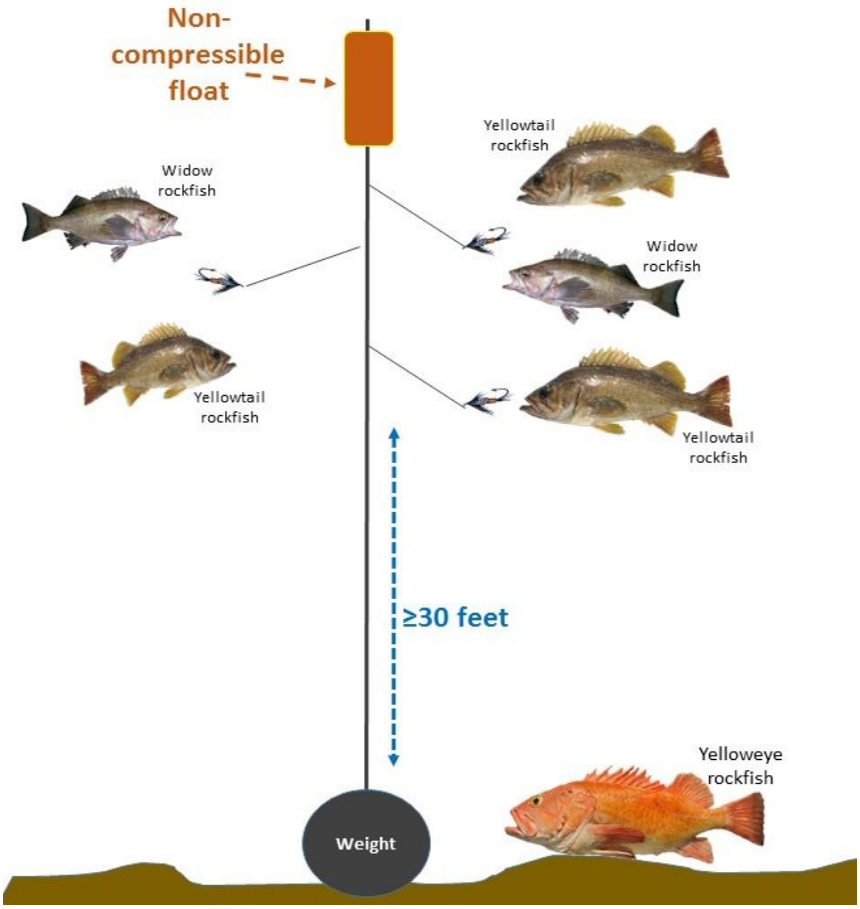


Figure 4-30. Schematic (not to scale) of the longleader sportfishing gear. (courtesy of ODFW)

Effort

Allowing longleader gear fishing and all-depth Pacific halibut fishing on the same trip is not anticipated to increase recreational effort off Oregon because it is unlikely to draw any new angler trips. Instead, the most likely scenario is that some current anglers targeting all-depth Pacific halibut will also fish with longleader gear. Based on angler input at a series of public meetings hosted by ODFW in the fall of 2019 and public comment to the September 2019 Council meeting (Agenda Item G.1.b., Public Comments), this would primarily happen if Pacific halibut fishing was very good, they had filled their halibut bags quickly, and wanted to try something else while offshore, or Pacific halibut fishing was really slow and anglers switch to longleader gear fishing to try to get something out of their trip offshore (Agenda Item G.1.a, ODFW

Report 1, September 2019 and Agenda Item F.1.a., ODFW Report 1, November 2019). During development of the longleader action, the analysis estimated up to 16,465 potential longleader and all-depth Pacific halibut trips would occur annually (NMFS 2017; Table 4-132). These would not be new trips, but trips that would have already happened for one or the other now doing both on the same trip. The difference between that number of potential longleader and all-depth Pacific halibut trips (16,465) trips analyzed previously (NMFS 2017; Table 4-134) and the 10-year average number of all-depth Pacific halibut trips (14,487) is a little less than 2,000 angler trips. It is also within the range of all-depth Pacific halibut trips that have been seen over the last 10 years (12,451 to 16,963) Therefore, this action is not anticipated to cause much, if any, increase in the total number of angler trips for bottomfish and all-depth Pacific halibut.

Table 4-134. Annual number of angler trips for traditional bottomfish, longleader, and all-depth Pacific halibut targeted trips in Oregon.

Year	Bottomfish Trips	Longleader Trips	All-Depth Halibut Trips	Total
2010	74,858	N/A	12,451	87,309
2011	69,877		13,205	83,082
2012	70,689		13,428	84,117
2013	88,505		16,468	104,973
2014	77,368		12,517	89,885
2015	108,548		14,844	123,392
2016	96,297		16,963	113,260
2017	103,048		16,445	119,493
2018	109,768	5,286	15,553	130,607
2019*	90,701	2,141	12,992	105,834
10-yr AVG.	88,966	3,714	14,487	104,195

* 2019 data is only through October, minimal bottomfish effort occurs after that and all halibut fisheries are closed.

Impact to Groundfish and Salmon Species

Since its inception in 2018, the longleader gear fishery has caught primarily midwater rockfish species, as intended with very little bycatch. In 2018, yellowtail, widow, and canary rockfish accounted for 99 percent of the fish landed, and 97 percent in 2019 (Table 4-168). Yelloweye rockfish accounted for less than one percent of total fish encountered each year (0.08 percent in 2018 and 0.4 percent in 2019). If longleader gear fishing and all-depth halibut were allowed on the same trip, there is the potential for an increase in the catch of the three main species, much lower potential for the other species, but should be within the Oregon recreational canary rockfish allocation and well within the non-trawl allocation of yellowtail and widow rockfish for both allocation options being considered for 2021-22 (Table 4-63). Total non-trawl projected attainments are projected to also be within both proposed petrale sole allocation options (Table 4-63).

Table 4-135. Total number of fish landed and released by species on longleader trips in 2018 and 2019 off of Oregon.

	2018		2019	
Species	**Landed**	**Released**	**Landed**	**Released**
Yellowtail rockfish	23,699	170	12,091	305
Widow rockfish	6,871	35	3,436	-
Canary rockfish	6,269	34	4,248	9

	2018		2019	
Species	**Landed**	**Released**	**Landed**	**Released**
Sablefish	66	15	-	5
Albacore tuna	63	-	146	-
Silvergray rockfish	62	-	19	-
Pacific mackerel	57	64	26	-
Redstripe rockfish	35	243	33	4
Rockfish Unid	29	11	-	58
Greenstriped rockfish	25	63	23	40
Chillipepper	10	-	32	26
Deacon rockfish	9	75	284	19
Jack mackerel	8	13	50	
Black rockfish	4	24	21	11
Blue shark	2	3	6	
Blue rockfish	-	56	-	-
Yelloweye rockfish	-	32	8	85
Lingcod	-	42	14	56
Quillback rockfish	-	-	3	
Bocaccio	-	4	2	5
Vermilion rockfish	-	4	-	-
Copper rockfish	-	2	-	-
Chinook salmon	-	2	-	-
Coho salmon	-	11	-	14

Yelloweye Rockfish

Briefly, the yelloweye rockfish impacts would be withing the amount allowed for the fishery. Over the two years that the longleader gear fishery has been allowed, the average encounter rate of yelloweye rockfish has been less than 0.02 fish per angler trip (Figure 4-31); this means that on average, there would be one yelloweye rockfish encountered every 59 trips. In comparison, the encounter rate of yelloweye rockfish on all-depth Pacific halibut trips averaged 0.04 fish per angler trip in 2018 and 2019 which equates to about one yelloweye rockfish encountered for every 25 all-depth halibut trips. The analysis for the longleader gear action (NMFS 2017) estimated that the potential number of combined longleader gear and all-depth Pacific halibut trips could be up to 16,465. The difference between that estimate and the 10-year average number of Pacific halibut trips is 1,978 trips. Applying the higher of the two above yelloweye rockfish encounter rates (to be precautionary) to the additional potential number of angler trips equals 80 potential yelloweye rockfish encounters. Assuming all are released dead, to be precautionary, and applying a 3.0 kg average weight results in approximately 0.2 mt of potential additional impacts. Those encounters would also be attributed to already occurring Pacific halibut trips or longleader trips. Therefore, there will likely be minimal additional impact to yelloweye rockfish from allowing longleader gear and all-depth Pacific halibut fishing to occur on the same trip. Additionally, those impacts when combined with impacts from the traditional bottomfish fishery are projected to be well within the Oregon recreational yelloweye rockfish allocation (9.0 mt).

Chinook and Coho Salmon

Coho salmon encounter rate was 0.003 fish per trip, or one fish for every 297 angler trips on longleader gear trips (Figure 4-31). On all-depth Pacific halibut trips, the encounter rate has been 0.002 fish per trip, or one for every 583 all-depth Pacific halibut trips. Of all the salmon species, Chinook salmon was encountered the least frequently, with only two fish encountered in two separate years for a total of four fish, for both the longleader gear and all-depth Pacific halibut fisheries. That is an encounter rate of 0.0003 fish per trip, or one Chinook salmon encountered for every 3,714 longleader trips on longleader trips (Figure 5). All-depth Pacific halibut trips had an encounter rate of 0.0001 fish per trip, or one Chinook salmon encountered for every 14,273 trips. Given those encounter rates, and the potential number of trips (16,465; Table 4-134) higher than the 10-year average halibut trips (14,487), potential additional Chinook salmon encounters would be approximately 0.6 fish per year and coho salmon encounters would be approximately 6 fish per year. As with yelloweye rockfish, those fish will be attributed to already occurring all-depth Pacific halibut or longleader gear trips, depending on how the angler explains their trip target to the ORBS sampler. When added to the encounters from the traditional bottomfish fishery, the total annual encounters will not be much different than the recent years' total estimates, and should not increase the potential for the total groundfish salmon thresholds to be reached or exceeded.

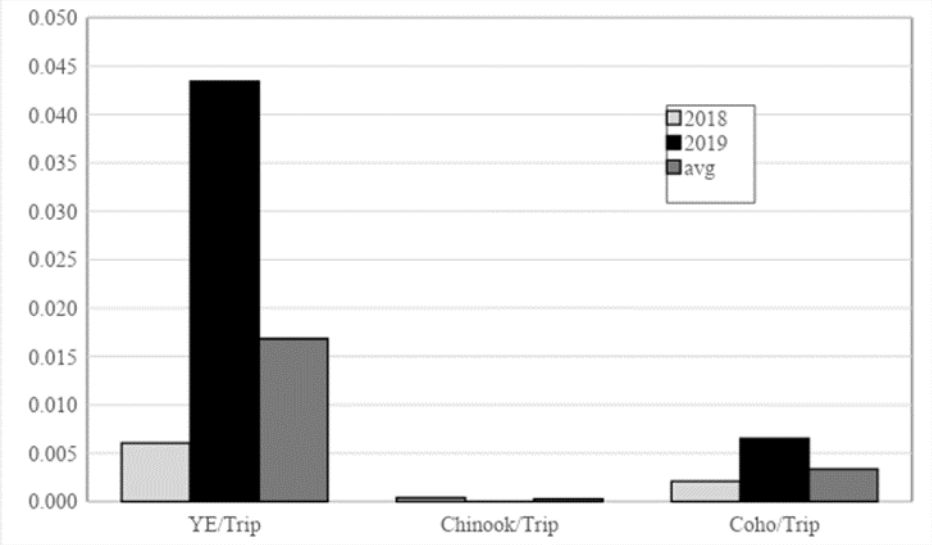


Figure 4-31. Catch rate of yelloweye rockfish, Chinook salmon and coho salmon on Oregon longleader gear trips in 2018 and 2019.

4.2.2.10 California Recreational Management Measures

Recreational Management Measures

As a result of the most recent cowcod assessment (2019), the stock has been rebuilt and resulted in substantially higher harvest specifications than in previous biennial cycles; however due to modeling uncertainties in the assessment, accountability measures (ACTs) are proposed to prevent any risk of exceeding the harvest limit in addition to continuing to prohibit retention in non-trawl fishery sectors. As a result, the harvest specification for 2021-2022 is 97.9 and 96.1 mt respectively with a proposed fishery ACT ranging from 40-60 mt (which is a precautionary reduction from the Fishery HG); followed by a 2021 non-trawl allocation range of 25.6-38.4 mt, and a 2021 CA recreational ACT range of 12.8-19.2 mt (see Figure 4-32). The ACT range of 12.8-19.2 is intended to be an accountability measure for the CA recreational sector that will be managed using inseason catch tracking. If during the fishing season, the CA

recreational cowcod ACT is projected to be reached, modifying depth based management measures (i.e. restricting to shallower depths) would be used to reduce impacts.

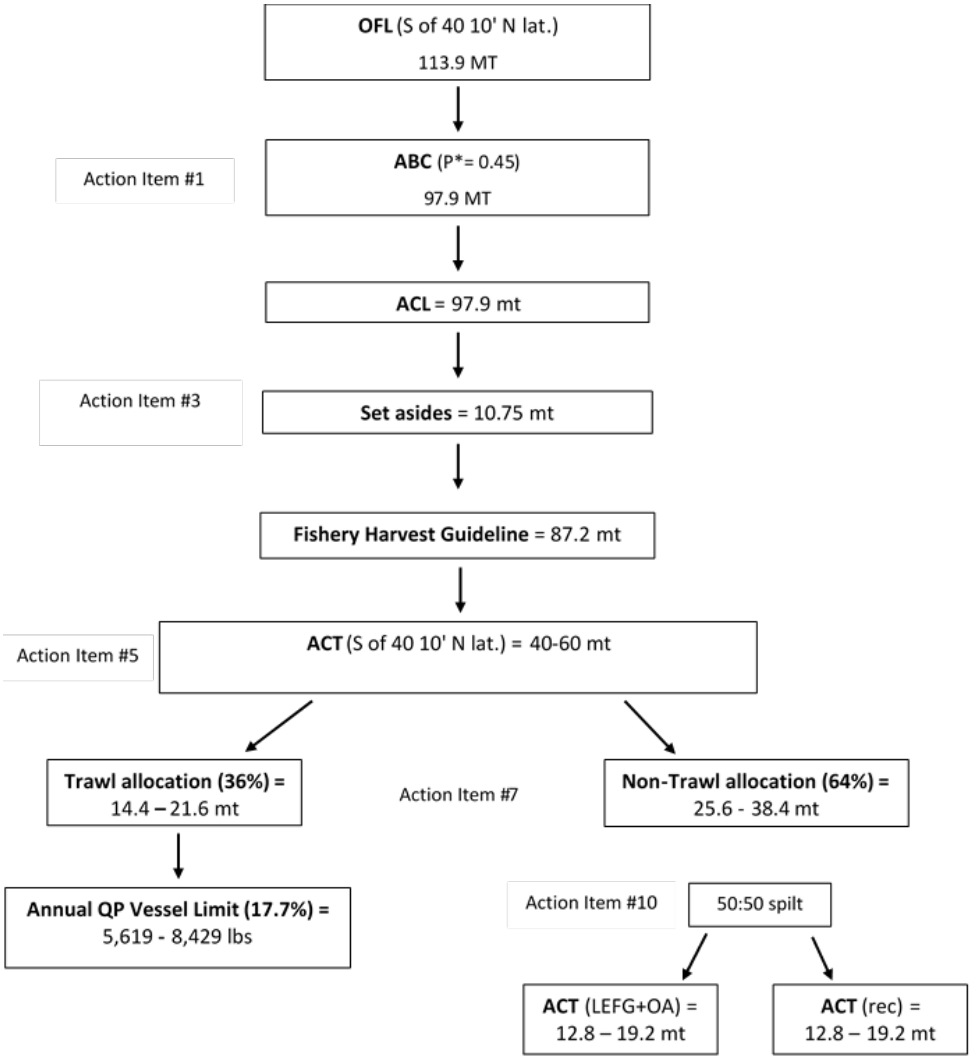


Figure 4-32. No Action: 2021 specifications at (P* 0.45 and ACL = ABC). Off the top set aside of 10.3 mt 2021.

The yelloweye rockfish HG for the CA recreational fishery is 11.4 mt for 2021 and 11.7 mt for 2022. Precautionary measures are suggested for yelloweye rockfish to ensure fishery sectors do not exceed the ACL. The Council recommended more conservative ACT limits be used for the recreational sectors; the CA recreational sector will utilize season and depth limit management measures to keep catch within 8.9 and 9.2 mt ACTs for 2021-2022 respectively.

As a result of the most recent cabezon stock assessment (2019), the sub-stocks in Northern and Southern California have surpassed the management targets for estimated depletion. The resulting ACL of the combined stocks (as they are managed as one) is 208.7 mt and 195 mt for 2021-2022, respectively.

Based on the two canary rockfish allocation proposals that pertain to the California recreational fisheries (see Chapter 4.2.2.3), Option 1 HGs are 116.7 mt in 2021 and 113.8 mt in 2022. Option 2 was designed to provide the non-trawl sectors the same fixed amounts they were provided in 2017-18 and would be 135 mt in both 2021-22 (Table 4-136).

Three allocation Options for the trawl/non-trawl lingcod south of 40°10' N. lat. are described in Chapter 4.2.2.3 above. There is no specific CA recreational HG designated for lingcod south of 40° 10' N. lat., therefore the entire non-trawl allocation amount is shared between the recreational and commercial non-trawl fisheries Table 4-63. The intent of this proposal is to provide more stability to the non-trawl sector given the recreational fishery was constrained to a 1 fish bag limit for a portion of the 2019 season. No additional changes to the current bag limit are proposed under these Options as shifting more allocation to the non-trawl sector is only intended to maintain the status quo 2 fish lingcod bag limit.

A stock assessment for black-and-yellow/gopher rockfish (2019) determined the stock was at healthy depletion levels. The black-and-yellow/gopher rockfish stock is managed as part of the minor nearshore rockfish complex both north and south of 40°10' N. lat. No significant changes in the harvest specification contribution to the Minor Nearshore Rockfish Complexes are expected as a result of the stock assessment outcome.

Table 4-136. No Action – California Recreational: Allocations (mt) to the non-trawl sector and shares (mt) for the California recreational fisheries for 2021 and 2022. O = option

Stock	Non-Trawl Allocation	California Recreational HG
Bocaccio	1036.4/1021.8	716.2/706.1
Canary rockfish a/	352.2/343.9	[O1] 116.7/113.8, [O2]135
Cowcod	55.8/54.5b/	
Darkblotched	42.4/39.9	
Nearshore rockfish North of 40°10´ N lat.	78.6/73.9	
POP	191.5/184.3	
Petrale sole	186.4/163.6	
Yelloweye Rockfish	37.9/38.8	11.4/11.7 (ACT = 8.9/9.2)

a/Brackets represent Option 1 [O1], and Option 2 [O2]
b/ For ACT limits see Table 2-35

Groundfish Seasons and Area Restrictions

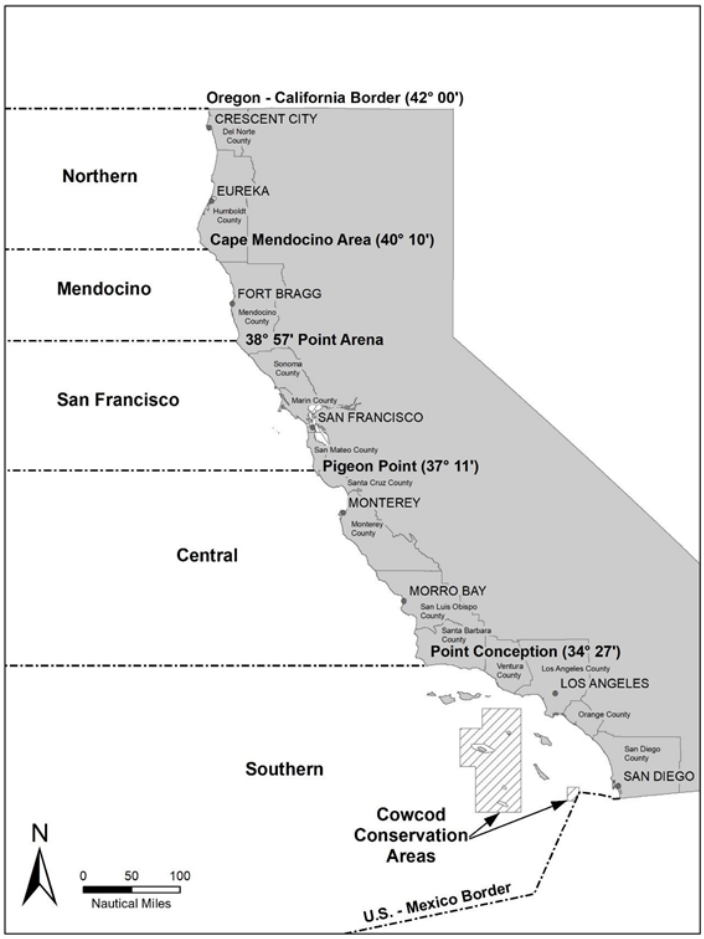
Season Structure
The 2021-2020 season structure under No Action is shown below in Figure 4-33

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	Closed				May 1 – Oct 31 <30fm						All Depth	
Mendocino	Closed				May 1 – Oct 31 <20fm						All Depth	
San Francisco	Closed			April 1 – Dec 31 <40fm								
Central	Closed			April 1 – Dec 31 <50fm								
Southern	Closed		Mar 1 – Dec 31 <75 fm									

Figure 4-33. No Action California recreational groundfish season structure and RCA boundaries

Area Restrictions

California is divided into five recreational management areas, Northern, Mendocino, San Francisco, Central, and Southern, as shown in Figure. These management areas can, as described in the above Figure 33, have distinct seasons and depth restrictions.



Cowcod Conservation Areas

The Cowcod Conservation Areas (CCAs) were established in 2001 to protect cowcod, which had been declared overfished(Figure 4-34b). These area closures were intended to close fishing opportunities in the main portion of the species' depth range to reduce encounters and mortality, allowing the stock to rebuild more quickly. The Western CCA encompasses 4,200 miles and the Eastern CCA encompasses 100 miles. Limited take by recreational and commercial fixed gears of groundfish species is permitted within the CCAs.

Within the Western CCA, the 2019 recreational fishery was permitted increased opportunity by extending the shoreward boundary from 20 fm to 40 fm during the open season of March 1-December 31 (Figure 4-34a) for species in the Nearshore Rockfish Complex, species in the Shelf Rockfish Complex, cabezon, greenlings, lingcod, ocean whitefish, and California sheephead. Recreational fishing for California scorpionfish in the CCAs is open year-round shoreward of 40 fm. Recreational fishing for Other Flatfish, petrale sole, and starry flounder is permitted year-round in all depths. Retention of yelloweye rockfish, bronzespotted rockfish, and cowcod is prohibited within the CCA.

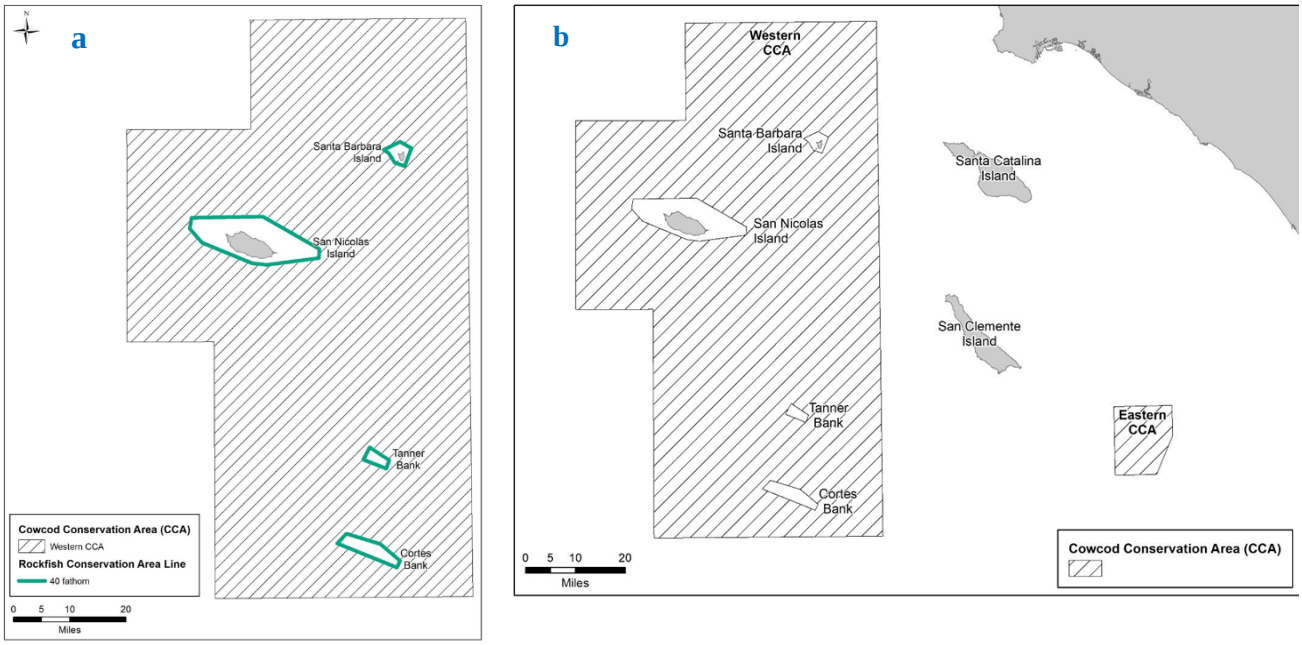


Figure 4-34. Overview of a) 40-fathom depth contour inside the Western Cowcod Conservation Area and b) Western and Eastern Cowcod Conservations Areas located in the Southern Management Area.

Yelloweye Rockfish Conservation Areas

In 2008, four YRCAs were adopted for use in management as part of the 2009-2010 biennial specifications (2009-2010 FEIS). The four YRCAs are in the general areas of Point St. George, South Reef, Reading Rock, and Point Delgada and the waypoints are specified in federal regulation at §660.70, subpart C. Federal regulations allow inseason implementation of YRCAs as needed. However, this management measure has never been implemented in California.

Groundfish Bag Limits Gear Limits and Size Limits

Bag limits, size limits and gear restrictions under No Action are the same as in 2019. All limits reflect inseason management action which became effective June 1, 2019.

A statewide 10 fish rockfish, cabezon and greenling (RCG) complex bag limit would remain in place. Retention of bronzespotted rockfish, cowcod, and yelloweye rockfish would continue to be prohibited. Species subject to sub-bag limits within the overall 10-fish RCG bag limit are as follows and reflect inseason management action effective June 1, 2019 to increase the sub-bag limit for black rockfish and canary rockfish (84 FR 25708):

- Black rockfish - 4 fish;
- Cabezon - 3 fish;
- Canary Rockfish - 3 fish.

The following state-wide bag limits also apply in state regulations only and are outside of the 10-fish RCG bag limit:

- Leopard shark - 3 fish;
- Soupfin shark – 1 fish.

Unless otherwise specified, there is a general bag limit of 20 finfish, of which no more than 10 fish can be of any one species. Pacific sanddab, petrale sole, and starry flounder are exempt from the general finfish bag limit; retention of these species is unlimited.

The following minimum size limits apply to California recreational fisheries:

- Cabezon- 15 inches, total length;
- Kelp greenling and all greenlings of the genus *Hexagrammos*- 15 inches, total length;
- Leopard shark- 36 inches, total length (state regulations only)

Gear restrictions apply to all species within the RCG Complex. No more than one line and two hooks maybe used to take or possess species within the complex

Lingcod Seasons, Bag Limits, Hook Limits, and Size Limits

The lingcod season structure is aligned with the RCG complex in each management area. The lingcod bag limit in the Northern Management Area was 2 fish for the entire 2019 season. In all other management areas, the bag limit was 1 fish at the start of the season but was increased to 2 fish as a result of Council recommended inseason action effective June 1, 2019 (84 FR 25708). The minimum size limit was 22 inches total length. The same RCG Complex gear restrictions apply for lingcod (i.e., no more than one line and two hooks).

California Scorpionfish Seasons, Bag Limits, and Size Limits

The season length for California scorpionfish aligns with that of the RCG complex in all management areas except for the Southern Management Area, where it is open year-round. In all areas, the bag limit is 5 fish with a minimum size of 10 inches total length. The same RCG Complex gear restrictions apply for California scorpionfish (i.e., no more than one line and two hooks).

Pacific Halibut Seasons

The recreational Pacific halibut fishery in waters off California occurs primarily from the Oregon/California border to Point Arena (Mendocino County). This fishery is structured to provide recreational fishing opportunities between May 1 and October 31. Annual fishery dates are established preseason by NMFS based on the annual quota and projected catch. The daily bag and possession limit is one fish, with no minimum size limit. No depth restrictions apply to the recreational Pacific halibut fishery off California. Anglers fishing for Pacific halibut may retain groundfish on the same trip but must abide by all applicable groundfish regulations.

Inseason Management Response

For actions outside of a Council meeting, the Regional Administrator, NMFS West Coast Region, after consultation with the Chairman of the Council and the Fishery Director of the CDFW, or their designees, is authorized to modify the following designated routine management measures for canary rockfish, yelloweye rockfish, and black rockfish in California: For commercial fisheries (specific to black rockfish), 1) trip landing and frequency limits; and 2) depth based management measures. For recreational fisheries, including all species aforementioned 1) bag limits; 2) time/area closures; and 3) depth-based management. Any modifications may be made only after NMFS has determined that a federal harvest limit for canary rockfish, yelloweye rockfish, or black rockfish in California, has been attained or is projected to be attained prior to the first day of the next Council meeting.

Impact (Groundfish Mortality)

The California recreational groundfish season structure and projected mortality under No Action were based on CDFW's RecFISH model. Model projections were calculated for the five recreational groundfish management areas using updated RecFIN estimates from 2017 through October 2019. Further description of the RecFISH model is provided in the 2019 SAFE document. Projected mortality under the management measures suggested for No Action in 2021-2022 is provided in Table 4-137. and shows that catch would be similar to Baseline mortality for all species.

Table 4-137. No Action Projected mortality in the California recreational fishery in 2021-2022.

Stock	Projected Recreational Mortality 2021/22	California Recreational HG 2021/22	Non-Trawl Allocation 2021/22 a/
Bocaccio	152.9	716.2/706.1	1036.4/1021.8
Canary Rockfish	69.8	[O1] 116.9/114.2 [O2]135	352.2/343.9
Cowcod	2.7	-	55.8/54.5
Yelloweye Rockfish	6.0	11.4/11.7	37.9/38.8
Black Rockfish	112.6	-	346.7/339.7
Cabezon	23.7	-	208.7/193.7
California Scorpionfish	157.0	-	287.1/271.1
Greenlings b/	5.1	-	b/
Lingcod N. of 40°10' N. lat. c/	48.9	-	2799.8/2573.8
Lingcod S. of 40°10' N. lat.	357.9		[O1] 599/637.5 [O2] 620.1/660.6 [O3] 816.8/869.2
Widow Rockfish	20.6	-	1302.9/1218.6
Nearshore Rockfish N. of 40°10' N. lat. d/	20.0	-	78.6/73.9
Nearshore Rockfish S. of 40°10' N. lat.	535.4	-	1011.6/1005.6
Petrale sole	6.1	-	186.4/163.6
Starry flounder	3.5	-	171.8

a/ Includes non-nearshore, nearshore, and recreational.

b/ Greenling is managed within the Other Fish Complex

c/ Projected impacts include only the area between 42° N latitude and 40°10' N latitude, while the non-trawl allocation is applicable for the entire area North of 40°10' N latitude.

d/not an official non-trawl allocation in regulation, but rather the sum of the WA, OR, CA state HGs that are managed to by the states as to not exceed the ACL when also factoring in minor IOA, tribal, EFP, research, and trawl impacts

Non-trawl RCA Area Adjustments

There are two new management measures related to RCA depth boundary changes See New Management Measure Questionnaires for RCA depth boundary changes as proposed by CDFW (see Section 4.2.5). They are summarized below:

Updates to the Non-trawl Rockfish Conservation Area Coordinates

The 40 fathom (fm) depth contour for the non-trawl RCA is proposed to be modified offshore of San Mateo County in central California. The modification of the coordinates is intended to better align with corresponding isobaths. This revision would allow better access to target species by more accurately defining the boundary of closed area and would increase the available fishing area by 6.3 miles^2.

Minor Adjustments to the Recreational Rockfish Conservation Areas off California, South of 40°10' N. lat.

This proposal would adjust the seaward RCA boundary to tree California recreational fishery management areas (MA) as follows

1) Mendocino MA (40° 10' N lat. to Point Arena (38° 57.50' N lat.): The proposed management measure would extend the RCA boundary from 20 fm to 30 fm; fishing would be prohibited seaward of the 30 fm depth contour from May 1 through October 31. From November 1 – December 31, this management area would continue to have no RCA and allow for all depth access. The fishery would remain closed to boat-based anglers from January 1 through April 30.

This management measure will provide access to deeper distributed nearshore stocks and some shelf species. Projected impacts to yelloweye rockfish increase with deeper access but are still under the precautionary California recreational ACT levels for 2021-2022. It should be noted that the CDFW actively tracks recreational mortality of yelloweye rockfish inseason to ensure limits are not exceeded and has additional inseason authority to take action outside of PFMC meetings to make any necessary changes to season, depth or bag limits, and implementation YRCA if needed or as appropriate. Mortality of all other species is expected to be within allocation or harvest limits.

2) Southern MA (Point Conception (34° 27' N lat.) to the California US/Mexico border): The proposed management measure would extend the RCA boundary from 75 fm to 100 fm; fishing would be prohibited seaward of the 100 fm depth contour from March 1 through December 31. The fishery would remain closed to boat-based anglers from January 1 through February 28.

This management measure will increase mortality of groundfish species found in the Southern Management Region. Catch of shelf rockfish is likely to increase with this management measure. Attainment of the shelf rockfish complex ACL south of 40° 10' N lat. has been low. Vermilion rockfish mortality has exceeded its contribution to the shelf rockfish complex ACL south of 40° 10' N lat., sub-bag limits are being considered to reduce catch which will mitigate increased mortality which may result from this proposed management measure. As a result, there is little risk of overfishing to shelf rockfish, including vermilion rockfish. Mortality of cowcod is also likely to increase with this management measure, however, harvest specifications are expected to increase, and mortality is anticipated to remain within allowable limits. Further, retention of cowcod will remain prohibited, and no modifications to the CCAs are proposed. CDFW actively monitors recreational cowcod mortality inseason, and can make changes to season, depth, or bag limits as appropriate, which will help mitigate against any increases in mortality resulting from this management measure and can make changes to season, depth, or bag limits as appropriate. Mortality of all other species is expected to be within allocation or harvest limits

3) San Francisco MA (Point Arena [38° 57.50' N lat.] to Point Pigeon [37° 11' N lat.]). The proposed management measure would extend the RCA boundary from 40 fm to 50 fm; fishing would be prohibited seaward of the 50 fm depth contour from April 1 through December 31. The fishery would remain closed to boat-based anglers from January 1 through March 31.

This measure would allow increased opportunity to access shelf groundfish stocks and some increase to mortality of shelf rockfish would be expected. This management measure is expected to increase catch of shelf rockfish. Attainment of the shelf rockfish complex ACL south of 40° 10' N lat. is low. Vermilion

rockfish mortality has exceeded its contribution to the shelf rockfish complex ACL south of 40° 10' N lat., sub-bag limits are being considered to reduce catch which will mitigate increased mortality which may result from this proposed management measure. As a result, there is little risk of overfishing to shelf rockfish, including vermilion rockfish. Mortality of yelloweye rockfish could also increase with this management measure but is expected to remain under the recreational HG/ACT. Mortality of all other species is expected to be within allocation or harvest limits. Some mortality of cowcod may be expected from this management measure, however impacts are likely to be minimal as the San Francisco Management Area is located more northly than the species' core distribution. Additionally, cowcod harvest specifications are expected to increase, and mortality is anticipated to remain within allowable limits. As a result, there is little risk to exceeding harvest specifications for either cowcod, or yelloweye rockfish as a result of this management measure. Mortality of all other species is expected to be within allocation or harvest limits

Corrections to the 100 Fathom Rockfish Conservation Area Boundary Line South of 34°27' N. lat.

The proposal is to modify the 100 fm RCA depth curve south of 34°27' N. lat. to better described the isobath curve in regulation. The proposal, (described above) by CDFW to extend the current shoreward 75 fm line out to 100 fm Southern Management Area (south of 34° 27' N. latitude) revealed crossover with the 75 fm depth curve. As such, if the existing 100 fm boundary line listed in regulation were used, this would create new closed areas in locations that are currently open to fishing activity utilizing the 75 fm line. In response, CDFW proposes additional waypoints and corrections to existing waypoints as described, in detail, in Agenda Item H.4.a Supplemental CDFW Report 1, March 2020. Additionally, CDFW proposes to waypoints to approximate the 100 fm curve around the northern Channel Islands as they do not currently exist in regulation.

4.2.3 Alternative 1

4.2.3.1 Deductions from the ACL

Under Alternative 1, the deductions from groundfish ACLs for, scientific research, non-groundfish target fisheries (i.e. IOA), recreational, and EFPs are the same as described under No Action (Section 4.2.2.1) and detailed in Table 4-47 and Table 4-48, with one exception. As detailed in Agenda Item H.8.a, Supplemental Tribal Report 3, November 2019, deductions from groundfish ACLs for sablefish N. of 36° N. lat. increase for the tribal fisheries over No Action from 604 mt to 647 mt in 2021 and from 575 to 616 mt in 2021 and 2022 respectively (Table 4-137; assuming Method 1 ACL apportionment) as the Tribal share is a fixed percentage of the ACL. Therefore, as the ACL increases so does the Tribal share for sablefish north of 36° N. lat.

While the off-the-top deductions do not vary under Alternative 1, the resulting HGs from the alternatives harvest specifications do vary for Oregon black rockfish, petrale sole, cowcod south of 40° 10' N. lat. and sablefish south of 36° N. lat. (Table 4-138). It is important to note, OR black rockfish is managed as part of the blue/deacon/black rockfish complex, as such the ACL deductions are at the complex level and not the individual species level. For reference, Oregon black rockfish HCR is specified at an ACL= ABC = 512 mt ACL for both 2021-2022. The HCR for the blue/deacon rockfish component would remain the same as No Action. Overall, this alternative would increase the OR black rockfish ACLs in 2021-2022 by 33 mt and 38 mt, respectively than under No Action

Table 4-138. Alternative 1. Estimates of tribal, EFP, research, and incidental OA groundfish mortality (in mt) used to calculate the fishery HG for species with alternative ACLs in 2021-22.

Stock/Complex	Area	Year	ACL	Tribal	EFP	Research	OA	Sum	Fishery HG
Blue/Deacon/Black rockfish	Oregon	2021	603	-	0.5	0.1	1.7	2.3	600.7
		2022	600	-	0.5	0.1	1.7	2.3	597.7
Cowcod	S of 40°10' N. lat.	2021	87	-	0.65	10.0	0.2	10.85	76.2
		2022	85	-	0.65	10.0	0.2	10.85	74.2
Petrale sole	Coastwide	2021	3,843	350.0	0.1	24.1	13.3	387.5	3,455
		2022	3,455	350.0	0.1	24.1	13.3	387.5	3,067.5
Sablefish	S of 36° N. lat.	2021	2,321	-	-	2.4	25.0	27.4	2,294
		2022	2,211	-	-	2.4	25.0	27.4	2,184
Shortbelly Rockfish	Coastwide	2021	3,000	-	0.1	8.2	21.6	29.9	2,940.3
		2022	3,000	-	0.1	8.2	21.6	29.9	2,940.3

Table 4-139. Alternative 1. Estimates of tribal, research, recreational (Rec.), and EFP mortality (in mt), used to calculate the fishery sablefish commercial harvest guideline north of 36° N. lat. for 2021 and 2022 under Method 1 apportionment.

Year	ACL (mt)	Tribal Share (mt)	Research (mt)	Rec. (mt)	EFP (mt)	Commercial HG (mt)
2021	6,041	647.0	30.7	6.0	1.1	5,785.2
2022	6,164	616.0	30.7	6.0	1.1	5,509.8

4.2.3.2 Allocating the Fishery HG

Under Alternative 1, the allocation percentages are the same as described under No Action. As shown below in Table 4-140 and Table 4-141, the increased ACLs for sablefish north and south of 36° N. lat. result in larger sector allocations; whereas, the reduced ACLs for cowcod and petrale sole result in smaller sector allocations. Note that these allocations for petrale sole are based on the status quo allocation options (Table 4-63), but all allocation options shown in Table 4-63 could be applied. Additionally, the cowcod ACT options described in Table 4-52 could apply under Alternative 1 specification. For reference, even though harvest specifications for OR black rockfish change under Alternative 1, this species does not have a trawl/non-trawl allocation.

Table 4-140. Alternative 1. 2021 sector allocations under Alternative 1 for cowcod, petrale sole and sablefish south of 36° N. lat.

Year	STOCK	AREA	Allocation Type	Fishery HG or ACT	Trawl		Non-Trawl	
					%	mt	%	mt
2021	Cowcod	S of 40°10' N. lat.	Biennial	76.2	36%	27.4	64%	48.8
2022				74.2	36%	26.7	64%	47.5
2021	Petrale sole	Coastwide	Amendment 21	3,455	95%	3,282.2	5%	153.4
2022				3,067	95%	2,914	5%	163.6
2021	Sablefish	S of 36° N. lat.	Amendment 21	2,284.6	42%	959.5	58%	1325.1
2022				2,175.6	42%	913.8	58%	1261.9

Table 4-141. Alternative 1 allocations for sablefish north of 36° N. lat. under both apportionment Methods.

Apportionment Method	Year	Commercial HG	Limited Entry HG		Limited Entry Trawl		Limited Entry FG		Open Access HG	
			%	mt	%	mt	%	Mt	%	mt
Method 1 (Long Term Avg.)	2021	5,785	90.6	5,241	58	3,040	42	2,201	9.4	544
	2022	5,510		4,992		2,895		2,097		518
Method 2 (5 Year Avg.)	2021	6,165		5,586		3,240		2,346		580
	2022	5,872		5,320		3,085		2,234		552

4.2.3.3 Rebuilding Species Allocation.

The rebuilding species, i.e. yelloweye rockfish, allocations are the same as described under No Action, as show in Table 4-63.

Shortbelly rockfish

Under Alternative 1 specifications, shortbelly rockfish would be managed with a P*0.40 and a constant 3,000 mt ACL set below the ABC. This would be the same ACL as the Council adopted for 2020 when they raised the ACL from 500 mt to 3,000 mt in part to reduce fishery constraints. The projected total groundfish impacts would be the same as discussed under No Action (i.e., 40 percent of bootstrap simulations exceeded 500 mt with some as high as 1,000 mt). A main benefit to Alternative 1 is that it would provide extra cushion for the fisheries than the No Action 500 mt ACL. While the maximum total mortality projection is 1,000 mt, these projections are highly speculative since high shortbelly rockfish bycatch has only occurred in recent years (2017-2019) and the reasons causing it are uncertain. Alternative 1 could help mitigate some of the uncertainty in the event that future bycatches could be higher. A downside to Alternative 1 is that it could reduce the incentive for trawlers to voluntarily avoid shortbelly rockfish. Alternative 1 is not expected to negatively impact the shortbelly rockfish forage base since all indications are that the stock is thriving and there also an abundance of other forage stocks currently (e.g., anchovy). See No Action for more detail.

4.2.3.4 Harvest Guidelines

Under Alternative 1, the HGs and state quotas are the same as described under No Action .

4.2.3.5 Shorebased IFQ

Management Measures

ACLs and allocations are the same as No Action, except for shortbelly rockfish, cowcod south of 40°10' N. lat, petrale sole and sablefish. Under Alternative 1, petrale sole is managed under a P* of 0.40 resulting in ~7 percent IFQ allocation decrease from No Action. For sablefish, the ABC is based on a P* of 0.45 resulting in increases for sablefish north and south of 36° N. lat. of approximately 15 percent. No additional management measures are proposed, but the same allocation and trip limit proposals described under No Action remain applicable to the Alternative 1 harvest specifications.

IFQ Groundfish Impacts

Table 4-142 shows the 2021-2022 allocations and projected catch under Alternative 1 (Method 1 applied to sablefish). Catch projections remain the same for all species except for petrale sole and sablefish.. The change in ACLs result in allocation changes. With increases in sablefish allocations, sablefish north sees an increase in catch of approximately 7 percent in both years while sablefish south projects a minor increase of ~2 percent. Petrale sole catch under Alternative 1 decrease by an average of 7 percent, the same percent reduction seen in the allocation. As described under No Action, the impacts for cowcod rockfish are not shown in the table due to the range of ACTs. For preliminary analysis, see discussion of impacts below.

Table 4-142. Alternative 1- Shorebased IFQ. 2021-22 Allocations, projected catch, and attainment under Alternative 1 (Method 1 for sablefish).

	2021 Alt 1			2022 Alt 1		
Species	**Allocation**	**Proj. Catch**	**% Attain**	**Allocation**	**Proj. Catch**	**% Attain**
Arrowtooth flounder	7,446.00	870.41	11.7%	5,974.75	842.99	14.1%
Bocaccio rockfish South of 40°10' N.	663.76	268.56	40.5%	654.39	264.79	40.5%
Canary rockfish	871.2	379.68	43.6%	848.78	372.22	43.9%
Chilipepper rockfish South of 40°10' N.	1,695.23	540.4	31.9%	1,620.97	516.76	31.9%
Cowcod South of 40°10' N.	2.16	0.76	35.2%	2.16	0.76	35.2%
Darkblotched rockfish	763.6	401.07	52.5%	717.74	381.36	53.1%
Dover sole	45,977.66	5,947.98	12.9%	45,977.66	5,947.98	12.9%
English sole	8,473.18	210.79	2.5%	8,409.53	210.6	2.5%
Lingcod North of 40°10' N.	2,275.77	526.46	23.1%	2,090.82	487.23	23.3%
Lingcod South of 40°10' N.	490.05	87.15	17.8%	521.55	92.65	17.8%
Longspine thornyheads North of 34°27' N.	2,446.29	311.94	12.8%	2,273.77	293.16	12.9%
Minor shelf rockfish North of 40°10' N.	829.23	397.14	47.9%	792.51	384.97	48.6%
Minor shelf rockfish South of 40°10' N.	161.67	8.08	5.0%	160.45	8.06	5.0%
Minor slope rockfish North of 40°10' N.	937.76	229.68	24.5%	915.89	228.8	25.0%
Minor slope rockfish South of 40°10' N.	422.16	42.17	10.0%	419.64	42.15	10.0%
Other flatfish	4,087.99	462.72	11.3%	4,120.39	463.29	11.2%
Pacific cod	1,034.21	14.17	1.4%	1,034.21	14.17	1.4%
Pacific halibut (IBQ) North of 40°10' N.	69.58	33.36	47.9%	69.58	32.7	47.0%
Pacific ocean perch North of 40°10' N.	3,268.69	474.82	14.5%	2,937.49	428.96	14.6%
Pacific whiting	169,126.03	144,851.68	85.6%	169,126.03	144,851.68	85.6%
Petrale sole	3,277.72	3,267.39	99.7%	2,909.12	2,900.29	99.7%
Sablefish North of 36° N.	2,990.02	2,949.96	98.7%	2,845.30	2,816.26	99.0%
Sablefish South of 36° N.	963.31	81.21	8.4%	917.11	80.1	8.7%
Shortspine thornyheads North of 34°27' N.	1,212.12	458.79	37.9%	1,178.87	446.26	37.9%
Shortspine thornyheads South of 34°27' N.	50	0	0.0%	50	0	0.0%
Splitnose rockfish South of 40°10' N.	1,565.22	20.11	1.3%	1,531.02	20.11	1.3%
Starry flounder	166.8	0.48	0.3%	166.8	0.48	0.3%

	2021 Alt 1			2022 Alt 1		
Species	**Allocation**	**Proj. Catch**	**% Attain**	**Allocation**	**Proj. Catch**	**% Attain**
Widow rockfish	12,409.70	11,435.82	92.2%	11,606.53	10,754.43	92.7%
Yelloweye rockfish	3.29	0.6	18.2%	3.37	0.57	16.9%
Yellowtail rockfish North of 40°10' N.	4,064.60	3,146.18	77.4%	3,871.88	3,059.43	79.0%

Pacific Halibut
Same as No Action

Cowcod south of 40°10' N. lat.
Under Alternative 1, cowcod would be managed with the ACL = ABC P*0.40 and status quo trawl and non-trawl allocations (Table 4-143). The impacts would however be the same as described under No Action since the Council is also considering using a more precautionary ACT range of 40 mt to 60 mt as the basis for managing the fisheries. The ACT is a mitigation method to reduce the risk to the ACL. These ACTs apply to all alternatives and are the basis for setting the trawl and non-trawl allocations. Alternative 1 would facilitate the ability to consider the full range of ACTs because they would be lower than fishery HGs in both 2021-22.

Table 4-143. Cowcod south of 40° 10' N. lat. Allocations for 2021-22 under Alternative 1 and without an ACT.

Year	ACL	Set-aside	Fishery HG	Trawl (IFQ) allocation (36%)
2021	87	10.85	76.2	27.4
2022	85	10.85	74.2	26.7

**For reference, the 2019 ACL is 10 mt and No Action is 97.9 in 2021 and 96.1 mt in 2022*

Sablefish
Under Alternative 1, the P* for the coastwide sablefish ABC is increased from 0.4 (No Action) to 0.45. Similar to the discussion under No Action, the Council is considering the Method by which to apportion the ACL north and south of 36° N. lat. Table 4-144 shows the 2021-22 allocations and projected catch under Alternative 1 for Methods 1 and 2. There is a ~6-7 percent increase in allocation and projected catch under Method 2 compared to Method 1 for sablefish north. Sablefish south is projected to see an overall 10-13 percent decline in projected catch based on model outputs, but may remain at constant levels since attainments are low (~10 percent in 2019) and the primary constraints are lack of markets and processing infrastructure. As under No Action, these allocations are based on the at-sea sector having a 50 mt set aside.

Under Alternative 1, the projected gains in ex-vessel revenue for Method 2 for the IFQ fishery north of 36° N. lat are +$516,207 in 2021 and +$491,764 in 2022 compared to Method 1 (Table 4-145). To the south, the projected decreases with Method 2 are -$22,279 in 2021 and -$27,736 in 2022 compared to Method 1. The net coastwide IFQ gains in ex-vessel revenue would be over +$450,000 per year when factoring in that gains to the north are projected to be greater than the declines to the south. As described under No Action, the projected declines to the south are however based on the IFQ model predicting that lower allocations would reduce catches; however, actual attainments may remain static and not decrease since attainments are low due to a lack of processing infrastructure.

Non-IFQ Species
Same as No Action

Table 4-144. Alternative 1 - Sablefish IFQ allocations and projected catches for both apportionment methods.

Species	2021				2022			
	Method 1		Method 2		Method 1		Method 2	
	Allocation	Proj. Catch	Allocation	Proj. Catch	Allocation	Proj. Catch	Allocation	Proj. Catch
Sablefish North of 36° N.	2,990.02	2,949.96	3,189.59	3,134.33	2,845.30	2,816.26	3,035.42	2,991.90
Sablefish South of 36° N.	963.31	81.21	782.29	73.11	917.11	80.1	744.91	70.02

Table 4-145. Alternative 1. Sablefish IFQ allocations, projected catches, and ex-vessel revenue to the north and south of 36° N. lat. for both ACL apportionment methods under Alternative 1 for 2021-22, as well as total coastwide projected impacts.

Method	Year	North				South				Coastwide	
		Allocation	Projected Catch	Projected IFQ $ ex-vessel revenue		Allocation	Projected Catch	Projected IFQ $ ex-vessel revenue		Projected IFQ $ ex-vessel revenue	
				Total $	$ difference with Method 2			Total $	$ difference with Method 2	Total $	$ difference with Method 2
1	2021	2,990.02	2,949.96	$8,259,422	NA	963	81.2	$223,333	NA	$8,482,755	NA
	2022	2,845.30	2,816.26	$7,885,083	NA	917	80.1	$220,283	NA	$8,105,366	NA
2	2021	3,189.59	3,134.33	$8,775,629	$516,207	782	73.1	$201,054	-$22,279	$8,976,683	$493,928
	2022	3,035.42	2,991.90	$8,376,847	$491,764	745	70	$192,546	-$27,736	$8,569,393	$464,028

To provide a comprehensive assessment of the impacts of the action alternatives with the apportionment Methods, Table 4-146 shows an overarching comparison of the harvest specifications and resulting allocations and ex-vessel revenue under all four ACL Options. All four are projected to increase IFQ ex-vessel revenue for sablefish coastwide due to higher ABCs in 2021-22, but by various degrees depending on the P* and the Method used to apportion the ACLs. Alternative 1 Method 1 is projected to result in the highest ex-vessel revenue coastwide total at $8.9 million in 2021 and 8.6 million in 2022, as it has the highest allocation to the north where attainments are high. This is +$1 million per year higher than No Action Method 1, which is the status quo. No Action Method 2 and Alternative 1 Method 1 are projected to provide similar intermediary economic benefits

of approximately +$0.5 million per year compared to No Action Method 1 and approximately -$0.5 million less per year than Alternative 1 Method 2.

Table 4-146. Alternative 1 - Comparison of IFQ sablefish allocations and projected ex-vessel revenue by area for all four ACL alternatives being considered for 2021-22.

Year	Alternative	Apport. Method	Coastwide ABC (mt)	North of 36° N. lat.			South of 36° N. lat.			Coastwide Ex-Vessel Revenue ($)
				ACL (mt)	IFQ Allocation (mt)	Ex-Vessel Revenue ($)	ACL (mt)	IFQ Allocation (mt)	Ex-Vessel Revenue ($) *	
2021	NA	1	8,208	6,041	2787	$7,106,585	2,167	899	$219,062	$7,953,682
		2		6,435	2,973	$8,216,684	1,765	723	$189,105	$8,405,789
	1	1	8,791	6,470	2,990	$8,259,422	2,321	963	$223,333	$8,482,755
		2		6892	3,190	$8,775,626	1,890	782	$201,054	$8,976,680
2022	NA	1	7,811	5,749	2,649	$7,377,416	2,062	855	$215,395	$7,592,811
		2		6,124	2,826	$7,836,170	1,679	694	$180,884	$8,017,054
	1	1	8,375	6,164	2,845	$7,885,083	2,211	917	$220,283	$8,105,366
		2		6,566	3,035	$8,376,847	1,801	745	$192,546	$8,569,393

*Based on IFQ model that projects attainments would change in response to higher or lower south of 36° IFQ allocations, but may remain similar to 2019 levels since attainments are low (<10 percent), would not be constrained by any of the allocations, and held constant due to a lack of processing infrastructure.

Petrale sole

Under Alternative 1, petrale sole would be managed with a more precautionary P* of 0.40 compared to No Action (P*=0.45). A main reason the Council selected Alternative 1 as the Preferred Alternative is because the GMT recommended being more precautionary due to concerns with the 2019 update assessment (described under No Action). However, the GMT also pointed out that both Alternative 1 and Alternative 2 ("stair-step" ACLs) are both equally as precautionary and provide similar long-term total IFQ allocations and economic benefits (~$89 million in 2019-2030 total ex-vessel revenue for both); the main difference is that Alternative 1 provides more short-term benefits whereas Alternative 2 spreads those same benefits more into the long-term (Agenda Item H.6.a GMT Report 2 November 2019). Since petrale sole are above the management target, there is a temporary surplus of yield associated with "fishing the stock down" toward the management target to better meet MSY goals. Alternative 1 utilizes more of that temporary surplus in 2021-22 and Alternative 2 utilizes the same amount, but with more of it in future biennium.

As detailed under No Action, there are two allocation being considered for petrale sole in 2021-22 that apply to all the harvest specification alternatives. Option 1 uses the status quo A-21 formulas of 95 percent to trawl and 5 percent to non-trawl (Table 4-147). Option 2 makes petrale sole a two year allocation stock and would have a fixed 30 mt non-trawl allocation in both 2021-22 with the remainder allocated to trawl. The purpose of Option 2 is to provide more economic benefits for IFQ while not constraining the non-trawl sectors. Under Option 1, Alternative 1 will decrease the 2021 IFQ allocation by 258.4 mt in 2021 compared to No Action and reduce the projected ex-vessel revenue by $674,451. The decrease in 2022 is 194.8 mt and $508,432 in projected ex-vessel revenue.

Option 2 can help mitigate the reductions associated with Alternative 1 (compared to No Action). Under Alternative 1, Option 2 increases the IFQ allocations from Option 1 by 142.8 mt and 123.4 mt and projected ex-vessel revenue by $372,694 and $322,053 in 2021-22, respectively. There will be net losses for IFQ under Alternative 1 for both allocation Options due to the more precautionary ABC than of No Action, but they would be reduced if Option 2 is selected.

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Table 4-147. Petrale sole allocations under the No Action and Alternative 1 ACLs and both allocation options, plus projected gains in IFQ ex-vessel revenue associated with Option 2.

No Action								
Option	**Allocations (mt)**						**Projected IFQ $ ex-vessel revenue**	
	Year	**ACL**	**Fishery HG**	**Non-trawl**	**Trawl**	**IFQ**	**Total $**	**$ gain with Option 2**
1 (SQ)	2021	4,115	3,727.5	186.4	3,541.1	3,536.1	9,230,482	NA
	2022	3,660	3,272.5	163.6	3,108.9	3,103.9	8,102,286	NA
2	2021	4,115	3,727.5	30	3,687.5	3,692.5	9,638,742	408,260
	2022	3,660	3,272.5	30	3,232.5	3,237.5	8,451,030	348,744
Alternative 1 (ABC= ACL P*0.40)								
Option	**Allocations (mt)**						**Projected IFQ $ ex-vessel revenue**	
	Year	**ACL**	**Fishery HG**	**Non-trawl**	**Trawl**	**IFQ**	**Total $**	**$ gain with Option 2**
1 (SQ)	2021	3,843	3,455.5	172.8	3,282.7	3,277.7	8,556,031	NA
	2022	3,455	3,067.5	153.4	2,914.1	2,909.1	7,593,854	NA
2	2021	3,843	3,455.5	30.0	3,425.5	3,420.5	8,928,725	372,694
	2022	3,455	3,067.5	30.0	3,037.5	3,032.5	7,915,906	322,053

**Option 1 uses the status quo trawl (95 percent) and non-trawl allocations (5 percent) whereas Option 2 fixes non-trawl at 30 mt with the remainder to trawl*

4.2.3.6 At-Sea Management Measures

The at-sea sector measures and impacts are the same as described under No Action (Section 4.2.2.5). The only consideration under Alternative 1 is the higher sablefish ACL due to the increase in P* from 0.4 to 0.45. The impacts of selecting a higher set aside for the at-sea sector, which would decrease the likelihood of the at-sea sector exceeding the set aside, on the IFQ sector are discussed in detail in Chapter 4.2.3.5 above. In general, the impacts to the IFQ sector would be less under Alternative 1 compared to No Action if the Council were to increase the sablefish north set aside for the at-sea sectors. Impacts of the apportionment method and resulting effects are discussed above as well.

Since the same trip limits and other regulations (e.g., non-trawl RCA) apply to both the non-nearshore and nearshore fisheries, analyses focus on impacts to both where applicable. Although the non-nearshore and nearshore each have their own impact sections, the non-nearshore is first and thus the detailed implications of adjustments to management measures for both are discussed in the non-nearshore section. The nearshore section contains summaries and links to the non-nearshore section.

4.2.3.7 Limited Entry and Open Access Fixed Gear

For Alternative 1, ACLs are the same as No Action for 2021-2022 except for sablefish, cowcod south of 40° 10' N. lat., Oregon black/blue/deacon rockfish complex, shortbelly rockfish, and petrale sole (Table 4-148). The impacts are the same as No Action for all but sablefish since the projected non-nearshore mortality is minor for these stocks and is expected to be well within the non-trawl allocations for all ACL alternatives. For reference, and as noted under No Action, there is a proposal to manage cowcod south of 40°10 N. lat. under an ACT. The cowcod south of 40°10 N. lat. non-trawl allocation based on a range of ACTs is listed in Table 4-148.

Table 4-148. Alternative 1 - 2021 and 2022 ACLs (mt) and non-trawl allocations (mt) for select species.

Stock	ACL		Non-trawl Allocation	
	2021	2022	2021	2022
Cowcod S. of 40°10' N. lat.				
ACT SQ (6mt)	87	85	3.8	3.8
ACT of 40 mt			25.6	25.6
ACT of 60 mt			38.4	38.4
Oregon Black/Blue/Deacon rockfish	602.6	599.5	NA	NA
Shortbelly rockfish	3,000	3,000	N/A	N/A
Petrale sole	3,843	3,455	172.8	153.4

For sablefish, Alternative 1 uses the maximum P*0.45 to set the coastwide ABC instead of the more precautionary P*0.40 under No Action. As with No Action, the Alternative 1 ACLs depend on the method used to apportion the coastwide ABC to the north and south ACLs. Method 1 again uses the long-term bottom trawl survey biomass average distributions to the north and south. Method 2 does the same except that a rolling 5-year average is used. Under Alternative 1, higher trip limits can be considered for the DTL fisheries north of 36° N lat.. However, the same trip limits are proposed to the south despite higher allocations since lack of processing infrastructure and close areas (i.e., CCA) have been identified as the main reason for less than full attainments (described more under No Action).

Non-Nearshore Trip Limit Analysis

The trip limit sections (and tier limits) for the non-nearshore fishery are organized as follows:

1. sablefish using ACL apportionment Method 1;
2. sablefish using ACL apportionment Method 2;
3. overarching comparison of non-nearshore sablefish for all four ACL alternatives

There are no additional non-sablefish trip limits proposed under Alternative 1; the same ones analyzed under No Action apply to Alternative 1.

Sablefish allocations and trip and tier limits based Alternative 1 Method 1:

The sablefish allocations and tier limits for 2021-22 are shown in Table 4-149– Table 4-149. The landings targets and proposed trip limits for the LE and OA DTL fisheries DTL north of 36° N. lat. are shown in Table 4-152; the trip limits were set to fully attain the landings targets. There is uncertainty in the landings projections and the upper end of the range is above the landings targets; however, this is not expected to be

a problem as the model has overestimated landings by 25-45 percent in 2019 and inseason actions can be used to reduce trip limits if landings are higher than projected.

The landings targets and trip limits for the LE DTL fishery south of 36° N. lat. (Table 4-153) continue to be set a constant 2,000 lbs. weekly as done in past cycles because other factors (e.g., lack of processing infrastructure and closed areas) have been identified by the GAP as the main hindrances to attainment. The projected attainment is less than 50 percent of the landings target.

There are two trip limit Options for OA DTL fishery south of 36° N. lat. (Table 4-153) that are described under No Action. In summary, OAS Option 1 maintains the 2019 daily (300 lbs.) and weekly limits (1,600 lbs.) but uses a year-round 4,800 lbs. bimonthly limit to be consistent with the Council's inseason action for 2020. The projected attainment for Option 1 is less than 10 percent of the landings target. OAS Option 2 uses the same weekly and bimonthly limits but removes the daily limit as means to increase profit margins (i.e., fewer trips needed) and to create incentive for more participation. The projected landings with Option 2 are expected to be less than 100 mt based on the maximum catch scenario (described under No Action and Table 4-86), which is 25 percent or less of the landings target.

Table 4-149. Alternative 1 Method 1 Limited entry sablefish FMP allocations north of 36° N. lat., based on a P* of 0.45 and a long-term average ACL apportionment Method 1.

Year	Sablefish Com. HG	LE Share	LE FG Share (mt)				Estimated Tier Limits (lbs.) a/		
			LE FG Total Catch Share	Landed Catch Share a/	Primary Season Share b/	LE FG DTL Share b/	Tier 1	Tier 2	Tier 3
2021	5,785	5,241	2,201	2,100	1,871	315	55,036	25,016	14,295
2022	5,510	4,992	2,097	2,000	1,782	300	52,416	23,826	13,615

a/ The limited entry fixed gear total catch share is reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2018. In 2021-2022, 23 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

b/ Shares do not include anticipated discard mortality.

Table 4-150. Alternative 1 Method 2 - Open access FMP allocations north of 36° N. lat. based on a P* of 0.45 and a long-term average ACL apportionment Method 1.

Year	OA Total Catch Share (mt)	Directed OA Landed Catch Share (mt) a/
2021	544	519
2022	518	494

a/ The open access total catch share is reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2018. In 2021-2022, 23 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

Table 4-151. Alternative 1 Method 2 - Short-term sablefish allocations south of 36° N. lat. for the non-trawl sector, based on a P* of 0.45 and a long-term average ACL apportionment Method 1. Limited entry and open access catch shares under the no action sharing alternative (70 percent limited entry; 30 percent open access).

Year	Commercial HG (mt)	Non-Trawl Allocation (mt)	LE FG Total Catch Share (mt)	Directed OA Total Catch Share (mt)	LE FG Landed Catch Share a/ (mt)	Directed OA Landed Catch Share a/ (mt)
2021	2,294	1,330	931	399	911	390
2022	2,184	1,266	887	380	867	372

a/ The limited entry and open access fixed gear total catch shares are reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2018. In 2021-22, 11 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

Table 4-152. Alternative 1 Method 1. Sablefish trip limits (lbs.) north of 36° N. lat. for limited entry and open access fixed gears. Landed shares and projected attainment for 2021 are based on a P* of 0.45 and a long-term average ACL apportionment Method 1.

Fishery	Jan-Feb	Mar-Apr	May-Jun	July-Aug	Sept-Oct	Nov-Dec	Landed Catch Share	Projected Attain.
LE	1,600 lb. week, not to exceed 4,800 lbs. / 2 months						315	276-337
OA	300 lbs. daily, or 1 landing per week up to 1,300 lbs., not to exceed 2,600 lbs. bimonthly						519	454-567

Table 4-153. Alternative 1 Method 1. Sablefish trip limits (lbs.) south of 36° N. lat. for limited entry and open access fixed gears. Landed shares and projected attainment for 2021 are based on a P* of 0.45 and a long-term average ACL apportionment Method 1.

Fishery	Jan-Feb	Mar-Apr	May-Jun	July-Aug	Sept-Oct	Nov-Dec	Landed Catch Share	Projected Attain.
LE	2,000 lbs./week						911	336-411
OA Option 1	300 lbs. daily, or 1 landing per week up to 1,600 lbs., not to exceed 4,800 lbs. bimonthly						399	26-39
OA Option 2	1,600 lbs. per week, not to exceed 4,800 lbs. bimonthly						399	< 100 a/

a/ Based on maximum catch scenario of which results are provided in Table 4-84

Sablefish allocations and trip and tier limits for Alternative 1 Method 2

Alternative 1 Method 2 is the Council's Preferred Alternative and also the GAP's recommendation (Agenda Item H.6.a, Supplemental GAP Report 1, November 2019). The sablefish allocations and tier limits are shown in Table 4-154 through Table 4-156 and the DTL are shown in Table 4-157 and Table 4-158

As described above, while the higher end of the range of projected mortality are above the landings target for the northern DTL fisheries, this is not expected to be a problem since the DTL model overestimated 2019 landings by 25-40 percent each month and inseason actions can be taken as needed. For the southern

DTL fisheries, the same trip limits are proposed as under No Action. Note that despite the higher allocations, the lack of processing infrastructure and closed areas (i.e., CCA) have been identified as the main causes of low attainments in this area.

Table 4-154. Alternative 1 Method 2- Limited entry sablefish FMP allocations north of 36° N. lat., based on a P* of 0.45 and a rolling 5-year average ACL apportionment Method 2.

Year	Sablefish Com. HG	LE Share	LE FG Share (mt)				Estimated Tier Limits (lbs.) a/		
			LE FG Total Catch Share	Landed Catch Share a/	Primary Season Share b/	LE FG DTL Share b/	Tier 1	Tier 2	Tier 3
2021	6,165	5,586	2,346	1,902	1,994	352	58,649	26,659	15,234
2022	5,872	5,320	2,234	1,812	1,899	335	55,858	25,390	14,509

a/ The limited entry fixed gear total catch share is reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2018. In 2021-2022, 23 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

b/ Shares do not include anticipated discard mortality.

Table 4-155. Alternative 1 Method 2- Open access sablefish FMP allocations north of 36° N. lat. based on a P* of 0.45 and a rolling 5-year average ACL apportionment Method 2.

Year	OA Total Catch Share (mt)	Directed OA Landed Catch Share (mt) a/
2021	580	553
2022	552	527

a/ The open access total catch share is reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2018. In 2021-2022, 23 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

Table 4-156. Alternative 1 Method 2- Short-term sablefish allocations south of 36° N. lat. for the non-trawl sector, based on a P* of 0.45 and Method 2. Limited entry and open access catch shares under the no act action sharing alternative (70 percent limited entry; 30 percent open access).

Year	Commercial HG (mt)	Non-Trawl Allocation (mt)	LE FG Total Catch Share (mt)	Directed OA Total Catch Share (mt)	LE FG Landed Catch Share a/ (mt)	Directed OA Landed Catch Share a/ (mt)
2021	1,863	1,080.3	756	324	740	317
2022	1,774	1,029	720	309	704	302

a/ The limited entry and open access fixed gear total catch shares are reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2018. In 2021-2022, 23 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

Table 4-157. Alternative 1 Method 2- Sablefish trip limits (lbs.) north of 36° N. lat. for limited entry and open access fixed gears, with landed share and projected attainment for 2021 based on a P* of 0.45 and a rolling 5-year average ACL apportionment Method 2.

Fishery	Jan-Feb	Mar-Apr	May-Jun	July-Aug	Sep-Oct	Nov-Dec	Landed Catch Share	Projected Attain.
LE	1,700 lb week, not to exceed 5,100 lbs. / 2 months						336	301-367
OA	300 lbs. daily, or 1 landing per week up to 1,400 lbs., not to exceed 2,800 lbs. bimonthly						553	514-553

Table 4-158. Alternative 1 Method 2Sablefish trip limits (lbs.) south of 36° N. lat. for limited entry and open access fixed gears, with landed share and projected attainment for 2021 based on a P* of 0.45 and a rolling 5-year average ACL apportionment Method 2.

fishery	Jan-Feb	Mar-Apr	May-Jun	July-Aug	Sept-Oct	Nov-Dec	Landed Catch Share	Projected Attain.
LE	2,000 lbs./week						740	336-411
OA Option 1	300 lbs. daily, or 1 landing per week up to 1,600 lbs., not to exceed 4,800 lbs. bimonthly						317	26-39
OA Option 2	1 landing per week up to 1,600 lbs., not to exceed 4,800 lbs. bimonthly						317	< 100 a/

a/ Based on maximum catch scenario of which results are provided in Table 4-84

Overarching comparison of non-nearshore sablefish for all four ACL alternatives

Given that there are a total of 26 sablefish allocation and trip limit tables in the sections above, it is difficult to compare it to the 2021-22 projected mortality for the two ACL alternatives and the two apportionment options. This section therefore provides a summary to allow easier comparisons of the ABCs and ACLs (Table 4-159 and Table 4-160), primary/tier limits (Table 4-161), and DTL trip limits and projections for the north (Table 4-162) and south (Table 4-163). The overall coastwide non-nearshore (FG) sablefish projected landings and ex-vessel revenue are provided in Table 4-164

Regarding the coastwide ABC, Alternative 1 (P*0.45) results in an additional 583 mt and 564 mt in 2021-22, respectively, then No Action (P*0.40). In regard to ACLs, Method 2 results in more of the coastwide ABC being allocated to the northern ACL and less to the southern ACL. For No Action (ABC = P*0.40), Method 2 results in an additional 402 mt and 383 mt for 2021-22, respectively, for the north and less to the south than Method 1. For Alternative 1 (ABC = P*0.45), Method 2 results in an additional 431 mt and 410 mt for 2021-22, respectively, for the north and less to the south.

The reduction in the southern ACL could be decreased if the higher Alternative 1 ABC (P*0.45) is selected. For example, the decline to the southern ACL would be 277 mt and 261 mt in 2021-22, respectively, if Alternative 1 Method 2 is selected instead of No Action Method 1, which is the status quo approach used in 2019. Under Alternative 1 Method 2, the southern ACL would decline by 100 and 189 mt in 2021-22, respectively, compared to the 2019 ACL.

Table 4-159. Comparison of the four sablefish ACLs north of 36° N. lat. of which the No Action and Alternative 1 affect the coastwide ABC, and Methods 1 and 2 affect how the coastwide ABC is apportioned to the northern and southern ACLs based on the trawl survey distributions.

Year	Coastwide ABC		N 36° N. lat. ACLs			
	No Action (P*0.40)	Alt 1 P*0.45	No Action Method 1 (P*0.40 x 73.6% long-term avg.)	Alt 1 Method 1 (P*0.45 x 73.6% long-term avg.	No Action Method 2 (P*0.40 x 78.4% 5-year avg.)	Alt 1 Method 2 (P*0.45 x 78.4% 5-year avg.)
2019*	7,750	---	5,606	---	---	---
2020*	7,896	---	5,723	---	---	---
2021	8,208	8,791	6,041	6,470	6,435	6,892
2022	7,811	8,375	5,749	6,164	6,124	6,566

**Values in reg. that differ from the 2019 assessment decision tables that use lower GMT projected catch*

In regard to the northern DTL fisheries (Table 4-162), the projected ex-vessel revenue for the LE and OA DTL fisheries is expected to increase by $0.1 - $0.9 million per year in 2021-22 depending on the ACL alternative compared to baseline (2019). Alternative 1 Method 2 is projected to result in the highest additional revenue of $0.9 and $0.6 million in 2021-22, respectively, above 2019 revenues.

Table 4-160. Comparison of the four sablefish ACLs south of 36° N. lat. of which the No Action and Alternative 1 affect the coastwide ABC, and Methods 1 and 2 affect how the coastwide ABC is apportioned to the northern and southern ACLs based on the trawl survey distributions.

Year	Coastwide ABC		S 36° N. lat. ACLs			
	No Action (P*0.40)	Alt 1 P*0.45	No Action Method 1 (P*0.40 x 26.4% long-term avg.)	Alt 1 Method 1 (P*0.45 x 26.4% long-term avg.	No Action Method 2 (P*0.40 x 21.5% 5-year avg.)	Alt 1 Method 2 (P*0.45 x 21.5% 5-year avg.)
2019*	7,750	---	1,990	---	---	---
2020*	7,896	---	2,032	---	---	---
2021	8,208	8,791	2,167	2,321	1,765	1,890
2022	7,811	8,375	2,062	2,211	1,679	1,801

**Values in reg. that differ from the 2019 assessment decision tables that use lower GMT projected catch.*

Table 4-161. Primary/tier sablefish (north of 36° N. lat.) landings shares, tier limits, projected landings, and projected ex-vessel revenue for the four ACL alternatives for 2021-22.

Item	Year	No Action Method 1 (P*0.40 x 73.6% long-term avg) (mt)	Alt 1 Method 1 (P*0.45 x 73.6% long-term avg) (mt)	No Action Method 2 (P*0.40 x 78.4% 5-year avg) (mt)	Alt 1 Method 2 (P*0.45 x 78.4% 5-year avg) (mt)
N 36° ACL	2019	---	---	---	---
	2021	6,041	6,470	6,435	6,892
	2022	5,749	6,164	6,124	6,566
Primary landings share (mt)	2019	---	---	---	---
	2021	1,666	1,785	1,775	1,902
	2022	1,585	1,700	1,689	1,812
Tier 1 limit (lbs.)	2019	---	---	---	---
	2021	51,363	55,036	54,737	58,649
	2022	48,863	52,416	52,074	55,858
Tier 2 limit (lbs.)	2019	---	---	---	---
	2021	23,347	25,016	24,880	26,659
	2022	22,211	23,826	23,670	25,390
Tier 3 limit (lbs.)	2019	---	---	---	---
	2021	13,341	14,295	14,217	15,234
	2022	12,692	13,615	13,526	14,509
Projected landings (mt)	2019	---	---	---	---
	2021	1,666	1,785	1,775	1,902
	2022	1,585	1,700	1,689	1,812
Projected ex-vessel $ revenue	2019	---	---	---	---
	2021	$8,335,602	$8,931,695	$8,883,063	$9,518,061
	2022	$7,929,870	$8,506,510	$8,450,930	$9,065,086

Table 4-162. Landings targets, trip limits, projected landings, and projected ex-vessel revenue for the limited entry (LEN) and open access (OAN) northern sablefish DTL fisheries for the four sablefish ACL alternative for 2021-22.

Year	Item	No Action Method 1 (P*0.40 x 73.6% long-term avg) (mt)	Alt 1 Method 1 (P*0.45 x 73.6% long-term avg) (mt)	No Action Method 2 (P*0.40 x 78.4% 5-year avg) (mt)	Alt 1 Method 2 (P*0.45 x 78.4% 5-year avg) (mt)
2019	N 36° ACL	---	---	---	---
2021		6,041	6,470	6,435	6,892
2022		5,749	6,164	6,124	6,566
2019	LEN landings target (mt)	---	---	---	---
2021		294	315	313	336
2022		280	300	298	320
LEN trip limit (lbs.)		No daily	No daily	No daily	No daily
		1,500 lbs. / week	1,600 lbs. / week	1,600 lbs. / week	1,700 lbs. / week
		4,500 lbs. / 2 months	4,800 lbs. / 2 months	4,800 lbs. / 2 months	5,100 lbs. / 2 months
2019	OAN landings target (mt)	---	---	---	---
2021		484	519	516	553
2022		461	494	491	527
OAN trip limit (lbs.)		300 lbs. / day	300 lbs. / day	300 lbs. / day	300 lbs. / day
		1,200 lbs. / week	1,300 lbs. / week	1,300 lbs. / week	1,400 lbs. / day
		2,400 lbs. / 2 months	2,600 lbs. / 2 months	2,600 lbs. / 2 months	2,800 lbs. / 2 months
2019	Projected DTL landings (mt)	---	---	---	---
2021		778	834	829	889
2022		740	794	789	846
2019	Projected DTL $ ex-vessel revenue	---	---	---	---
2021		$4,016,639	$4,303,876	$4,280,442	$4,586,426
2022		$3,821,131	$4,098,994	$4,072,212	$4,368,153

a/ LEN Periods 1-4: 1,300 lbs. / week, not to exceed 3,900 lbs. / 2 months; Periods 5-6: 1,700 lbs. / week, not to exceed 5,100 lbs. / 2 months

b/ OAN Periods 1-2: 300 lbs. / day; or one landing per week up to 1,200 lbs., not to exceed 2,400 lbs. / 2 months; Period 3: 300 lbs. / day; or one landing per week up to 1,400 lbs., not to exceed 2,800 lbs. / 2 months; Periods 4-6: 300 lbs. / day, or one landing per week up to 1,500 lbs., not to exceed 3,000 lbs. bimonthly

In regard to the southern DTL fisheries (Table 4-163), the projected increase in ex-vessel revenue in 2021-22 is contingent on the trip limit Option for OA. For trip limit Option 1, the projected increase in total DTL ex-vessel revenue is $0.9 million in 2021-22 for all four ACL alternatives. For trip limit Option 2, the projected increase is $1.4 million in ex-vessel revenue. The southern DTL fisheries are expected to be below their landings targets for all four ACL alternatives, and are not expected to be negatively impacted by apportionment Method 2 that would shift ~400 mt of the coastwide ABC from south to the north. As the SSC, GMT, and GAP noted in November 2019, sablefish ACL apportionment is a policy call best addressed by the Council and could be adjusted in future biennium if survey distributions or the needs of southern sablefish fishery change.

Table 4-163. Landings targets, trip limits, projected landings, and projected ex-vessel revenue for the limited entry (LES) and open access (OAS) southern sablefish DTL fisheries and the four sablefish ACL alternative for 2021-22.

Year	Item	No Action Method 1 (P*0.40 x 26.4% long-term avg.) (mt)	Alt 1 Method 1 (P*0.45 x 26.4% long-term avg. (mt)	No Action Method 2 (P*0.40 x 21.5% 5-year avg.) (mt)	Alt 1 Method 2 (P*0.45 x 21.5% 5-year avg.) (mt)
2019	S 36° ACL	---	---	---	---
2021		2,167	2,321	1,765	1,890
2022		2,062	2,211	1,679	1,801
2019	LES landings target (mt)	---	---	---	---
2021		850	911	690	740
2022		808	867	656	704
LES trip limit (lbs.)		No daily	No daily	No daily	No daily
		2,000 lbs. / week	2,000 lbs. / week	2,000 lbs. / week	2,000 lbs. / week
		No bimonthly	No bimonthly	No bimonthly	No bimonthly
2019	OAN landings target (mt)	---	---	---	---
2021		364	390	296	317
2022		346	372	281	302
OAS trip limit Option 1 (lbs.)		300 lbs. / day	300 lbs. / day	300 lbs. / day	300 lbs. / day
		1,600 lbs. / week	1,600 lbs. / week	1,600 lbs. / week	1,600 lbs. / week
		4,800 lbs. /2 weeks	4,800 lbs. / 2 months	4,800 lbs. / 2 months	4,800 lbs. / 2 months
OAS trip limit Option 2 (lbs.)		No daily	No daily	No daily	No daily
		1,600 lbs. / week	1,600 lbs. / week	1,600 lbs. / week	1,600 lbs. / week
		4,800 lbs. / 2 months	4,800 lbs. / 2 months	4,800 lbs. / 2 months	4,800 lbs. / 2 months
2019	Projected DTL landings Option 1(mt)	---	---	---	---
2021		406	406	406	406
2022		406	406	406	406

Year	Item	No Action Method 1 (P*0.40 x 26.4% long-term avg.) (mt)	Alt 1 Method 1 (P*0.45 x 26.4% long-term avg. (mt)	No Action Method 2 (P*0.40 x 21.5% 5-year avg.) (mt)	Alt 1 Method 2 (P*0.45 x 21.5% 5-year avg.) (mt)
2019	Projected DTL ex-vessel rev. Option 1(mt)	---	---	---	---
2021		$2,742,523	$2,742,523	$2,742,523	$2,742,523
2022		$2,742,523	$2,742,523	$2,742,523	$2,742,523
2019	Projected DTL landings Option 2 (mt)	---	---	---	---
2021		473.5	473.5	473.5	473.5
2022		473.5	473.5	473.5	473.5
2019	Projected DTL ex-vessel rev. Option 2 (mt)	---	---	---	---
2021		$3,198,485	$3,198,485	$3,198,485	$3,198,485
2022		$3,198,485	$3,198,485	$3,198,485	$3,198,485

a/ OAS period 1-3: 300 lbs. daily, or 1 landing per week up to 1,600 lbs., not to exceed 3,200 lbs. bimonthly; Period 4-6: 300 lbs. daily, or 1 landing per week up to 1,600 lbs., not to exceed 4,800 lbs. bimonthly

In regard to coastwide non-nearshore sablefish, baseline is projected to result in $13.3 million in ex-vessel revenue and multi-million-dollar increases are expected in 2021-22 under all four ACL allocations (Table 4 200). The highest projected increase in ex-vessel revenue is with Alternative 1 Method 2 with +4.0 million in 2021 and +3.3 million in 2022. Alternative 1 Method 1 is projected to result in the next highest increase to ex-vessel revenue at +3.1 million in 2021 and +2.5 million in 2022. The projected increases are highest for these alternatives since they result in the highest allocations to the north where the fisheries typically take their full allocations.

The lowest projected coastwide increase in ex-vessel revenue is for No Action Method 1 at +2.2 million in 2021 and +1.6 million in 2022. (Table 4 200). This has the lowest projected gains since it uses a more conservative ABC and a higher ACL apportionment to the south where attainments are routinely low. The second lowest projected increase in ex-vessel revenue is for No Action Method 2 at +$3.1 million in 2021 and +2.4 million in 2022. This alternative uses a more conservative ABC but with a greater ACL shift to the north which produces intermediary benefits.

Table 4-164. Coastwide and regional non-nearshore sablefish projected landings and ex-vessel revenue for the four ACL alternatives for 2021-22.

Year	Item	No Action Method 1 (P*0.40 x 26.4% long-term avg.) (mt)	Alt 1 Method 1 (P*0.45 x 26.4% long-term avg.) (mt)	No Action Method 2 (P*0.40 x 21.5% 5-year avg.) (mt)	Alt 1 Method 2 (P*0.45 x 21.5% 5-year avg.) (mt)
2019	Primary/tier N 36° projected landings (mt)	---	---	---	---
2021		1,666	1,785	1,775	1,902
2022		1,585	1,700	1,689	1,812
2019	N 36° DTL projected landings (mt)	---	---	---	---
2021		778	834	829	889
2022		740	794	789	846
2019	S 36° DTL projected landings (mt)	---	---	---	---
2021		474	474	474	474
2022		474	474	474	474
2019	Total FG landings (mt)	---	---	---	---
2021		2,918	3,092	3,078	3,264
2022		2,799	2,968	2,951	3,132
2019	Primary/tier projected ex-vessel rev. (mt)	---	---	---	---
2021		$8,335,602	$8,931,695	$8,883,063	$9,518,061
2022		$7,929,870	$8,506,510	$8,450,930	$9,065,086
2019	N36° DTL projected ex-vessel rev. (mt)	---	---	---	---
2021		$4,016,639	$4,303,876	$4,280,442	$4,586,426
2022		$3,821,131	$4,098,994	$4,072,212	$4,368,153
2019	S36° DTL projected ex-vessel rev. (mt)	---	---	---	---
2021		$3,198,485	$3,198,485	$3,198,485	$3,198,485
2022		$3,198,485	$3,198,485	$3,198,485	$3,198,485
2019	*Total FG Ex-vessel rev. (mt)*	---	---	---	---
2021		*$15,550,726*	*$16,434,056*	*$16,361,989*	*$17,302,972*
2022		*$14,949,486*	*$15,803,989*	*$15,721,627*	*$16,631,724*

Impact (Groundfish Mortality) – Non-Nearshore North of 36° N. latitude

The non-nearshore model projects mortality of rebuilding and other species for the LEFG and the OA sectors north of 36° N. lat. and seaward of the non-trawl RCA based on the northern sablefish ACL. The sablefish north stock is the primary target and provides the main source of revenue in both sectors. The bycatch projections are based on the assumption that the LE and OA allocations for sablefish are completely harvested. The projected species mortality, as a result of harvesting the sablefish allocations, was evaluated using 2002-2018 WCGOP data in the non-nearshore model under both apportionment methods, long-term average (Method 1; Table 4-165 and Table 4-166) and rolling 5-year average (Method 2; Table 4-168 and Table 4-169). Impact projections under Alternative 1 for yelloweye rockfish in the non-nearshore fishery are likely to be similar to or slightly higher than No Action (1.3 mt). Mortality generally increases under Alt 1 over No Action as shown in Table 4-167 for Methods 1 and 2, respectively. In general, most stocks increase by an average of 6.5%.

Table 4-165. Alternative 1. Projected non-nearshore groundfish mortality for the limited entry and open access fixed gear fisheries north of 36° N. lat. (in mt) for 2021 compared to the non-trawl allocation (excluding proposed routine adjustments). Projection are based on a default HCR of P* 0.45 and Method 1.

Stock/Stock Complex	Management Area	LE (mt)	OA (mt)	Total (mt)	NonTrawl Alloc. [a/] (mt)
Arrowtooth flounder	Coastwide	55.62	9.35	64.97	391.9
Big skate	Coastwide	8.45	1.44	9.89	71.0
Black rockfish	California	0.02	0.00	0.02	346.7
Bocaccio	S. of 40° 10’ N. lat.	0.30	0.08	0.38	1,036.4
Canary rockfish [b/]	Coastwide	1.30	0.22	1.53	352.4
Chilipepper rockfish	S. of 40° 10’ N. lat.	0.41	0.11	0.52	567.4
Darkblotched rockfish	Coastwide	5.61	1.05	6.66	42.4
Dover sole	Coastwide	5.92	1.24	7.16	2,420.1
English sole	Coastwide	0.03	0.01	0.04	446.2
Lingcod	N. of 40° 10’ N. lat.	14.82	2.07	16.89	2,799.8
Lingcod	S. of 40° 10’ N. lat.	1.83	1.86	3.69	599.0
Longnose skate	Coastwide	68.74	12.55	81.29	157.2
Longspine thornyhead	N. of 34° 27’ N. lat.	1.88	0.46	2.33	129.0
Mixed thornyheads	--	0.92	0.24	1.16	--
Pacific cod	Coastwide	2.35	0.40	2.75	54.7
Pacific hake	Coastwide	0.84	0.15	0.98	0.0
Pacific ocean perch	N. of 40° 10’ N. lat.	0.69	0.12	0.81	191.5
Petrale sole	Coastwide	1.32	0.24	1.55	129.4
Shortbelly rockfish	Coastwide	0.00	0.00	0.01	0.0
Shortspine thornyhead	N. of 34° 27’ N. lat.	30.76	6.63	37.39	67.5
Spiny dogfish	Coastwide	130.53	22.43	152.96	--
Splitnose rockfish	S. of 40° 10’ N. lat.	0.05	0.02	0.07	82.4
Starry flounder	Coastwide	0.01	0.00	0.01	171.8
Widow rockfish	Coastwide	0.22	0.04	0.25	1,302.9
Yellowtail rockfish	N. of 40° 10’ N. lat.	1.02	0.17	1.19	596.6

Stock/Stock Complex	Management Area	LE (mt)	OA (mt)	Total (mt)	NonTrawl Alloc. [a/] (mt)
Minor nearshore rockfish	N. of 40° 10’ N. lat.	0.01	0.00	0.01	567.3
Black/Blue/Deacon rockfish[c/]	Oregon	0.13	0.02	0.16	75.9
Minor nearshore rockfish	S. of 40° 10’ N. lat.	0.00	0.00	0.00	1,011.5
Minor shelf rockfish	N. of 40° 10’ N. lat.	5.55	0.94	6.49	571.4
Minor shelf rockfish	S. of 40° 10’ N. lat.	0.11	0.03	0.14	1,163.5
Minor slope rockfish	N. of 40° 10’ N. lat.	100.43	16.73	117.16	290.3
Minor slope rockfish	S. of 40° 10’ N. lat.	20.90	7.36	28.25	247.9
Cabezon/Kelp greenling	Oregon	0.01	0.00	0.01	197.7
Other flatfish	Coastwide	0.28	0.05	0.33	458.1
Other groundfish	--	0.00	0.00	0.00	--
Other rockfish	--	0.12	0.03	0.15	--
Ecosystem component species	--	77.13	19.71	0.00	--

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.

b/ The non-nearshore share for canary rockfish in 2021 is 46.5 mt.

c/ In 2019, new complexes were formed for OR black/blue/deacon rockfish

Table 4-166. Alternative 1. Projected groundfish mortality for the limited entry and open access fixed gear fisheries north of 36° N. lat. (in mt) for 2022 compared to the non-trawl allocation. Projections are based on a sablefish default harvest control rule of P* 0.45 and Method 1.

Stock/Stock Complex	Management Area	LE (mt)	OA (mt)	Total (mt)	Non-Trawl Alloc. [a/] (mt)
Arrowtooth flounder	Coastwide	52.97	9.35	62.32	318.1
Big skate	Coastwide	8.04	1.44	9.49	66.6
Black rockfish	California	0.02	0.00	0.02	339.7
Bocaccio	S. of 40° 10’ N. lat.	0.28	0.08	0.36	1,021.8
Canary rockfish [b/]	Coastwide	1.24	0.22	1.46	344.0
Chilipepper rockfish	S. of 40° 10’ N. lat.	0.39	0.11	0.50	542.7
Darkblotched rockfish	Coastwide	5.34	1.05	6.39	39.9
Dover sole	Coastwide	5.64	1.22	6.86	2,420.1
English sole	Coastwide	0.03	0.01	0.04	442.5
Lingcod	N. of 40° 10’ N. lat.	14.11	2.07	16.18	2,573.0
Lingcod	S. of 40° 10’ N. lat.	1.74	1.84	3.59	638.3
Longnose skate	Coastwide	65.47	12.45	77.91	151.0

Stock/Stock Complex	Management Area	LE (mt)	OA (mt)	Total (mt)	Non-Trawl Alloc. [a/] (mt)
Longspine thornyhead	N. of 34° 27’ N. lat.	1.79	0.44	2.23	119.9
Mixed thornyheads	--	0.88	0.23	1.11	--
Pacific cod	Coastwide	2.24	0.40	2.64	54.7
Pacific hake	Coastwide	0.80	0.15	0.94	0.0
Pacific ocean perch	N. of 40° 10’ N. lat.	0.66	0.12	0.78	184.3
Petrale sole	Coastwide	1.26	0.24	1.49	162.5
Shortbelly rockfish	Coastwide	0.00	0.00	0.01	0.0
Shortspine thornyhead	N. of 34° 27’ N. lat.	29.30	6.46	35.76	67.5
Spiny dogfish	Coastwide	124.32	22.40	146.72	--
Splitnose rockfish	S. of 40° 10’ N. lat.	0.05	0.02	0.07	82.4
Starry flounder	Coastwide	0.01	0.00	0.01	171.8
Widow rockfish	Coastwide	0.21	0.04	0.24	1,302.9
Yellowtail rockfish	N. of 40° 10’ N. lat.	0.97	0.17	1.14	596.6
Minor nearshore rockfish	N. of 40° 10’ N. lat.	0.13	0.02	0.15	559.3
Black/Blue/Deacon rockfish[c/]	Oregon	0.01	0.00	0.01	73.9
Minor nearshore rockfish	S. of 40° 10’ N. lat.	0.00	0.00	0.00	1,005.5
Minor shelf rockfish	N. of 40° 10’ N. lat.	5.29	0.94	6.22	547.1
Minor shelf rockfish	S. of 40° 10’ N. lat.	0.10	0.03	0.13	1,154.7
Minor slope rockfish	N. of 40° 10’ N. lat.	95.65	16.73	112.37	285.2
Minor slope rockfish	S. of 40° 10’ N. lat.	19.90	7.09	26.99	246.5
Cabezon/Kelp greenling	Oregon	0.01	0.00	0.01	189.7
Other flatfish	Coastwide	0.27	0.05	0.32	461.7
Other groundfish	--	0.00	0.00	0.00	--
Other rockfish	--	0.11	0.03	0.14	--
Ecosystem component species	--	73.46	18.92	92.38	--

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.

b/ The non-nearshore share for canary rockfish in 2021 is 46.5 mt.

c/ In 2019, new complexes were formed for OR black/blue/deacon rockfish, OR cabezon and kelp greenling,

Table 4-167. Comparison of 2021/2022 No Action and Alternative 1 projected groundfish LEFG and OA mortality for fisheries north of 36° N. lat. (in mt) under Method 1

Stock/Stock Complex	2020			2022		
	No Action	Alt 1	% change	No Action	Alt 1	% change
Arrowtooth flounder	60.63	64.97	6.7%	58.10	62.32	6.8%
Big skate	9.23	9.89	6.7%	8.84	9.49	6.8%
Black rockfish	0.02	0.02	0.0%	0.02	0.02	0.0%
Bocaccio	0.36	0.38	5.3%	0.34	0.36	5.6%
Canary rockfish [b/]	1.42	1.53	7.2%	1.36	1.46	6.8%
Chilipepper rockfish	0.49	0.52	5.8%	0.46	0.50	8.0%
Darkblotched rockfish	6.22	6.66	6.6%	5.96	6.39	6.7%
Dover sole	6.68	7.16	6.7%	6.40	6.86	6.7%
English sole	0.04	0.04	0.0%	0.04	0.04	0.0%
Lingcod	15.76	16.89	6.7%	15.09	16.18	6.7%
Lingcod	3.44	3.69	6.8%	3.34	3.59	7.0%
Longnose skate	75.87	81.29	6.7%	72.64	77.91	6.8%
Longspine thornyhead	2.18	2.33	6.4%	2.08	2.23	6.7%
Mixed thornyheads	1.08	1.16	6.9%	1.03	1.11	7.2%
Pacific cod	2.56	2.75	6.9%	2.46	2.64	6.8%
Pacific hake	0.92	0.98	6.1%	0.88	0.94	6.4%
Pacific ocean perch	0.76	0.81	6.2%	0.72	0.78	7.7%
Petrale sole	1.45	1.55	6.5%	1.39	1.49	6.7%
Shortbelly rockfish	0.01	0.01	0.0%	0.00	0.01	100.0%
Shortspine thornyhead	34.90	37.39	6.7%	33.34	35.76	6.8%
Spiny dogfish	142.75	152.96	6.7%	136.80	146.72	6.8%
Splitnose rockfish	0.07	0.07	0.0%	0.06	0.07	14.3%
Starry flounder	0.01	0.01	0.0%	0.01	0.01	0.0%
Widow rockfish	0.24	0.25	4.0%	0.23	0.24	4.2%
Yellowtail rockfish	1.11	1.19	6.7%	1.06	1.14	7.0%
Black/Blue/Deacon rockfish[c/]	0.01	0.01	0.0%	0.01	0.15	0.0%
Minor nearshore rockfish	0.14	0.16	12.5%	0.14	0.01	6.7%
Minor nearshore rockfish	0.00	0.00	-	0.00	0.00	-
Minor shelf rockfish	6.05	6.49	6.8%	5.80	6.22	6.8%
Minor shelf rockfish	0.13	0.14	7.1%	0.12	0.13	7.7%
Minor slope rockfish	109.34	117.16	6.7%	104.77	112.37	6.8%
Minor slope rockfish	26.37	28.25	6.7%	25.16	26.99	6.8%
Cabezon/Kelp greenling	0.01	0.01	0.0%	0.01	0.01	0.0%
Other flatfish	0.31	0.33	6.1%	0.30	0.32	6.3%
Other groundfish	0.00	0.00	-	0.00	0.00	-
Other rockfish	0.14	0.15	6.7%	0.13	0.14	7.1%
Ecosystem component species	90.38	96.85	6.7%	86.12	92.38	6.8%

Table 4-168.Alternative 1. Projected non-nearshore groundfish mortality for the limited entry and open access fixed gear fisheries north of 36° N. lat. (in mt) for 2021 compared to the non-trawl allocation (excluding proposed routine adjustments). Projections are based on a sablefish DHCR of P* 0.45 and Method 2.

Stock/Stock Complex	Management Area	Limited Entry (mt)	Open Access (mt)	Total (mt)	Non-Trawl Alloc. [a/] (mt)
Arrowtooth flounder	Coastwide	59.27	9.96	69.23	391.9
Big skate	Coastwide	9.00	1.54	10.54	71.0
Black rockfish	California	0.02	0.00	0.02	346.7
Bocaccio	S. of 40° 10’ N. lat.	0.32	0.09	0.41	1,036.4
Canary rockfish [b/]	Coastwide	1.39	0.24	1.63	352.4
Chilipepper rockfish	S. of 40° 10’ N. lat.	0.44	0.12	0.56	567.4
Darkblotched rockfish	Coastwide	5.98	1.12	7.10	42.4
Dover sole	Coastwide	6.31	1.32	7.63	2,420.1
English sole	Coastwide	0.04	0.01	0.04	446.2
Lingcod	N. of 40° 10’ N. lat.	15.79	2.21	17.99	2,799.8
Lingcod	S. of 40° 10’ N. lat.	1.95	1.98	3.93	599.0
Longnose skate	Coastwide	73.25	13.37	86.63	157.2
Longspine thornyhead	N. of 34° 27’ N. lat.	2.00	0.49	2.49	129.0
Mixed thornyheads	-	0.98	0.26	1.24	--
Pacific cod	Coastwide	2.50	0.43	2.93	54.7
Pacific hake	Coastwide	0.89	0.16	1.05	0.0
Pacific ocean perch	N. of 40° 10’ N. lat.	0.74	0.12	0.86	191.5
Petrale sole	Coastwide	1.41	0.25	1.66	129.4
Shortbelly rockfish	Coastwide	0.01	0.00	0.01	0.0
Shortspine thornyhead	N. of 34° 27’ N. lat.	32.78	7.06	39.85	67.5
Spiny dogfish	Coastwide	139.10	23.90	163.00	--
Splitnose rockfish	S. of 40° 10’ N. lat.	0.05	0.02	0.08	82.4
Starry flounder	Coastwide	0.01	0.00	0.01	171.8
Widow rockfish	Coastwide	0.23	0.04	0.27	1,302.9
Yellowtail rockfish	N. of 40° 10’ N. lat.	1.08	0.18	1.27	596.6
Black/Blue/Deacon rockfish [c/]	Oregon	0.01	0.00	0.01	567.3
Minor nearshore rockfish	N. of 40° 10’ N. lat.	0.14	0.02	0.17	75.9
Minor nearshore rockfish	S. of 40° 10’ N. lat.	0.00	0.00	0.00	1,011.5
Minor shelf rockfish	N. of 40° 10’ N. lat.	5.91	1.00	6.91	571.4
Minor shelf rockfish	S. of 40° 10’ N. lat.	0.11	0.03	0.15	1,163.5
Minor slope rockfish	N. of 40° 10’ N. lat.	107.02	17.83	124.85	290.3
Minor slope rockfish	S. of 40° 10’ N. lat.	22.27	7.84	30.11	247.9
Cabezon/Kelp greenling	Oregon	0.01	0.00	0.01	197.7
Other flatfish	Coastwide	0.30	0.05	0.35	458.1
Other groundfish	--	0.00	0.00	0.00	--
Other rockfish	--	0.12	0.03	0.16	--

Stock/Stock Complex	Management Area	Limited Entry (mt)	Open Access (mt)	Total (mt)	Non-Trawl Alloc. [a/] (mt)
Ecosystem component species	--	82.20	21.01	103.20	--

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.

b/ The non-nearshore share for canary rockfish in 2021 is 46.5 mt.

c/ In 2019, new complexes were formed for OR black/blue/deacon rockfish

Table 4-169. Alternative 1. Projected groundfish mortality for the limited entry and open access fixed gear fisheries north of 36° N. lat. (in mt) for 2022 compared to the non-trawl allocation. Projections are based on a sablefish DHCR of P* 0.45 and Method 2.

Stock/Stock Complex	Management Area	Limited Entry (mt)	Open Access (mt)	Total (mt)	Non-Trawl Alloc. [a/] (mt)
Arrowtooth flounder	Coastwide	56.45	9.96	66.41	318.1
Big skate	Coastwide	8.57	1.53	10.11	66.6
Black rockfish	California	0.02	0.00		339.7
Bocaccio	S. of 40° 10’ N. lat.	0.30	0.08	0.39	1,021.8
Canary rockfish [b/]	Coastwide	1.32	0.24	1.56	344.0
Chilipepper rockfish	S. of 40° 10’ N. lat.	0.42	0.11	0.53	542.7
Darkblotched rockfish	Coastwide	5.69	1.12	6.81	39.9
Dover sole	Coastwide	6.01	1.30	7.31	2,420.1
English sole	Coastwide	0.03	0.01	0.04	442.5
Lingcod	N. of 40° 10’ N. lat.	15.04	2.21	17.24	2,573.0
Lingcod	S. of 40° 10’ N. lat.	1.86	1.97	3.82	638.3
Longnose skate	Coastwide	69.77	13.26	83.03	151.0
Longspine thornyhead	N. of 34° 27’ N. lat.	1.90	0.47	2.37	119.9
Mixed thornyheads		0.93	0.25	1.18	--
Pacific cod	Coastwide	2.38	0.43	2.81	54.7
Pacific hake	Coastwide	0.85	0.16	1.01	0.0
Pacific ocean perch	N. of 40° 10’ N. lat.	0.70	0.12	0.83	184.3
Petrale sole	Coastwide	1.34	0.25	1.59	162.5
Shortbelly rockfish	Coastwide	0.00	0.00	0.01	0.0
Shortspine thornyhead	N. of 34° 27’ N. lat.	31.22	6.88	38.11	67.5
Spiny dogfish	Coastwide	132.48	23.87	156.35	--
Splitnose rockfish	S. of 40° 10’ N. lat.	0.05	0.02	0.07	82.4
Starry flounder	Coastwide	0.01	0.00	0.01	171.8
Widow rockfish	Coastwide	0.22	0.04	0.26	1,302.9
Yellowtail rockfish	N. of 40° 10’ N. lat.	1.03	0.18	1.21	596.6
Minor nearshore rockfish	N. of 40° 10’ N. lat.	0.13	0.02	0.16	559.3
Black/Blue/Deacon rockfish [c/]	Oregon	0.01	0.00	0.01	73.9
Minor nearshore rockfish	S. of 40° 10’ N. lat.	0.00	0.00	0.00	1,005.5

Stock/Stock Complex	Management Area	Limited Entry (mt)	Open Access (mt)	Total (mt)	Non-Trawl Alloc. [a/] (mt)
Minor shelf rockfish	N. of 40° 10' N. lat.	5.63	1.00	6.63	547.1
Minor shelf rockfish	S. of 40° 10' N. lat.	0.11	0.03	0.14	1,154.7
Minor slope rockfish	N. of 40° 10' N. lat.	101.93	17.83	119.75	285.2
Minor slope rockfish	S. of 40° 10' N. lat.	21.21	7.56	28.76	246.5
Cabezon/Kelp greenling	Oregon	0.01	0.00	0.01	189.7
Other flatfish	Coastwide	0.29	0.05	0.34	461.7
Other groundfish	--	0.00	0.00	0.00	--
Other rockfish	--	0.12	0.03	0.15	--
Ecosystem component species	--	78.29	20.16	98.45	--

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.
b/ The non-nearshore share for canary rockfish in 2021 is 46.5 mt.
c/ In 2019, new complexes were formed for OR black/blue/deacon rockfish.

Table 4-170. Comparison of 2021/2022 No Action to Alternative 1 projected groundfish LEFG and OA mortality for fisheries north of 36° N. lat. (in mt) under Method 2

Stock/Stock Complex	2021			2022		
	No Action	Alt 1	% change	No Action	Alt 1	% change
Arrowtooth flounder	64.62	69.23	6.7%	61.92	66.41	6.8%
Big skate	9.83	10.54	6.7%	9.42	10.11	6.8%
Black rockfish	0.02	0.02	0.0%	0.02	.02	0.0%
Bocaccio	0.38	0.41	7.3%	0.36	0.39	7.7%
Canary rockfish [b/]	1.52	1.63	6.7%	1.45	1.56	7.1%
Chilipepper rockfish	0.52	0.56	7.1%	0.50	0.53	5.7%
Darkblotched rockfish	6.63	7.10	6.6%	6.35	6.81	6.8%
Dover sole	7.12	7.63	6.7%	6.82	7.31	6.7%
English sole	0.04	0.04	0.0%	0.04	0.04	0.0%
Lingcod	16.79	17.99	6.7%	16.08	17.24	6.7%
Lingcod	3.67	3.93	6.6%	3.56	3.82	6.8%
Longnose skate	80.85	86.63	6.7%	77.42	83.03	6.8%
Longspine thornyhead	2.32	2.49	6.8%	2.21	2.37	6.8%
Mixed thornyheads	1.15	1.24	7.3%	1.10	1.18	6.8%
Pacific cod	2.73	2.93	6.8%	2.62	2.81	6.8%
Pacific hake	0.98	1.05	6.7%	0.94	1.01	6.9%
Pacific ocean perch	0.80	0.86	7.0%	0.77	0.83	7.2%
Petrale sole	1.55	1.66	6.6%	1.48	1.59	6.9%
Shortbelly rockfish	0.01	0.01	0.0%	0.01	0.01	0.0%
Shortspine thornyhead	37.19	39.85	6.7%	35.53	38.11	6.8%
Spiny dogfish	152.13	163.00	6.7%	145.78	156.35	6.8%
Splitnose rockfish	0.07	0.08	12.5%	0.07	0.07	0.0%

Stock/Stock Complex	2021			2022		
	No Action	Alt 1	% change	No Action	Alt 1	% change
Starry flounder	0.01	0.01	0.0%	0.01	0.01	0.0%
Widow rockfish	0.25	0.27	7.4%	0.24	0.26	7.7%
Yellowtail rockfish	1.18	1.27	7.1%	1.13	1.21	6.6%
Black/Blue/Deacon rockfish[c/]	0.01	0.01	0.0%	0.01	0.01	-
Minor nearshore rockfish	0.15	0.17	11.8%	0.15	0.16	0.06%
Minor nearshore rockfish	0.00	0.00	-	0.00	0.00	-
Minor shelf rockfish	6.45	6.91	6.7%	6.18	6.63	6.8%
Minor shelf rockfish	0.14	0.15	6.7%	0.13	0.14	7.1%
Minor slope rockfish	116.52	124.85	6.7%	111.66	119.75	6.8%
Minor slope rockfish	28.10	30.11	6.7%	26.82	28.76	6.7%
Cabezon/Kelp greenling	0.01	0.01	0.0%	0.01	0.01	0.0%
Other flatfish	0.33	0.35	5.7%	0.31	0.34	8.8%
Other groundfish	0.00	0.00	0.0%	0.00	0.00	0.0%
Other rockfish	0.15	0.16	6.3%	0.14	0.15	6.7%
Ecosystem component species	96.32	103.20	6.7%	91.78	98.45	6.8%

Impact (Groundfish Mortality) – Non-Nearshore South of 36° N. latitude

Impacts for non-nearshore south of 36° N. lat management measures under Alternative 1 are the same as under No Action.

Impact (Groundfish Mortality) - Nearshore – Alternative 1

Projected landings, routine management measures, and projected mortality would be the same as No Action since the Alternative 1 harvest specifications are for stocks that are rarely encountered by the nearshore fisheries (i.e., shortbellly rockfish, sablefish, cowcod south of 40°10' N. lat., shortbelly rockfish, and petrale sole).

The one exception is that Alternative 1 for Oregon black rockfish would increase Oregon's unofficial state-specified landings target for the nearshore fishery from 113.0 mt and 112.2 mt in 2021-22, respectively, to 120.8 mt in both years of 2021-22. Alternative 1 for Oregon black rockfish would be expected to increase landings by 7.8 mt and ex-vessel revenue by $36,000 in 2021, and 8.6 mt in landings and $40,000 in ex-vessel revenue in 2022 (compared to No Action using a P*0.45). Alternative 1 for Oregon black rockfish is projected to increase the Oregon nearshore mortality of yelloweye rockfish by 0.1 mt to 1.6 mt compared to 1.5 mt under No Action (Table 4-120). An additional 0.1 mt of yelloweye rockfish would be projected for the Oregon nearshore fishery if the higher Option 2 LEFG and OA lingcod trip limits are adopted to the north of 42° N. lat. (as discussed under No Action). The maximum projected yelloweye rockfish for the Oregon nearshore fishery would be 1.7 in 2021-22 if both changes occur, which would be ~50 percent of the Oregon shares of the 2021-22 ACTs.

Additional Management Measures

There are no additional new management measures proposed under Alternative 1.

4.2.3.8 Tribal Fisheries

Tribal fisheries would operate under the HGs and allocations displayed in Table 4-125 and Table 4-126. Tribal fisheries would be managed using the same measures described under No Action. As described under No Action, the Tribal sablefish allocation is a set percentage of the ACL. Table 4-171 shows the allocations under Alternative 1 and both apportionment methods.

Table 4-171. Potential Tribal allocations of sablefish under Alternative 1 based on apportionment Methods 1 and 2.

Year	Alternative 1	
	Method 1	Method 2
2021	647	689
2022	616	657

4.2.3.9 Washington Recreational Management Measures

Under Alternative 1, Washington recreational fisheries would operate under the same ACLs and associated Washington recreational HGs and ACTs and the same management approach as No Action (Table 4-127).

4.2.3.10 Oregon Recreational Management Measures

Management Measures – Alternative 1

Alternative 1 analyzes the default HCR ACLs, except cowcod, , black/blue/deacon rockfish OR complex, petrale sole and shortbelly rockfish. The management measures for the Oregon recreational fisheries are responsive to the black/blue/deacon rockfish OR complex ACLs (based on the case-by-case use of a constant ACL contribution for the black rockfish; Table 4-172). As under No Action, the primary catch controls for the Oregon recreational fishery are season dates, depth closures, bag limits, and GCAs, including YRCAs.

Under Alternative 1, the presumed black/blue/deacon rockfish OR complex ACL and associated Oregon recreational HG of 462.8 mt and 460.3 mt (Table 4-172) for 2019-2020, respectively, is higher than under No Action (Table 4-172 and Table 4-132, 457.1 and 450.6 mt) and the same as what is currently in regulation for 2019. Even with the black rockfish increases compared to No Action, black rockfish will be the primary species driving management measures adjustments in the Oregon recreational fishery.

Table 4-172. Alternative 1. Oregon recreational Federal harvest guidelines (HG) or state quotas under Alternative 1 (mt).

Stock	2021 HG [a/]	2022 HG [a/]
Black/Blue/Deacon Rockfish Complex OR a/	462.8	460.3
Canary rockfish b/ (Option 1/Option 2)	65/75	63.4/75
Cabezon/Greenling Complex OR c/	55.2	53
Nearshore Rockfish North of 40°10' N. Lat.	10.8	10.5
YELLOWEYE ROCKFISH (HG/ACT)	6.9/8.8	7.1/9.0

a/ The state process in Oregon establishes the commercial and recreational quotas for black, blue, and deacon rockfish. The values are the recreational share based on the 2019 recreational and commercial sharing percentages in Oregon state regulations.
b/ Federal HGs are established for canary and yelloweye rockfish and should be included in Federal regulation

c/ Includes kelp and other greenlings. Kelp greenling accounts for over 99 percent of the landings. The state process in Oregon establishes the commercial and recreational shares for the cabezon/greenling OR complex. The values are the recreational share based on the 2019 recreational and commercial sharing percentages in Oregon state regulations.

Groundfish Seasons and Area Restrictions

Season Structure

Under Alternative 1, the Oregon recreational groundfish fishery would be open offshore year-round (Figure 4-35). This is the same season structure as under No Action. The seasonal depth restrictions, implemented during periods of the highest angler effort and yelloweye rockfish encounters, have been used in the past to mitigate mortality of yelloweye rockfish. Shallow depth restrictions increase encounters, and associated mortality impacts, with more nearshore species such as black rockfish. Under Alternative 1, the state-specified black/blue/deacon rockfish OR complex and nearshore rockfish north complex species will drive the season structure more than yelloweye rockfish. Therefore, the season structure and bag limit are designed to balance impacts to black/blue/deacon rockfish OR and nearshore rockfish north complexes while staying within the updated yelloweye rockfish HGs. Projected mortality of yelloweye rockfish is within the Federal HGs/ACTs, therefore the shore-based fishery would also be open year-round.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bottomfish Season	Open all depths											
Marine Bag Limit [a/]	Ten (10)											
Lingcod Bag Limit	Three (3)											
Flatfish Bag Limit [b/]	Twenty Five (25)											

a/ Marine bag limit is 10 fish per day and includes all species other than lingcod, salmon, steelhead, Pacific halibut, flatfish, surfperch, sturgeon, striped bass, pelagic tuna and mackerel species, and bait fish such as herring, anchovy, sardine, and smelt; of which no more than one may be cabezon.
b/ Flounders, soles, sanddabs, turbots, and halibuts except Pacific halibut

Figure 4-35. Oregon recreational groundfish season structure and bag limits under Alternative 1.

Area Restrictions

The same area restrictions as under the No Action Alternative would be in place under Alternative 1. The Stonewall Bank YRCA is an area of known high yelloweye rockfish concentrations, therefore keeping it closed should help to ensure that the HG is not exceeded.

Groundfish Bag Limits and Size Limits

The same bag limits and size limits under the No Action Alternative would be in place under Alternative 1.

Pacific Halibut Seasons

Under Alternative 1, the recreational Pacific halibut fisheries should be able to proceed under the No Action Alternative.

Additional Considerations

Under Alternative 1, the black/blue/deacon rockfish OR complex HGs will be higher than under No Action. Given recent high bottomfish effort trends, and the stable or decreasing HGs for those complex, and recent years catch rates (fish/per angler trip), the modeling shows that those species HG would be met before any other species. Yelloweye rockfish HG used to be the most constraining for the OR rec fishery and bag limits, season structures, etc. were set up around limiting bycatch mortality to that species. Now black

rockfish and the other nearshore rockfish complex species are the HGs that are reached first in all modeling. Therefore, the season structure is set around staying within the HG for those species. Adjustments to routine and currently available management measures, as described No Action (and Baseline) would be used to keep recreational harvests of overfished species within specified Federal HGs under Alternative 1.

As under No Action, under Alternative 1, the midwater recreational fishery targeting yellowtail rockfish would be available.

Inseason Management Response

The same inseason response as described under No Action will be in place under Alternative 1.

Impact (Groundfish Mortality)

The annual projected mortality presented in Table 4-109 is anticipated, given the season structure and bag limits detailed above. The model uncertainties are the same as described under No Action, except for yelloweye rockfish. The recreational groundfish fishery has not been open at all-depth year round since 2003. Therefore, there is some uncertainty in the projected estimates for the high effort and impact months of June, July, and August, particularly for yelloweye rockfish. Yelloweye rockfish impacts would increase due to the increased encounter rate and higher discard mortality rate at deeper depth, even with no retention allowed.

With the fishery being open to all depth year round, the projected impacts to black rockfish decrease from what is projected under No Action. As anglers are allowed to fish deeper depths they encounter and catch fewer black rockfish. The projected impacts to lingcod, and yellowtail and widow rockfish increase compared to No Action. However, the impacts should be well within the non-trawl sector allocations.

If it is necessary to close the recreational groundfish fishery inseason due to attainment of a particular species, the offshore longleader gear would be available as an alternative opportunity. The projected impacts would be within what is estimated in Table 4-173 which has estimates for a full year all-depth season, since the longleader gear opening would be more restrictive than the full year all-depth season.

Table 4-173. Alternative 1, Projected Mortality (mt) of species with Oregon recreational specific allocations

Stock	Projected Mortality (mt)
Canary rockfish	61.7
YELLOWEYE ROCKFISH	4.9
Black/Blue/Deacon Rockfish OR	376.7
Cabezon/Greenlings a/	32.9
Nearshore Rockfish North of 40° 10' N. lat.	27.0
Yellowtail Rockfish	60.5
Widow Rockfish	13.2

a/ Includes kelp and other greenlings

4.2.3.11 California Recreational Management Measures

Management Measures – Alternative 1

Under Alternative 1, Table 4-174 shows the CA recreational allocations. The cowcod harvest specification would be 87/85 mt for 2021-2022, respectively. In response to the uncertainty in the assessment, a more conservative reduction to the Fishery HG is proposed by evaluating a lower Fishery ACT range between 40-60 mt for both years. The range of 40-60 mt is then further divided into the trawl/non-trawl allocation shares (36 percent trawl, 64 percent non trawl) followed by a proposal to split the within non-trawl fishery at 50:50 between recreational and commercial. This results in a range of possible ACT values of 12.8-19.2 mt for the CA recreational fishery (Figure 4-36).

Table 4-174. Alternative 1 – California Recreational: Allocations (mt) to the non-trawl sector and shares (mt) for the California recreational fisheries for 2021 and 2022.

Stock	Non-Trawl Allocation (mt)	California Recreational HG (mt)
Bocaccio	1036.4/1021.8	716.2/706.1
Canary rockfish	406.5	[O1]116.7/ 113.8 [O2]135
Cowcod	25.6-38.4	12.8-19.2
Darkblotched	42.4/39.9	
Nearshore rockfish North of 40°10´ N lat.	78.6/73.9	
POP	191.5/184.3	
Petrale sole	186.4/163.6	
Yelloweye Rockfish	37.9/38.8	11.4/11.7

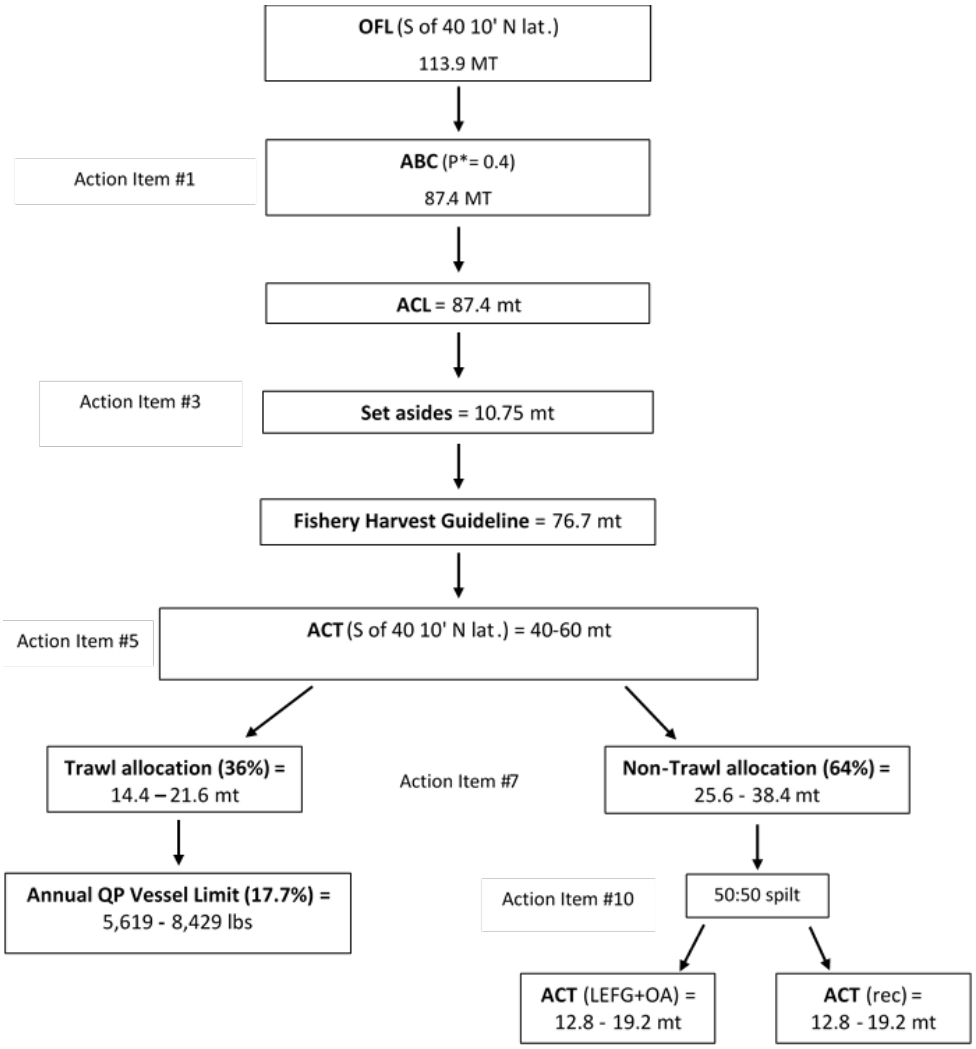

Figure 4-36. Alternative 1: 2021 specifications at (P* = 0.4 and ACL = ABC). Off the top set aside of 10.3 mt. Allocation numbers are reported from Table 5 in November 2019 Action Item H.6.a GMT Report #2.

Sub Options within Alternative 1 Overview

Option 1: Implements new sub-bag limits for select species within the RGC complex as described below. All other sections are the same as described under No Action. Figure 4-37

Option 2: Implements the new sub-bag limits from Option 1 and also modifies RCA depth boundaries in three management areas (refer to Section 4.2.5.3). All other sections are the same as described under No Action. Figure 4-38

Option 3: Implements the new sub-bag limits from Option 1 and eliminates season and RCA depth boundary restrictions in the five management areas statewide, which results in an all-depth fishery open year-round (does not apply to the CCAs). All other management measures are the same as described under No Action. Figure 4-39

Groundfish Seasons and Area Restrictions

Season Structure

Option 1: The season dates are the same as described under No Action.

Option 2: The season dates are the same as described under No Action.

Option 3: The season would be open January 1 – December 31 in all five management areas (i.e. statewide).

Area Restrictions

Option 1: The recreational RCAs, CCAs, and YRCAs are the same as described under No Action.

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	Closed				May 1 – Oct 31 <30fm						All Depth	
Mendocino	Closed				May 1 – Oct 31 <20fm						All Depth	
San Francisco	Closed			April 1 – Dec 31 <40fm								
Central	Closed			April 1 – Dec 31 <50fm								
Southern	Closed		Mar 1 – Dec 31 <75 fm									

Figure 4-37. Alternative 1, Option 1: California recreational groundfish season structure and RCA boundaries

Option 2: The recreational RCAs are proposed to be modified in three management areas. The Mendocino Management Area depth restriction would be extended from 20 fm to 30 fm, the San Francisco Management Area depth restriction would be extended from 40 fm to 50 fm, and the Southern Management Area depth restriction would be extended from 75 fm to 100 fm. All other area restrictions (remaining RCAs, CCAs, YRCAs) are the same as described under No Action.

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	Closed				May 1 – Oct 31 <30fm						All Depth	
Mendocino	Closed				May 1 – Oct 31 <30fm						All Depth	
San Francisco	Closed			April 1 – Dec 31 <50fm								
Central	Closed			April 1 – Dec 31 <50fm								
Southern	Closed		Mar 1 – Dec 31 <100 fm									

Figure 4-38. Alternative 1, Option 2: California recreational groundfish season structure RCA depth boundary modifications to the Mendocino, San Francisco, and Southern Management Areas

Option 3: The RCAs are removed in all five management areas, allowing access at all-depths. All other area restrictions (CCAs, YRCAs) are the same as described under No Action .

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	Jan 1 – Dec 31; Open all depths											
Mendocino	Jan 1 – Dec 31; Open all depths											
San Francisco	Jan 1 – Dec 31; Open all depths											
Central	Jan 1 – Dec 31; Open all depths											
Southern	Jan 1 – Dec 31; Open all depths											

Figure 4-39. Alternative 1, Option 3: California recreational groundfish season structure open year-round and statewide, RCA depth boundaries removed for all five management areas.

Groundfish Bag Limits Gear Limits and Size Limits

Under Options 1, 2 and 3, the same species-specific sub-bag limits within the 10 fish RGC limit are evaluated. These sub-bag limits are as follows:

- Cabezon: removal of the sub-bag limit - allow up to 10 fish.
- Black rockfish: removal of the sub-bag limit - up to 10 fish.
- Canary rockfish: removal of the sub-bag limit - up to 10 fish.
- Vermilion rockfish: implementing a new sub-bag limit - as few as 2 fish

The 2019 stock assessment of cabezon noted that both California sub-stocks have hit their rebuilding goals. Increasing the sub-bag limit for cabezon from three to ten fish allows recreational anglers additional opportunities to benefit from a healthy stock.

Retention of canary rockfish by recreational anglers in California was first allowed in the 2017-2018 cycle. Following a precautionary approach, the initial sub-bag limit of one fish was set for 2017, which was then increased to a two fish sub-bag limit for the 2018 season through an inseason action. Continued low attainment (reason unknown) of the 2018 California recreational HG (March 2019 G5a Supplemental CDFW Report 1) allowed an additional inseason action effective June 1, 2019 which increased the sub-bag limit to three fish. The increased limit resulted in approximately 10 mt more catch than in 2018. Fishery mortality in 2019 under the 3-fish sub-bag limit continued to be significantly below the CA recreational HG, which prompted the sub-bag limit proposal to increase up to 10 fish for 2021-2022.

For black rockfish, the recreational fishery has steadily declined in performance since 2017 the cause of which is unknown. For the 2019 fishing year, an inseason management action was taken to increase the black rockfish sub-bag limit from 3 fish to 4 fish, effective June 1, 2019 which resulted in 109.3 mt caught in 2019 (and increase of approximately 14 mt compared to 2018) out of the 329 mt non-trawl allocation (informally shared between recreational and commercial sectors). Despite the increased catch attainment, the total harvest is still well below the non-trawl allocation which prompted the consideration to increase the sub-bag limit, including potential removal with allowance of up to 10 fish for 2021-2022. This change would provide additional fishing opportunities and may shift pressure away from yelloweye rockfish (Agenda Item G5a Supplemental CDFW Report 1, March 2019).

Vermilion rockfish is managed as part of the minor shelf rockfish complex south of 40° 10’ N. Lat. Catch of vermilion rockfish in California’s recreational fishery has recently been increasing such that the stock’s OFL contribution to the complex has been exceeded from 2015-2019, however the overall complex ACL limit has not been exceeded. Review of recent attainments prompted the proposal for additional management measures to be considered to slow catch until such time that vermilion rockfish can be fully assessed. In consideration of the proposed depth boundaries changes that could result in continued vermilion interactions, a new sub-bag limit of as few as 2 vermilion within the 10 fish RCG limit is being proposed. There is currently no inseason tracking mechanism for vermilion rockfish and therefore post-season review of catch estimates will be conducted to inform future sub-bag limit changes.

Lingcod Seasons, Bag Limits, Hook Limits, and Size Limits

Same as described under No Action.

California Scorpionfish Seasons, Bag Limits, and Size Limits

Same as described under No Action.

Pacific Halibut Seasons

Same as described under No Action.

Inseason Management Response

Same as described under No Action.

Impact (Groundfish Mortality)

Option 1: The projected mortality for all species is similar to the No Action Alternative, except for the select species for which sub-bag limit increases are being considered (Table 4-175) which are: canary rockfish, black rockfish, and cabezon. The increased mortality for those species is projected to remain below the non-trawl allocation or California recreational HG as appropriate.

Table 4-175. Alternative 1, Option 1: Projected mortality in the California recreational fishery in 2021-2022. Parenthetical and bracketed items show projected mortality under different bag limits for cabezon and canary and black rockfish. Option =[O]

Stock	Projected Recreational Mortality 2021/22	California Recreational HG 2021/22	Non-Trawl Allocation 2021/22[a]
Bocaccio	152.9	716.2/706.1	1036.4/1021.8
Canary Rockfish (5)[10]	69.8 (85.0) [102.9]	[O1]116.7/113.8 [O2]135	406.5
Cowcod	2.7	12.8-19.2	25.6-38.4
Yelloweye Rockfish	6.0	11.4/11.7	37.9/38.8
Black Rockfish (5)[10]	112.6 (162.2) [197.7]	-	346.7/339.7
Cabezon (10)	23.7 (25.8)	-	208.7/193.7
California Scorpionfish	157	-	287.1/271.1
Greenlings b/	5.1	-	b/
Lingcod N. of 40°10' N. lat. c/	48.9	-	2799.8/2573.8
Lingcod S. of 40°10' N. lat.	357.9	-	[O1] 599/637.5 [O2] 620.1/660.6 [O3] 816.8/869.2
Widow Rockfish	20.6	-	1302.9/1218.6
Nearshore Rockfish N. of 40°10' N. lat. d/	20.0	-	78.6/73.9

Stock	Projected Recreational Mortality 2021/22	California Recreational HG 2021/22	Non-Trawl Allocation 2021/22[a]
Nearshore Rockfish S. of 40°10' N. lat.	535.4	-	1011.6/1005.6
Petrale sole	6.1	-	186.4/163.6
Starry flounder	3.5	-	171.8

a/ Includes non-nearshore, nearshore, and recreational.

b/ Greenling is managed within the Other Fish Complex

c/ Projected impacts include only the area between 42° N latitude and 40°10' N latitude, while the non-trawl allocation is applicable for the entire area North of 40°10' N latitude.

d/not an official non-trawl allocation in regulation, but rather the sum of the WA, OR, CA state HGs that are managed to by the states as to not exceed the ACL when also factoring in minor IOA, tribal, EFP, research, and trawl impacts

Option 2: The RCA depth restrictions being considered in Option 2 leads to modest changes in projected mortality compared to Option 1 (Table 4-176). Bocaccio, canary rockfish, cowcod, yelloweye rockfish, black rockfish, widow rockfish, lingcod south of 40°10' N. lat., and nearshore rockfish south of 40°10' N. lat. are all projected to have mortality slightly higher than Option 1. The additional depth in the Southern Management Area is expected to increase cowcod mortality but total mortality is still projected to be below the Fishery HG under this alternative. The projected increase in yelloweye rockfish mortality of 8.5 mt remains under the more conservative fishery ACT of 8.9/9.2 mt and well under the fishery HG of 11.4/11.7 mt.

Table 4-176. Alternative 1, Option 2: Projected mortality in the California recreational fishery in 2021-2022. Parenthetical and bracketed items show projected mortality under different bag limits for cabezon and canary and black rockfish. Option =[O]

Stock	Projected Recreational Mortality	California Recreational HG 2020/21	Non-Trawl Allocation 2021/22[a]
Bocaccio	179.9	716.2/706.1	1036.4/1021.8
Canary Rockfish (5)[10]	83.8 (104.1) [117.4]	[O1] 116.7/113.8 [O2] 135	406.5
Cowcod	4.1	12.8-19.2	25.6-38.4
Yelloweye Rockfish	8.5	11.4/11.7	37.9/38.8
Black Rockfish (5)[10]	114.9 (162.8) [197.8]	-	346.7/339.7
Cabezon (10)	23.5 (25.6)	-	208.7/193.7
California Scorpionfish	157.1	-	287.1/271.1
Greenlings b/	5.1	-	b/
Lingcod N. of 40°10' N. lat. c/	48.9	-	2799.8/2573.8
Lingcod S. of 40°10' N. lat.	419.5	-	[O1] 599/637.5 [O2] 620.1/660.6 [O3] 816.8/869.2

Stock	Projected Recreational Mortality	California Recreational HG 2020/21	Non-Trawl Allocation 2021/22[a]
Widow Rockfish	30.2	-	1302.9/1218.6
Nearshore Rockfish N. of 40°10' N. lat. d/	20.0	-	78.6/73.9
Nearshore Rockfish S. of 40°10' N. lat.	548.3	-	1011.6/1005.6
Petrale sole	6.1	-	186.4/163.6
Starry flounder	3.5	-	171.8

a/ Includes non-nearshore, nearshore, and recreational.

b/ Greenling is managed within the Other Fish Complex

c/ Projected impacts include only the area between 42° N latitude and 40°10' N latitude, while the non-trawl allocation is applicable for the entire area North of 40°10' N latitude.

d/not an official non-trawl allocation in regulation, but rather the sum of the WA, OR, CA state HGs that are managed to by the states as to not exceed the ACL when also factoring in minor IOA, tribal, EFP, research, and trawl impacts

Option 3: The projected mortality under Option 3 shows further increases for most species (Table 4-177). Projected catch of yelloweye would exceed both the ACT and Fishery HG. Canary rockfish catch would exceed the HG for all sub-bag limit options modeled. Catch of black rockfish would exceed the non-trawl allocation under a 5 or 10 fish sub-bag limit.

Table 4-177. Alternative 1, Option 3: Projected mortality in the California recreational fishery in 2021-2022. Parenthetical and bracketed items show projected mortality under different bag limits for cabezon and canary and black rockfish. Option =[O]

Stock	Projected Recreational Mortality	California Recreational HG 2020/21	Non-Trawl Allocation 2021/22[a]
Bocaccio	464.1	716.2/706.1	1036.4/1021.8
Canary Rockfish (5)[10]	156.0 (191.3) [193.6]	[O1] 116.7/113.8 [O2] 135	406.5
Cowcod	7.7	12.8-19.2	25.6-38.4
Yelloweye Rockfish	23.0	11.4/11.7	37.9/38.8
Black Rockfish (5)[10]	122.7 (195.0) [257.0]		346.7/339.7
Cabezon (10)	25.3 (27.5)		208.7/193.7
California Scorpionfish	157.1		287.1/271.1
Greenlings b/	5.7		b/
Lingcod N. of 40°10' N. lat. c/	63.3		2799.8/2573.8
Lingcod S. of 40°10' N. lat.	573.2		[O1] 599/637.5

Stock	Projected Recreational Mortality	California Recreational HG 2020/21	Non-Trawl Allocation 2021/22[a]
			[O2] 620.1/660.6 [O3] 816.8/869.2
Widow Rockfish	144.1		1302.9/1218.6
Nearshore Rockfish N. of 40°10' N. lat. d/	30.0		78.6/73.9
Nearshore Rockfish S. of 40°10' N. lat.	731.3		1011.6/1005.6
Petrale sole	6.1		186.4/163.6
Starry flounder	3.5		171.8

a/ Includes non-nearshore, nearshore, and recreational.

b/ Greenling is managed within the Other Fish Complex

c/ Projected impacts include only the area between 42° N latitude and 40°10' N latitude, while the non-trawl allocation is applicable for the entire area North of 40°10' N latitude.

d/not an official non-trawl allocation in regulation, but rather the sum of the WA, OR, CA state HGs that are managed to by the states as to not exceed the ACL when also factoring in minor IOA, tribal, EFP, research, and trawl impacts

4.2.4 Alternative 2

4.2.4.1 Deductions from the ACL

Under Alternative 2, the deductions from groundfish ACLs for the treaty Indian tribal fisheries, scientific research, non-groundfish target fisheries (incidental open access fisheries), recreational (sablefish north of 36° N. lat. only), and EFPs are the same as described under Alternative 1. For cowcod and petrale sole, shows the resulting HGs based on the Alternative 2 ACLs (Table 4-178).

Table 4-178. Alternative 2. Fishery HGs for cowcod rockfish south of 40° 10' N. lat. and petrale sole under Alternative 2 ACLs.

Stock	Area	Year	ACL	Tribal	EFP	Research	OA	Sum	Fishery HG
Cowcod	S of 40°10' N. lat.	2021	69	-	0.85	10.0	0.2	10.85	58.2
		2022	66	-	0.85	10.0	0.2	10.85	55.2
Petrale Sole	Coastwide	2021	3,600	350.0	0.1	24.1	13.3	387.5	3,212.5
		2022	3,600	350.0	0.1	24.1	13.3	387.5	3,212.5

4.2.4.2 Allocating the Fishery HG

Under Alternative 2, the allocation percentages are the same as described under Alternative 1; however, the ACLs for cowcod and petrale sole are different from No Action and Alternative 1. These different ACLs therefore result in different HGs and are shown below in Table 4-177 and summarize the stock specific HGs for these species in 2021 and 2022. Note that these allocations for petrale sole are based on the status quo allocation options (Table 4-63), but all allocation options shown in Table 4-63 could be applied. However, the full range of cowcod ACT options described in Table 4-50 would not be available as the fishery HG ranges from 48.7-51.6 mt.

Table 4-179. Alternative 2 2021. Stock-specific fishery HGs or ACTs and allocations for 2021 (in mt).

Species	Area	Allocation Type	Fishery HG	Trawl		Non-Trawl	
				%	mt	%	mt
Cowcod	S of 40°10' N. lat.	Biennial	58.2	36%	21.0	64%	37.2
			55.2	36%	19.9	64%	35.3
Petrale Sole	Coastwide	Biennial	3,212.5	-	3,207	-	30
			3,212.5	-	3,207.5	-	30

4.2.4.3 Rebuilding Species Allocation.

The rebuilding species, i.e. yelloweye rockfish, allocations are the same as described under No Action, see Table 4-63.

Shortbelly rockfish

Alternative 2 was proposed by the Council, and would identify shortbelly rockfish an EC species. EC species (see 50 CFR §§600.305(c)(13) and 600.310(d)(1)) are stocks that a Council or the Secretary of Commerce has determined do not require conservation and management, but desire to list in a FMP in order

to achieve ecosystem management objectives. The 2016 revisions to the National Standards clarify factors to consider when determining which stocks are in need of conservation and management, and therefore cannot be designated as EC species. These factors include:

- The stock is an important component of the marine environment.
- The stock is caught by the fishery.
- Whether an FMP can improve or maintain the condition of the stock.
- The stock is a target of a fishery.
- The stock is important to commercial, recreational, or subsistence users.
- The fishery is important to the Nation or to the regional economy.
- The need to resolve competing interests and conflicts among user groups and whether an FMP can further that resolution.
- The economic condition of a fishery and whether an FMP can produce more efficient utilization.
- The needs of a developing fishery, and whether an FMP can foster orderly growth.
- The extent to which the fishery is already adequately managed by states, by state/Federal programs, or by Federal regulations pursuant to other FMPs or international commissions, or by industry self-regulation, consistent with the requirements of the Magnuson-Stevens Act and other applicable law

The National Standards also define non-target species and non-target stocks ((§ 600.305(d)(12)) as fish caught incidentally during the pursuit of target stocks in a fishery. Non-target stocks may require conservation and management as determined using factors listed above, and if so, must be included in the FMP, and be identified at the stock or stock complex level. If non-target species are not in need of conservation and management, they may be identified in an FMP as an EC species.

The Council had previously considered shortbelly rockfish for an EC species designation under FMP Amendment 23 following the 2009 Revisions to National Standard 1. Rather than classify shortbelly rockfish as an EC species, the Council chose to recommend a very conservative ACL of 50 mt, which was below historical catch levels, for the 2011-2012 and the 2013-2014 management cycles. The ACL was increased to 500 mt beginning in 2015 to prevent unavoidable bycatch from prematurely shutting down emerging midwater trawl fisheries targeting yellowtail and widow rockfishes. The ACL was raised to 3,000 mt in 2020 in part to not constrain mid-water trawl fisheries since the 2018-2019 ACLs had been exceeded. The Council is also considering raising the 2021-22 ACL to 3,000 mt for that same reason (Alternative 1).

Although the intent of an EC designation would be to prevent the development of a directed fishery, industry testified during public comment at the September meeting that the risk is unfounded as shortbelly rockfish has little or no value as fillets, bait, or fishmeal. Public testimony and Council discussion suggest that a fishmeal market would be unlikely to develop as the revenue would be less than operating costs. Maintaining an ACL (No Action or Alternative 1) that would allow for some incidental take while limiting directed fishing could be more consistent with the Council's specified goals in regard to the management of shortbelly rockfish.

4.2.4.4 Harvest Guidelines

Under Alternative 2, the 2021-2022 HGs are the same as described under Alternative 1.

4.2.4.5 Shorebased IFQ-

Management Measures – Alternative 2

ACLs and allocations are the same as Alternative 1, except for shortbelly rockfish, cowcod south of 40°10' N. lat., and petrale sole (detailed overviews provided below). Under Alternative 2, petrale sole would maintain a constant 3,600 mt ACL in 2021-22. For 2021, this would be a ~14 percent decrease from No Action and a ~7 percent decrease from Alternative 1. For 2022 however, it would be only a ~2 percent decrease from No Action and would be a ~5 percent increase from Alternative 1. No additional management measures are proposed.

IFQ Groundfish Impacts

Table 4-180 shows the 2021-2022 allocations and projected catch under Alternative 2 (Alternative 1-Method 1 applied to sablefish). Petrale sole catch under Alternative 2 saw the approximate same responses in the projected catch as the changes in the allocations compared to Alternative 1 and No Action. Note that cowcod projections are not provided again and will be provided in June after a final ACT is selected.

Table 4-180: Alternative 2- Shorebased IFQ. 2021-22 Allocations, projected catch, and attainment under Alternative 2 (method 1 for sablefish).

Species	2021 Alt 2			2022 Alt 2		
	Allocation	Proj. Catch	% Attain	Allocation	Proj. Catch	% Attain
Arrowtooth flounder	7,446.00	870.41	11.7%	5,974.75	842.99	14.1%
Bocaccio rockfish South of 40°10' N.	663.76	268.56	40.5%	654.39	264.79	40.5%
Canary rockfish	871.2	379.68	43.6%	848.78	372.22	43.9%
Chilipepper rockfish South of 40°10'	1,695.23	540.4	31.9%	1,620.97	516.76	31.9%
Cowcod South of 40°10' N.						
Darkblotched rockfish	763.6	401.07	52.5%	717.74	381.36	53.1%
Dover sole	45,977.66	5,947.98	12.9%	45,977.66	5,947.98	12.9%
English sole	8,473.18	210.79	2.5%	8,409.53	210.6	2.5%
Lingcod North of 40°10' N.	2,275.77	526.46	23.1%	2,090.82	487.23	23.3%
Lingcod South of 40°10' N.	490.05	87.15	17.8%	521.55	92.65	17.8%
Longspine thornyheads North of 34°27'	2,446.29	311.94	12.8%	2,273.77	293.16	12.9%
Minor shelf rockfish North of 40°10'	829.23	397.14	47.9%	792.51	384.97	48.6%
Minor shelf rockfish South of 40°10'	161.67	8.08	5.0%	160.45	8.06	5.0%
Minor slope rockfish North of 40°10'	937.76	229.68	24.5%	915.89	228.8	25.0%

Species	2021 Alt 2	Proj. Catch	% Attain	Allocation	Proj. Catch	% Attain
Minor slope rockfish South of 40°10'	Allocation	42.17	10.0%	419.64	42.15	10.0%
Other flatfish	4,087.99	462.72	11.3%	4,120.39	463.29	11.2%
Pacific cod	1,034.21	14.17	1.4%	1,034.21	14.17	1.4%
Pacific halibut (IBQ) North of 40°10'	69.58	33.36	47.9%	69.58	32.7	47.0%
Pacific ocean perch North of 40°10'	3,268.69	474.82	14.5%	2,937.49	428.96	14.6%
Pacific whiting	169,126.03	144,851.68	85.6%	169,126.03	144,851.68	85.6%
Petrale sole	3,046.87	3,037.48	99.7%	3,046.87	3,037.48	99.7%
Sablefish North of 36° N.	2,990.02	2,949.96	98.7%	2,845.30	2,816.26	99.0%
Sablefish South of 36° N.	963.31	81.21	8.4%	917.11	80.1	8.7%
Shortspine thornyheads North of 34°27' N.	1,212.12	458.79	37.9%	1,178.87	446.26	37.9%
Shortspine thornyheads South of 34°27' N.	50	0	0.0%	50	0	0.0%
Splitnose rockfish South of 40°10' N.	1,565.22	20.11	1.3%	1,531.02	20.11	1.3%
Starry flounder	166.8	0.48	0.3%	166.8	0.48	0.3%
Widow rockfish	12,409.70	11,435.82	92.2%	11,606.53	10,754.43	92.7%
Yelloweye rockfish	3.29	0.59	17.9%	3.37	0.58	17.2%
Yellowtail rockfish North of 40°10'	4,064.60	3,146.18	77.4%	3,871.88	3,059.43	79.0%

Cowcod south of 40°10’ N. lat

Under Alternative 2, cowcod would be managed with the ACL = ABC, a P*=0.30 and status quo trawl and non-trawl allocations (Table 4-181). The impacts would however be the same as described under No Action since the Council is also considering using a more precautionary ACT range of 40 mt to 60 mt as the basis for managing the fisheries. These ACTs apply to all alternatives and are the basis for setting the trawl and non-trawl allocations. However, given the current set-asides forwarded by the Council, the 60 mt ACT could not be considered for Alternative 2 because it would be above the fishery HG.

Table 4-181. Alternative 2 -Cowcod south of 40° 10' N. lat. allocations for 2021-22 under Alternative 2 and without an ACT.

Year	ACL	Set-aside	Fishery HG	Trawl (IFQ) allocation (36%)
2021	69	10.85	58.2	21.0
2022	66	10.85	55.2	19.9

**For reference, the 2019ACL is 10 mt, the No Action ACLs are 98 mt in 2021 and 96 mt in 2022, and the Alternative 1 ACLs are 87 mt in 2021 and 85 mt in 2022.*

Petrale sole

Under Alternative 2, petrale sole would be managed with a more precautionary approach than No Action and with similar long-term precaution as Alternative 1; the main difference is that Alternative 1 provides greater short-term benefits whereas Alternative 2 provides the same benefits but more evenly distributed throughout future biennium (as detailed under Alternative 1). While both Alternative 1 and 2 meet the Council's main goal of being more precautionary than No Action, they selected Alternative 1 as the Preferred Alternative based on input from the GAP that they would prefer more of the benefits in the short-term (mainly the 2021-22 biennium). Alternative 1 and 2 both provide similar long-term IFQ allocations and economic benefits, but Alternative 1 utilizes more the temporary surplus of yield associated with the stock being above the management target in 2021-22 whereas Alternative 2 uses a "stair step" approach where constant ACLs are used each biennium that decrease over time. Greater detail of the comparisons of these alternative approaches are detailed in Agenda Item H.6.a GMT Report 2 November 2019.

Alternative 2 provides the lowest IFQ allocations and projected ex-vessel revenue amongst the three Alternatives being considered in 2021-22 (Table 4-182). Under allocation Option 1, the total IFQ allocations for Alternative 2 in 2021-22 are 93 mt lower Alternative 1 and 546 mt lower than No Action. However, that is once again because Alternative 2 spreads more the long-term benefits into future biennium whereas Alternative 1 utilizes more of it in this cycle; the long-term 2019-2030 projected total ex-vessel revenue is ~$89 million for both Alternatives 1 and 2 (Agenda Item H.6.a GMT Report 2 November 2019). As under No Action and Alternative 1, allocation Option 2 provides greater IFQ allocations and economic benefits (+130.6 mt and +$340,978 in ex-vessel) in both 2021 and 2022 compared to Option 1.

Table 4-182. Petrale sole allocations under all three ACL alternatives and both allocation options, plus projected gains in IFQ ex-vessel revenue associated with Option 2.

No Action (ABC= ACL P*0.45)								
Option	Allocations (mt)						Projected IFQ $ ex-vessel revenue	
	Year	ACL	Fishery HG	Trawl	Non-trawl	IFQ	Total $	$ gain with Option 2
1 (SQ)	2021	4,115	3,727.5	3,541.1	186.4	3,536.1	9,230,482	NA
	2022	3,660	3,272.5	3,108.9	163.6	3,103.9	8,102,286	NA
2	2021	4,115	3,727.5	3,687.5	30	3,692.5	9,638,742	408,260
	2022	3,660	3,272.5	3,232.5	30	3,237.5	8,451,030	348,744
Alternative 1 (ABC= ACL P*0.40)								
Option	Allocations (mt)						Projected IFQ $ ex-vessel revenue	
	Year	ACL	Fishery HG	Trawl	Non-trawl	IFQ	Total $	$ gain with Option 2
1 (SQ)	2021	3,843	3,455.5	3,282.7	172.8	3,277.7	8,556,031	NA
	2022	3,455	3,067.5	2,914.1	153.4	2,909.1	7,593,854	NA
2	2021	3,843	3,455.5	3,425.5	30.0	3,420.5	8,928,725	372,694
	2022	3,455	3,067.5	3,037.5	30.0	3,032.5	7,915,906	322,053
Alternative 2 ("stair step" ACLs that are constant each biennium and decline in future biennium)								
Option	Allocations (mt)						Projected IFQ $ ex-vessel revenue	
	Year	ACL	Fishery HG	Trawl	Non-trawl	IFQ	Total $	$ gain with Option 2
1 (SQ)	2021	3,600	3,212.5	3,051.9	160.6	3,046.9	7,953,430	NA
	2022	3,600	3,212.5	3,051.9	160.6	3,046.9	7,953,430	NA
2	2021	3,600	3,212.5	3,207.5	30.0	3,177.5	8,294,408	340,978
	2022	3,600	3,212.5	3,182.5	30.0	3,177.5	8,294,408	340,978

Non-IFQ Species

Same as No Action.

4.2.4.6 At-Sea

The at-sea sector measures and impacts are the same as described under Alternative 1 (Chapter 4.4.4).

4.2.4.7 Limited Entry and Open Access Fixed Gear- Alternative 2

Management Measures

For Alternative 2, ACLs are the same as Alternative for 2021-2022 except for cowcod south of 40° 10' N. lat. and petrale sole. Cowcod south of 40°10' N. lat. will be managed under an ACT under Alternative 2, just as under Alternative 1. The cowcod south of 40°10' N. lat. non-trawl allocation under no ACT is provided in Table 4-183. Again, the full range of ACTs is not available under Alternative 2 as described above. Petrale sole will be managed under a constant 3,600 mt ACL, which equates to a 160.6 mt non-trawl allocation for both years 2021 and 2022.

Table 4-183. Cowcod south of 40° 10' N. lat. allocations for 2021-22 under Alternative 2 and without an ACT.

Year	ACL	Set-aside	Fishery HG	Non-Trawl allocation (64 %)
2021	69	10.85	58.2	37.2
2022	66	10.85	55.2	35.3

**For reference, the 2019 ACL is 10 mt, the No Action ACLs are 98 mt in 2021 and 96 mt in 2022, and the Alternative 1 ACLs are 87 mt in 2021 and 85 mt in 2022.*

Trip Limit Analysis

Trip limit mortality for Alternative 2 are the same as under No Action for sablefish and non-sablefish proposed trip limits or Alternative 1 for sablefish proposed trip limits.

Impact (Groundfish Mortality) – Non-Nearshore North of 36° N. latitude

All remaining mortality the same as Alternative 1.

Impact (Groundfish Mortality) – Non-Nearshore South of 36° N. latitude

Mortality the same as under Alternative 1.

Trip Limit Analysis- Nearshore

The trip limits under Alternative 2 would be the same as Alternative 1.

Impact (Groundfish Mortality) - Nearshore

Projected landings, routine management measures, and projected mortality of stocks with nearshore specific limits would be the same as Alternative 1, which is also the same as No Action.

4.2.4.8 Tribal Fisheries

Tribal fisheries would operate under the HGs and allocations displayed in Table 4-125 and Table 4-171. Tribal fisheries would be managed using the same measures described under No Action.

4.2.4.9 Washington Recreational Management Measures

Under Alternative 2, Washington recreational fisheries would operate under the same ACLs and associated Washington recreational HGs and ACTs and the same management approach as No Action (Table 4-129).

4.2.4.10 Oregon Recreational Management Measures

The Alternative 2 ACLs and associated Oregon recreational values are the same as Alternative 1 (Table 4-165), as the only species with changes are petrale sole and shortbelly rockfish, neither of which changes anything for the Oregon recreational fishery.

4.2.4.11 California Recreational Management Measures

The Alternative 2 harvest specification and associated California recreational projected impact values are the same as Alternative 1 with the exception of cowcod (Table 4-184). Under this alternative, cowcod harvest specifications are 69.2 and 67.3 mt for 2021-2022 respectively (Figure 4-40). Cowcod retention would continue to be prohibited, the projected impacts are still below the proposed fishery ACT.

Table 4-184. Alternative 2 – California Recreational: Allocations (mt) to the non-trawl sector and shares (mt) for the California recreational fisheries for 2021 and 2022. Option = [O]

Stock	Non-Trawl Allocation (mt)	California Recreational HG (mt)
Bocaccio	1036.4/1021.8	716.2/706.1
Canary rockfish	406.5	[O1 116.7/113.8 [O2] 135
Cowcod	69.2/67.3	12.8-18.8
Darkblotched	42.4/39.9	-
Nearshore rockfish North of 40°10´ N lat.	78.6/73.9	-
POP	191.5/184.3	-

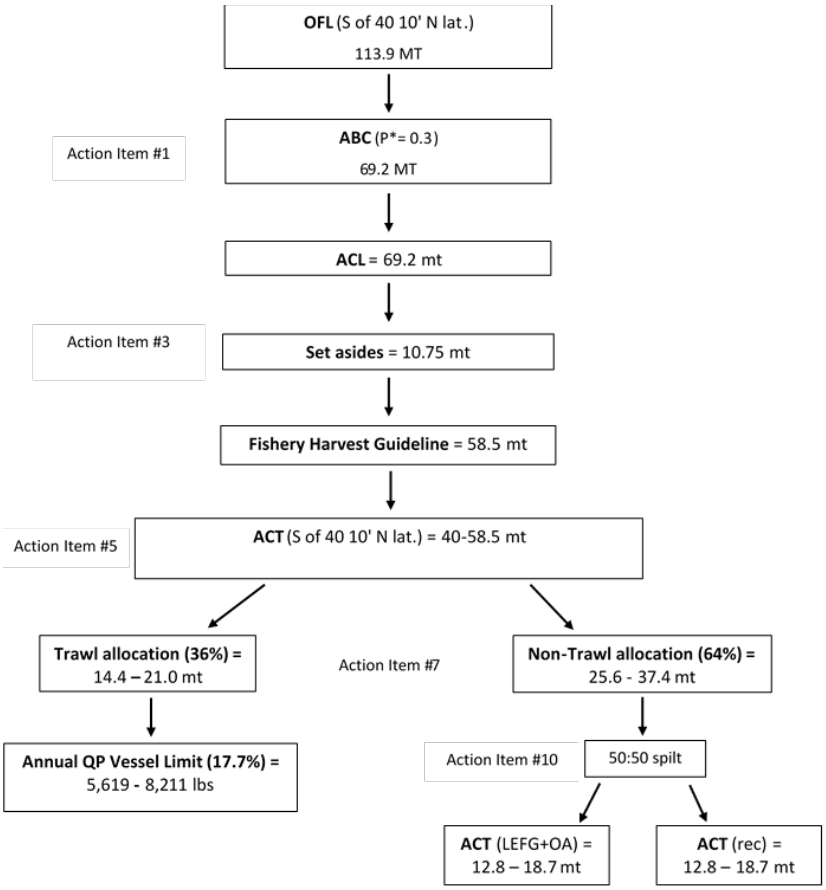

Figure 4-40. Alternative 2 – California Recreational: Allocations (mt) to the non-trawl sector and shares (mt) for the California recreational fisheries for 2021 and 2022.

4.2.5 Supplemental Analysis for RCA and Salmon Troll Trip Limits Proposals

4.2.5.1 Updates to Non-trawl Rockfish Conservation Area Coordinates in California

This management measure proposes to modify the current non-trawl RCA boundaries, which are intended to approximate the fathom isobaths, in California to better align depth contours with actual depths. The Council regularly examines the appropriateness of the coordinates defining the boundary lines used to define closed areas through the harvest specifications and management measure process. For 2021-22, the Council is considering modifying the 40-fathom depth contour offshore of San Mateo in central California. A chart delineating the proposed modifications is provided in Figure 4-41 and a proposed modified waypoint coordinate table is provided in Table 4-185.

Geographic Information System (GIS) software was used to compare non-trawl RCA line to depth contour lines generated from National Geophysical Data Center coastal relief models to ensure that RCA modifications approximated actual depths as closely as possible. California's Law Enforcement Division (LED) personnel reviewed the proposed depth contour modifications and agreed they were reasonable and enforceable.

By modifying the 40 fathom non-trawl RCA line to achieve better alignment with the corresponding isobath, it will allow better access to target species by more accurately defining closed areas while increasing the available fishing area by 6.3 mi^2. In addition, mortality generated from fishing effort will better fit the bycatch model estimates since estimates assume that mortality is derived from specific fishing areas and the depths defining those areas.

The intent of the non-trawl RCA was to protect overfished species (e.g., bocaccio, widow rockfish, and canary rockfish) by minimizing bycatch. As of 2019, only yelloweye rockfish is under a rebuilding plan and projected to rebuild by 2029. Proposed modifications aim to maintain the intent of the non-trawl RCA lines, while at the same time keeping the harvest levels of healthy target species (e.g. bocaccio, yellowtail rockfish, canary rockfish, widow rockfish) within acceptable harvest limits and providing additional opportunities for industry. These changes are not expected to result in changes in catch of target groundfish stocks compared to past catches or any of the harvest specifications approved for 2021-2022. These changes are not expected to increase the risk of overfishing and managed species are expected to remain within the annual catch limits (ACL) through the use of cumulative trip limits. Any changes to the harvest patterns of the fishing community are expected to be very minor due to the fact that only small changes are being proposed for the boundary lines. There are likely little to no impacts to nongroundfish species, ESA-listed, or marine mammals given the small area of change. Furthermore, all EFH closures will remain in effect and will not be affected by this action.

Table 4-185. Coordinates for proposed modifications at San Mateo to the "40 fathom (73 m) depth contour between 46°16' N. lat. and the U.S. border with Mexico" RCA line south of 40°10' N. latitude.

Waypoint Number	Action	Latitude Degree	Latitude Minute	Longitude Degree	Longitude Minute
132	No Change	37	35.67	122	49.47
New # 1	Add	37	25	122	38.66
New # 2	Add	37	20.68	122	36.79
133	No change	37	20.24	122	33.82

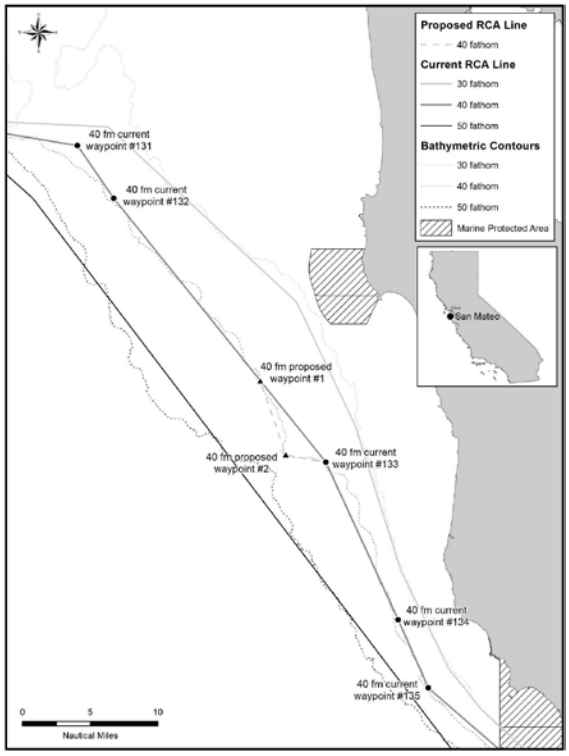

Figure 4-41 Proposed 40 fathom RCA line changes at San Mateo. This proposed change would decrease the size of the non-trawl and recreational RCA by 6.3 mi².

4.2.5.2 Minor Adjustments to the Commercial Non-Trawl Rockfish Conservation Area's off California, south of 40° 10' N. lat.

The Council routinely modifies RCAs for trawl and non-trawl fisheries during inseason actions and biennial specifications. In 2017, NMFS implemented changes to the seaward non-trawl RCA for the area between 40°10' N. latitude and 34°27' N. lat. and the shoreward non-trawl RCA for the area south of 34°27' N. lat. for the commercial non-trawl fixed gear fishery through both the harvest specifications and management measure process and through inseason action. Referencing Agenda Item H.8.a, Supplemental CDFW Report 1, November 2019, this management measure would provide minor adjustments the shoreward boundary of the non-trawl RCA, in the following priority order:

Priority 1 - Area from Point Conception (34° 27' N lat.) to the CA/Mexico border. This proposed management measure is to modify the shoreward non-trawl RCA boundary from 75 fm to 100 fm, resulting in RCA configuration of 100 fm to 150 fm. In this region, the primary purpose of the RCAs was to provide protections for bocaccio and cowcod, both have been declared rebuilt. Further, yelloweye rockfish encounters are uncommon, as this region is the southernmost extent of the species population. This management measure will increase mortality of groundfish species found in the Southern Management Region. Despite the rebuilt status of cowcod, the uncertainty in the outcome of the assessment does not allow for considering fishery retention for the 2021-2022 cycle. As retention of cowcod will remain prohibited, allowing additional depth will provide access to healthy and abundant shelf species with minimum risk to cowcod impacts. This measure is expected to increase discard mortality of cowcod; however, this increase not projected to exceed the proposed Fishery HG as proposed under the higher Cowcod ACLs and ACTs being considered for 2021-22. Yelloweye rockfish are uncommon in this area, as this management measure would modify the non-trawl RCA in the southern most extent of the species' range. This management measure is expected to have little to no impact on yelloweye rockfish. Finally, state managed trawl fisheries (California halibut, ridgeback prawn and sea cucumber) are permitted to fish shoreward of the 100 fm depth line. This management measure would allow for a slight increase in opportunity for the fixed gear sector, in depths in which bottom trawling is currently permitted.

Priority 2 – Area between 37° 11' N latitude and 34° 27' N latitude. This proposed management measure would add a management line at Pigeon Point (37° 11' N lat.; as specified in CFR 660.310) and modify the shoreward non-trawl RCA boundary between 37° 11' N. lat. and 34° 27' N lat. from 40 fm to 50 fm, resulting in an RCA configuration of 50 fm to 125 fm. In this region, the initial purpose of the RCAs was to provide protections for bocaccio, canary rockfish, yelloweye rockfish, widow rockfish and cowcod. All species have been declared rebuilt, except for yelloweye rockfish, which is rebuilding ahead of schedule. The use of this management line will allow for additional partitioning of management areas with the intent to provide increased depth access using a stepwise and precautionary approach without risking exceeding yelloweye rockfish impacts. The additional management lines provide maximum flexibility to make inseason changes as needed to mitigate yelloweye rockfish impacts or modify other trip and sub trip limits (i.e. vermilion rockfish). This measure would allow increases in opportunity to access groundfish stocks and some increase to mortality of shelf rockfish. Yelloweye rockfish are encountered in this area, however less frequently than in more northerly latitudes. This management measure may have slight impact on yelloweye rockfish, though, allowable harvest is likely to increase and with the addition of the management line at 37° 11' N latitude, regulatory modifications can be made to ensure mortality remains within allowable limits. Note, the 2018 estimated mortality from the coastwide non-nearshore fisher was 1.34 mt, the 2021 coastwide non-nearshore ACT is 2.0 mt.

Additionally, beginning in the 2019-2020 biennium the California recreation groundfish fishery was permitted to utilize this area, the mainland coast to 50 fathoms. Moreover, federal RCA regulations also

apply to OA state-managed trawl fisheries operating in this area (California halibut, ridgeback prawn and sea cucumber), allowing bottom trawl activities from the mainland coast out to the shoreward 100 fathom RCA line. These changes would therefore increase equity amongst sectors.

Priority 3 - Area between 38° 57.50 N latitude and 37° 11' N lat.. This proposed management measure would add a management line at Point Arena (38° 57.50' N lat.; as specified in CFR 660.310) and modify the shoreward non-trawl RCA boundary between 38° 57.50 N. lat. and 37° 11' N. lat. from 40 fm to 50 fm, resulting in an RCA configuration of 50 fm to 125 fm. This proposed change has similar impacts as described under Priority 2. Given that the increase in allowable mortality resulting from the latest assessments for cowcod and yelloweye rockfish, increased opportunity may be afforded. While yelloweye rockfish are more common in this area than those considered under non-trawl RCA modification priority 1 or 2, the opening of this area may increase yelloweye rockfish impacts. However, allowable harvest is likely to increase and with the addition of the management line at 38° 57.50' N. lat., regulatory modifications can be made to ensure mortality remains in allowable limits. Note, the 2018 estimated mortality from the coastwide non-nearshore fisher was 1.34 mt, the 2021 coastwide non-nearshore ACT is 2.0 mt.

Furthermore, this management area is already utilized by state-managed trawl fisheries operating (California halibut, ridgeback prawn and sea cucumber) that operate under incidental OA federal RCA regulations which allow for bottom trawl activities from the mainland coast out to the shoreward 100 fathom RCA line. Increases to commercial cowcod and yelloweye rockfish impacts might be expected, and would hit against 2021-2022 annual catch targets (ACT) issued to non-trawl commercial fisheries.

The objective of these management measures is to allow increased opportunity to catch healthy target species (e.g. bocaccio, canary rockfish, yellowtail rockfish, widow rockfish), which are underutilized and inaccessible due to the current non-trawl RCA configurations. These measures will also restore access to historical fishing grounds to fleets in California that were severely restricted due to implementation of the RCAs in the early 2000s. These management measures are likely to result in greater attainment of shelf rockfish ACLs (both the stock complex and individual species), which in turn is likely to result in economic benefits to coastal communities. These management measures would also allow slight increases to the commercial non-trawl fixed gear fleet in depths that are already accessed by the incidental OA bottom trawl fishery, resulting in more equitable fishing opportunities among each user group.

These prosed management measures are not anticipated to result in adverse impacts to any of the affected stocks' harvest specifications or result in overfishing. Catch of widow rockfish, yellowtail rockfish, and other healthy shelf rockfish species by allowing access to depths in which they are most prevalent, is expected. While vermilion rockfish mortality has exceeded its contribution to the shelf rockfish complex ACL south of 40° 10' N latitude, sub trip limits are being considered to reduce catch. As a result, no adverse impacts are anticipated for target stocks. The non-trawl fisheries are currently managed with cumulative trip limits, and any increases in catch are expected to remain within allowable harvest limits. There are little impacts to other nongroundfish or ESA listed species expected.

Table 4-186 summarizes the 2018 total mortality estimates and 2019 landings estimates for select target groundfish stocks compared to the respective non-trawl allocation. It is not feasible to specify impacts to target stocks for each individual RCA modification priority, however, given the target stocks low attainment of the non-trawl allocation, there is minimal risk to overfishing from these management measures in aggregate.

Table 4-186. The 2018 total mortality estimates and 2019 landings estimates for the commercial non-trawl fisheries (LE and OA) for select species compared to the non-trawl allocations. Data source: 2018 WCGOP GEMM data product and PacFIN.

Stock	Management Area	2018		2019	
		Total Mortality (mt)	Non-Trawl Allocation (mt)	Landings (mt)	Non-Trawl Allocation (mt)
Bocaccio	South of 40° 10' N lat.	10.0	442.3	18.2	1,250.23
Canary rockfish[1,2,3]	Coastwide	12.5	406.5	14.2	383.3
Chilipepper rockfish	South of 40° 10' N lat.	2.8	615.3	2.8	612.8
Shelf rockfish	South of 40° 10' N lat.	68.5	1,384.40	76.9	1,357.30
Widow rockfish[1]	Coastwide	2.1	1,119.40	2.1	1,042.40

1 Data are provided coastwide and are not summarized south of 40° 10' N lat.

2 The 2018 commercial non-nearshore HG was 46.5 mt and the nearshore HG was 100 mt. The CA share of the nearshore canary rockfish HG is 73.3% and the OR share is 26.7%.

3 The 2019 commercial non-nearshore HG was 43.8 mt and the nearshore HG was 94.3 mt. The CA share of the nearshore canary rockfish HG is 73.3% and the OR share is 26.7%.

These measures are expected to increase catch opportunities in California ports south of 38° 57.50' N lat. in the management area the proposal is adopted. California's groundfish fleet is unique and comprised of many more non-trawl fixed gear fishermen compared to other states and many of these fishermen relied on shelf rockfish species such as yellowtail rockfish and widow rockfish as a staple in their fishery portfolios. Restoring access to areas where yellowtail, widow and shelf rockfishes, non-trawl fishermen will have positive social and economic effects on these ports. The scale of these positive impacts cannot yet be quantified. Additionally, it is difficult to project if the proposed non-trawl RCA modifications will provide enough economic incentive for fishermen to install a VMS to take advantage of this proposed opportunity in federal waters. This measure is not expected to negatively impact any user groups. This measure would not have any effect on allocations so it would not affect any other sector's allowable harvest levels or ability to harvest those fish.

Cumulative effects from RCA modifications 1 through 3 are similar among the priorities and are not additive, unless noted otherwise. Note that there are no cumulative impacts expected for nongroundfish or ESA listed species or EFH.

Groundfish – Trip limit adjustments are being considered for California scorpionfish, sablefish, all rockfish (except yelloweye rockfish and cowcod), lingcod and thornyheads, as well as a sub limit for vermilion rockfish, in the areas affected by these management measures.

Many of these species are not found at the depths being considered under these management measures because they are more deeply distributed (e.g. sablefish and thornyheads) or are found in more shallow depths (e.g. nearshore rockfish and California scorpionfish). Trip limit adjustments for lingcod, shelf rockfish, widow rockfish, canary rockfish, chilipepper rockfish and bocaccio may result in a cumulative additive impact with each of the proposed RCA modifications, although these impacts can be

accommodated given the underutilization of these stocks. Further, trip limits are established for these species which may be modified, such that the risk of overfishing is minimal.

Social - This management measure will have minor positive social impacts by restoring a portion of historical fishing grounds in California whose fisheries were curtailed due to the implementation of the RCAs in the early 2000s.

Economic - These management measures will have positive economic impacts by restoring a portion of historical fishing grounds that were eliminated due to the implementation of the RCAs in the early 2000s. The scale of these positive impacts cannot yet be quantified due the unresolved question of whether or not this increase trip limit increase, in combination with the proposed RCA modifications will provide enough economic incentive for nearshore fishermen to install VMS so that they can take advantage of this proposed opportunity. Some increase in landings and revenue could be expected under each priority RCA modification, with the greatest beneficial economic impact resulting in the implementation of all three priority RCA modifications.

Modifying each of the priority non-trawl RCAs is consistent with the following National Standards: (1) result in more optimal yield without overfishing; (2) based on the best scientific information; and (8) take into account/benefit fishing communities. This action is consistent with National Standard 1 by providing the greatest overall benefit to the nation by allowing harvest of healthy stocks which are currently being underutilized (e.g., shelf rockfish stocks). Prior to many rockfish species being declared overfished, the non-trawl fixed gear fisheries used to support a vibrant shelf rockfish fishery, which was eliminated when the RCAs were implemented. This action is also consistent with National Standard 2 by utilizing the best available scientific information, which indicates that many stocks have rebuilt and a more optimistic outlook of the yelloweye rockfish population. Further, this management measure leaves in place a large portion of the non-trawl RCA, which would continue to provide protection to, yelloweye rockfish. This action is also consistent with conservation requirements and takes into account the importance of fishery resources to fishing communities. Many coastal communities in central and southern California are comprised with non-trawl fishermen who depend on income from fixed gear fisheries. This measure will allow access to many important shelf rockfish stocks, which will benefit local economies.

4.2.5.3 Minor Adjustments to the Recreational Rockfish Conservation Areas off California, South of 40° 10' North latitude

Considerations to RCAs in order to optimize their performance are the current stock status of yelloweye rockfish and the likelihood of encounters with yelloweye rockfish in each MA, compared to the opportunity to provide access to healthy and abundant shelf species. RCAs were originally implemented in 2003 to provide protection to overfished stocks (e.g., bocaccio, widow rockfish, and canary rockfish), which varied by geographic region. As of 2019, only yelloweye rockfish is under a rebuilding plan and is projected to rebuild by 2029. The RCAs were intended to close areas (or to restrict access) in the main portion of the overfished species' depth ranges to reduce encounters and mortality, thereby allowing the stock(s) to rebuild more quickly. While RCAs have been successful in reducing encounters with overfished species, they have also reduced access to many co-occurring healthy target stocks found in similar and deeper depths. Allowable depths in California's recreational fisheries vary by MA and are driven by the need to protect yelloweye rockfish in the more northern MAs and cowcod in the more southern Mas, which align with the geographic areas the stocks are found.

The Council routinely modifies RCAs for trawl and non-trawl fisheries during inseason actions and the biennial specifications process. For the 2017-2018 management cycle, the RCA boundaries North of Pt. Conception were allowed additional opportunity including: extending the Northern Management Area RCA from 20 fm to 30 fm from May 1 through October 31; removal of the RCA boundary from November 1 through December 31 in the Mendocino and Northern MAs (Pt. Arena (38° 57.50 N. lat.) to the Oregon border (42° N lat.)); extending the San Francisco Management Area RCA from 30 fm to 40 fm from April 1 through December 31; and extending the Central Management Area RCA from 40 fm to 50 fm from April 1 through December 31. However, inseason actions in 2017 and 2018 were taken to limit fishing depths in these management areas in the late summer through December 31 as a result of high yelloweye rockfish impacts. In the 2019-2020 management cycle, the RCA boundary for the Southern Management Area was extended from 60 fm to 75 fms and inside the Cowcod Conservation Area was extended from 20 fm to 40 fm from March 1 through December 31.

Referencing Agenda Item H.8.a, Supplemental CDFW Report 1, November 2019, these management measures would provide minor adjustment to the shoreward RCA boundary in specified Management Areas (MA) in the California recreational fishery. The following proposals are in priority order:

Priority 1 **-** The Mendocino Management Area for the California recreational fishery extends from Cape Mendocino (40° 10' N lat.) to Point Arena (38° 57.50' N lat.). For the 2019-2020 management cycle, the RCA boundary for this management area was 20 fathoms (fm) from May 1 through October 31, and no RCA boundary (access to all depths) from November 1 through December 31. The proposed management measure would extend the RCA boundary from 20 fm to 30 fm; fishing would be prohibited seaward of the 30 fm depth contour from May 1 through October 31. From November 1 – December 31, this management area would continue to have no RCA and allow for all depth access. The fishery would remain closed to boat-based anglers from January 1 through April 30. This management measure will provide access to deeper distributed nearshore stocks and some shelf species. Projected impacts to yelloweye rockfish increase with deeper access but are still under the precautionary California recreational ACT levels for 2021-2022.

The Mendocino Management Area has had the most restrictive depth constraints in California's recreational fisheries in recent years. This has largely been driven by the need to reduce yelloweye rockfish mortality. However, given the increase in the California recreational yelloweye ACT, increased opportunity may be afforded with little risk of exceeding allowable limits. It should be noted that the CDFW actively tracks recreational mortality of yelloweye rockfish inseason to ensure limits are not exceeded and has additional

inseason authority to take action outside of PFMC meetings to make any necessary changes to season, depth or bag limits, and implementation YRCA if needed or as appropriate.

Since its first implementation in 2001, the 20 fm line has posed both enforcement and safety concerns. The Northern coastline of California can routinely experience turbulent tide and weather conditions putting anglers at higher risk to fish under the shallowest RCA possible. Extending the RCA boundary to 30 fm would allow safer angling conditions without jeopardizing precautionary harvest limits for yelloweye rockfish. Additionally, unlike all other RCA boundaries currently in use, the 20 fm boundary line is not defined by individual waypoint coordinates to approximate the depth contour. Instead, the 20 fm depth contour is used by anglers to define legal fishing depths. Modifying the depth constraint to prohibit fishing seaward of the 30 fm depth contour would allow for federal waypoints to be used and is a more preferred option for effective enforcement.

The proposed management measure would also provide additional access to depths that are already allowed during certain times of the year. Currently the Mendocino Management Area does not have a RCA boundary in effect from November 1 through December 31 which allows for all depth access while groundfish fishing. In addition, a 30 fm RCA in the Mendocino Management are would align the RCA depth constraints between the Mendocino Management Area and the adjacent Northern Management Area, in which fishing is also prohibited seaward of the 30 fathom depth contour, further reducing regulatory complexity for anglers that commonly fish in both areas, as well as enforcement entities. This management measure is expected to increase catch of deeper nearshore and shelf rockfish species where attainment of those species is low. Increases are expected to be similar to that of the Northern Management Area which has been at a 30 fm RCA boundary since 2017. Mortality of yelloweye rockfish could also increase with this management measure but is expected to remain under the recreational HG/ACT. Mortality of all other species is expected to be within allocation or harvest limits (refer to California Recreational Integrated Alternative Analysis mortality tables as appropriate). There are minimal to no impacts expected for nongroundfish or ESA listed species.

Priority 2 - The Southern Management Area for the California recreational fishery extends from Point Conception (34° 27’ N lat.) to the California US/Mexico border. For the 2019-2020 management cycle, the RCA boundary for this management area was 75 fm from March 1 through December 31. The proposed management measure would extend the RCA boundary from 75 fm to 100 fm; fishing would be prohibited seaward of the 100 fm depth contour from March 1 through December 31. The fishery would remain closed to boat-based anglers from January 1 through February 28. This management measure will increase mortality of groundfish species found in the Southern Management Region.

The Southern Management Area is predominately constrained by cowcod limits (yelloweye rockfish is rarely encountered and contributes trace amounts to projected impacts compared to more northern areas). The 2019 cowcod assessment indicated the stock to be above target biomass and rebuilt. For the 2021-2022 management cycle, the proposed fishery HG is expected to significantly increase with additional harvest target reductions to “buffer” in between the ACL and fishery HGs. Despite the rebuilt status of cowcod, the uncertainty in the outcome of the stock assessment does not allow for considering fishery retention for the 2021-2022 cycle. As retention of cowcod will remain prohibited, allowing additional depth would provide access to other healthy and abundant shelf species with minimum risk to cowcod impacts. CDFW actively monitors recreational cowcod mortality inseason, and can make changes to season, depth, or bag limits as appropriate, which will help mitigate against any increases in mortality resulting from this management measure and can make changes to season, depth, or bag limits as appropriate.

Catch of shelf rockfish is likely to increase with this management measure. Attainment of the shelf rockfish complex ACL south of 40° 10’ N lat. has been low. Vermilion rockfish mortality has exceeded its contribution to the shelf rockfish complex ACL south of 40° 10’ N lat., sub-bag limits are being considered

to reduce catch which will mitigate increased mortality which may result from this proposed management measure. As a result, there is little risk of overfishing to shelf rockfish, including vermilion rockfish.

Mortality of cowcod is also likely to increase with this management measure, however, harvest specifications are expected to increase, and mortality is anticipated to remain within allowable limits. Further, retention of cowcod will remain prohibited, and no modifications to the CCAs are proposed.

Mortality of all other species is expected to be within allocation or harvest limits (refer to California Recreational Integrated Alternative Analysis mortality tables as appropriate). There are minimal to no impacts expected for nongroundfish or ESA listed species.

Priority 3 - The San Francisco Management Area for the California recreational fishery extends from Point Arena (38° 57.50' N lat.) to Point Pigeon (37° 11' N lat.). For the 2019-2020 management cycle, the RCA boundary for this management area was 40 fm from April 1 through December 31. The proposed management measure would extend the RCA boundary from 40 fm to 50 fm; fishing would be prohibited seaward of the 50 fm depth contour from April 1 through December 31. The fishery would remain closed to boat-based anglers from January 1 through March 31. This measure would allow increased opportunity to access shelf groundfish stocks and some increase to mortality of shelf rockfish would be expected.

The San Francisco Management Area has been constrained by the overfished status of cowcod and yelloweye rockfish. Given that the increase in allowable mortality resulting from the latest assessments for these stocks, increased opportunity may be afforded. Recreational mortality of cowcod and yelloweye rockfish are actively tracked inseason, as a result, increased access to underutilized shelf rockfish stocks may be afforded with little risk of exceeding allowable limits of cowcod and yelloweye rockfish. This management measure would also align the recreational depth constraints between the San Francisco and Central MAs reducing regulatory complexity.

This management measure is expected to increase catch of shelf rockfish. Attainment of the shelf rockfish complex ACL south of 40° 10' N lat. is low. Vermilion rockfish mortality has exceeded its contribution to the shelf rockfish complex ACL south of 40° 10' N lat., sub-bag limits are being considered to reduce catch which will mitigate increased mortality which may result from this proposed management measure. As a result, there is little risk of overfishing to shelf rockfish, including vermilion rockfish. Mortality of yelloweye rockfish could also increase with this management measure but is expected to remain under the recreational HG/ACT. Mortality of all other species is expected to be within allocation or harvest limits (refer to California Recreational Integrated Alternative Analysis mortality tables as appropriate). Some mortality of cowcod may be expected from this management measure, however impacts are likely to be minimal as the San Francisco Management Area is located more northly than the species' core distribution. Additionally, cowcod harvest specifications are expected to increase, and mortality is anticipated to remain within allowable limits.

As a result, there is little risk to exceeding harvest specifications for either cowcod, or yelloweye rockfish as a result of this management measure. Mortality of all other species is expected to be within allocation or harvest limits (refer to California Recreational Integrated Alternative Analysis mortality tables as appropriate). There are minimal to no impacts expected for nongroundfish or ESA listed species.

Overall, these proposed management measures are expected to diversify the species composition of catch to include more shelf rockfish which may lead to increased quality of fishing trips. The magnitude of the change is difficult to quantify as the fishing effort models are not as responsive to RCA boundary changes as they are to changes to season length. It is not expected that any user group will see a lost catch

opportunity, and the MAs with proposed RCA depth boundary changes are expected to have increased catch opportunity.

These management measures are consistent with the following National Standards: (1) result in more optimal yield without overfishing; (2) based on the best scientific information; and (8) take into account/benefit fishing communities. This action is consistent with National Standard 1 by providing the greatest overall benefit to the nation by allowing harvest of healthy stocks which are currently being underutilized (e.g., shelf rockfish complex). Prior to canary rockfish being declared overfished, the non-trawl fixed gear fisheries used to support a vibrant shelf rockfish fishery, which was eliminated when the RCAs were implemented. This action is also consistent with National Standard 2 by utilizing the best available scientific information. The latest stock assessments indicate a more optimistic status of the yelloweye rockfish population and that cowcod has rebuilt to healthy levels. Further, these management measures provided a cautious approach to increasing access to greater depths, while continuing to provide protection to yelloweye rockfish. This action is also consistent with conservation requirements and takes into account the importance of fishery resources to fishing communities.

4.2.5.4 Yellowtail Rockfish Retention within the Non-Trawl RCA in the Salmon Troll Fishery South of 40°10' N. Lat.

The request for the new management measure originated from a Salmon Advisory Subpanel (SAS) at the September 2019 meeting to add retention of groundfish within the commercial non-trawl RCA, coastwide, to be added to the Groundfish Workload and New Management Measures list (Agenda Item H.2.a, Supplemental SAS Report 2, September 2019). At that time, the Groundfish Management Team (GMT) recommended to incorporate the request into the non-trawl RCA modification package as the goal of the request may be met once more of the fishing grounds on the shelf were opened up from reducing the size of the non-trawl RCA. This management measure would allow retention of yellowtail rockfish within the commercial non-trawl RCA as incidental catch in the salmon troll fishery south of 40°10 N. lat. All other regulations regarding groundfish retention and use of VMS in the commercial salmon fishery still applied as noted in 50 CFR 660 Subpart H. The proposed open access trip limit to retail yellowtail rockfish in the salmon troll[22] fishery south of 40°10' N. lat. is as follows:

> *Salmon trollers may retain and land up to 1 lb of yellowtail rockfish for every 2 lbs of salmon landed, with a cumulative limit of 200 lb/month, both within and outside of the RCA. This limit is within the open access* (insert 2021 trip limit) *shelf rockfish trip limit and not in addition to that limit. All groundfish species are subject to the open access limits, seasons, size limits and RCA restrictions listed in the table above, unless otherwise stated here.*

The proposed trip limit is similar to the 2019 OA trip limit north of 40°10'N. lat. where retention of yellowtail rockfish in the salmon troll fishery has been permitted within the commercial non-trawl RCA since 2001:

> *Salmon trollers may retain and land up to 1 lb of yellowtail rockfish for every 2 lbs of salmon landed, with a cumulative limit of 200 lb/month, both within and outside of the RCA. This limit is within the 200 lb per month combined limit for minor shelf rockfish, widow rockfish and yellowtail rockfish, and not in addition to that limit…All groundfish species are subject to the open access limits, seasons, size limits and RCA restrictions listed in the table above, unless otherwise stated here.*

This management measure affects the southern yellowtail rockfish stock, which is managed as part of shelf rockfish complex south of 40°10' N. lat. The 2021 and 2022 ACL for shelf rockfish complex south of 40°10' N. lat. is 1,438 mt and 1,428 mt, respectively. Since the landed yellowtail rockfish would be considered incidental catch in the salmon troll fishery, the projected mortality for this proposed trip limit would be included in the IOA set-aside for the shelf rockfish complex south of 40°10' N. lat. and deducted from the shelf rockfish complex south of 40°10' N. lat. ACL. This additional IOA set-aside will also further reduce the trawl and non-trawl allocations for the shelf rockfish complex south of 40°10' N latitude. The draft annual IOA set-asides for the shelf rockfish complex south of 40°10' N. lat. is 67.7 mt, for both 2021 and 2022 (Table 4-50 and Table 4-51).

Yellowtail rockfish range from the Aleutian Islands of Alaska south to La Jolla, California; however, the southern stock is predominantly found from the 40°10' N. lat. management line to the northern Channel Islands within the southern California bight. The species can be found from the surface to approximately 300 fm, but most abundant from approximately 50 fm to 100 fm (Love et al, 2000). The non-trawl RCA between 40°10' to 34°27 N latitude is 40 fm to 125 fm; however, there are proposals to adjust the shoreward boundary line from 40 fm to 50 fm off central California (see Chapter 4.2.5.2). Additionally, the non-trawl RCA between 34°27' N. lat. to the California/Mexico border is 75 fm to 150 fm, and similarly, there are proposals to adjust the shoreward boundary line from 75 fm to 100 fm. Although troll caught salmon is

[22] It is important to note that in the commercial salmon troll fishery off of California coho salmon are prohibited

commercially landed south of 34° 27’ N. lat., as far south as Long Beach, the majority of the salmon is landed in central California ports. Therefore, this management measure would mainly affect the salmon troll and groundfish fisheries between 40°10’ to 34°27 N. lat. and would have limited impact in southern California.

In 2019, there were 1,053 vessels permitted to land salmon in California, of which 570 vessels participated in the commercial salmon fishery (all gears) and 89 of vessels had 50 percent of the landings. Approximately, 920 vessels have a home port south of 40°10’ N. lat., of which 527 vessels participated in the salmon troll fishery and landed south of 40°10’ N. lat., and 82 of those vessels had 50 percent of the landings from the salmon troll fishery (Table 4-187).

Table 4-187. Number of vessels permitted and participating in the 2019 California commercial salmon fishery. Data source: CDFW Ocean Salmon Project, Marine Landings Data System and PacFIN.

Area	# of Permitted Vessels	# of Participating Vessels	# of vessels with 50% of landings
Statewide	1053	570	89
South of 40º10' N lat*	920	527	80

*Approximate number of vessels permitted and participating in the salmon troll fishery.

The 2021 and 2022 commercial salmon seasons and quotas will be not be determined until the April meeting of those years, well after the submission on this analysis. Therefore, the 2019 commercial salmon fishery season, which spanned across six months (May through Oct), and number of participating vessels were used as a proxy to project a *maximum landings* scenario for yellowtail rockfish south of 40°10’ N. lat. in the salmon troll fishery. However, through discussions with industry members, a more likely scenario would be to assume encounters with yellowtail rockfish would occur during the months of May, June, and early July; under certain tide, current, and bait conditions; and from the most active participants (i.e. number of vessels with 50 percent of the salmon landings).

Under the *maximum landings* scenario, it was assumed that if a vessel landed 400 lbs or more of salmon per month, it also landed the full 200 lbs of yellowtail rockfish because the proposed trip limit is a 2:1 ratio with a monthly limit of 200 lbs. That is, for every 2 lbs of salmon, up to 1 lb of yellowtail may be retained and landed but no more than 200 lbs per month. Conversely, if the vessel landed less than 400 lbs of salmon per month, then the vessel landed half the amount in yellowtail rockfish (i.e. if 300 lbs of salmon were landed, then 150 lbs of yellowtail rockfish was also landed). Additionally, it was assumed that all 527 participating salmon troll vessels fished within the non-trawl RCA south of 40°10 N latitude and thus, were subject to the proposed trip limit. Under these assumptions, the *maximum landings* projection yellowtail rockfish in the salmon troll fishery south of 40°10 N latitude is 121 mt. The 2019 average price per pound for hook-and-line caught yellowtail rockfish south of 40°10’ N latitude was $3.13; using the *maximum landings* projection the ex-vessel revenue could be approximately $835,000. The IOA set-aside would increase to 188.7 mt with the additional *maximum landings* projection, which would result in the allocations shown in Table 4-188

Under the scenario discussed with industry, using 2019 data, should approximately 80 vessels of the 527 participating vessels landing south of 40°10’ N. lat. encounter yellowtail rockfish for only three months and took the full 200 lbs per month, the projection would be 22 mt. Using the 2019 average price per pound of $3.13, the projected ex-vessel revenue would be $152,118. The resulting fishery HG and allocations are shown in Table 4-188

Table 4-188. Resulting fishery HGs and allocations (mt) for shelf rockfish south of 40° 10' N. lat. under the status quo and two impact scenarios for allowing yellowtail rockfish retention in the salmon troll fishery.

Specification/ Allocation	Status Quo		Maximum Landings		Industry Scenario	
	2021	2022	2021	2022	2021	2022
ACL	1,438	1,428	1,438	1,428	1,438	1,428
IOA	67.7		188.7		89.7	
Fishery HG	1,370.3	1,360.3	1,204.2	1,194.2	1,303.2	1,293.2
Trawl	167.2	166.0	146.9	145.7	159	157.8
Non-Trawl	1,203.1	1,194.3	1,057.3	1,048.5	1,144.2	1,135.4

For a refence point, the salmon toll fishery north of 40°10' N. lat., under this same trip limit, which has been in place since 2001, landed 1.8 mt of yellowtail rockfish in 2019. The average annual landing of yellowtail rockfish by the salmon troll fishery over the last ten years was approximately 2 mt, the highest was 3.9 mt in 2015. The average price per pound in 2019 for yellowtail rockfish north of 40°10' N latitude was just under $1.00; with a 10-year average (2010-2019) of approximately $1.50. The small annual landings suggest the catch was incidental and the low price per pound suggests there is little to no incentive to target yellowtail rockfish in the salmon troll fishery.

Given the salmon troll fishery in the north lands around 2 mt of yellowtail rockfish per year under a trip limit that has been in place since 2001 and discussions with industry, it is highly unlikely that the landings would be as great as the *maximum landings* projection. However, if the price per pound of yellowtail rockfish in the south continues to fetch around $3.00, it is probable that landings of yellowtail rockfish south of 40°10' N latitude, under the same trip limit, could be higher than the average annual landings of 2 mt in the north (i.e. more incentive to turn discards into landings). That said, it is still difficult to specify a single projection for this proposed trip limit since there are many unknowns: 2021 and 2022 salmon season length and quota, number of vessels that will be permitted and participating in the salmon fishery, number of vessels with a VMS that will be trolling in the RCA, and if conditions would be optimal for encountering yellowtail rockfish while salmon trolling. Therefore, the precautionary approach may be to utilize the projection based on industry input (i.e. 22 mt) until data has come in to better inform the projection, noting that adjustments to the trip limit and off-the-top IOA deduction can be made through inseason action or the harvest specification and management measures process in the event the directed groundfish fisheries are approaching their harvest limits for the shelf rockfish complex south of 40°10' N. lat.. Under this scenario, neither the trawl nor non-trawl is expected to be constrained by the new shelf rockfish south allocations as attainments have been low. With respect to other impacts, there is little impacts to yelloweye rockfish, as salmon trollers actively avoid rocky areas as to not destroy their gear and salmon do not co-occur with yelloweye rockfish. There is expected to be little impact to other nongroundfish or other ESA listed species, however, it is uncertain as the fishery is not observed.

As the salmon troll fishery targets chinook salmon, an ESA listed species, the effects of this measure will be in part determine on the 2021 and 2022 salmon seasons and quotas. According to the Marine Mammal Protection Act List of Fisheries for the last 5 years (2015-2019) no marine mammals have been documented in the California salmon troll fishery, thus it is likely this management measure will not adversely affect marine mammals as the fishery operation is not changing do to this measure.

This management measure is not expected to have adverse effects on groundfish stocks because the incidental take of yellowtail rockfish would be managed through cumulative trip limits designed to reduce regulatory discarding and is also restricted by the length of the salmon season and quota. Additionally, salmon vessels possessing groundfish in federal water must have a VMS. Moreover, if at any time during a fishing trip, a participant in the salmon troll fishery operates inside the RCA, the vessel may not then

switch target strategies and retain groundfish other than yellowtail rockfish outside the RCA in the same trip as noted in the Federal Regulations for West Coast Salmon Fisheries Applying in the Exclusive Economic Zone (3-200 miles) off the Coasts of Washington, Oregon, and California.

Modifications to the commercial non-trawl RCA are also being considered which may have a cumulative effect on shelf rockfish stocks, however given the low attainment of the shelf rockfish non-trawl allocation, it is unlikely that there will be a negative cumulative effect. Further, the non-trawl commercial fisheries are managed with cumulative trip limits which may be modified through routine inseason action, should mortality in the sector need to be reduced.

The combined cumulative impact of this management measure on groundfish is expected to be negligible because the incidental take of yellowtail rockfish would be managed through cumulative trip limits designed to reduce regulatory discarding and is also restricted by the length of the salmon season and quota.

These management measures are consistent with the following National Standards: (1) result in more optimal yield without overfishing; (2) based on the best scientific information; and (8) take into account/benefit fishing communities. This action is consistent with National Standard 1 by providing the greatest overall benefit to the nation by allowing harvest of healthy stocks which are currently being underutilized (e.g., shelf rockfish complex). Prior to many rockfish species being declared overfished, the non-trawl fixed gear fisheries used to support a vibrant shelf rockfish fishery, which was eliminated when the RCAs were implemented. This action is also consistent with National Standard 2 by utilizing the best available scientific information. The latest stock assessments indicate a more optimistic status of the yelloweye rockfish population. Further, these management measures provided a cautious approach to affording increased access to depth, continuing to provide protection to, yelloweye rockfish. This action is also consistent with conservation requirements and takes into account the importance of fishery resources to fishing communities.

4.2.6 Socioeconomic Environment

4.2.6.1 Estimated Commercial Ex-Vessel Revenue and Recreational Effort Impacts of the Integrated Alternatives

This section evaluates the effects of the Alternatives on fishery participants and fishing communities. As described in Section 3.3 the Status Quo scenario characterizes catch, ex-vessel revenue, and recreational fishing effort in 2019 using the same GMT catch projection methods that were applied under the Alternatives (Section 3.3 supplements this characterization for the commercial fishery sectors with historical landings and ex-vessel revenue amounts recorded in the PacFIN database.)

Status Quo represents the environmental baseline using actual totals and projections based on regulations in place towards the end of 2019. The analysis assumes reapportionment of unused tribal fishery quota to the non-tribal commercial fishery occurs under all the Alternatives, including Preferred Alternative (PA)[23]. In years when reapportionment has occurred, as it did in 2019, whiting quota and potential catch were shifted from the tribal sector to the non-tribal sector. Since such shifts generally have occurred late in the year, catch in the shorebased IFQ sector has been only mildly affected. In this analysis the shift in whiting quota is assumed to affect potential catch and revenue with respect to Status Quo for the at-sea tribal sector and the non-tribal at-sea mothership and catcher-processor sectors. Since impacts to the tribal and at-sea whiting sectors are reported only in terms of potential sector ex-vessel revenues, and are not traced through to shorebased communities, the projected effects of whiting quota reapportionment under the Alternatives do not extend to estimated community income or employment impacts.

The Alternatives were constructed to illustrate how conditions may change from Status Quo, both by applying harvest specifications based on default HCRs and compliant management measures (i.e., the No Action Alternative), and varying ACLs and management measures for certain stocks [shortbelly rockfish, black rockfish (Oregon), cowcod (south of 40º10'), petrale sole and sablefish] under the action Alternatives (Alternative 1, Alternative 2, and the PA). The ACLs for all remaining stocks are consistent across all Alternatives. Also, under No Action, Alternative 1 and Alternative 2, there are two scenarios corresponding to use of alternative methods to apportion sablefish between fisheries conducted in the relatively low-attainment Conception area vs relatively high-attainment fisheries conducted north of Conception. Method 1 is based on "status quo" apportionment while Method 2 allots a larger portion of sablefish to fisheries north of the Conception area with correspondingly higher projected coastwide landings and associated community economic impacts.[24]

For simplicity, fishery and community economic impacts in the following sections are displayed for 2021, the first year of the two-year management cycle, only. Although the totals during the second year of the management cycle in 2022 may be somewhat different in some cases, the relative distribution of economic effects and inferences regarding rankings of the Alternatives would not change. The 2015 EIS included detailed descriptions of the models and data used to project socioeconomic impacts. Updated documentation of the models may be found in the Groundfish SAFE document. The projection models include:

- GMT catch and landings projection models for various sectors of the commercial groundfish fishery,
- GMT fishing effort (angler trips) projections for the recreational groundfish fishery,

[23] See Chapter 4

[24] Sablefish apportionment Method 1 uses the long-term (2002-2018) average bottom trawl survey biomass distributions while Method 2 uses the rolling 5-year (2014-2018) average survey biomass distributions. The reduction in sablefish apportioned to Conception area fisheries under Method 2 is not projected to affect catch, landings and ex-vessel revenue in that area because historical sablefish attainment rates there are so low (See Appendix A page 2-87).

- The landings distribution model (LDM), which is used to assign where commercial landings are likely to occur, and resulting port-level ex-vessel revenues based on recent year ex-vessel prices,
- The IOPAC economic impact model used to evaluate the effects of the Alternatives on coastal communities (ports where commercial groundfish landings and recreational groundfish effort occur) in terms of personal income generated ("income impacts") and associated employment ("employment impacts"),
- Net revenue in commercial fishery operations based on projected landings, ex-vessel revenues and vessel cost earnings surveys.

The following sections assess socioeconomic impacts in terms of:

- Changes in landings and ex-vessel revenue by commercial fishery sector,
- Change in recreational effort (angler trips) by originating community,
- Change in net revenue by limited entry fishery sector,
- Change in income and employment impacts by community resulting from changes in commercial landings revenue and recreational effort.

4.2.6.2 Commercial Fisheries

Revenue estimates are based on projected landings estimates from the GMT models referenced above. Table 4-189, Table 4-190, and Table 4-191 compare ex-vessel revenue estimates under the Alternatives to Status Quo. All projections assume average ex-vessel prices observed in 2019. Effects are presented by groundfish fishery "sectors," which are described in Section 3.3.

A number of caveats apply to modeling commercial fishery impacts. First, effort displaced by management measures is assumed not to switch readily into other fishery sectors or geographic regions. Second, landings projection models and economic impact models like IOPAC are calibrated to represent a baseline or "snapshot" of the economy at a particular point in time. Consequently, these models are best able to address impacts of scenarios that are not too far removed from what has occurred in the recent past. Third, catch projections in the IFQ fishery may not reflect the leveraging effect of increases in ACLs for certain "choke" species (those with low ACLs/allocations). A higher or lower allocation of a particularly constraining species may generate more or less actual revenue than is forecast using the current catch projection models. At the same time, market limitations may constrain the extent to which commercial fisheries are able to take advantage of increased allocations. Finally, stock recruitment variability and catch monitoring uncertainty will contribute to the divergence between the projections and actual catches. Although actual ACL attainment may differ from projections, inseason management measures are routinely applied to prevent ACLs from being exceeded.

As noted above, the Pacific whiting TAC is determined annually, consistent with the Agreement with Canada on Pacific Hake/Whiting where 73.88% of the TAC is allocated to U.S. fisheries, of which 17.5% is allocated to the Tribal sector. Since the TAC and resulting allocation is not determined during the harvest specifications process, a historical TAC (2019) is used to estimate socioeconomic impacts. The actual TACs for 2021 and 2022 could be higher or lower than the assumed value.

Key points regarding estimated ex-vessel revenue impacts by fishery sector are as follows:

- Under No Action and action Alternatives 1 and 2, annual average coastwide ex-vessel revenue, including the at-sea sectors, is projected to exceed Status Quo by from $22.7 million to $25 million. Under the Preferred Alternative annual average coastwide ex-vessel revenue, including the at-sea sectors, is projected to exceed Status Quo by $26.3 million. Approximately half of the projected increase from Status Quo ($13 million) under the Alternatives is due to the attainment assumptions affecting the at-sea whiting sectors. The relatively slight differences in projected overall ex-vessel

revenue for the combined shoreside sectors between No Action, Alternative 1, Alternative 2 and the PA, i.e., a range of $3.7 million, are likely within the margin of error for these estimates.

- The TAC for Pacific whiting is set annually outside of this harvest specifications process. In this analysis the 2021-2022 TAC and allocations (including tribal reapportionment) are assumed to be the same as 2019.
    - Projections for the shoreside IFQ non-tribal whiting fishery do not vary under the Alternatives. Ex-vessel revenues from non-tribal whiting landings are estimated to be approximately $28.9 million under Status Quo, No Action, Alternative 1, Alternative 2 and the PA.
    - For the non-tribal at-sea whiting fisheries (Mothership and Catcher Processor sectors), increases relative to Status Quo reflect assumed 100% whiting attainment given the same reapportionment of quota from tribal to non-tribal sectors assumed under Status Quo. Status Quo ex-vessel revenue for the non-tribal at-sea whiting sectors is $33.8 million. Higher attainment in non-tribal at-sea sector is assumed to result in ex-vessel revenue of approximately $46.8 million under No Action, Alternative 1, Alternative 2 and the PA.
    - Projected revenues in the tribal at-sea whiting fishery are approximately $4 million under all Alternatives (No Action, Alternative 1, Alternative 2 and the PA), the same as Status Quo.
- Projected increases from Status Quo in shoreside IFQ non-whiting sector ex-vessel revenues range from $3.7 million to $5 million under No Action, Alternative 1 and Alternative 2, with higher revenues projected under sablefish apportionment Method 2 than under Method 1. Under the PA annual average ex-vessel revenue in the shoreside IFQ non-whiting sector is projected to exceed Status Quo by $6.3 million.
- The non-nearshore limited entry fixed gear and open access sectors target sablefish and other species, with sablefish landings accounting for approximately 85% of Status Quo ex-vessel revenue (see Groundfish SAFE Table 8b). Compared with Status Quo ex-vessel revenue in the limited entry fixed gear sector is estimated to increase from $0.8 million to $2.2 million under No Action, Alternative 1 and Alternative 2, with greater revenues under sablefish apportionment Method 2 than Method 1. Under the PA annual ex-vessel revenue in the sector is projected to exceed Status Quo by $2.2 million. Increases in revenues in the non-nearshore open access sector are projected to range from $1 million to $1.4 million under No Action, Alternative 1 and Alternative 2, with greater revenues under sablefish apportionment Method 2 than Method 1. Under the PA annual average ex-vessel revenue in the non-nearshore open access sector is projected to exceed Status Quo by $1.4 million.
- The nearshore open access sector primarily targets rockfish, cabezon, and lingcod, with black rockfish accounting for the largest share of any single species (see Groundfish SAFE Table 9b). Compared with Status Quo the nearshore open access sector is projected to see an increase $1.4 million under No Action, Alternative 1 and Alternative 2. Under the PA annual average ex-vessel revenue in the sector is also projected to exceed Status Quo by $1.4 million. There is no noticeable difference for this sector between the two sablefish apportionment methods. While the nearshore sector contributes a relatively small portion to coastwide shoreside revenue, it is important especially in Southern Oregon and Northern and Central California fishing communities.
- There is no difference in projected revenues compared with Status Quo for the incidental open access sector under any of the Alternatives, including PA.
- Revenues in the Tribal groundfish sector (including shorebased whiting) are projected to increase over Status Quo by the same amount, under No Action, Alternative 1, Alternative 2 and the PA (approximately $2.1 million).

Table 4-189. Estimated ex-vessel revenues by groundfish harvest sector under the Alternatives (2019 $million). M =sablefish allocation method

	Status Quo	No Action		Alternative 1		Alternative 2		PA
		M-1	M-2	M-1	M-2	M-1	M-2	
Shoreside Sectors:								
Whiting	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
Non-whiting Trawl+Non-trawl IFQ	34.3	38.6	39.2	38.6	39.2	37.9	38.5	40.6
LEFG	14.8	15.6	16.2	16.3	16.9	16.3	16.9	16.9
Nearshore OA	3.8	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Non-nearshore OA	3.1	4.2	4.3	4.3	4.5	4.3	4.5	4.5
IOA	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Tribal (incl. whiting)	3.8	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Shoreside Totals	**88.9**	**98.6**	**99.9**	**99.5**	**100.9**	**98.8**	**100.2**	**102.2**
At-sea Sectors:								
Non-Tribal Whiting	33.8	46.8	46.8	46.8	46.8	46.8	46.8	46.8
Tribal Whiting	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
At-sea sectors' Totals	**37.8**	**50.8**	**50.8**	**50.8**	**50.8**	**50.8**	**50.8**	**50.8**
TOTAL Groundfish Revenue	**126.7**	**149.4**	**150.7**	**150.3**	**151.7**	**149.6**	**151.0**	**153.0**

Table 4-190. Change in groundfish ex-vessel revenues from Status Quo by groundfish harvest sector under the Alternatives (2019 $million). M =sablefish allocation method

	Status Quo	No Action		Alternative 1		Alternative 2		PA
		M-1	M-2	M-1	M-2	M-1	M-2	
Shoreside Sectors:								
Whiting	*28.9*	+0	+0	+0	+0	+0	+0	+0
Non-whiting Trawl+Non-trawl IFQ	*34.3*	+4.4	+4.9	+4.4	+5.0	+3.7	+4.3	+6.3
LEFG	*14.8*	+0.8	+1.4	+1.5	+2.2	+1.5	+2.2	+2.2
Nearshore OA	*3.8*	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4
Non-nearshore OA	*3.1*	+1.0	+1.2	+1.2	+1.4	+1.2	+1.4	+1.4
IOA	*0.3*	+0	+0	+0	+0	+0	+0	+0
Tribal (incl. whiting)	*3.8*	+2.1	+2.1	+2.1	+2.1	+2.1	+2.1	+2.1
Shoreside Totals	***88.9***	**+9.7**	**+11.0**	**+10.6**	**+12.0**	**+9.9**	**+11.3**	**+13.4**
At-sea Sectors:								
Non-Tribal Whiting	*33.8*	+13.0	+13.0	+13.0	+13.0	+13.0	+13.0	+13.0
Tribal Whiting	*4.0*	+0	+0	+0	+0	+0	+0	+0
At-sea sectors' Totals	***37.8***	**+13.0**	**+13.0**	**+13.0**	**+13.0**	**+13.0**	**+13.0**	**+13.0**
TOTAL Groundfish Revenue	***126.7***	**+22.7**	**+24.0**	**+23.5**	**+25.0**	**+22.9**	**+24.3**	**+26.3**

Table 4-191. Change in groundfish ex-vessel revenues from Status Quo by groundfish harvest sector under the Alternatives (percent). M =sablefish allocation method

	Status Quo *($mil)*	**No Action**		**Alternative 1**		**Alternative 2**		**PA**
		M-1	**M-2**	**M-1**	**M-2**	**M-1**	**M-2**	
Shoreside Sectors:								
Whiting	*28.9*	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%
Non-whiting Trawl+Non-trawl IFQ	*34.3*	+12.8%	+14.4%	+12.7%	+14.5%	+10.7%	+12.5%	+18.3%
Limited Entry Fixed Gear	*14.8*	+5.5%	+9.7%	+10.1%	+14.8%	+10.1%	+14.8%	+14.8%
Nearshore Open Access	*3.8*	+35.6%	+35.6%	+36.5%	+36.5%	+36.5%	+36.5%	+36.5%
Non-nearshore Open Access	*3.1*	+33.5%	+38.6%	+39.1%	+44.5%	+39.1%	+44.5%	+44.5%
Incidental Open Access	*0.3*	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%
Tribal (incl. whiting)	*3.8*	+55.8%	+55.8%	+55.8%	+55.8%	+55.8%	+55.8%	+55.8%
Shoreside sectors' Totals	***88.9***	**+10.9%**	**+12.4%**	**+11.9%**	**+13.5%**	**+11.1%**	**+12.8%**	**+15.0%**
At-sea Sectors:								
Non-Tribal Whiting	*33.8*	+38.4%	+38.4%	+38.4%	+38.4%	+38.4%	+38.4%	+38.4%
Tribal Whiting	*4.0*	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%
At-sea sectors' Totals	***37.8***	**+34.3%**	**+34.3%**	**+34.3%**	**+34.3%**	**+34.3%**	**+34.3%**	**+34.3%**
TOTAL Groundfish Revenue	***126.7***	**+17.9%**	**+18.9%**	**+18.6%**	**+19.7%**	**+18.0%**	**+19.2%**	**+20.8%**

4.2.6.3 Recreational Fisheries

For recreational fisheries, projected marine area angler boat trips taken in groundfish plus Pacific halibut recreational fisheries are compared to Status Quo fishing effort under the proposed management alternatives. Table 4-192, Table 4-193, and Table 4-194 compare projected recreational angler trips under the No Action and Action Alternatives to Status Quo average annual angler effort. Results are shown by coastal regions that are aggregated from statistical reporting regions.[25]

Most of the recreational management options considered are projected to have modest or unquantifiable effects on projected angler fishing effort. To produce a tractable number economic impact projections that cover the range of possible outcomes, in addition to No Action two Action Alternatives plus the PA were constructed from the range of management Alternatives or options proposed for each state: Under coastwide Alternative 1, Washington's and Oregon's Alternative 1 is paired with California recreational Options 1 and 2 (limited seasons and fishing depths), while under coastwide Alternative 2, Washington's and Oregon's Alternative 2 is paired with California recreational Option 3 (year-round all depth fishing). These associations are maintained in this and subsequent sections of the economic analysis.[26] Although

[25] The Puget Sound region is not shown in these tables because Council managed recreational fisheries do not occur in this region.
[26] For more information about the proposed recreational management options see Sections 4.5.8 through 4.5.10 descriptions .

management measures under the PA may offer somewhat greater recreational fishing opportunity than No Action, the difference was not quantifiable for this analysis. Therefore, angler effort and associated economic impacts under the PA are assumed to be equivalent to No Action

Key points regarding estimated recreational effort impacts by coastal region are as follows:

- Coastwide recreational effort is projected to increase marginally (3,500 trips, 0.4%) from Status Quo under No Action and Alternative 1. Under Alternative 2 overall recreational fishing effort is projected to increase by 184,700 trips (21.8%). Coastwide effort under the PA is assumed to be same as No Action.
- Recreational fishing effort for the Washington Coast is projected to increase by 3,500 trips (7.2%) from Status Quo under all Alternatives[27]. Washington Coast effort under the PA is projected to be the same as No Action. Washington accounts for 5.8% of coastwide Status Quo fishing effort.
- Recreational fishing effort in Oregon is not projected to change from Status Quo under the Alternatives, including PA. This results from the observation that, although recreational management measures would change, a response in terms of change in effort dies not necessarily follow changes in bag limits or open fishing depths. The combined three coastal regions of Oregon account for 12.2% of coastwide Status Quo fishing effort.
- California recreational fishing effort is not projected to change under No Action and Alternative 1, but is projected to increase in all regions under Alternative 2. Note that under Alternative 2 (California recreational Option 3) fishing would be allowed at all depths throughout the year. The Santa Barbara to San Diego region accounts for more than half (57.8%) of coastwide Status Quo recreational angler trips, and this region also shows the largest absolute change in effort, an increase of 140,200 trips (28.8%). Increases projected for the other California regions under Alternative 2 are: Crescent City-Eureka 4,900 trips (19.4%), Fort Bragg-Bodega Bay 700 trips (4.2%), San Francisco Area 15,400 trips (22.3%), and Santa Cruz to Morro Bay 20,000 trips (20.7%). Angler effort in California under the PA is assumed to be same as No Action. The combined five California management areas account for 82% of coastwide Status Quo fishing effort.

Table 4-192. Estimated Recreational Effort (halibut+bottomfish) under Status Quo and the Alternatives (thousands of angler trips).

Community Groups	Status Quo	No Action	Alternative 1	Alternative 2	PA
Washington Coast	49.2	52.8	52.8	52.8	52.8
Astoria-Tillamook	18.9	18.9	18.9	18.9	18.9
Newport	45.9	45.9	45.9	45.9	45.9
Coos Bay-Brookings	38.2	38.2	38.2	38.2	38.2
Crescent City-Eureka	25.3	25.3	25.3	30.3	25.3
Fort Bragg - Bodega Bay	16.5	16.5	16.5	17.2	16.5
San Francisco Area	69.2	69.2	69.2	84.6	69.2
SC – Mo – MB*	96.7	96.7	96.7	116.7	96.7
SB – LA – SD*	487.0	487.0	487.0	627.2	487.0
Coastwide Total	**846.9**	**850.4**	**850.4**	**1,031.7**	**850.4**

*SC – Mo – MB = Santa Cruz, Monterey, and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles, and San Diego.

[27] This is chiefly due to somewhat relaxed yelloweye rockfish avoidance measures.

Table 4-193. Estimated change from Status Quo Recreational Effort (halibut+bottomfish) under the Alternatives (thousands of angler trips).

Community Groups	Status Quo	No Action	Alternative 1	Alternative 2	PA
Washington Coast	*49.2*	+3.5	+3.5	+3.5	+3.5
Astoria-Tillamook	*18.9*	-	-	-	-
Newport	*45.9*	-	-	-	-
Coos Bay-Brookings	*38.2*	-	-	-	-
Crescent City-Eureka	*25.3*	-	-	+4.9	-
Fort Bragg - Bodega Bay	*16.5*	-	-	+0.7	-
San Francisco Area	*69.2*	-	-	+15.4	-
SC – Mo – MB*	*96.7*	-	-	+20.0	-
SB – LA – SD*	*487.0*	-	-	+140.2	-
Coastwide Total	***846.9***	+3.5	+3.5	+184.7	+3.5

*SC – Mo – MB = Santa Cruz, Monterey, and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles, and San Diego.

Table 4-194. Estimated change from Status Quo Recreational Effort (halibut+bottomfish) under the Alternatives (percent).

Community Groups	Status Quo	No Action	Alternative 1	Alternative 2	PA
Washington Coast	*49.2*	+7.2%	+7.2%	+7.2%	+7.2%
Astoria-Tillamook	*18.9*	-	-	-	-
Newport	*45.9*	-	-	-	-
Coos Bay-Brookings	*38.2*	-	-	-	-
Crescent City-Eureka	*25.3*	-	-	+19.4%	-
Fort Bragg - Bodega Bay	*16.5*	-	-	+4.2%	-
San Francisco Area	*69.2*	-	-	+22.3%	-
SC – Mo – MB*	*96.7*	-	-	+20.7%	-
SB – LA – SD*	*487.0*	-	-	+28.8%	-
Coastwide Total	***846.9***	+0.4%	+0.4%	+21.8%	+0.4%

*SC – Mo – MB = Santa Cruz, Monterey, and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles, and San Diego.

4.2.6.4 Commercial Fishery Sectors Net Revenue

Table 4-193, Table 4-194, and Table 4-195 provides estimates of net revenues for the 1) Shoreside Whiting, 2) Non-whiting Trawl & Non-trawl IFQ, and 3) Limited Entry Fixed Gear sectors. These are based on the estimated revenues (from Table 4-1), and projected landings derived from the GMT and landings distribution models. Combined with cost-earnings data collected from surveys fielded by the Economics and Social Science Research program at the Northwest Fisheries Science Center, we use an economic model linking historical landings and costs to construct measures of projected costs and net revenues. These measures are constructed only for sectors with sufficient cost and earnings data coverage to perform the modeling described below.

In order to project how changes in future landings may affect costs, we form a model where the landings L for groundfish species s, as well as their respective interactions, are associated with the natural log of non-labor variable costs VC, for the i^{th} vessel in year t as seen in equation (1). Key variable costs vary by sector,

including, for example fuel, bait, ice, food, observer coverage, and electronic monitoring costs. Intuitively, we might expect costs to increase when a vessel catches a greater quantity of fish, and interactions allow for cost complementarities between species. The economic rationale behind examining the log of non-labor variable costs is that marginal costs increase with landings.[28]

$$\ln(VC_{it}) = \sum_{s=1} L_{its} + \sum_{s=1} \sum_{r=1, r \neq s} L_{its} L_{itr} + \epsilon_{it} \quad (1)$$

Total costs net revenues (*TCNR*) are calculated as revenues (*R*), less projected non-labor variable costs (*VC*), wages, cost recovery fees (*CR*), buyback fees (*BB*), and fixed costs (*FC*) as shown in equation (2). First, projections of non-labor variable costs are obtained from forecasted catches, applied to our regression results, by species and vessel. Then, to obtain projected wages, we calculate the historical proportions of wages (*wp*) to variable costs net revenues, and apply them to projected variable costs net revenues. The intuition here is that wages are typically paid out as shares of variable costs net revenues. Cost recovery fees and buyback fees were calculated using 2020 rates of 3.0 percent and 3.5 percent, respectively. Finally, fixed costs, including vessel and on-board equipment, fishing gear, moorage, and insurance are aggregated from survey data by sector for all vessels that fished in 2019, although a sector-specific mean is applied in cases when a specific vessel is not included in the survey sample.

$$TCNR = R - VC - (R - VC) * wp - FC - CR - BB \quad (2)$$

Then, we examine potential differences between proposed Alternatives, where Methods 1 and 2 are the different sablefish allocation methods used in the GMT models. While additional model details can be obtained from the authors by request, key points regarding estimates of net revenue by fishery sector are as follows:

- Shoreside whiting sector net revenue is estimated between $8.5 and $8.6 million across the Alternatives. The relatively small differences in net revenue estimates are the result of slight variations in projections of catch of non-whiting groundfish species while targeting whiting.
- The largest absolute and percentage increases compared to Status Quo for groundfish harvesting sectors occur under the PA, which incorporates Method 2 regarding projected sablefish harvest by vessels operating north of the Conception area.
- While estimates of net revenue appear similar across Alternatives, the 2021 specifications for the Non-whiting Trawl & Non-trawl IFQ and Limited Entry Fixed Gear sectors do appear to be an economic improvement compared with the 2019 Status Quo.
- The intervals in Figure 4-42 represent the 5th and 95th percentiles of our sampling distribution and suggest that increases in revenue from increases in landings could outpace corresponding increases in costs. Although not included in the figure, estimated sector net revenues under the PA follow a pattern similar to the Alternatives shown..

[28] Marginal costs might increase with landings if for example there exists a stock effect, such that it becomes harder and harder to find fish as catches increase.

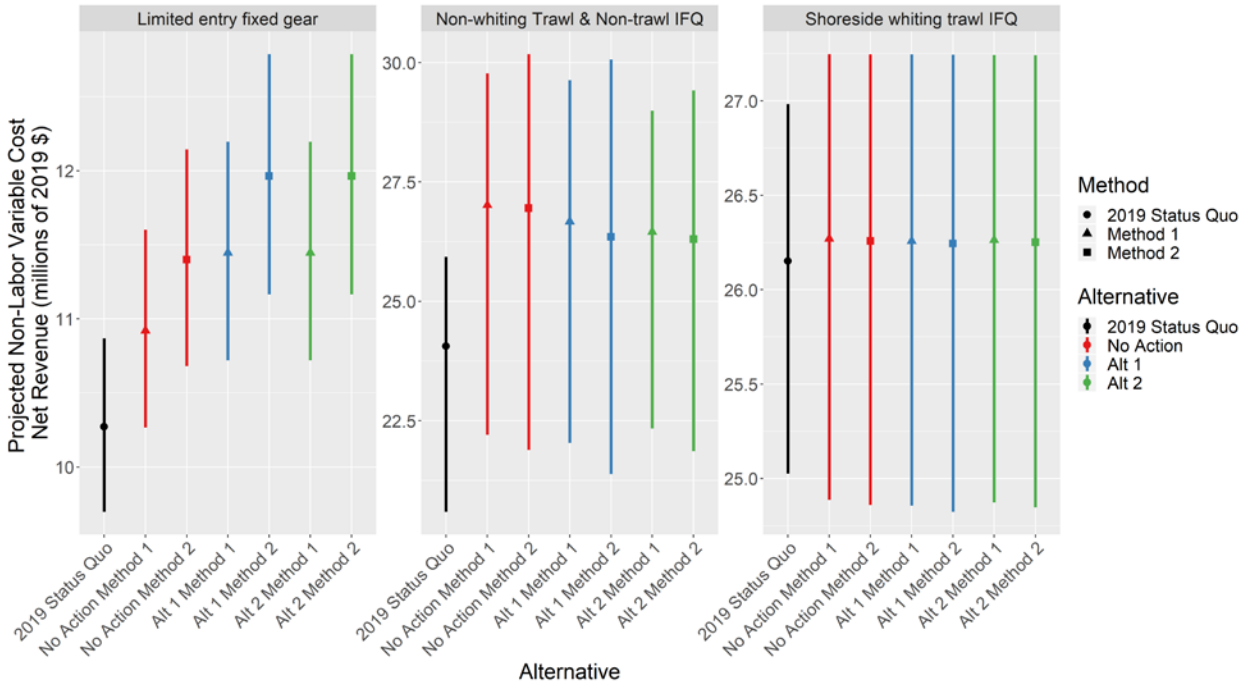

Figure 4-42. Estimated sector-wide total non-labor variable costs net revenues by groundfish harvesting sector under the alternatives, 5th and 95th percentile intervals (2019 $million).

Table 4-195. Estimated vessel net revenues for the whiting, shoreside IFQ, and limited entry fixed gear sectors under the alternatives in millions of dollars (2019 $million) compared to status quo. M =sablefish allocation method

	Status Quo ($mil)	No Action		Alternative 1		Alternative 2		PA
		M- 1	M-2	M- 1	M-2	M- 1	M-2	
Shoreside Sectors:								
Whiting	8.5	8.6	8.6	8.5	8.5	8.6	8.5	8.6
Non-whiting Trawl+Non-trawl IFQ	6.7	8.6	8.7	8.5	8.7	8.2	8.4	9.2
Limited Entry Fixed Gear	1.7	2.0	2.3	2.4	2.7	2.4	2.7	2.7

Table 4-196. Change in groundfish net revenues from Status Quo for the whiting, shoreside IFQ, and limited entry fixed gear sectors under the alternatives in millions of dollars (2019 $million). M =sablefish allocation method

	Status Quo ($mil)	No Action		Alternative 1		Alternative 2		PA
		M- 1	M-2	M- 1	M-2	M- 1	M-2	
Shoreside Sectors:								
Whiting	8.5	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1
Non-whiting Trawl+Non-trawl IFQ	6.7	+1.8	+2.0	+1.8	+2.0	+1.5	+1.7	+2.5
Limited Entry Fixed Gear	1.7	+0.4	+0.7	+0.7	+1.0	+0.7	+1.0	+1.0

Table 4-197. Estimated percent change in groundfish net revenues from Status Quo for whiting, shoreside IFQ, and limited entry fixed gear sectors under the alternatives (2019 $million). M =sablefish allocation method

	Status Quo ($mil)	No Action		Alternative 1		Alternative 2		PA
		M- 1	M-2	M- 1	M-2	M- 1	M-2	
Shoreside Sectors:								
Whiting	8.5	+ 1.0%	+ 1.0%	+ 1.0%	+ 0.9%	+ 1.0%	+ 0.9%	+1.2%
Non-whiting Trawl+Non-trawl IFQ	6.7	+27.4%	+30.2%	+26.5%	+29.3%	+22.2%	+25.0%	+37.3%
Limited Entry Fixed Gear	1.7	+23.4%	+40.6%	+42.3%	+60.9%	+42.3%	+60.9%	+58.8%

Table 4-198, Table 4-199, Table 4-200 represent projected payments made by vessels to both captain and crew. Owners of vessels who operate as the captain may be paid a wage and/or receive a share of the vessel's profits as compensation. Wage projections are based on actual recorded wages, as such compensation received by captains on vessels that do not pay a captain's wage is included in vessel net revenue. As in the case of vessel net revenue projections, wages are available only for sectors for which sufficient cost and earnings data are available.

Key points regarding estimates of crew and captain wages by fishery sector are as follows.

- Shoreside whiting sector net revenue is estimated between $8.5 and $8.6 million across the Alternatives. The relatively small differences in net revenue estimates are the result of slight variations in projections of catch of non-whiting groundfish species while targeting whiting.
- The largest absolute and percentage increases compared to Status Quo for groundfish harvesting sectors occur under the PA, which incorporates Method 2 regarding projected sablefish harvest by vessels operating north of the Conception area.
- While estimates of net revenue appear similar across Alternatives, the 2021 specifications for the Non-whiting Trawl & Non-trawl IFQ and Limited Entry Fixed Gear sectors do appear to be an economic improvement compared with the 2019 Status Quo.

Table 4-198. Estimated vessel wages (crew and captain) for whiting, shoreside IFQ, and limited entry fixed gear sectors under the alternatives in millions of dollars (2019 $million) compared to status quo. M =sablefish allocation method

	Status Quo ($mil)	No Action		Alternative 1		Alternative 2		PA
		M- 1	M-2	M- 1	M-2	M- 1	M-2	
Shoreside Sectors:								
Whiting	10.2	10.3	10.3	10.3	10.3	10.3	10.3	10.3
Non-whiting Trawl+Non-trawl IFQ	10.4	12.0	12.1	11.9	12.0	11.6	11.8	12.5
Limited Entry Fixed Gear	4.1	4.4	4.6	4.6	4.8	4.6	4.8	4.8

Table 4-199. Estimated change in vessel wages (crew and captain) whiting, shoreside IFQ, and limited entry fixed gear sectors under the alternatives in millions of dollars (2019 $million) compared to status quo. M =sablefish allocation method

	Status Quo ($mil)	No Action		Alternative 1		Alternative 2		PA
		M- 1	M-2	M- 1	M-2	M- 1	M-2	
Shoreside Sectors:								
Whiting	10.2	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1
Non-whiting Trawl+Non-trawl IFQ	10.4	+1.5	+1.7	+1.5	+1.6	+1.2	+1.4	+2.1
Limited Entry Fixed Gear	4.1	+0.3	+0.5	+0.5	+0.7	+0.5	+0.7	+0.7

Table 4-200. Estimated percent change in vessel wages (crew and captain) for whiting, shoreside IFQ, and limited entry fixed gear sectors under the alternatives compared to status quo wages. (2019 $million). M =sablefish allocation method

	Status Quo ($mil)	No Action		Alternative 1		Alternative 2		PA
		M- 1	M-2	M- 1	M-2	M- 1	M-2	
Shoreside Sectors:								
Whiting	+1.0%	+1.0%	+1.0%	+1.0%	+1.0%	+1.0%	+1.0%	+1.0%
Non-whiting Trawl+Non-trawl IFQ	+15.4%	+16.3%	+14.4%	+15.4%	+11.5%	+13.5%	+20.2%	+15.4%
Limited Entry Fixed Gear	+7.3%	+12.2%	+12.2%	+17.1%	+12.2%	+17.1%	+17.1%	+7.3%

4.2.6.5 Estimated Change in Income and Employment Impacts by Community

Socioeconomic impacts to fishing communities engaged in groundfish fisheries are evaluated based on the changes in personal income (dollar income impacts) and employment (number of jobs) under the Alternatives. These effects are functions of the projected changes in commercial landings, ex-vessel revenue, and recreational effort described above. Comparisons are with respect to Status Quo for the No Action, Alternative 1, Alternative 2, and the PA.

For simplification and ease of comparing impacts from commercial and recreational fishing activities, coastal port groups are further aggregated regionally so as to be more consistent with the recreational reporting regions. For a description of the counties included in these regions see page 378 in the 2015 EIS.

Impacts were monetized and converted into income and employment effects using results from the National NMFS Northwest Fisheries Science Center (NWFSC) IOPAC input-output model. Impacts include combined direct, indirect, and induced economic effects resulting from projected changes in recreational angling, commercial fishing, fish processing, and related input supply and industry support activities.

Community impacts from commercial and recreational fishing are displayed separately. Impacts are calculated by applying income and employment multipliers generated using IOPAC regional impact models to the projected levels of local expenditures by commercial harvesters, seafood processors, and recreational anglers under Status Quo and the Alternatives.

Income and employment impacts from Tribal fisheries and at-sea Pacific whiting catcher-processor and mothership sectors are not included in the community impact totals for the following reasons:

1. Tribal groundfish harvesting and shorebased processing are not included in any of the cost-revenue data collected by NWFSC.
2. While overall estimators of income and employment impacts derived from the at-sea whiting fishery (tribal and non-tribal catcher processors and motherships) have been developed, the detail required to attribute these impacts to particular port groups has not.

That being said, presumably most of the income and employment impacts associated with at-sea whiting fisheries would likely accrue in the Puget Sound region; while corresponding impacts of shorebased tribal groundfish fisheries most likely accrue in Washington Coast and Puget Sound communities.

Economic impact models like IOPAC are calibrated to represent a baseline or "snapshot" of the economy at a particular point in time. Consequently, these models are best able to address impacts of scenarios that are within the range of what may have occurred over the recent past. Analysis of scenarios that represent particularly large departures from the Status Quo may, therefore, result in biased impact estimates.

4.2.6.6 Commercial Fishery Community Income Impacts

Coastwide estimated personal income impacts from commercial groundfish fishing are estimated to be $152.2 million under Status Quo and projected to increase by between $11.2 million (7.4%) under No Action Method 1 and Alternative 2 Method 1, and $16.9 million (11.1%) under the PA. Coastwide income impacts are more than $2 million higher under sablefish apportionment Method 2 than Method 1. The highest coastwide total income impacts and also the highest levels for each community occur under the PA.

Table 4-201 presents estimates of community personal income impacts by region due to projected commercial groundfish fishing activity under the range of Alternatives. Table 4-202 and Table 4-203 comparing those estimates relative to Status Quo.

Key points regarding estimated income impacts from commercial groundfish fisheries by coastal region are as follows:

- Coastwide estimated personal income impacts from commercial groundfish fishing are estimated to be $152.2 million under Status Quo and projected to increase by between $11.2 million (7.4%) under No Action Method 1 and Alternative 2 Method 1, and $16.9 million (11.1%) under the PA. Coastwide income impacts are more than $2 million higher under sablefish apportionment Method 2 than Method 1. The highest coastwide total income impacts and also the highest levels for each community occur under the PA.
- Puget Sound ports show increases over Status Quo ranging from $0.7 million (9.2%) under No Action Method 1 to $1.5 million (19.8%) under PA. Puget Sound ports account for 5% of estimated coastwide Status Quo personal income impacts from commercial fishing.
- Washington Coast port areas show personal income increases over Status Quo ranging from $0.4 million (1.4%) under No Action Method 1 to $0.8 million (3.1%) under PA. Washington Coast ports account for 17.4% of estimated coastwide Status Quo personal income impacts from commercial fishing.
- Oregon port areas show personal income increases over Status Quo ranging from $0.9 million (Coos Bay-Brookings under No Action Method 1) to $4.8 million (Astoria-Tillamook under the PA). The Coos Bay-Brookings area shows the largest percentage increase in income impacts among Oregon ports, ranging from $0.9 million (9.1%) under No Action Method 1 to $1.7 million (17%) under the PA. Astoria-Tillamook is the port group with the largest estimated absolute increase in income impacts under each Alternative: No Action - $3.8 million (6.9%) under Method 2; Alternative 1 - $3.8 million (6.9%) under Method 2; Alternative 2 - $3.3 million (6.1%) under Method 2; and the PA - an increase

of $4.8 million (8.9%). Oregon ports combined account for 61.7% of estimated coastwide Status Quo personal income impacts from commercial fishing.

- All California port groups are projected to see increases from Status Quo under all Alternatives ranging from $0.3 million (San Francisco under several Alternatives) to $1.5 million (Santa Barbara to San Diego under all Alternatives, including PA). The largest relative increases in personal income impacts compared to Status Quo among California port groups are projected for the Santa Cruz to Morro Bay region, ranging from $0.9 million (29.1%) under No Action Method 2 to $1 million (31%) under Alternative 1 Method 2, Alternative 2 Method 2, and the PA. Projected landings by fixed gear fisheries account for much of the increased income impacts in California port groups. California ports combined account for 15.9% of coastwide Status Quo income impacts from commercial fishing.

Table 4-201. Commercial fishery income impacts under Status Quo and the Alternatives by community group (2019 $million). M =sablefish allocation method

Community Groups	Status Quo	No Action		Alternative 1		Alternative 2		PA
		M-1	M-2	M-1	M-2	M-1	M-2	
Puget Sound	7.6	8.3	8.7	8.6	9.0	8.5	8.9	9.1
Washington Coast	26.5	26.9	27.1	27.1	27.2	27.1	27.2	27.3
Astoria-Tillamook	54.6	57.9	58.3	57.9	58.3	57.4	57.8	59.4
Newport	29.5	31.3	31.8	31.6	32.1	31.4	31.9	32.7
Coos Bay-Brookings	9.8	10.7	11.1	11.0	11.3	10.8	11.2	11.5
Crescent City-Eureka	6.5	7.4	7.5	7.4	7.5	7.3	7.4	7.7
Fort Bragg – Bodega Bay	3.9	4.3	4.4	4.4	4.5	4.4	4.5	4.5
San Francisco Area	3.0	3.3	3.4	3.4	3.4	3.3	3.4	3.5
SC – Mo – MB*	3.2	4.1	4.1	4.1	4.1	4.1	4.1	4.1
SB – LA – SD*	7.6	9.1	9.1	9.1	9.1	9.1	9.1	9.1
Coastwide Total	152.2	163.4	165.4	164.6	166.7	163.4	165.6	169.1

* SC – Mo – MB = Santa Cruz, Monterey, and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles, and San Diego.

Table 4-202. Change in commercial fishery income impacts (from Status Quo) under the Alternatives by community group (2019 $ million). M =sablefish allocation method

Community Groups	*Status Quo*	No Action		Alternative 1		Alternative 2		PA
		M-1	M-2	M-1	M-2	M-1	M-2	
Puget Sound	*7.6*	+0.7	+1.1	+1.0	+1.4	+0.9	+1.3	+1.5
Washington Coast	*26.5*	+0.4	+0.5	+0.5	+0.7	+0.5	+0.7	+0.8
Astoria-Tillamook	*54.6*	+3.3	+3.8	+3.3	+3.8	+2.8	+3.3	+4.8
Newport	*29.5*	+1.9	+2.3	+2.2	+2.7	+2.0	+2.5	+3.2
Coos Bay-Brookings	*9.8*	+0.9	+1.2	+1.1	+1.5	+1.0	+1.4	+1.7
Crescent City-Eureka	*6.5*	+0.9	+1.1	+0.9	+1.1	+0.8	+0.9	+1.2
Fort Bragg – Bodega Bay	*3.9*	+0.4	+0.5	+0.5	+0.6	+0.5	+0.6	+0.6
San Francisco Area	*3.0*	+0.3	+0.4	+0.3	+0.4	+0.3	+0.3	+0.5
SC – Mo – MB*	*3.2*	+0.9	+0.9	+1.0	+1.0	+1.0	+1.0	+1.0
SB – LA – SD*	*7.6*	+1.5	+1.5	+1.5	+1.5	+1.5	+1.5	+1.5
Coastwide Total	*152.2*	+11.2	+13.2	+12.4	+14.6	+11.2	+13.4	+16.9

* SC – Mo – MB = Santa Cruz, Monterey, and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles, and San Diego.

Table 4-203. Change in commercial fishery income impacts (from Status Quo) under the Alternatives by community group (percent). M =sablefish allocation method

Community Groups	*Status Quo ($mil)*	No Action		Alternative 1		Alternative 2		PA
		M-1	M-2	M-1	M-2	M-1	M-2	
Puget Sound	*7.6*	+9.2%	+13.8%	+13.0%	+18.0%	+11.7%	+16.7%	+19.8%
Washington Coast	*26.5*	+1.4%	+2.0%	+2.0%	+2.6%	+2.0%	+2.6%	+3.1%
Astoria-Tillamook	*54.6*	+6.1%	+6.9%	+6.1%	+6.9%	+5.2%	+6.0%	+8.9%
Newport	*29.5*	+6.4%	+7.9%	+7.4%	+9.1%	+6.7%	+8.4%	+10.9%
Coos Bay-Brookings	*9.8*	+9.1%	+12.4%	+11.6%	+15.2%	+10.2%	+13.8%	+17.0%
Crescent City-Eureka	*6.5*	+14.5%	+16.4%	+14.6%	+16.6%	+12.4%	+14.5%	+19.4%
Fort Bragg – Bodega Bay	*3.9*	+9.4%	+12.9%	+12.6%	+16.3%	+11.8%	+15.6%	+16.5%
San Francisco Area	*3.0*	+9.7%	+12.0%	+10.3%	+12.7%	+8.5%	+11.0%	+15.3%
SC – Mo – MB*	*3.2*	+29.2%	+29.1%	+30.7%	+31.0%	+30.7%	+31.0%	+31.0%
SB – LA – SD*	*7.6*	+19.6%	+19.6%	+19.6%	+19.6%	+19.6%	+19.6%	+19.6%
Coastwide Total	*152.2*	+7.4%	+8.7%	+8.1%	+9.6%	+7.4%	+8.8%	+11.1%

* SC – Mo – MB = Santa Cruz, Monterey, and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles, and San Diego.

4.2.6.7 Recreational Fishery Community Income Impacts

Table 4-204 shows recreational income impacts under the Alternatives; Table 4-205 shows the incremental change; Table 4-206 comparing those estimates relative to Status Quo.

For purposes of comparing economic impacts in this section, under Alternative 1 Washington's and Oregon's Alternative 1 is paired with California recreational Options 1 and 2 (limited seasons and fishing depths), while under alternative 2 Washington's and Oregon's Alternative 2 is paired with California recreational Option 3 (year-round all depth fishing). Economic impacts under the PA are assumed to be equivalent to No Action.

Key points regarding estimated income impacts from recreational groundfish fisheries by coastal region are as follows:

- Coastwide Status Quo recreational fishing income impacts of $157.1 million are projected to increase by $0.5 million (0.3%) under No Action, Alternative 1 and the PA, and by $38.7 million (24.6%) under Alternative 2.
- The Washington Coast shows relative increases under No Action, Alternative 1, Alternative 2 and PA of $0.5 million (7.3%). The Washington Coast is the only region showing a change from Status Quo under No Action, Alternative 1 and the PA.
- Recreational fishing income impacts are not projected to change from Status Quo in all regions in Oregon across all Alternatives, including PA.
- Impacts in all California regions are mot projected to change from Status Quo under No Action, Alternative 1 and the PA.
- Impacts are projected to increase for all California regions under Alternative 2 (which assumes year-round fishing in all depths - California option 3). Under Alternative 2 the Santa Barbara to San Diego region shows the largest absolute change in income impacts, an increase of $32.2 million. This is also the largest relative increase in projected income impacts (29%) under the range of Alternatives. The next largest relative increases in income impacts are shown in the San Francisco Area ($2.7 million, 22.4%), Santa Cruz to Morro Bay ($2.7 million, 20.5%), and Crescent City-Eureka ($0.4

million, 19.4%), all under Alternative 2. The Fort Bragg-Bodega Bay region shows an increase under Alternative 2 of $0.1 million (5.7%).

Table 4-204. Recreational fishery income impacts under Status Quo and the Alternatives by community group ($ mil.).

Community Groups	*Status Quo ($ mil)*	No Action	Alternative 1	Alternative 2	PA
Washington Coast	6.2	6.7	6.7	6.7	6.7
Astoria-Tillamook	1.3	1.3	1.3	1.3	1.3
Newport	5.8	5.8	5.8	5.8	5.8
Coos Bay-Brookings	2.5	2.5	2.5	2.5	2.5
Crescent City-Eureka	2.2	2.2	2.2	2.6	2.2
Fort Bragg - Bodega Bay	2.4	2.4	2.4	2.5	2.4
San Francisco Area	12.2	12.2	12.2	14.9	12.2
SC – Mo – MB*	13.4	13.4	13.4	16.1	13.4
SB – LA – SD*	111.2	111.2	111.2	143.4	111.2
Coastwide Total	**157.1**	**157.6**	**157.6**	**195.8**	**157.6**

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-205. Change in recreational fishery income impacts from Status Quo under the Alternatives by community group ($ mil.)

Community Groups	*Status Quo ($ mil)*	No Action	Alternative 1	Alternative 2	PA
Washington Coast	*6.2*	+0.5	+0.5	+0.5	+0.5
Astoria-Tillamook	*1.3*	-	-	-	-
Newport	*5.8*	-	-	-	-
Coos Bay-Brookings	*2.5*	-	-	-	-
Crescent City-Eureka	*2.2*	-	-	+0.4	-
Fort Bragg - Bodega Bay	*2.4*	-	-	+0.1	-
San Francisco Area	*12.2*	-	-	+2.7	-
SC – Mo – MB*	*13.4*	-	-	+2.7	-
SB – LA – SD*	*111.2*	-	-	+32.2	-
Coastwide Total	*157.1*	+0.5	+0.5	+38.7	+0.5

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-206. Change in recreational fishery income impacts from Status Quo under the Alternatives by community group (percent).

Community Groups	*Status Quo ($ mil)*	No Action	Alternative 1	Alternative 2	PA
Washington Coast	*6.2*	+7.3%	+7.3%	+7.3%	+7.3%
Astoria-Tillamook	*1.3*	-	-	-	-
Newport	*5.8*	-	-	-	-
Coos Bay-Brookings	*2.5*	-	-	-	-
Crescent City-Eureka	*2.2*	-	-	+19.4%	-
Fort Bragg - Bodega Bay	*2.4*	-	-	+5.7%	-

Community Groups	*Status Quo ($ mil)*	No Action	Alternative 1	Alternative 2	PA
San Francisco Area	*12.2*	-	-	+22.4%	-
SC – Mo – MB*	*13.4*	-	-	+20.5%	-
SB – LA – SD*	*111.2*	-	-	+29.0%	-
Coastwide Total	*157.1*	+0.3%	+0.3%	+24.6%	+0.3%

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

4.2.6.8 Commercial Fishery Community Employment Impacts

Table 4-205 shows projected employment impacts due to the commercial groundfish fishery under the alternatives; Table 4-206 and Table 4-208 show the change in commercial fishery impacts relative to Status Quo in terms of dollars and percentage, respectively.

Key points regarding estimated employment impacts from commercial groundfish fisheries by coastal region are as follows:

- Coastwide estimated employment impacts from commercial groundfish fishing are estimated to be 2,344 jobs under Status Quo and projected to increase by between 224 jobs (9.6%) under No Action Method 1 and 307 jobs (13.1%) under the PA. Employment impacts are at least 30 jobs greater under sablefish apportionment Method 2 than Method 1. The highest coastwide total increase in employment impacts and also the highest levels for each community occur under the PA.
- Puget Sound ports show increases over Status Quo ranging from 8 jobs (9.0%) under No Action Method 1 to 17 jobs (19.6%) under PA. Puget Sound ports account for 3.7% of estimated coastwide Status Quo employment impacts from commercial fishing.
- Washington Coast port areas show increases in employment impacts over Status Quo ranging from 5 jobs (1.4%) under No Action Method 1 to 12 jobs (3.4%) under PA. Washington Coast ports account for 15.5% of estimated coastwide Status Quo employment impacts from commercial fishing.
- Oregon port areas show employment increases over Status Quo ranging from 14 jobs (Coos Bay-Brookings under No Action Method 1) to 65 jobs (Astoria-Tillamook under the PA). The Coos Bay-Brookings area shows the largest percentage increase in employment impacts among Oregon ports, ranging from 14 jobs (7%) under No Action Method 1 to 26 jobs (13.5%) under the PA. Oregon ports combined account for 56.1% of estimated coastwide Status Quo employment impacts from commercial fishing.
- All California port groups are projected to see increases from Status Quo under all Alternatives ranging from 8 jobs (San Francisco under No Action Method 1 and Alternative 2 Method 1) to 50 jobs (Santa Cruz to Morro Bay under Alternative 1 Method 2, Alternative 2 Method 2, and the PA). The largest relative increases in employment impacts compared to Status Quo are projected for the Santa Cruz to Morro Bay region, ranging from 49 jobs (43.2%) under No Action to 50 jobs (44%) under Alternative 1 Method 2, Alternative 2 Method 2, and the PA. Projected landings by fixed gear fisheries account for much of the increased employment impacts in California port groups. California ports account for 24.7% of coastwide Status Quo employment impacts from commercial fishing.

Table 4-207. Commercial fishery employment impacts under Status Quo and the Alternatives by community group (number of jobs). M =sablefish allocation method

Community Groups	Status Quo ($mil)	No Action		Alternative 1		Alternative 2		PA
		M-1	M-2	M-1	M-2	M-1	M-2	
Puget Sound	86	93	97	97	101	96	100	102

Community Groups	Status Quo ($mil)	No Action		Alternative 1		Alternative 2		PA
		M-1	M-2	M-1	M-2	M-1	M-2	
Washington Coast	364	370	372	372	375	372	375	377
Astoria-Tillamook	712	758	762	757	762	750	755	777
Newport	408	432	438	437	443	434	441	450
Coos Bay-Brookings	196	209	214	214	220	213	218	222
Crescent City-Eureka	107	131	133	131	133	130	132	135
Fort Bragg – Bodega Bay	109	129	133	134	138	133	138	138
San Francisco Area	64	72	74	73	74	72	74	75
SC – Mo – MB*	113	161	161	162	162	162	162	162
SB – LA – SD*	186	213	213	213	213	213	213	213
Coastwide Total	2,344	2,569	2,598	2,590	2,622	2,575	2,607	2,652

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-208. Change in commercial fishery employment impacts from Status Quo under the Alternatives by community group (number of jobs). M =sablefish allocation method

Community Groups	*Status Quo ($mil)*	No Action		Alternative 1		Alternative 2		PA
		M-1	M-2	M-1	M-2	M-1	M-2	
Puget Sound	*86*	+8	+12	+11	+15	+10	+14	+17
Washington Coast	*364*	+5	+8	+8	+11	+8	+11	+12
Astoria-Tillamook	*712*	+46	+50	+45	+50	+38	+43	+65
Newport	*408*	+24	+30	+29	+35	+26	+33	+42
Coos Bay-Brookings	*196*	+14	+19	+19	+24	+17	+22	+26
Crescent City-Eureka	*107*	+24	+26	+24	+26	+23	+25	+28
Fort Bragg – Bodega Bay	*109*	+21	+25	+25	+29	+25	+29	+29
San Francisco Area	*64*	+8	+9	+9	+10	+8	+9	+11
SC – Mo – MB*	*113*	+49	+49	+49	+50	+49	+50	+50
SB – LA – SD*	*186*	+27	+27	+27	+27	+27	+27	+27
Coastwide Total	*2,344*	+224	+254	+246	+278	+231	+263	+307

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-209. Change in commercial fishery employment impacts from Status Quo under the Alternatives by community group (percent). M =sablefish allocation method

Community Groups	*Status Quo (# of jobs)*	No Action		Alternative 1		Alternative 2		PA
		M-1	M-2	M-1	M-2	M-1	M-2	
Puget Sound	*86*	+9.0%	+13.7%	+12.9%	+17.9%	+11.7%	+16.7%	+19.6%
Washington Coast	*364*	+1.4%	+2.1%	+2.2%	+3.0%	+2.2%	+2.9%	+3.4%
Astoria-Tillamook	*712*	+6.4%	+7.1%	+6.3%	+7.0%	+5.3%	+6.1%	+9.1%
Newport	*408*	+5.9%	+7.4%	+7.0%	+8.7%	+6.4%	+8.1%	+10.2%
Coos Bay-Brookings	*196*	+7.0%	+9.6%	+9.6%	+12.3%	+8.7%	+11.4%	+13.5%
Crescent City-Eureka	*107*	+22.3%	+24.0%	+22.8%	+24.7%	+21.4%	+23.3%	+26.6%
Fort Bragg – Bodega Bay	*109*	+19.0%	+22.8%	+22.8%	+26.9%	+22.6%	+26.6%	+26.9%
San Francisco Area	*64*	+12.5%	+14.6%	+13.6%	+15.8%	+12.4%	+14.7%	+17.4%
SC – Mo – MB*	*113*	+43.2%	+43.2%	+43.8%	+44.0%	+43.8%	+44.0%	+44.0%

Community Groups	*Status Quo (# of jobs)*	No Action		Alternative 1		Alternative 2		PA
		M-1	M-2	M-1	M-2	M-1	M-2	
SB – LA – SD*	*186*	+14.5%	+14.5%	+14.5%	+14.5%	+14.5%	+14.5%	+14.5%
Coastwide Total	*2,344*	+9.6%	+10.8%	+10.5%	+11.9%	+9.8%	+11.2%	+13.1%

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

4.2.6.9 Recreational Fishery Community Employment Impacts

Table 4-210 shows projected employment impacts due to the recreational groundfish fishery under the alternatives; Table 4-211 and Table 4-212 show the change in recreational fishery impacts relative to Status Quo in terms of dollars and percentage, respectively.

For purposes of comparing economic impacts in this section, under Alternative 1 Washington's and Oregon's Alternative 1 is paired with California recreational Options 1 and 2 (limited seasons and fishing depths), while under Alternative 2 Washington's and Oregon's Alternative 2 is paired with California recreational Option 3 (year-round all depth fishing). Economic impacts under the PA are assumed to be equivalent to No Action.

Key points regarding estimated employment impacts from recreational groundfish fisheries by coastal region are as follows:

- Coastwide Status Quo recreational fishing employment impacts of 2,734 jobs are projected to increase by 14 jobs (0.5%) under No Action, Alternative 1 and the PA, and by 618 jobs (22.6%) under Alternative 2.
- The Washington Coast shows relative increases under No Action, Alternative 1, Alternative 2 and PA of 14 jobs (7.4%). The Washington Coast is the only region showing a change from Status Quo under No Action, Alternative 1 and the PA.
- Recreational fishing employment impacts are not projected to change from Status Quo in all regions in Oregon across all Alternatives, including PA.
- Impacts in all California regions are not projected to change from Status Quo under No Action, Alternative 1 and the PA.
- Impacts for all California regions are projected to increase under Alternative 2 (which assumes year-round fishing in all depths - California option 3). Under Alternative 2 the Santa Barbara to San Diego region shows the largest absolute increase in employment impacts, 504 jobs. This is also the largest relative increase in projected employment impacts (29%) for any port group under the range of Alternatives. The next largest relative increases in employment impacts are shown in the San Francisco Area (42 jobs, 22.4%), Santa Cruz to Morro Bay (48 jobs, 20.4%), and Crescent City-Eureka (7 jobs, 19.4%), all under Alternative 2. Fort Bragg-Bodega Bay shows an increase under Alternative 2 of two jobs (6.0%).

Table 4-210. Recreational fishery employment impacts under Status Quo and the Alternatives by community group (number of jobs).

Community Groups	*Status Quo*	No Action	Alternative 1	Alternative 2	PA
Washington Coast	189	202	202	202	202
Astoria-Tillamook	52	52	52	52	52

Community Groups	*Status Quo*	No Action	Alternative 1	Alternative 2	PA
Newport	175	175	175	175	175
Coos Bay-Brookings	79	79	79	79	79
Crescent City-Eureka	37	37	37	44	37
Fort Bragg - Bodega Bay	41	41	41	44	41
San Francisco Area	188	188	188	231	188
SC – Mo – MB*	236	236	236	285	236
SB – LA – SD*	1,738	1,738	1,738	2,242	1,738
Coastwide Total	2,734	2,748	2,748	3,352	2,748

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-211. Change in recreational fishery employment impacts from Status Quo under the Alternatives by community group (number of jobs).

Community Groups	*Status Quo*	No Action	Alternative 1	Alternative 2	PA
Washington Coast	*189*	+14	+14	+14	+14
Astoria-Tillamook	*52*	-	-	-	-
Newport	*175*	-	-	-	-
Coos Bay-Brookings	*79*	-	-	-	-
Crescent City-Eureka	*37*	-	-	+7	-
Fort Bragg - Bodega Bay	*41*	-	-	+2	-
San Francisco Area	*188*	-	-	+42	-
SC – Mo – MB*	*236*	-	-	+48	-
SB – LA – SD*	*1,738*	-	-	+504	-
Coastwide Total	*2,734*	+14	+14	+618	+14

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-212. Change in recreational fishery employment impacts from Status Quo under the Alternatives by community group (percent).

Community Groups	*Status Quo*	No Action	Alternative 1	Alternative 2	PA
Washington Coast	*189*	+7.4%	+7.4%	+7.4%	+7.4%
Astoria-Tillamook	*52*	-	-	-	-
Newport	*175*	-	-	-	-
Coos Bay-Brookings	*79*	-	-	-	-
Crescent City-Eureka	*37*	-	-	+19.4%	-
Fort Bragg - Bodega Bay	*41*	-	-	+6.0%	-
San Francisco Area	*188*	-	-	+22.4%	-
SC – Mo – MB*	*236*	-	-	+20.4%	-
SB – LA – SD*	*1,738*	-	-	+29.0%	-
Coastwide Total	*2,734*	+0.5%	+0.5%	+22.6%	+0.5%

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

4.2.7 Essential Fish Habitat Impacts

Evaluation of impacts to the physical environment focuses on groundfish Essential Fishing Habitat (EFH) because this is the habitat principally affected by the groundfish fishery. Effects on EFH are a function of the distribution of fishing effort by gear type. Generally, for a given habitat type, dredge and trawl gear are likely to have a greater effect than other bottom contacting gear types (e.g., demersal longline and pot gear, recreational gear), because the contact is more extensive. Biogenic and hard bottom habitats may be substantially modified with relatively little fishing effort via dredge and trawl gear. Lost gear (e.g. trawl nets, pots and longlines) can affect habitat through "ghost fishing" (trapping or entangling biogenic species, fish, and prey species) or degrading habitat.

4.2.7.1 No Action

Trawl Impacts

When considering the nine stocks with ACLs increasing outside what was implemented in the 2019-20 biennium, only big skate, petrale sole, and widow rockfish are trawl dominant species. Of these three species, big skate and petrale sole are caught primarily with bottom trawl gear over soft bottom; whereas widow rockfish is a midwater rockfish species. Sablefish north of 36° N. lat. is harvested by both bottom trawl and by midwater gear as bycatch in the whiting fishery. Shortbelly rockfish is primarily caught as bycatch in the whiting fisheries using midwater gear.

Increases in the ACLs for petrale sole, big skate and sablefish are expected to result in additional harvest in the IFQ bottom trawl sector (see Section 4.2.2.4). As these species are predominantly found over soft bottom, increased effort to target these species could result in a negative impact to that habitat type; however, as described in both Appendix C of the PCGFMP and in Section 4.1.1 of Amendment 28 EIS, soft bottom substrate is the fastest to recover from fishing gear disturbances. As no new areas would be open to trawl gear under the proposed action, the overall impact of the increased ACLs on EFH for these trawl dominant species is neutral to slightly negative.

Midwater gear is associated with little to no impact on bottom habitat (Section 4.2 of the PCGFMP). Impacts of the midwater trawl to bottom habitats might be similar to what is described for bottom trawls over similar habitats, though the geographic extent and frequency of impacts would be much smaller (Appendix C Part 1. of the Pacific Coast Groundfish FMP (Whitmire and Wakefield, 2019).

The Council recommended a change to complex management of blackgill rockfish and other slope rockfish species. Historically, the stock complex was managed under Amendment 21 allocations, which allocated 63 percent to trawl and 37 percent to non-trawl. For 2021-2022, the Council recommended creating custom allocations of blackgill rockfish and the other slope species within the slope rockfish complex. Blackgill rockfish south of 40°10' N. lat. is to be allocated 41 percent to trawl, 59 percent to non-trawl; the other slope rockfish complex south of 40°10' N. lat. species are allocated 91 percent to trawl, 9 percent to non-trawl.[29]. While this change may incrementally increase the amount of other slope species taken with trawl gear and increase the amount of blackgill rockfish taken with non-trawl gear, the impacts are not expected to be significant to EFH as they do not affect overall harvest levels. Even if additional trawl effort were to occur under the higher ACLs or with the reallocation of the southern slope complex, the impacts of any additional effort would be limited to those areas not designated as prohibited to bottom trawl gear (detailed at 50 CFR 660.12) .

[29] For the distribution of the ACLs, see Table 4-65 of Agenda Item F.1., Attachment 8, June 2020.

Non-Trawl

Directed groundfish fixed gear fishing is primarily observed in limited entry fixed gear fisheries, open access fisheries, and in nearshore fisheries of California and Oregon. The WCGOP observes these fisheries. On cursory examination of WCGOP data, fixed gear fishing appears biased towards the north and over the upper slope in soft sediments; however, in all regions, fixed gear fishing effort is evident on both the shelf and upper slope over hard habitat (Appendix C-1). It is important to note that since all LEFG and OA fishing operations are not observed, WCGOP data cannot be used as a census of fixed gear effort. It does, however, provide the current best scientific information available on the spatial aspects of these fleets.

Gear impacts to habitat were considered in Agenda Item F.1, Supplemental GMT Report 4, June 2020. In summary, non-trawl gear (e.g., pot, longline, etc.) will cause some level of habitat disturbance; however, due to the lack of data surrounding the impact of these gear types on habitat in the eastern Pacific, the extent of the impact is highly uncertain and must largely be described qualitatively. Gear impacts are described in Appendix C-1 of the PCGFMP and notes some gear may have higher impacts than other gear types. Components of gear that contact the seafloor (e.g., weights, pots, mainline, etc.) has the potential to disturb bottom habitat from such means as gear landing footprint, dragging, or sweeping across the bottom, hooking, or snagging habitat forming invertebrates, etc. cross all bottom types, average impacts in terms of both habitat sensitivity and recovery time are low. In terms of habitat impacts, and as noted in Appendix C-1, of the three general bottom type categories (hard, mixed, soft), hard bottom is the most sensitive to fixed gear compared to the other two bottom types. Though counter to sensitivity, recovery time is lowest for hard substrates and highest for soft bottom. In general, recreational gear has a low habitat impact relative to commercial gear. Recreational gear in general has limited bottom contact but weights and hooks can impact rocky reef and habitat forming invertebrates. The impacts to habitat are likely to be incremental as fishermen return to these areas. Cumulatively, impacts will link to area use and overlap of recreational and commercial effort

Non-trawl gear has a variety of impacts on habitat. The following describes the gear type and summarizes its impacts:

> –Bottom Longline: Components of the gear that are in contact with the seafloor include anchors or weights, hooks, and the mainline. During retrieval, bottom longlines can sweep laterally several meters and overturn or undercut emergent organisms such as corals and sponges (Baer et al. 2010, Heifetz et al. 2009, Stone 2006). Habitat damage from longline gear is linked to the number of hooks, weights, line type, and gear configuration and the impact to habitat is further associated with haul speed (Fuller et al, 2008)
>
> –Pot Gear:. Pot and trap gear can adversely affect EFH by smothering estuarine eelgrass beds and other marine/estuarine benthic habitats such as cobble and vegetated surfaces utilized by groundfish and can disturb biogenic habitat. Gear may be dragged across the benthos by strong tidal or ocean currents. Damage to benthic habitat occurs both when the gear 'lands' on the bottom as well as any current effects whereby the gear is dragged along the substrate. An FAO (2007) study noted that while pot gear has a small footprint it can have a larger impact on habitat forming invertebrates than does longline gear, notably in instances where the pot gear moves across the seafloor due to current and/or during gear retrieval.
>
> –Hook and line: This gear type is used both by commercial and recreational anglers. Hook and line gear involves use of weight and multiple hooks on a single mainline deployed from a surface-based platform (e.g.,, boat, pier, etc.). Metal weights can impact biogenic habitat and soft and hard substrate when lost or when contacting the bottom. Hooks, lines, and smaller weights can be lost and become entangled in rocky and biogenic habitat.. Biogenic habitats are most at-risk from this

gear type, followed by hard substrate and lastly, soft sediments. Lost gear may remain in-place and adversely affect organism growth while continuing to fish.

As noted in Appendix C-1, biogenic substrates (e.g., habitat forming invertebrates, kelp beds) are most at-risk from fixed gear impacts followed by hard bottom then soft sedimentary bottom. Impacts are likely proportional to effort. In past Council documents on EFH, sensitivity scale of habitat to gear impacts and recovery time were developed (Table 4-212)

Table 4-213. Descriptions of sensitivity levels and recovery time (years) for gear impacts from Appendix C.

Sensitivity Level	Sensitivity Description
0	No detectable adverse impacts on seabed; i.e. no significant differences between impact and control areas in any metrics.
1	Minor impacts such as shallow furrows on bottom; small differences between impact and control sites, <25% in most measured metrics.
2	Substantial changes such as deep furrows on bottom; differences between impact and control sites 25 to 50% in most metrics measured.
3	Major changes in bottom structure such as re-arranged boulders; large losses of many organisms with differences between impact and control sites >50% in most measured metrics.
Recovery Time	**Recovery Description**
0	No recovery time required because no detectable adverse impacts on seabed.
n	n = time (years) required for return to pre-impact condition; i.e. no significant differences between impact and control areas in any metrics.

Habitat sensitivity and recovery time vary between habitat type, the following tables provide an overview of the impacts and recovery time from fixed gear. Appendix C-1 examined fixed gear by two metrics, longline gear, and pot gear (FG) and hook-and-line gear other than longline gear and open access fixed gear or state-permitted nearshore fixed gear sectors using pot gear(other FG). Each have a different impact and recovery time on bottom substrate types, as displayed in Table 4-213

Table 4-214. Sensitivity level ranges (0 = no detectable impacts, 1 = minor impacts, 2 = substantial changes, 3 = major changes in bottom structures) and recovery time in years for longline/pot gear and other fixed gear types -after Appendix C.

	Longline/Pot Gear		Other FG types	
Substrate	**Sensitivity**	**Recovery**	**Sensitivity**	**Recovery**
Hard shelf	0.3	0.1	0.1	0.1
Hard upper slope	0.3	0.3	0.1	0.1
Hard lower slope	0.3	0.3	0.1	0.1
Average	0.3	0.23	0.1	0.1
Mixed shelf	0.2	0.4	0.1	0.1
Mixed upper slope	0.2	0.4	0.1	0.1
Mixed lower slope	0.2	0.4	0.1	0.1
Average	0.2	0.4	0.1	0.1
Soft shelf	0.1	0.4	0.1	0.1
Soft upper slope	0.1	0.4	0.1	0.1

	Longline/Pot Gear		Other FG types	
Substrate	**Sensitivity**	**Recovery**	**Sensitivity**	**Recovery**
Soft lower slope	0.1	0.4	0.1	0.1
Average	0.1	0.4	0.1	0.1

Across all bottom types, average impacts in terms of both habitat sensitivity and recovery time are low (4 months or less). Of the two fixed gear metrics, longline and pot gear have the highest sensitivity and recovery time. Notably, there is no variance for other types of fixed gear in terms of sensitivity and recovery time. Of the three general bottom type categories (hard, mixed, soft), hard bottom experiences is the most sensitive to fixed gear compared to the other two bottom types. Though counter to sensitivity, recovery time is lowest for hard substrates and highest for soft bottom.

Other regional studies have examined the impact of fixed gear as a vulnerability index. Notably in NEFMC 2011, where habitat vulnerability (S) to gear type is seen as a percent reduction in functional value (Table 4-215) While this study was specific to New England fisheries, fixed gear is similarly fished in the Pacific; therefore, that study can be used to gauge relative impacts in a general sense. Overall, habitat is marginally vulnerable in terms of geological impact and biological impact to longline/pot gear

Table 4-215. Impact levels represented as vulnerability (S) of geological and biological features to trawl impacts according to substrate, and low and high energy environments, adapted from NEFMC 2011. (S = 0, 0-10%; S=1, 10-25%; S=2, 25-50%; S=3, 50-100%.)

	Longline		Trap	
	Geological	**Biological**	**Geological**	**Biological**
High energy mud / sand	0.3-0.4	0.0	0.6-1.0	0.6-0.8
Low energy mud / sand	0.3-0.4	0.0	0.8-1.0	0.7-0.8
High energy pebble / cobble / boulder	0.0-0.3	0.0-1.5	0.0-0.3	0.9-0.9
Low energy pebble / cobble / boulder	0.0-0.5	0.0-1.5	0.0-0.5	0.9-1.0

There will be differential impacts to the habitat from fixed gear relative to the bottom type in the areas of the non-trawl boundary extensions. However, due to uncertainties of effort, especially in terms of both gear hours and types of gear used, it is difficult to predict what the overall impact to habitat will be. Based on Appendix C and the analyses therein, it appears that impacts to bottom type from fixed gear are low. Additionally, recovery time of habitat impacted from fixed gear appears to occur readily.

In summary, non-trawl gear (e.g., pot, longline, etc.) in these areas will cause some level of habitat disturbance; however, due to the lack of data surrounding the impact of these gear types on habitat in the eastern Pacific, the extent of the impact is highly uncertain and must largely be described qualitatively. Overall, the impacts of non-trawl gear are expected to neutral to slightly negative. The overall impacts to the physical area management proposals are unlikely to be significant. While there is likely to be some impacts to habitat and target species, areas that are currently protected from bottom contact gear will remain closed and all species impacts are likely to be within allowable limits. Additionally, all areas that are proposed for opening are already open to other fisheries with both similar and dissimilar gears. Opening these areas to other gear groups or sectors is not likely to result in a significant increase in negative impacts to habits or target species.

Conclusion

Of the management measures evaluated under the action alternatives, none would be expected to have significant changes to impacts on groundfish EFH beyond those previously disclosed in the 2015 FEIS and Amendment 28 for the bottom trawl fishery. Section 4.1.1 in the 2015 EIS evaluates the long-term impacts of groundfish fishery management on EFH. The proposed management measures are not expected to change fishing activity that would adversely affect EFH). There are no EFH bottom contact closures in the proposed action areas. Any EFH closures currently in effect will remain in place and will not be affected by any alternative, including the No Action.

4.2.7.2 RCA Changes and EFH Impacts

Under No Action, there are recommended changes to the non-trawl and recreational RCAs in the 2021-2022 biennium. Note that no bottom contact closed areas(e.g., EFHCA) are recommended to be opened as a part of this action. None of the recommended changes are expected to significantly impact EFH as they are providing small additional increases in fishing area to non-trawl gears, which have a smaller impact than trawl gear, or are providing access to areas already open to other gears.

For the commercial non-trawl RCA changes off of Oregon and California, the habitat impacts are expected to be slightly negative. Between 40°10' N. lat. and 46°16' N. lat, the shoreward boundary of the non-trawl RCA would be moved from 30 fm to 40 fm; however, only hook and line gears, with the exception of dinglebar and longline (defined at 50 CFR §660.11), would be permitted in this area. Longlines and dinglebar gear were excluded from the permitted gear list as there is uncertainty around the amount of activity (and therefore impacts) that may occur in that depth bin. Pot gear was also not included in the recommended gear types as it would have greater habitat impacts. In addition to limiting effort via gear types, VMS requirements may also limit new participation. given that VMS is required to retain groundfish in federal waters, and as the state waters boundaries lie within the 30-40 fm depth bin, prohibitive for some fishers.

As described in Agenda Item F.1.a, Supplemental GMT Report 4, June 2020, while there are other fisheries, including recreational fisheries with similar gear types, operating in the area to be opened, there could be regional impacts to rocky reefs in certain areas where little recreational fisheries occur (e.g., Port Orford). South of 40°10' N. lat., the shoreward boundary would be moved from 40 to 50 fm from 38°57.5' N. lat.-34° 27' N. lat and 75 to 100 fm south of 34°27' N. lat. As described in Agenda Item F.1.a, Supplemental GMT Report 4, June 2020, other fishing activity, including trawling, is already permitted in these areas. Specifically, for the area between Point Arena and 34°27' N. lat., hook and line gear is already permitted for non-groundfish targeting in addition to other trawl fisheries (Table C-7 in Agenda Item F.1.a, Supplemental GMT Report 4), therefore there is likely little additional impact to sensitive habitats in this areas. For the changes south of 34°27' N. lat., there are bottom contact gears (bottom trawl, pot, and hook and line fisheries) being used to target fish and invertebrates between 75-100 fathoms (see Table C-12 in Agenda Item F.1.a, Supplemental GMT Report 4), However, as noted in that report, hard substrate would be open to additional effort near the Channel Islands (primarily west of Anacapa Island and southeast of Santa Rosa Island).

Given that it would be opening these areas up to hook and line gear to target rockfish, there are likely additional negative impacts; however, the extent of these impacts is uncertain. As noted in Appendix C of the PCGFMP, hook and line gear has low impact to hard non-biotic structures, i.e. rocks. Areas with habitat forming invertebrates (e.g., sponges, corals) could experience localized impact; however, the resiliency of these organisms to hook and line gear is high. Changes to the 40 fm and 100 fm non-trawl RCA waypoints would provide corrections to better align the boundaries with depth contours. The 40 fm corrections would increase the amount of available fishing area by 6.3 mi^2. An evaluation of the NOAA Deep Sea Coral

database reveals that these small area modifications do not open any fishing areas that overlap areas known to support deep sea coral ecosystems. For the 100 fm corrections, current waypoints for the 100 fm boundary crossover the current 75 fm boundary line. Under the recommended configuration for south of 34°27' N. lat. discussed above, the crossover points of the 100 fm boundary and the existing boundaries would inadvertently create new closed areas for those fisheries using the 75 fm boundary; therefore, the Council recommended the aforementioned waypoints to correct this issue. This measure would also create a 100 fm line around the northern Channel Islands, where there are only 75 and 150 fathom boundaries available.

For the recreational RCA changes off of California, as shown in Table 1-30 below, the Mendocino recreational management area is currently open in all depths during November and December, therefore, no new areas within this management area are proposed to be opened. Furthermore, other hook and line gears and trawl gears operate in this area as shown in Agenda Item F.1.a, Supplemental GMT Report 4, June 2020 (Table C-6). For the San Francisco and Southern recreational management areas, the openings are the same as those recommended for the commercial fishery above. The impacts would therefore likely be the same as described under the commercial RCA changes or potentially less given that recreational fishers harvest with hook and line gear as opposed to pot or longline gear. However, as above, it would be opening rocky substrate areas around the Channel Islands up to hook and line gear to target rockfish, and therefore, there are likely additional negative impacts.

Off Washington, the Council recommended opening the Westport Offshore YRCA and the South Coast YRCA to recreational fishing for groundfish and halibut year-round. This recommendation would open up a total of five square miles off the Washington coast to recreational fishing. As described in Agenda Item F.1.a, Supplemental GMT Report 4, June 2020, commercial fishing is not prohibited in these areas. Furthermore, there are minimal sensitive habitats, such as rocky reefs or corals, within these areas (see Figure A-1 in Agenda Item F.1.a, Supplemental GMT Report 4, June 2020). Therefore, the habitat impacts are expected to be neutral.

The overall impacts to the physical environments of all area management proposals are unlikely to be significant. While there is likely to be some impacts to habitat and target species, areas that are currently protected from bottom contact gear will remain closed and all species impacts are likely to be within allowable limits. Additionally, all areas that are proposed for opening are already open to other fisheries with both similar and dissimilar gears. Opening these areas to other gear groups or sectors is not likely to result in a significant increase in negative impacts to habits or target species

4.2.7.3 Alternative 1

The impacts to the physical environment (EFH, CCE, and RCAs) under Alternative 1 would likely be similar to those described under No Action because only minor changes exist between the No Action alternative and Alternative 1. Under Alternative 1, impacts to the physical environment as a result of harvest specifications for all stocks except for Oregon black rockfish, sablefish north of 36° N. lat., cowcod south of 40°10' N. lat., petrale sole, and shortbelly rockfish are likely to be the same as those disclosed under the No Action alternative. Impacts to the physical environment as a result of alternative harvest specifications are discussed for those stocks below.

Under Alternative 1, the ACL for Oregon black rockfish will increase from 479 mt to 512 mt in both 2021 and 2022. Therefore, there could be increased effort associated with Alternative 1 compared to No Action. As described in Section 4.2.7, rocky reef habitats are sensitive to hook and line gear- which is the main gear used to target black rockfish. However, there are no new areas proposed to be opened under Alternative 1 compared to No Action and therefore impacts are likely to be similar. The ACLs for both cowcod south of 40°10' N. lat. And petrale sole would decrease under Alternative 1. Therefore, any impacts to the

physical environment as a result of the harvest specifications for these species is likely to be less than those discussed under the No Action alternative as we would expect a smaller increase in trawl effort is expected under No Action.

The increased ACL for shortbelly rockfish under Alternative 1 is likely to increase impacts to the physical environment by removing more shortbelly rockfish from the ecosystem. However, those impacts are not expected to be significant because they would be considerably less at 2,000 mt than the ABC for shortbelly rockfish (4,184 mt). The increased ACL for shortbelly rockfish under Alternative 1 is not expected to encourage targeting of shortbelly rockfish. Vessels are not expected to change their behavior as there are other incentives to avoid shortbelly rockfish, such as the little to no value of the fish and it can spoil otherwise valuable catch (Pacific whiting). Therefore, this increase would not be expected to have significant impacts on groundfish EFH, including prey availability, since the increased shortbelly bycatch is a result of an overall increase in abundance and range extension of shortbelly rockfish.

The ACL for sablefish north of 36° N. lat. would likely result in additional impacts to the environment. However, it is unlikely that these impacts would be significant as there are no new areas proposed to be open under Alternative 1 (same as No Action) which are not expected to provide additional access to sablefish grounds.

4.2.7.4 Alternative 2

The overall physical impacts under Alternative 2 are expected to be similar as Alternative 1 and No Action. Petrale sole and cowcod ACLs would decrease compare to No Action, and therefore the impacts here would be less than those described under No Action. With the exception of shortbelly rockfish all other stocks would be managed using the harvest specifications discussed under either the No Action alternative or Alternative 1.

With respect to shortbelly rockfish, under Alternative 2, the Council's preferred alternative, the stock would be moved out of the fishery and classified as an ecosystem component species. Therefore, under this Alternative, the Council did not recommend and NMFS would not implement any harvest specifications for shortbelly rockfish for the 2021-2022 biennium. Alternative 2 would neither decrease nor likely substantially increase the incidental catch of shortbelly rockfish in groundfish fisheries as shortbelly are not targeted in any way and incentives to not target shortbelly rockfish already exist It is likely that shortbelly rockfish catch would be similar under Alternative 1 and Alternative 2. Incidental catch of shortbelly rockfish has been substantially lower than the OFL or ABC. There is no directed fishery for shortbelly rockfish and there is a low probability of a market developing. Additionally, even if bycatch rates were to increase and the Council were to take no action inseason to slow the incidental , the groundfish fisheries would still likely take less than full ABC considered under No Action or Alternative 1. Therefore, there would be sufficient population of shortbelly rockfish within the ecosystem, in addition to the other forage species (e.g. anchovy) to support the CCE (Shortbelly/Cowcod EA)

4.2.8 California Current Ecosystem

The Preferred Alternative is expected to have similar impact on the California current ecosystem (CCE) to those impacts previously disclosed in the Programmatic EIS.

It is important to reference the role of shortbelly rockfish in the CCE shortbelly rockfish a healthy and valuable forage species and estimated to have the highest productivity of any West Coast rockfish (Field, et al. 2007a,b). Shortbelly rockfish is not targeted in any commercial or recreational fisheries and is only taken incidentally in commercial groundfish trawl fisheries. It has been well documented that shortbelly

rockfish are forage for fish, seabirds, and marine mammals; thus, are an important ecosystem component. As described in the EA/RIR/IRFA for Cowcod and Shortbelly Rockfish:

> *"it is not anticipated that an increase in fishing mortality of shortbelly rockfish would negatively affect the role of shortbelly rockfish as forage in the ecosystem. NOAA Fisheries surveys and 2018-2019 State of the California Current reports provide evidence of above average forage conditions in the California Current Ecosystem with higher abundances of forage species such as anchovy and a high overall shortbelly rockfish population in 2018-2019 (Thompson et al. 2019).…The high abundance of additional forage species including northern anchovy, may also lessen any potential impact of shortbelly rockfish bycatch on higher tropic levels in the CCE."*

Furthermore, while recruitment trends in recent years are close to average levels in southern CCE, they have been high in the northern CCE where the whiting fishing primarily occurs, and therefore resulting in increased interactions. Additionally, Schroeder (2019) reported that atypical ecosystem conditions between 2013 through 2016 allowed for high recruitment of this species to the CCE.

All of the Action alternative are expected to have neutral to low negative impacts to forage in the CCE given abundance of other species, like anchovy, and the extension of the range of shortbelly to the north, providing more food sources for predators.

4.2.9 Protected Species Impacts

This EA evaluates the impacts of the proposed action on marine mammals (mainly humpback whales), eulachon, seabirds (mainly short-tailed albatross), sea turtles (mainly leatherback) and salmon. Groundfish fisheries generally have minimal interactions with protected and prohibited species. The rarity of encounters in fisheries with less than 100 percent observer coverage (open access fixed gear, limited entry fixed gear sablefish tier fishery, and recreational fishery) can result in estimates of take being imprecise and variable. Even where 100 percent observer coverage exists (i.e., catch shares fishery), variability and rarity of encounters can add uncertainty to future projections. Therefore, we provide a qualitative assessment of the potential impacts of the actions on protected and prohibited species and how they may differ between the alternatives.

The 2017 NMFS bycatch report provided to the ESA Workgroup (Agenda Item F.5.a, NMFS Report 2, April 2017) as well as information from Agenda Item I.4.a Groundfish Endangered Species Workgroup Report, June 2019 provide a baseline of current impacts to protected species.

There are no clear correlations between areas fished and interactions with protected species to predict estimates of impact. However, changes in fishing patterns or areas fished may or may not increase or decrease estimated impacts from the what has been observed in the past. Overall effort in each fishery is unlikely to change significantly (up or down) and we don't anticipate significant shifts in areas being fished under each alternative; therefore, we do not anticipate significant changes to projected impacts to protected species under any alternative compared to the No Action alternative described in this document or discussed in previous assessments (i.e., 2015 EIS and Amendment 28). A substantial increase in the level of take would trigger action under applicable laws to mitigate any increased take, if necessary.

The groundfish fisheries do not operate in the area of designated critical habitat for leatherback sea turtles or Steller sea lion eastern DPS. None of the proposed alternatives, including No Action, would impact or change these designations. Based on this conclusion, we did not further analyze impacts to designated critical habitat for these two species. However, some fishing activity may occur in designated critical habitat for green sturgeon DPS. We do not know the magnitude of impact due to trawling these areas since there

are no studies specific to this habitat. Therefore, we do not further analyze these impacts. We expect recovery of these habitats based on previous analyses in Amendment 28.

4.2.9.1 Marine Mammals

We anticipate that interactions with marine mammals will continue to occur in some groundfish fisheries, but it is not possible to predict annual occurrences and which species would be encountered. There are no clear correlations between areas fished and marine mammal interactions. We assume under the No Action that any future interactions would reflect the type of interaction (entanglement, feeding on catch, etc.) and the type of species that have been observed in the past 5 years since the type of species and the manner in which they interact with the fishery would not change significantly.

Under Alternative 1 we anticipate some increase in effort for sablefish due to increased available harvest. This could increase the amount of gear or the number of fishing days; therefore, this could increase the potential for whale entanglements. However, we cannot predict the number of interactions that may occur. The potential for interactions exists if longline gear (pot or groundline) are concentrated in areas where whales migrate or congregate but it is not possible to predict these occurrences since we do not have logbook data that shows where fishing activity is occurring and where whales may congregate or potentially interact. Based on historic interaction rates, we anticipate Alternative 1, could result in humpback whale take increase but the level of take is uncertain.

Under Alternative 2, we do not anticipate changes to the level of fishing effort or areas fished for any groundfish fishery since ACLs under the alterative will not increase; therefore, we expect impacts to marine mammals to remain similar to No Action.

Area modifications are not likely to result in increased fishing effort by local recreational participants in a manner that would result in impacts to marine mammals. Recreational fishing gear poses little risk for entanglement leading to serious injury or mortality because the gear is light weight and not likely to seriously impair an animal; furthermore, it is unlikely that recreational fishers would be close enough to humpback whale so that their gear could become entangled. Therefore, no anticipated additional effects are expected under the alternatives, including the No Action.

4.2.9.2 Eulachon

Eulachon are bycatch in groundfish trawl fisheries, and the distribution of total bycatch among fisheries varies from year to year. The following commercial groundfish fishery sectors had observed eulachon bycatch during 2002–2017:

- LE and IFQ bottom trawl fishery
- IFQ non-hake midwater trawl fishery
- IFQ shoreside Pacific hake trawl
- IFQ at-sea Pacific hake mothership fishery
- IFQ at-sea Pacific hake catcher-processor fishery
- IFQ at-sea Pacific hake tribal mothership

The following information comes the ESA Work Group Report from the June 2019 Council Meeting and from eulachon bycatch summaries under Agenda Item I.4.a NMFS Report 2 (Electronic Only) June 2019. This is the most recent data for the groundfish fisheries. Overall, a large decrease in eulachon bycatch occurred in 2016 and 2017 compared to 2014-2015 levels. Total fleetwide bycatch was estimated at 56 total eulachon in 2016 and 90 total eulachon in 2017. The five-year mean bycatch estimates were 1,326

eulachon in 2016 and 676 eulachon in 2017. The precautionary threshold is 3,946 eulachon and the reinitiation threshold and 7,891 eulachon. Therefore, ITS thresholds were not exceeded in 2016 or 2017.

Under No Action, we expect interaction rates to be variable as observed in the past five years. Based on the 2018 BiOp effects of the fishery on eulachon fluctuates with eulachon abundance more than any changes in fishery effort or operation. Therefore, we do not anticipate a significant increase or decrease in interaction rates under the No Action alternative, Alternative 1 or 2 since we do not expect large fluctuations in the abundance of eulachon nor do we expect substantial changes to fishing behavior or effort. Even though the ACL for sable fish under Alternative 1 would increase, bycatch of eulachon is not anticipated to increase based on the assumption that impacts are largely reflective of abundance of eulachon. The 2018 BiOp indicates that eulachon may escape or avoid trawl nets. Removal of the minimum net mesh size could influence retention rates (less escapement) under all alternatives; however, it is uncertain what size of mesh the fleet, overall, would use and what size would increase capture. Therefore, its uncertain how this would influence the interaction rates in the future. We do not anticipate that any alternative would cause exceedance of the ITS. Observer data would continue to be used to evaluate the impacts relative to the incidental take limits for all groundfish fisheries.

4.2.9.3 Green Sturgeon

Since green sturgeon are historically caught in the bottom trawl fishery, we anticipate the fishery will continue to encounter green sturgeon at varying rates under No action and Alternatives 1 and 2. There is no clear relationship between bycatch and effort; therefore, it is not possible to predict bycatch pattern or potential interactions. Bycatch would mainly continue to occur at depths less than 40 fm where the LE bottom trawl and OA CA halibut fishery occurs.

The estimated number of Southern DPS green sturgeon encountered was 26 individuals in 2016 and 2 individuals in 2017 IFQ bottom trawl fishery. The midwater trawl fishery for whiting has encountered 3 green sturgeon since (one at-sea tribal in 2005, two mothership 2006). Therefore, the estimated bycatch of the Southern DPS of green sturgeon has not exceeded the ITS amount of 28 fish per year.

Under the No Action or the proposed alternatives, fishing effort (in federal and non-federal fisheries) would likely not change significantly (up or down). Although effort under Alternative 1 could increase for fisheries targeting sablefish; we anticipate that bycatch would remain under the ITS for the Southern DPS since sablefish are targeted in depths greater than 45 fm. As noted under the NMFS bycatch report and ESA Workgroup report, bycatch in state-managed fisheries continues to occur and the fishery is monitored by NMFS.

4.2.9.4 Seabirds and Short-tailed Albatross

There may be a low potential for increased interactions under the No Action and Alternatives 1 and 2. Any impacts that occur are unlikely to noticeably impact seabirds, including short-tailed albatross.

Trawl vessels typically do not interact with seabirds; therefore, the No action and Alternatives 1 and 2 would likely not increase seabird interactions. Under Alternative 1, an increase in the sablefish ACL could result in more effort and gear being deployed in the fixed gear fishery, thereby increasing the potential for seabird interactions. However, it is not possible to predict the level of interactions since there a no clear correlations between the operation of the fishery and the catch rates of seabirds including short-tailed albatross take. Even though some management measures would result in opening areas to fixed gear fishing activity, the relatively small areas proposed to be opened is not likely to pose a significant risk with respect to takes. There are no know concentrations inside areas that could be fished that were previously closed nor

in areas available for fishing; therefore, it is unlikely that interactions with fixed gear fisheries would change from what has been estimated in previous years under the No Action and Alternatives 1 and 2.

4.2.9.5 Salmon

We anticipate that interactions with salmon, mainly Chinook, will continue to occur in groundfish fisheries (mainly midwater trawl and bottom trawl) under No Action and Alternative 1 and 2, but it is not possible to predict accurate, annual occurrences. Salmon interactions for a groundfish fisheries from 2002 to 2018 are shown in Table 4-216 and recent data on PacFin Apex Website for 2019 shows encounters with salmon in the whiting fishery to be 5,586 and in the non-whiting midwater and bottom trawl to be 557. We expect that interaction rates under the No Action and Alternatives 1 and 2 would be similar to what has been observed in the past three years, with some variance based on the amount of effort under each alternative.

It is not possible to predict where salmon occur to avoid areas of concentration since there are no clear correlations between areas fished and salmon interaction rates in all groundfish fisheries. We do see consistent catch of salmon within whiting catch; however, it is not possible to predict where salmon may occur while targeting whiting. When whiting fishermen see salmon in their catch, they move to other areas to avoid further impact. We expect this response to continue under all alternatives. Similarly, we expect bottom trawl or non-whiting trawl fishing a activity to cease and mover to other areas if large catches of salmon were to occur. As noted in the 2019-2020 specifications EA, the Council and NMFS implemented mitigation measures to keep the fisheries within the ITS allotted with near real time monitoring.

Under No Action, fishing effort would largely not change; therefore, it is possible that impact rates may be similar what has been seen in the past two years. Under Alternative 1 effort may only increase for sablefish therefore its possible some fisherman may interact with more salmon while targeting sablefish. Under Alternative 2 effort may decrease compared to the No Action; therefore, we could expect reduced take of salmon. Based on historic interaction rates we anticipate the fisheries would not exceed the ITS under any alternative. Again, it is not possible to predict what ESA listed species would be caught and the overall effect it may have on population recovery.

Table 4-216. Chinook catch by fishery sector, 2002-2018. Source: Agenda Item H.9 Attachment 1 (Revised), November 2019

Sector		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Whiting	At-sea	1,663	2,617	803	3,958	1,192	1,317	718	318	714	3,989	4,209	3,739	6,695	1,806	3,051	3,772	4,402
	Shoreside/IFQ	1,062	425	4,206	4,018	839	2,462	1,962	278	2,997	3,722	2,359	1,263	6,898	2,002	738	1,394	1,330
	Tribal (all fisheries)	1,018	3,439	3,740	3,985	1,940	2,404	697	2,147	678	906	17	1,025	154	1	200	577	125
	Total	3,743	6,481	8,749	11,961	3,971	6,183	3,377	2,743	4,389	8,617	6,585	6,027	13,747	3,809	3,989	5,743	5,607
	Threshold	11,000																
	% Threshold	34%	59%	80%	109%	36%	56%	31%	25%	40%	78%	60%	55%	125%	35%	36%	52%	53%
	# above threshold	---	---	---	961	---	---	---	---	---	---	---	---	2,747	---	---	---	---
Non-whiting	Bottom trawl	15,384	16,855	1,773	816	61	191	419	308	237	175	304	323	984	1020	374	243	348
	Mid-water a/	*45*	*45*	*45*	*45*	*45*	*45*	*45*	*45*	*45*	*45*	*45*	*45*	*45*	*661*	*484*	42	45
	Rec + FG max b/	*500*	*500*	*500*	*500*	*500*	*500*	*500*	*500*	*500*	*500*	*500*	*500*	*500*	*500*	*500*	*500*	*500*
	Total	15,929	17,400	2,318	1,361	606	736	964	853	782	720	849	868	1,529	2,181	1,358	785	893
	Threshold	5500																
	% Threshold	290%	316%	42%	25%	11%	13%	18%	16%	14%	13%	15%	16%	28%	40%	25%	14%	16%
	# above threshold	10929	12400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total	Total Chinook	19,672	23,881	11,067	13,322	4,577	6,919	4,341	3,596	5,171	9,337	7,434	6,895	15,276	5,990	5,347	6,528	6,500
	Closure threshold	20,000																
	% of threshold	98%	119%	55%	67%	23%	35%	22%	18%	26%	47%	37%	34%	76%	30%	27%	33%	33%
	# above threshold	---	3881	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

a/ EFP including in mid-water because almost exclusively targeting rockfish in mid-water column despite using "bottom trawl" gear in 2017 But excludes 173 chinook EFP trip from Noah's Ark since were using "non-EFP" large footrope for DTS. These 173 from Noah's Ark included bottom trawl total which is more fitting due to fishing DTS; Assume 45 each year, which is the high from 2017-2018 when fishery re-emerged; Actual mid-water catches were 661 in 2015 and 484 in 2016, but were not deemed reflective of fishery as was before canary rebuilt and widow quotas low

b/ Assume 500 each year: maximum of total rec + FG (154) from Table 2-53 of BiOp + cushion of 346

5. Cumulative Effects

5.1 Scope of Analysis

The 2015 EIS (PFMC and NMFS 2015) includes an analysis of the cumulative effects of biennial management under the Groundfish FMP framework. That EIS addresses the significance of the expected cumulative impacts as they relate to the federally managed groundfish fishery. The 2016 EA (NMFS 2016) and the 2018 EA (NMFS 2018) updates that analysis by evaluating subsequent actions. These analyses, as well as new information indicating potential changes for the 2021-2022 biennium, are incorporated by reference, and summarized here in cumulative effects is also presented. This chapter focuses on the cumulative effects analysis of the proposed action combined with potential effects of other actions.

Actions are understood to be human actions (e.g., a designation of northern right whale critical habitat in the Pacific Ocean), as distinguished from natural events (e.g., an ecological regime shift). CEQ regulations require consideration of actions, whether taken by a government or by private persons, which are reasonably foreseeable. This requirement is interpreted to indicate actions that are more than merely possible or speculative. Actions are considered reasonably foreseeable if some concrete step has been taken toward implementation, such as a Council recommendation or NMFS's publication of a proposed rule. Actions only "under consideration" have not generally been included, because they may change substantially or may not be adopted, and so cannot be reasonably described, predicted, or foreseen. Identification of actions likely to impact a resource component within this action's area and time frame will allow the public and Council to make a reasoned choice among alternatives.

5.1.1 Affected Resources

Chapter 3 identifies the resources affected by the proposed action. Chapter 4 evaluates the direct and indirect impacts of the proposed action on these resources. The cumulative effects analysis caries forward this information. Those resources are as follows

- Groundfish
- Habitat including Groundfish Essential Fish Habitat
- Protected species
- Socioeconomic environment including fishing communities

5.1.2 Geographic Boundaries

The analysis of impacts focuses on actions related to the management unit of species in the Groundfish FMP. The geographic scope for groundfish, habitat, and protected species is the West Coast Exclusive Economic Zone (EEZ). For the socioeconomic environment, the geographic scope is defined as those U.S. fishing communities directly involved in the harvest or processing of Council-managed resources, particularly those of the states of Washington, Oregon, and California.

5.1.3 Temporal Boundaries

The temporal scope of past and present actions for the affected resources encompasses actions that occurred after FMP implementation (1982). The cumulative effects analysis in this EA incorporates that long-term time scale but focuses specifically on actions that have occurred since the implementation of the previous cumulative effects analysis in the 2018 EA (NMFS 2018). For protected species, the scope of past and

present actions is determined by analysis pursuant to ESA and the Marine Mammal Protection Act (MMPA), including Biological Opinions for the groundfish fishery and marine mammal stock assessment reports. The temporal scope of future actions for all affected resources takes into account the fact that this tiered action is undertaken every two years and evaluation of this periodic action includes a consideration of cumulative effects. Thus, in this instance, the cumulative effects of establishing harvest specifications, adjusting routine management measures, and adopting new management measures will again be evaluated in 2022 for the 2023–24 biennial period. That analysis will take advantage of the most current information on which to base the assessment of future effects beyond the 2020–21 biennial period subject to this evaluation. Therefore, the temporal scope of the cumulative effects analysis in this EA is the same as that for the evaluation of direct indirect effects, through the 2021–22 biennial period.

5.2 Effects of Past, Present, and Reasonably Foreseeable Future Actions other than the Proposed Action

The cumulative effects analysis (CEA) does not specifically identify past actions no longer affecting resources as those effects have contributed to current status quo conditions described in Chapter 3. Chapter 1 above describes that this EA is tiered from the 2015 EIS, as updated by the 2016 EA and 2018 EA. The effects of both past and present fishing and non-fishing actions were described in both of those documents (see Section 4.15.4 of the 2015 EIS, Section 5.2.3 of the 2016 EA, and Section 5.4 of the 2018 EA).

5.2.1 Reasonably Foreseeable Future Actions

Reasonably Foreseeable Future Actions (RFFA) included in this CEA are based on following four criteria

1) Actions in the West Coast EEZ that affect the same resources affected by the proposed action. Administrative fishery management actions that have no discernible effect are not included.
2) Actions that are not speculative in that the action is defined to an extent that it can be analyzed, including actions for which the Council has adopted a Preliminary Preferred Alternative (PPA) or a Final Preferred Alternative.
3) Actions that are not identified in the 2018 EA
4) Actions in which additional information or analysis has been completed since the 2018 EA.

Based on these criteria, the following RFFA are considered in this EA.

Table 5-1. Reasonably Foreseeable Future Actions and the estimated effective dates considered in the cumulative effects analysis.

Reasonable Foreseeable Future Action	Estimated Effective Dates
Salmon Bycatch Mitigation Measures	Jan 2021
Electronic Monitoring	2020

Salmon Bycatch Mitigation Measures

The Council recommended salmon bycatch mitigation measures for the groundfish fishery to NMFS at their November 2019 meeting (shown below). These measures are detailed in Agenda Item H.9, Attachment 1 (Revised) Initial Review Draft, Preliminary Preferred Alternatives Regulatory Impact Review for Proposed Endangered Species Act Salmon Bycatch Mitigation Measures under the Pacific Coast Groundfish Fishery Management Plan, November 2019. The action was designed to mitigate salmon bycatch in the groundfish fishery.

The mitigation measures are expected to have a positive effect on salmon and industry, if activated, by curtailing groundfish trawl activity, which is the primary source of salmon bycatch in the groundfish fishery, could reduce incidental catch of salmon and allow the industry to remain in operation. However, the measure(s) implemented could have a negative economic impact on the trawl fishery as they would restrict fishing in specific areas/times, require specific gear, etc. The extent of the impacts are detailed in the aforementioned report. It is important to note the mitigation measures, would allow trawl fisheries to continue operating; however, measures like a BAC may require vessels to shift away from preferred fishing grounds and into areas where high valued target species may not be present in densities similar to the preferred areas.

Mitigation Measures:

- Block Area Closures (BAC)
- Selective Flatfish Trawl Net Gear Requirement
- Pacific Whiting Cooperative Agreements
- Automatic Authority for NMFS to close Trawl Sectors and Preserve 500 Chinook Salmon for Fixed Gear and Select Recreational Fisheries at 19,500 Chinook and non-whiting trawl fisheries at 8,500 Chinook.
- Salmon Reserve Access.

Electronic Monitoring

Electronic monitoring as a whole is meant to create efficiencies in catch monitoring aboard whiting and fixed gear vessels. The impacts of this type of catch monitoring are expected to beneficial in the sense of accurate assessment of fishing activities and catch accounting; however, there is a cost impact associated with this method that will be borne by the industry. Cost of the technology and associated review will have direct impacts on revenue of vessels; however, it is difficult to ascertain if these costs can be mitigated by current and future catch limits of target species. Additionally, the initial concept of this technology was to reduce/remove the cost for a human observer as industry must pay for coverage. The action is expected to have neutral effects on EFH and ecosystems. It is expected to have a positive effect on prohibited and protected species as EM could aide in detection of these species and could increase accuracy of these estimates. There are little to no direct effects of the action on the biological resources, thereby it will have neutral impacts. Notably, maximized retention fisheries and fixed gear operations would be allowed to only discard identifiable species. The action may produce low negative socioeconomic effects as the cost of operation will be borne by the industry, thus reducing overall profit. However, these costs may be mitigated through increased attainments or other avenues.

EM would produce no adverse effect on the physical or biological environment because they are not expected to change fishing location, amount of catch, or types of gear used. The action may provide operational flexibility, and reduce costs of catch monitoring required by the Catch Share Program. These actions are not expected to: 1) change incentives and fishing behavior in such a way as to cause impacts; 2) alter the allocation structures or annual catch limits (ACLs) analyzed in previous NEPA documents; 3) change the risks and controls for exceeding ACLs; and 4) change the rate of endangered species or marine mammal encounters; and would not change the effects on physical habitat.

5.2.2 Actions Commencing in the Past with Ongoing Effects

The 2018 EA identified three actions in that were, at that time, RFFAs. The Pacific Coast Trawl Gear rule change was implemented in 2019 and PCGFMP Amendment 28 Groundfish EFH/RCA rule in 2020. The third, PCGFMP Amendment 26, which was to adopt revised allocations of harvest opportunity between sectors of blackgill rockfish and other species managed in the slope rockfish complex south of 40°10′ N

latitude, was rescinded in April 2019. Additional non-administrative actions relevant to the 2021-2022 biennium implemented (or expected to be implemented) in 2019 or 2020 are shown in Table 5-2

Table 5-2. Schedule for groundfish fishery-related actions implementation dates and final rule links

Action	Final Rule	Implementation Date
Groundfish Harvest Specifications and Management Measures	85 FR 250, *correcting amendments at* 85 FR 8200	January 1, 2019
Pacific Coast Groundfish Trawl Gear Changes	83 FR 62269	January 1, 2019
Amendment 28 to the PCGFMP	84 FR 41818	January 1, 2020
Seabird Bycatch Avoidance Measures	84 FR 67674	January 10, 2020
Amendment 21-4 to the PCGFMP	84 FR 68799	January 16, 2020
Cowcod & Shortbelly Harvest Specifications	85 FR 21372	June 18, 2020

The actions shown above in Table 5-2 are summarized below.

2019-2020 Groundfish Harvest Specifications and Management Measures

Past harvest specifications and management measures allow controlled fishing harvest while managing stocks within science-based catch limits. This action was expected to have low negative to neutral effects on all groundfish stocks and complexes. The effects on ecosystem, EFH and biological resources were considered to have neutral to low negative impacts due to increased effort, increased ACLs, and adjustments to RCA boundaries. The effects of the action on protected species, however, were expected to be neutral to low positive and largely positive for socioeconomics.

Pacific Coast Groundfish Trawl Gear Changes

This rule revised regulations that specified the use and configuration of bottom and midwater trawl gear in the Pacific coast groundfish trawl rationalization program. This action improved participant's flexibility of configuring trawl gear types to improve efficiency, increase catch of target stocks, reduce bycatch to meet the conservation objectives of IFQ program. Though detailed in the Trawl Gear Changes EA, the effects of these changes are summarized here. Overall, the gear changes are expected to result in neutral impacts to groundfish. Fishing would not occur outside of areas typically fished. EFH protections would continue to prohibit bottom contact gear, including bottom trawl, from specific areas designated as EFHCA. Footrope restrictions for some fishing operations would continue and therefore provide additional protection to rock habitats that may not be closed to bottom contact gear. Impacts to the ecosystem are expected to be low negative; whereas to EFH they were expected to be neutral. Biological impacts were neutral, however they were considered to have a low negative impact on salmon and eulachon. The gear change rule is expected to increase operational flexibility and have positive socioeconomic impacts.

Amendment 28 to the PCGFMP

The measures adopted new and revised area closures to bottom trawling as well as reopens areas previously closed to fishing to protect overfished groundfish species. In all, Amendment 28 (A-28) reopened approximately 3,000 square miles and closed approximately 13,000 square miles (including almost all of the Southern California Bight) to groundfish bottom trawling. Additionally, it closed approximately 123,000 square miles to all bottom contact groundfish gear, in waters deeper than 3,500 meters Overall, this action improves protections to groundfish EFH and increases flexibility for participants fishing in the

groundfish trawl. Detailed analyses of the impacts are found in Agenda Item F.3.a, Project Team Report 1: Preliminary Draft Environmental Impact Statement. The magnitude of the overall effects of A-28 on habitat, are expected to be positive in the long-term. Trawl effort may shift to the newly reopened areas. As such, biological impacts are expected to be low negative to neutral as ACL attainments may increase. Ecosystem and EFH are expected to somewhat benefit from A-28, as there will be less access to sensitive EFH areas than were fished historically because of net increases in the protection of priority habitats such as high relief areas, areas with relatively high densities of habitat forming invertebrates, etc. This habitat protection would benefit groundfish and non-groundfish. Flexibility for operations and access to more fishing area with the potential for increased attainment in those areas would provide positive economic benefits to the fleet, supply chains, and associated coastal communities.

Seabird Bycatch Avoidance Measures:

The action responds to a 2017 biological opinion published by the United States Fish and Wildlife Service (USFWS) that includes the proposed action as a term and condition to address takes of endangered short-tailed albatross. The measure requires groundfish longline vessels fishing in the EEZ to use either streamer lines or set gear at night when fishing north of 36° N. This measure is expected to reduce incidental take of seabirds by longline vessels that target groundfish. Detailed analysis of impacts are described under Agenda Item I.5, Attachment 1, June 2019. The measures do not change fishing gear but require the aforementioned mitigation measures for seabird bycatch avoidance, therefore, it is expected they effects of this action on groundfish will be negligible. Effects on the ecosystem and EFH are expected to be neutral as there is relatively no interaction between the measures and the ecosystem or EFH. This action is expected to have positive effects on seabirds, notably short-tailed albatross, as it is designed to prevent incidental take of these animals. The action may affect such factors as gear performance, vessel efficiency while setting/retrieving gear, etc., but the extent of these impacts is unclear. The streamer lines could add increased cost to vessel operations; however, as noted in Agenda Item I.5, Attachment 1, it appears as if the purchase of streamer lines may be covered though grants from the USFWS. Overall, these measures may have a positive effect on socioeconomics as they are designed to reduce seabird bycatch which would, therefore, reduce the risk of a fishery closure.

Amendment 21-4 of the PCGFMP

This measure implemented changes to four areas of the Catch Share Program as a result of the Catch Share Program Five-Year review. Those changes were:

1. At-Sea Sector Bycatch Management: 1. Change the management of widow and canary rockfish in the at-sea sector to set aside management and 2. remove the Amendment 21 formulas for widow rockfish, darkblotched rockfish, and POP for setting the set aside amounts and determine values within the biennial process

2. IFQ quota utilization improvements: 1. Allow for post-season trading of previous year QPs and 2. Eliminate September 1 deadline to transfer quota from QS accounts to vessel accounts.

3. Catcher Processor Accumulation Limits: Establishes a permit accumulation limit of five at-sea Pacific whiting C/P endorsed permits that any one person or entity may own or control. Includes regulations that define "own and control" as it relates to C/P endorsed trawl permits. This limit only takes effect if the C/P cooperative fails.

4. Data Collections: 1. C/P Ownership survey- Establishes the requirement for C/P endorsed permit owners to submit the Trawl Identification of Ownership Interest form annually during permit renewal and 2. QS Ownership survey- Requires all QS permit owners to submit information to the EDC program annually.

This action also implemented regulatory language related to cost recovery program clarifications and provided technical corrections to catch share program regulations.

Overall, this action was determined to have no significant impact on the resources as it promoted operational flexibility, allowed for maximization of quota pound utilization, and provided technical corrections to the regulations- none of which would result in changes to fishing behavior or effort. Therefore, this action will not be discussed further in this Section.

Cowcod and Shortbelly Rockfish Catch Limits

The Council recommended eliminating the 2020 ACT and reducing the research set-aside for cowcod south of 40° 10' N. lat. to cover unanticipated mortality in the trawl fishery and increased the 2020 ACL shortbelly rockfish in the 2019 from 500 mt to 3,000 mt (Agenda Item H.4, Supplemental REVISED Attachment 1: Draft Regulatory Impact Review/Initial Regulatory Flexibility Analysis for a Proposed Regulatory Amendment under the Pacific Coast Groundfish Fishery Management Plan).

Cowcod south of 40°10' N lat. is one of two West Coast groundfish stocks currently managed under a rebuilding plan. According to the 2019 stock assessment adopted by the Council at their September 2019 meeting, cowcod has now attained a healthy and rebuilt status. As the stock has increased in abundance, incidental bycatch of cowcod by trawling vessels has been increasingly difficult to avoid. The 6 mt ACT adopted for 2019-2020 resulted in a 2.2 mt trawl allocation, which corresponded to very small IFQs allocated to quota shareholders and annual vessel limits for shorebased IFQ participants According to the 2019 stock assessment adopted by the Council at their September 2019 meeting, cowcod has now attained a healthy and rebuilt status. As the stock has increased in abundance, incidental bycatch of cowcod has been increasingly difficult to avoid. Some groundfish trawlers south of 40°10' N. lat. were prematurely approaching their annual vessel limit for cowcod which would their ability to prosecute their fishery. By eliminating the ACT and reducing the research set-aside, the trawl and non-trawl allocations were increased to 3.2 and 5.8 mt, respectively. This resulted in an increase of 406 lbs for the annual vessel limit, reducing the constraints to shorebased IFQ participants. Given the difference in the ACL of 10 mt and the ABC of 68 mt for 2020 and the new stock assessment information, this proposed changed is expected to have a negligible impact on the status of the stock.

Shortbelly rockfish is one of the most abundant rockfish species in the California Current and is not targeted in any West Coast fishery (Field, *et al*. 2007a,b). The observed magnitude of encounters of shortbelly rockfish north of 40°10' N lat. in recent years is unprecedented and may be the result of a climate change-driven distributional shift and/or the effect of large recruitments. It appears both explanations are contributing factors given evidence of continued high recruitment and abundance in the core habitats off southern and central California. The shortbelly ACL of 500 mt was exceeded in 2018 and 2019. This action raised the ACL from 500 mt to 3,000 mt (for 2020) to avoid premature closure of groundfish fisheries that incidentally take shortbelly rockfish. The analysis showed there was little danger to the status of the shortbelly stock through this action, especially given the 1,184 mt difference between the ABC and the recommended 3,000 mt ACL. . The socioeconomic impacts are largely positive, noting that the actions for both species will allow participants to conduct their fishing operations more efficiently in 2020. The impacts are fully described in the EA for this action.

Other Impacts

The 2015 EIS identified the following actions not related to fishing that could contribute to the cumulative effects of the proposed action: water pollution, other authorities to conserve biological resources affected by the proposed action, and cyclical and ongoing climate change. Potential climate-change effects are described as part of the affected environment in Chapter 3 of the 2015 EIS. Range shifts of target species might cause the biggest climate-change-related impact on fisheries in the foreseeable future. No other non-

fishing actions discernably affecting the resources have been identified within the scope of the proposed action.

5.3 Effects of the Proposed Action

The proposed action, in summary, implements harvest specifications for all PCGFMP stocks and changes the default harvest control rule for cowcod, Oregon black rockfish, shortbelly rockfish, sablefish, and petrale sole. For most species, the changes to their respective harvest specifications, within the context of past, present and RFFAs, the effects are largely negligible. This section, therefore, identifies those non-negligible differences in effects that may exist between alternatives.

Adjustments to management measures are undertaken to both end and prevent overfishing of groundfish stocks and to attain but not exceed ACLs. Mortality of some stocks may increase relative to No Action. Modifications to 2021-2022 management measures, however, do consider stock productivity and fishing mortality and are expected to continue to maintain current conservation efforts for groundfish stocks into the future. While the proposed management measures could increase the risk of overfishing, harvest policies and fishery performance are not expected to substantially change in the 2021-2022 biennium. Further, management measures are designed to keep fishery impacts within the ACLs. Overall, the proposed action is expected to have neutral to low negative impacts on groundfish.

Increases in recommended harvest specifications, particularly for sablefish north of 36° N. lat and lingcod, could result in increased fishing pressure on other species that coexist in the same habitat, geography, and depth range. Of the management measures, changes to allocations, set-asides, trip limits, and area restrictions (e.g., RCA boundary changes) could directly and indirectly result in higher attainment of target and non-target species. Additionally, these changes could increase effort, which may increase habitat impacts. Notably, the modification of the non-trawl RCA off California and Oregon (see Section 4.2.5) and removal of the YRCAs in Washington could expose these areas to increased fishing effort, although the majority of these areas are fished by both trawl and non-groundfish fisheries (e.g. sea cucumber, spot prawn, etc.). The GMT noted these impacts in Agenda Item F.1.a, Supplemental GMT Report 4, June 2020.

In light of RCA depth increases, cowcod and yelloweye rockfish could be incidentally caught more often. However, impacts to these species are both managed in a precautionary manner that allows the Council to respond inseason should catch levels close in on catch limits. Additionally, retention of yelloweye and cowcod is to remain prohibited in the non-trawl fishery, which is the primary source of mortality for both species. These species specific prohibition are likely to reduce the incentive to fish in depths and habitats where densities of these species are known to be high. Therefore, risk to exceeding their ACLs should be considered low. Fishing in areas that have been closed may impact the ecosystem and EFH negatively. A detailed discussion of potential impacts to EFH was provided to the Council in Agenda Item F.1.a, Supplemental GMT Report 4, June 2020. This report detailed potential impacts related to reopening the RCA and YRCA areas. In summary, the impacts of fixed gear on bottom substrate are not well known, however, based on available research, fixed gear is expected to have a low to moderately negative impact. Yet, substrate is key to the impacts. As noted above in Chap 4, hardbottom with bottom dwelling invertebrate communities are most susceptible to fixed gear impacts; however, these communities appear to be very resilient to disturbance and repair themselves rather quickly. Therefore, this action is expected to have low negative impacts on groundfish habitat and EFH, though these impacts could be localized rather than region-wide depending on effort locations.

This Preferred Alternative designates shortbelly rockfish as an ecosystem component (EC) species, which is a departure from active management of this stock. Concern from stakeholders was voiced regarding potential harm to the forage base from too high an incidental catch of shortbelly rockfish As noted in Agenda Item H.4.a, Supplemental GMT Report 1, November 2019, that even if the full ABC (4,184 mt)

were attained, the forage base would not be negatively impacted, stating: "*all indications are that the shortbelly rockfish stock is thriving as are abundances of other important prey species (e.g., anchovy), and even full ABC removals (4,184 mt) would not be expected to negatively impact forage bases*.". All indications are that the shortbelly rockfish stock is thriving with unprecedented recent recruitment and abundance in the California Current Ecosystem. The current high abundance of shortbelly and other forage species (e.g., anchovy) suggest there is a strong forage base in the ecosystem. The high abundance of shortbelly is predicted to persist in the next decade due to the exceptionally high recruitment observed in recent years.

There is no market currently for shortbelly rockfish, they are not a commercially valuable stock, and neither the Council nor the industry anticipate a surge in demand for fishmeal or other fishmeal product types resulting from any incidental shortbelly catch that would drive prices high enough to encourage targeting of shortbelly by the trawl fishery in the 2021-2022 biennium. As discussed above in Section 4.2.8, noting the importance of shortbelly as a forage base in the California Current Ecosystem, the Council adopted a precautionary policy measure under which the Council would closely monitor the species as part of the routine inseason agenda item. Under this policy guidance, should catch exceed 2,000 mt in a calendar year, it would trigger the Council initiate investigation into the cause(s) of such amounts and could, at that time, reconsider its EC designation or other management actions necessary to reduce the catch of the species. To accomplish this goal, the Council requested that shortbelly rockfish catches continue to be monitored inseason by the GMT in the groundfish species scorecard. The fisheries primarily responsible for shortbelly catch are observed at a 100 percent rate and catch estimates are provided inseason to the Council. The Council would also have the opportunity to recommend management measures to curtail catch of this species including, but not limited to, area closures, gear prohibitions, etc. Further, noting the If at any time a conservation concerns arises, the Regional Administrator for NMFS's West Coast Region has the ability to restrict fishing through spatial closures, close a sector, or close a fishery. This action can be taken during routine inseason management or through automatic action authority.

Under this action, fishing effort in both trawl and non-trawl fisheries could increase. Increases in effort could change the amount and extent of fishery interactions with prohibited and protected species. Protected species take under the management measures could occur, however, it is difficult to project where/when these events would happen.

Increased ACLs and allocations for trawl dominant species, such as petrale sole, could affect eulachon; however, as reported in the 2019 Groundfish Endangered Species Workgroup Report (GESW), bycatch of this species is well under both precautionary and reinitiation thresholds. The whiting fleet is actively monitored for eulachon bycatch. Green sturgeon is a protected species that may be taken in groundfish fisheries; however, as detailed in the GESW report, green sturgeon are primarily taken in California state managed species. Based on the GESW report, take in federally managed trawl fisheries is expected to remain at negligible levels regardless of increases to ACLs and/or allocations.

Salmon bycatch is a primary concern in the trawl groundfish fishery. With increases to ACLs/allocations as well the adjustments to area restrictions, there is uncertainty of how these factors may impact salmon. However, with the mitigation measures adopted in the 2019-20 harvest specifications, Amendment 28, and the salmon mitigation measure action, the Council is well positioned to mitigate incidental salmon bycatch in a timely manner, in necessary. Thus the overall risk of exceeding salmon bycatch guideline limits (as described in the salmon mitigation action) is low. This action is not expected to increase salmon bycatch and the mitigation measures the Council will be able to employ will have a positive impact on salmon.

In the fixed gear fishery, short-tailed albatross take has been documented. Short-tailed albatross are known to be attracted to and feed on bait from longline gear being deployed. Increased ACLs, allocations, and trip limits could increase seabird take; however, the new measures implemented under the seabird action in

2019 are expected to reduce take (as described above and in Section 4.2.9 of the above EA). The seabird mitigation is expected to provide positive impacts on incidental take for short-tailed albatross and may afford other seabird species similar benefits.

Marine mammals are known to be impacted by fishing activity. While impacts are low in the groundfish fishery, take for some species (e.g., humpback whale) in other fisheries -i.e. Dungeness crab has increased in recent years (NOAA Fisheries 2019). Crab gear and sablefish pot gear both use long lines to attach the pot to a surface buoy. Whales are susceptible to becoming entangled in these lines. As described above at Section 4.2.9, Humpback whale interactions are known to occur in the fixed gear fishery, where they may become entangled in gear; however, as noted in the GESW report, it appears fishery interactions are low; however, precision related to estimates of take is low. Based on past history, interactions with the groundfish fishery and humpback whale are expected to remain low under the proposed action. A new biological opinion is expected in summer of 2020 that could describe mitigation measures for the fishery. Overall, the action is not expected to appreciably change, either positive or negatively, interactions with protected species. The net effect of this action is expected to be neutral on marine mammals as impacts outside what was described in the 2015 EIS are not expected.

Southern resident killer whale (SRKW) are thought to consume groundfish; however, the extent is unknown. Based on studies, their primary source of food is Chinook salmon. However, given the current population status of SRKW, food resources for the population are under investigation. As such, there may be impact to this species from the groundfish fishery, but, the extent of which is unknown. Therefore, an informed conclusion of the effects of the groundfish fishery on SRKW cannot be made at this time.

Increases in harvest specifications amounts for 2021-2022 under the Preferred Alternative would result in increased commercial and recreational fishing opportunities and revenues compared to No Action. Preliminary economic analysis indicates the average estimated ex-vessel revenue for shoreside sectors (trawl and non-trawl) is over $100 million and for at-sea sectors, the estimated average ex-vessel revenue is $151 million. The shoreside sector ex-vessel revenue increases by an average of 14 percent and at-sea sector ex-vessel revenue increases by approximately 20 percent. In all states, the recreational seasons are proposed to be adjusted and as such, projections indicate effort in all states could increase. Coastwide, income impacts are expected to result in a positive socioeconomic benefit. Overall coastwide employment may increase as a result of the increased ACLs associated with the preferred alternative.

5.4 Summary of the Cumulative Effects of the Proposed Action and Past, Present, and Reasonably Foreseeable Future Actions.

The differences between the No Action, Alternative 1, and Alternative 2 are relatively small within the context of the entire EEZ and the scope of past, present and RFFAs. Therefore, the effects of the cumulative differences are largely negligible. This tiered cumulative effects analysis therefore presents the cumulative effects with the Preferred Alternative.

Overall, when the proposed action or alternatives are considered in conjunction with all the other pressures placed on fisheries by past, present, and reasonably foreseeable future actions, the incremental effect of the proposed action or alternatives is not expected to result in any significant cumulative impacts, positive or negative, for any affected resource."

5.4.1 Groundfish

Amendment 28 is designed to protect groundfish habitat and may shift the distribution of fishing effort through the removal of the trawl RCA and changes to the EFHCA areas. When combined with the expected increase in catch limits under the proposed action, Amendment 28 would further serve to increase flexibility

and efficiency so fishermen may increase catch of rebuilt groundfish species and attain more of the ACL. Notably, A-28 reopens some 3,000 square miles to trawling. This change is significant in terms of areas available to fishermen; however, the catch limits under the proposed action would be set consistent with the PCGFMP based on the best available science, and would be intended to prevent overfishing while achieving optimum yield as required by the MSA. There is 100 percent monitoring and accountability for groundfish IFQ species caught. Amendment 28 would establish another management tool in Block Area Closure (BAC) boundaries that could be closed to reduce harvest of target or non-target stocks (e.g., prohibited species, protected species, etc.).

The trawl gear action may have an impact on stock productivity if changing the trawl mesh size causes smaller fish to be harvested; however, in general, smaller fish are not marketable. It is unlikely fishermen will target smaller fish or reduce the net size so as to catch more small fish. The incremental change of the trawl gear action on the fishery is it may increase attainments of target species over time and, potentially, incentivize development of net-types that reduce prohibited and protected species (e.g., salmon and eulachon). This, along with improved used and experimentation with selective devices, may also change size or species selectivity slightly. If at any time a conservation concerns arises such as the exceedance of an annual catch limit in the 2020-2021 harvest specifications, the Regional Administrator for NMFS's West Coast Region has the ability to restrict fishing through spatial closures, close a sector, or close a fishery. This action can be taken during routine inseason management or through automatic action authority.

Salmon mitigation measures may impact fishery operations. In the course of normal trawl fishing, vessels may catch salmon incidentally. There is a cap to the amount of salmon the fishery, by sector, and if reached will close the fishery, either by sector or in totality. To reduce take of listed salmon, these measures may be implemented. In general, these measures will restrict fishing to certain areas, depths, etc., however, they will still allow the groundfish fishery to continue operation in open areas. Further, the Whiting Cooperative Salmon Mitigation Plans incentivize industry lead actions to actively avoid salmon bycatch though a host of measures. These measure are designed to reduce the risk of a total fishery shutdown, which would have significant effects on groundfish attainments. The measures, however, improve Council flexibility to attend to specific sectors in case of unexpected incidental salmon take, and may not result in complete closures to the fishery as they are meant to be temporary. EM is unlikely to directly affect groundfish; however, EM could improve the ability of NMFS to receive timely data to the Council for the fleet(s) equipped with EM devices. These data could, therefore, improve the ability of the Council to monitor inseason activity of catch and thereby ensure catch limits are not exceeded.

The cowcod and shortbelly rockfish actions are specific to the 2020 fishery. The action for cowcod south of 40°10' N lat. eliminated the 2020 ACT and reduced the research set-aside to increase the annual vessel limit in the limited entry trawl fishery. The shortbelly rockfish action increased the 2020 ACL. Based on the analyses informing these actions, catch of these species will potentially increase; however, the status of these species is not expected to be negatively impacted. In this action, the cowcod south of 40°10 N. lat ACL is the highest in over 20 yrs. This ACL is representative of the stock being declared rebuilt. Noting the concerns of accuracy relating to uncertainty of certain aspects in the stock assessment, the Council recommended an ACT of 50 mt be placed on this species. As the fishery begins to expand into cowcod depth ranges, it is expected catch will increase incrementally, but still remain low due to other mitigating factors (i.e. no retention in the non-trawl fishery, avoidance practices by fishermen, etc.).

Shortbelly rockfish are not a target species and industry actively attempts to avoid this species and this action is not anticipated to negatively impact these species. Given the recent recruitment events of shortbelly rockfish (described in Section 5.4.2 below and in Chapter 2 above), the overall stock is likely to remain highly abundant. Incremental increases in shortbelly catch may occur over the biennium due to the abundance of the stock and the apparent range expansion to the north; however, as they are not targeted and disrupt normal fishing operations, industry will continue to avoid them.

When the EM action and this action are examined together, there is very little impact that can be described. EM has no direct impact on groundfish. No changes to groundfish populations are expected from implementation of this rule. Similarly, the seabird action does not directly affect groundfish populations as it is a mitigation measure to reduce take of seabirds above water. Therefore, the impacts from these two actions on groundfish are neutral.

When all items are taken into account, the measure cumulatively increase the likelihood that ACLs will not be exceeded. The action in concert with A-28, gear changes, salmon mitigation measures and EM act to mitigate overages. Overall, the Council and NMFS have a multitude of mitigation measures available to modify fishing behavior. If at any time a conservation concern arises, the Regional Administrator for the NMFS West Coast Region has the ability to restrict fishing via a variety of measures. This action can be taken during routine inseason management.

In a cumulative sense, when the past, present, and reasonably foreseeable future actions and the action are taken into account, they are likely to have neutral or low negative impacts on groundfish. When combined with the medium positive effects of past, present, and reasonably foreseeable future actions, the incremental effect of the proposed action or alternatives would not result in significant cumulative impacts on the biological environment.

5.4.2 Habitat including Groundfish Essential Fish Habitat.

The action increases ACLs for nine species. Under Amendment 28, the trawl RCA was removed off Oregon and California; however, as described above, there is a net increase in the amount of area closed to bottom trawl and bottom contact gear. A-28 opens some 3,000 sq. miles to trawl, it closes approximately 13,000 square miles (including almost all of the Southern California Bight), and closes approximately 123,000 square miles to all bottom contact groundfish gear, in waters deeper than 3,500 meters. This change could allow for bottom trawlers to target a more diffuse area and could, therefore, lessen the impact on areas repeatedly fished in the past. Additionally, bottom trawl fishermen generally avoid high-relief substrate as it has the high potential of damaging gear and target soft bottom. Soft substrates are the most resilient and the fastest to recover, with full recovery possible in as little as one year after bottom trawling. While hard substrate (including high rocky, relief areas) is more vulnerable to the negative impacts associated with trawl gear fishing, only a small portion of the former RCA area consists of hard substrate. In fact, A-28 is expected to provide a net-gain in protection of high relief as EFH Conservation Areas remain in place and provide protection to this type of bottom.

It has been well documented shortbelly rockfish are forage for fish, seabirds, and marine mammals; thus, are an important ecosystem component in the CCE. The designation of shortbelly rockfish as an EC species under the Preferred Alternative in the present action is unlikely to cause negative effects. This species is not targeted and no market exists for them -nor is one expected to develop. They are caught incidental to midwater trawl fishing and are actively avoided as they impact fishing activities negatively.

Federal regulations to implement the MSA's requirements for EFH at 50 CFR 600.815(a)(7) also regard human activities that may affect species that are the prey of FMP species as having potential effects on EFH functionality. While prey species are not considered habitat, the availability of prey species is considered a component of EFH, similar to temperature, water quality, or sediment type. The loss of prey species within EFH may affect the ability of a managed species to use that EFH as feeding habitat just as, for example, significant shifts in water quality may affect the ability of a managed species to use an EFH area as feeding habitat.

The 2015 EIS describes impacts of fishing gear on groundfish EFH; effects vary by gear and benthic substrate type. Midwater or pelagic trawls are used to harvest Pacific whiting and some rockfish species

off Washington and Oregon. In the Groundfish EFH RCA modifications recently implemented (PFMC and NMFS, 2019), the general effects of midwater trawl gear were identified as being limited to (1) removal of prey species, (2) direct removal of adult and juvenile groundfish, (3) occasional contact with the bottom, and (4) effects resulting from loss of trawl gear, potentially resulting in impacts to bottom habitats and ghost fishing (Whitmire and Wakefield 2019).

Impacts of the midwater trawl to bottom habitats might be similar to what is described for bottom trawls over similar habitats, though the geographic extent and frequency of impacts would be much smaller (Appendix C Part 1. of the Pacific Coast Groundfish FMP, Whitmire and Wakefield, 2019). There are no additional impacts to EFH beyond those previously disclosed in the 2015 EIS and 2019-2020 EA. Section 4.1.1 in the 2015 EIS evaluates the long-term impacts of groundfish fishery management on EFH. EFH bottom habitat is not affected by the proposed shortbelly action because the affected fishery sector predominantly uses mid-water trawl gear.

This action designates shortbelly rockfish as an EC species. It has been well documented shortbelly are forage for fish, seabirds, and marine mammals; thus, are an important ecosystem component. The EC designation for shortbelly rockfish, a forage species, coupled with the ACL increase in 2020, is unlikely to cause negative effects on the ecosystem. It is unlikely there would be negative effects on the forage base as this species is not targeted and no market exists for them. They are caught incidental to midwater trawl fishing and are actively avoided as they impact fishing activities negatively.

Increased bycatch of shortbelly rockfish in the whiting fishery and midwater trawl fishery may occur if shortbelly rockfish abundance remains high or further increases in the northern waters. Shortbelly rockfish bycatch not be expected to have significant impacts on groundfish EFH, including prey availability, since the increased shortbelly bycatch is a result of an overall increase in abundance and range extension of shortbelly rockfish. NOAA Fisheries survey data and fishery data show strong evidence that overall shortbelly rockfish abundance has increased in recent years ((Field, *et al.* 2007a,b). Additionally, while recruitment trends in recent years are close to average levels in southern CCE, they have been high in the northern CCE where the whiting fishing primarily occurs, and therefore resulting in increased interactions.

Furthermore, (Schroeder, 2019) indicate that several strong recruitment years could continue to impact the mid-water fishery in 2020 and beyond. The 2018 and 2019 high bycatch was tied to relatively strong 2013 and 2014 year classes off central California. As the shortbelly recruits aged, they moved north into Oregon and Washington. Schroeder et al. 2019 show that 2013 was the highest recruitment anomaly of any rockfish in any year since records began being kept in 1983. If individuals from this record year class continue to remain to the north off Oregon and Washington, then they will continue to be encountered as bycatch in coming years. Furthermore, Schroeder et al. show that there were also atypically high year classes in 2014, 2015, and 2016 that could start to become encountered as bycatch in 2019 and beyond. Shortbelly rockfish is a healthy and valuable forage species and estimated to have the highest productivity of any West Coast rockfish (Field, *et al.* 2007a,b). It is therefore unlikely fishing practices will have a negative impact on this species.

Overall impacts from the proposed action or alternatives were found to be low negative on the physical environment due primarily to the increased fishing effort associated with the catch limits. When combined with the low positive effects of past, present, and reasonably foreseeable future actions, the incremental effect of the proposed action or alternatives would not result in significant cumulative impacts on the physical environment.

5.4.3 Protected Resources

This action coupled with the newly opened areas under A-28 could increase protected species interactions due to potential fishing effort changes. Commonly encountered protected species in the groundfish fishery are seabirds and salmon. Seabirds and salmon are incidentally taken in the course of normal fishing operations; however, the Seabird Bycatch Avoidance Measures (84 FR 67674) action and the forthcoming salmon mitigation measures are designed to mitigate incidental take. Additionally, the groundfish fishery operates in areas where eulachon, humpback whale, SRKW are known to exist.

Seabird bycatch avoidance mitigation measures are expected to reduce take of seabirds, in particular short-tailed albatross. These measures, as described in the Seabird Bycatch Avoidance Measure action, are expected to have positive effects on seabirds as they are known to actively discourage interactions with gear, and therefore reduce incidental mortality. Although fixed gear effort via longline may increase with ACL increases for sablefish north of 36° N. lat. under the proposed action, the overall impact to seabirds is expected to be neutral given mitigation measures.

Salmon bycatch incrementally increases during the course of a fishing year; however, the rate at which it increases is highly variable. Salmon are incidentally caught in all sectors of the groundfish; however, they are encountered at a higher rate in trawl fisheries. With increased fishing area available under A-28 and increased ACLs for target species, this could increase fishing effort, including in newly opened areas. This could relate to a change, either positive (if vessels are able to avoid salmon within the new areas) or negative (if effort increases lead to a corresponding increase in interactions), in salmon bycatch. The trawl gear rule allows for innovation in gear design (e.g., selective flatfish trawl gear) that are expected to reduce incidental salmon take. The salmon mitigation measures described above measures can be implemented pre-season or inseason as the Council reviews salmon bycatch estimates on a regular basis and is well positioned to take action prior to bycatch limits being achieved. The salmon action allows the Council or NMFS to require the groundfish fishery sectors to cease fishing should mitigation measures fail and the fishery specific bycatch amounts are attained. This grants further protection to salmon. Overall, these measures are expected to have positive effects on these resources even if effort were to increase.

Eulachon are incidentally caught primarily in the midwater trawl fishery. With the increased ACLs, allocations, etc., bycatch of this species could increase if effort, notably in midwater, increases. However, as noted in the GESW report, eulachon catch is not expected to exceed the thresholds set in the biological opinion. Coupling this action with A-28, increase in trawlable area may disperse effort sufficiently to reduce frequency of interactions. When trawl effort is confined, it is likely localized impacts of eulchon could arise as multiple vessels are fishing the same area. It is important to note that the trawl fishery is observed at 100 percent and catch estimates are available in a timely manner that is sufficient for inseason. Any negative impacts to this species thought are expected to be incremental as effort will develop overtime and as market forces allow. Additionally, The trawl gear rule specifically notes the potential impacts to this species by gear design. As such, this rule allowed for modification of net gear that may have incrementally positive effects on this species and reduce incidental take.

Several distinct population segments of humpback whale are present in the action area. As noted above, this species is subject to current Section 7 ESA reconsultation, with an expected completion in summer 2020. In the past 10 years, there have been two takes in the fixed gear fishery. The increased limits in that fishery under the action may result in additional gear in the fishery; however, it is unclear, based on paucity of data, how much humpback interact with fixed-gear. Under the Marine Mammal Protection Act (MMPA) list of fisheries, the West Coast sablefish pot fishery is considered a category II fishery, which correlates to occasional interactions. Meaning, the mean annual mortality and serious injury potential is greater than one percent but less than 50 percent of the stock's Potential Biological Removal level. The Council is scheduled to take this issue up in Fall of 2020 -should the Incidental Take Statement of the biological opinion dictate

a roll for them. Due to the increased ACLs for sablefish, there could likely be a concomitant increase of pot gear. Additional effort is, however, expected to be incremental and will naturally occur as a response to increased trip limits, but is highly dependent on the market conditions. As noted in the GESW report, increased entanglements of humpback are not expected in the groundfish fishery. Therefore, these actions in a cumulative sense likely result in in neutral effects to this species; however, it is important to note that independent of effort, any take of humpback is a negative impact.

SRKW are a species of concern on the West Coast. The primarily food source for SRKW is Chinook salmon and other salmon species, however, they have been documented consuming a non-salmonid species as well (Ford et al. 1998; Ford et al. 2000; Ford and Ellis 2006; Hanson et al. 2010; Ford et al. 2016). While it is important to note SRKW diet does include groundfish, as detailed in (Hanson 2010; Hanson et al 2018), the extent of SRKW predation on groundfish is highly uncertain and thought to be low. Noting that the groundfish fishery does catch salmon incidentally, there may therefore be some impact to SRKW. However, the uncertainty of how salmon bycatch would impact SRKW makes determination of impact impossible at this point without further data. It is important to note that the salmon mitigation measure is designed to reduce the level of salmon bycatch and, though indirectly, may provide positive benefits to SRKW. At their April 2019, the Council established a SRKW workgroup with NMFS to help assess the impacts of Council-area fisheries on SRKW, with particular focus on salmon fisheries. The workgroup's risk assessment (Agenda Item E.2.a, June, 2020) will inform NMFS ESA consultation and biological opinion regarding the salmon fishery. At this juncture, the interactions of SRKW and the groundfish fishery, including impacts from those interactions, are unknown. It is therefore speculative that this action, coupled with all other past, present, and foreseeable future actions will have a positive or negative impact on the species with any degree of certainty.

It is important to note, measures implemented to reduce take of protected species could also affect fishing opportunity and catch. Reduced fishing effort would likely have a low positive impact on target species, on non-target species, and on protected species.

Overall impacts from the proposed action or alternatives were found to be neutral to low positive as the mitigation measures for seabirds present a positive benefit to short-tailed albatross, net design changes may allow for reduction of eulachon bycatch, etc.. When considered in the context of the fishery management process, the effects of the proposed action or alternatives are incrementally positive, but controlled, and not expected to be significant.

5.4.3.1 Socioeconomic

A-28 and the trawl gear rule increase operational flexibility and are expected to provide positive socioeconomic impacts. Further, these items may increase operational efficiencies that allow vessels to increase catch and ACL attainment of non-whiting groundfish species.

The salmon mitigation measures are designed to address incidental salmon bycatch in such a way that would keep the fishery, as a whole or by sector, operational. Some of the measures, e.g. BACs and aspects of Salmon Mitigation Plans, may result in time/area closures; however, these closures are meant to be temporary and would allow fishing in areas outside of the closure. Vessels could therefore continue to fish, though to what benefit is unknown as it is uncertain if target species would be present in areas outside the closures. These measures and associated impacts are further described in Agenda Item H.9, Attachment 1 (Revised), November 2019. Overall, the salmon mitigation measures afford the Council a tool set to attempt to reduce salmon bycatch rates and thereby keep the fishery or fishery sector open. While the mitigation measures may affect a subset of the fishery, overall, it creates positive impacts as the mitigation measures would be used to keep the majority of the fishery open. It is important to note, the mitigation measures could be incrementally implemented to control incidental salmon bycatch; thereby, operations could adjust

to compensate for losses. However, if bycatch were to suddenly spike, the Council could act to curtail bycatch in a fishery with any measures available to them at that point.

EM directly effects revenue, specifically vessel owner/operators as they will likely be required to fund these technologies. These costs may be mitigated, however, by operational flexibility created by past actions and, if adopted, changes to catch limits in this action. time, this action may incrementally increase in cost to operate the technology.

This action combined with recent past, present, and reasonably foreseeable future actions offer improved flexibility to the fishery. Further, efficiency gains created from these combined actions may improve the ability of fishermen to prosecute the fishery as well as increase catch of rebuilt groundfish stocks and, therefore, achieve optimum yield from the fishery. While catch limits under the proposed action have increased based on the PCGFMP and available science, the proposed alternatives control catch in some cases (e.g., cowcod, petrale etc.) to ensure that the efficiency gains of past, present, and reasonably foreseeable future actions (e.g., gear change or RCA removal) continue to prevent the risk of overfishing while helping fishermen and the fishery achieving optimal yield. When considered in the context of the fishery management process, the effects of the proposed action or alternatives are incrementally positive, but controlled, and not expected to be significant.

Table 5-3. Cumulative impacts of the past, present and reasonably foreseeable future actions

Environmental Component	Past Actions	Present Actions	Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, Future Actions
Groundfish Stocks	**Mixed (Low Positive and Low Negative)** Most stocks above or near target biomass; one stock, yelloweye rockfish status is overfished	**Low to Moderate Positive** The current management framework is effective in rebuilding stocks to the target biomass and achieving optimum yield.	**Low Positive** No actions are identified that would reduce the effectiveness of the management framework	**Low Positive** No actions are identified that would reduce the effectiveness of the management framework; however, misspecification of catch limits and management error could occur

Environmental Component	Past Actions	Present Actions	Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, Future Actions
Essential Fish Habitat	**Low to Moderate Positive** Trawl RCA eliminated (A-28). Large areas of EFH are protected. Past actions have mitigated adverse effects of fishing on EFH. Fisheries have impact on EFH at varying levels depending on gear type	**Mixed (Low Positive and Low Negative)** Trawl fishing effort stable; Ongoing actions continue to mitigate adverse effects of fishing on EFH; Boundary changes to RCA may impact habitat, though at what level is unknown.	**Low Positive** Part/present actions likely to enhance the mitigation of adverse effects of fishing on EFH. Stability in fishery may reduce risk of increased trawl footprint.	**Low to Moderate Positive** Trawl fishery is stable, Trawl RCA reopened with large areas protected from fishing to protect EFH. future actions likely to enhance the mitigation of adverse effects of fishing on EFH.
Socioeconomic (Human Communities)	**Mixed (Low Positive and Low Negative)** Fishery resources have supported profitable industry. Trawl opportunities and flexibility increased due to gear rule and A-28. Trip limit changes allow for increased attainment of target species.	**Mixed (Low Positive and Low Negative)** Stock status and yield may allow fishery revenues to increase; Increased trip limits may allow increased operational flexibility. Increases to participation/ employment are marginal, may not expand significantly over biennium	**Low Positive** Fishery closure due to incidental salmon bycatch would be unexpected. Mitigation measures reduce risk of attaining bycatch guideline. EM participants may incur costs to fund EM program. EM may offer operational flexibility.	**Low to Moderate Positive** Stock status and yield have allowed fishery revenues to increase; A-28 will allow access to trawl fishery to target shelf/slope stocks that are under-utilized.
Protected Resources	**Low Positive** Mitigation measures may reduce adverse effects on seabird populations. Net design may allow for reduced incidental take of protected & prohibited species (salmon)	**Neutral** Ongoing prosecution of fisheries at current levels not expected to change ecosystem attributes from the baseline; other actions likely have negligible impacts	**Low Positive** Fishery effort may impact protected species. Mitigation plans for salmon to reduce adverse effects of fishing on protected/prohibited species.	**Low Positive.** Mitigation measures reduce risk of negative impact to protected resources. Current action is expected to have negligible impact.

6. Regulatory Impact Review

The President of the United States signed E.O. 12866, "Regulatory Planning and Review," on September 30, 1993. This order established guidelines for promulgating new regulations and reviewing existing regulations. The E.O. covers a variety of regulatory policy considerations and establishes procedural requirements for analysis of the benefits and costs of regulatory actions. The E.O. stresses that in deciding whether and how to regulate, agencies should assess all of the costs and benefits of available regulatory alternatives. Based on this analysis, they should choose those approaches that maximize net benefits to the Nation, unless a statute requires another regulatory approach.

NMFS satisfies the requirements of E.O. 12866 through the preparation of an RIR. The RIR provides a review of the potential economic effects of a proposed regulatory action in order to gauge the net benefits to the Nation associated with the proposed action. The analysis also provides a review of the problem and policy objectives prompting the regulatory proposal and an evaluation of the available alternatives that could be used to solve the problem.

The RIR provides an assessment that can be used by the Office of Management and Budget to determine whether the proposed action could be considered a significant regulatory action under E.O. 12866. E.O. 12866 defines what qualifies as a "significant regulatory action" and requires agencies to provide analyses of the costs and benefits of such action and of potentially effective and reasonably feasible alternatives. An action may be considered significant if it is expected to:

- Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in E.O. 12866.

6.1 Statement of Problem

The proposed action is needed to conserve and manage Pacific Coast groundfish fishery resources. This proposed action would set catch limit specifications for 2021-2022 consistent with existing or revised harvest control rules for all stocks, and established management measures designed to keep catch within the appropriate limits.

6.2 Description of Management Goals and Objectives

A description of the management goals and objectives is available above in Chapter 1.2 titled "Proposed Action, Purpose and Need".

6.3 Description of Fisheries and Other Affected Entities

Federally managed Pacific groundfish fisheries occurring within the Exclusive Economic Zone off the coasts of Washington, Oregon, and California establish the geographic context for the proposed action. West Coast communities engaged in these fisheries are also part of the context. Although this is the federal fishery management area, the states manage the fisheries in within 3 miles of their coastlines to meet the goals and objectives of the Pacific Groundfish FMP. The number of vessels permitted in the fishery are shown in Table 6-1.

A detailed description of the fishery and affected entities is available in the SAFE document. The SAFE includes a summary of historic harvests, description of management, and economic characteristics of the commercial fishery, tribal fisheries, and recreational fishery, along with commercial port communities.

Table 6-1. Number of participating vessel, by sector and fishery, and number of processors that are associated with the sector/fishery in 2019. Source PacFIN, February 2020

Sector	Vessels
Whiting -total	58
• Catcher Processor	9
• Mothership	6
• MS Catcher Vessel	19
• Shoreside	27
IFQ Non-whiting - total	131
• Mid-water trawl	28
• Bottom trawl	66
• Fixed Gear	16
LEFG - total	134
• Sablefish	130
• Nearshore	25
• Other non-nearshore	34
OA - total	592
• Sablefish	171
• Nearshore	280
• Other non-nearshore	259

6.4 Methods Used for Impact Analysis

The harvest specifications are set consistent with the optimum yield (OY) harvest management framework described in Chapter 4 of the PCGFMP. The management objectives of this action are: to prevent overfishing, to rebuild overfished stocks, to ensure conservation, to facilitate long-term protection of essential fish habitat (EFH), and to realize the full potential of the nation's fishery resources (MSA §2(a)(6)) This rule is authorized by 16 U.S.C. § 1854–55 and by the PCGFMP.

The analysis of the economic impacts effects illustrate how conditions may change, both by applying harvest specifications based on default HCRs and compliant management measures (i.e., the No Action Alternative), and varying ACLs and management measures for certain stocks [shortbelly rockfish, black rockfish (Oregon), cowcod (south of 40º10' N. lat.), petrale sole, and sablefish] under the action Alternatives (Alternative 1, Alternative 2, and the Preferred Alternative). The ACLs for all remaining stocks are consistent across all Alternatives.

For simplicity, fishery and community economic impacts in the following sections are displayed for 2021, the first year of the two-year management cycle, only. Although the totals during the second year of the management cycle in 2022 may be somewhat different in some cases, the relative distribution of economic effects and inferences regarding rankings of the Alternatives would not change. The 2015 EIS included detailed descriptions of the models and data used to project socioeconomic impacts. Updated documentation of the models may be found in the Groundfish SAFE document.

6.5 Description of the Alternatives

A complete description of the Alternatives is available above in Chapter 2 of the EA. A detailed analysis of the economic effects expected to result from this action is provided in Section 4.2.6.

Additionally, under No Action, Alternative 1 and Alternative 2, there are two scenarios corresponding to use of alternative methods to apportion sablefish between fisheries conducted in the relatively low-attainment Conception area vs relatively high-attainment fisheries conducted north of Conception. Method 1 is based on "status quo" apportionment while Method 2 allots a larger portion of sablefish to fisheries north of the Conception area with correspondingly higher projected coastwide landings and associated community economic impacts. The Council adopted Method 2 as their preferred apportionment method for sablefish. As such, the following summarizes the economic effects of Method 2 only. Method 1 economic impacts are detailed above in Section 4.2.2.6

For reference, No Action is compared to status quo (baseline). Note that status quo is not an option under consideration; however, it is used to provide a frame of reference to the effects of No Action as well as to retain the comparative analysis structure discussed under Alternative 1, and Alternative.

The following discussion summarizes and compares expected economic effects for each of the Alternatives. All monetary values are in 2019 dollars. Detailed tables are available above in Section 4.2.6; however, Table 6-2 provides a quick reference guide to those tables.

Table 6-2. Quick reference guide to tables in Section 4.2.6 that provide detail pertaining to the summarization below.

Subject	Tables
Commercial Fishery	
Ex-vessel Revenue	4-188 to 4-190
Vessel Net Revenue	4-194 to 4-196
Captain/Crew Wages	4-197 to 4-199
Community Income Impact	4-200 to 4-202
Employment Impact	4-206 to 4-208
Recreational Fishery	
Effort Impact	4-191 to 4-193
Community Income Impact	4-203 to 4-205
Employment Impact	4-209 to 4-211

6.5.1 Analysis of Expected Effects: No Action

In the commercial sector, under No Action, ex-vessel revenue in shoreside sectors is expected to be $99.9 million dollars and the whiting sector ex-vessel revenue is an estimated $50.8 million dollars. The shoreside sector vessel net revenue under No Action are $8.6 million for whiting, $8.7 million for non-whiting

trawl/IFQ, and $2.3 million for LEFG. Wages (coastwide) are estimated at a cumulative, coastwide total of $10.3 million for whiting sector, $12.1 million for non-whiting trawl/IFQ sector, and 4.3 million for LEFG sector. Coastwide, the community income impacts are estimated at $165.4 million with an estimated employment impact of 2,598 jobs.

6.5.1.1 No Action Compared to Status Quo

Ex-vessel revenue in the shoreside and whiting sectors are, approximately, +$11.0 million and +$13.0 million, respectively, more than status quo ex-vessel revenue. Compared to status quo, shoreside whiting net revenues are +$0.1 million higher, non-whiting trawl/IFQ is +$2.0 million higher, and LEFG is +$0.6 million higher than status quo. In the shoreside whiting fishery, No Action wages are approximately $0.1 million more than under status quo. The non-whiting trawl/IFQ is +$1.7 million and LEFG is +$0.5 million over status quo values. No Action is estimated to provide +$13.4 million more in commercial fishery community impacts than status quo with approximately +258 more jobs.

In the recreational sector, under No Action, effort for groundfish, for all three states, is estimated at 850.4 thousand trips. This amount is a marginal increase of +0.4 percent from status quo. Similarly, recreational fishery income increases by +0.5 percent from status quo, $157.6 million from $157.1 million

6.5.2 Analysis of Expected Effects: Alternative 1

In the commercial sector, under Alternative 1, ex-vessel revenue in shoreside sectors is expected to be $100.9 million dollars and the whiting sector ex-vessel revenue is an estimated $50.8 million dollars. The shoreside sector vessel net revenue under No Action are $8.5 million for whiting, $8.7 million for non-whiting trawl/IFQ, and $2.7 million for LEFG. Wages (coastwide) are estimated at a cumulative, coastwide total of $10.3 million for whiting sector, $12.0 million for non-whiting trawl/IFQ sector, and 4.8 million for LEFG sector. Coastwide, the community income impacts are estimated at $166.7 million with an estimated employment impact of 2,622 jobs

6.5.2.1 Alternative 1 Compared to No Action

Cumulative ex-vessel revenue under Alternative 1 increases by +$1.0 million dollars from No Action for the shoreside sectors. The estimated whiting sector ex-vessel revenue under Alternative 1 is the same as No Action. Vessel net revenue for the shoreside whiting under Alternative 1 are -$0.1 million less than No Action; whereas, non-whiting trawl/IFQ is expected to the same as No Action. LEFG net revenue is expected to be +$0.4 million more than No Action. Wages under Alternative 1 for shoreside whiting are expected to be the same as No Action; whereas, non-trawl/IFQ wages are expected to be -$0.1 million less than No Action. LEFG wages are expected to increase by +$0.2 million compared to No Action. Community impact increases by +$1.3 million under Alternative 1 over No Action. Alternative 1 employment impacts are +24 more jobs than No Action.

6.5.2.2 Alternative 1 Recreational Impacts

Under the Alternative 1, effort, income impact, and employment impacts are assumed to be the same as No Action

6.5.3 Analysis of Expected Effects: Alternative 2

In the commercial sector, under No Action, ex-vessel revenue in shoreside sectors is expected to be $100.2 million dollars and the whiting sector ex-vessel revenue is an estimated $50.8 million dollars. The shoreside sector vessel net revenue under No Action are $8.5 million for whiting, $8.4 million for non-whiting trawl/IFQ, and $2.7 million for LEFG. Wages (coastwide) are estimated at a cumulative, coastwide total of $10.3 million for whiting sector, $11.8 million for non-whiting trawl/IFQ sector, and 4.8 million for LEFG

sector. Coastwide, the community income impacts are estimated at $165.6 million Commercial fishery employment impacts are expected to be 2,607 jobs.

6.5.3.1 Alternative 2 Compared to No Action

Cumulative ex-vessel revenue under Alternative 2 increases by +$0.3 million dollars from No Action for the shoreside sectors. The estimated whiting sector ex-vessel revenue under Alternative 1 is the same as No Action. Vessel net revenue under Alternative 2 for shoreside whiting and non-whiting trawl/IFQ decreases by -$0.1 and -$0.3 million, respectively, compared to No Action. LEFG vessel net revenue under Alternative 2 is an estimated +$0.4 million greater than under No Action. Wages under Alternative 2 is the same as No Action for shoreside whiting; whereas wages for non-whiting trawl/IFQ decreases by -$0.3 million. LEFG wages increase by +$0.2. The Commercial fishery community impact increases by +$0.2 million under Alternative 2 over No Action. Under Alternative 2, there are an estimated +9 more jobs than under No Action.

6.5.3.2 Alternative 2 Compared to Alternative 1

Cumulative ex-vessel revenue under Alternative 2 decreases by -$0.7 million dollars from Alternative 1 for the shoreside sectors. The estimated whiting sector ex-vessel revenue under Alternative 1 is the same as Alternative 1 [and No Action]. Vessel net revenue under Alternative 2 for shoreside whiting and LEFG are the same as Alternative 1; whereas, non-whiting trawl/IFQ decreases by -$0.3 million from Alternative 1. Estimated wages under Alternative 2 for shoreside whiting and LEFG are the same as Alternative 1; whereas, wages for non-whiting trawl/IFQ wages decrease under Alternative 2 (from Alternative 1) by -$0.2 million. Community impact under Alternative 2 decrease by -$1.1 million from Alternative 1. Coastwide, under Alternative 2 there are an estimated -15 fewer jobs than under Alternative 1.

6.5.3.3 Alternative 2 Recreational Impacts

Under Alternative 2, recreational effort is projected to increase by approximately +181.4 thousand trips over No Action and Alternative 1. The increase in effort under Alternative 2 appears to be driven by California as angler trips in Washington and Oregon remain the static across all Alternatives, including the Preferred Alternative. Similarly, income impacts increase by approximately +$38.2 million under Alternative 2 over No Action or Alternative 1. Employment impacts are estimated at +604 more jobs than under No Action or Alternative 1.

6.5.4 Preferred Alternative

In the commercial sector, under No Action, ex-vessel revenue in shoreside sectors is expected to be $102.2 million dollars and the whiting sector ex-vessel revenue is an estimated $50.8 million dollars. The shoreside sector vessel net revenue under No Action are $8.6 million for whiting, $9.2 million for non-whiting trawl/IFQ, and $2.7 million for LEFG. Wages (coastwide) are estimated at a cumulative, coastwide total of $10.3 million for whiting sector, $12.5 million for non-whiting trawl/IFQ sector, and 4.8 million for LEFG sector. Coastwide, the community income impacts are estimated at $169.1 million Under the Preferred Alternative, the employment impacts are expected to be 2,652 jobs.

Under the Preferred Alternative the recreational effort, income impact, and employment impacts are assumed to be the same as under No Action and Alternative 1

6.5.4.1 The Preferred Alternative Compared to No Action

Cumulative ex-vessel revenue under the Preferred Alternative is +$2.3 million dollars from No Action for the shoreside sectors. The estimated whiting sector ex-vessel revenue under Preferred Alternative is the same as No Action. Vessel net revenue under the Preferred Alternative for shoreside whiting is the same as No Action; whereas, non-whiting trawl/IFQ increases by +$0.5 and LEFG +$0.4 million compared to

No Action. Wages under the Preferred Alternative is the same as No Action for shoreside whiting; whereas, wages increase for non-whiting trawl/IFQ and LEFG by +$0.4 million and +$0.2 million, respectively. Community impact increases by +$3.7 million under Preferred Alternative from No Action. Under the Preferred Alternative , number of jobs is +54 from No Action

6.5.4.2 The Preferred Alternative Compared to Alternative 1

Cumulative ex-vessel revenue under the Preferred Alternative increases by +$1.3 million dollars from Alternative 1 for the shoreside sectors. The estimated whiting sector ex-vessel revenue under Alternative 1 is the same as Alternative 1 and No Action. Vessel net revenue under the Preferred Alternative for LEFG is the same as under Alternative 1; whereas for non-whiting trawl/IFQ and LEFG increase by +$0.1 and +$0.5 million, respectively, compared to Alternative 1. Estimated wages under the Preferred Alternative for shoreside whiting and LEFG are the same as Alternative 1; whereas, wages for non-whiting trawl/IFQ wages increase under the Preferred Alternative by +$0.5 million. Community impacts under the Preferred Alternative increase by +$2.4 million from Alternative 1. Coastwide, the Preferred Alternative is expected to increase the number of jobs by +30 from Alternative 1.

6.5.4.3 The Preferred Alternative Compared to Alternative 2

Cumulative ex-vessel revenue under the Preferred Alternative increases by +$2.0 million dollars from Alternative 2 for the shoreside sectors. The estimated whiting sector ex-vessel revenue under the Preferred Alternative is the same as Alternative 2. Vessel net revenue under the Preferred Alternative for shoreside whiting and non-whiting trawl/IFQ vessel increases by +$0.1 million and +$0.8 million from Alternative 2; whereas, LEFG under the Preferred Alternative is the same as under Alternative 2. Estimated wages under the Preferred Alternative for shoreside whiting and LEFG are the same as Alternative 2; whereas, wages for non-whiting trawl/IFQ wages increases under the Preferred Alternative (from Alternative 1) by +$0.7 million. Commercial impact to the community under the Preferred Alternative increases by +$3.5 million from Alternative 2. Coastwide, the Preferred Alternative increases commercial employment by +45 jobs from Alternative 2.

6.5.4.4 Preferred Alternative Recreational Impacts

Under the Preferred Alternative recreational effort, income impact, and employment impacts are assumed to be the same as No Action and Alternative 1. Compared to Alternative 2, recreational effort is projected to decrease by approximately -181.4 thousand trips under the Preferred Alternative , income impacts under the Preferred Alternative decrease by approximately -$38.2 million, and the number of jobs decrease by approximately -604 jobs. Under the Preferred Alternative , Washington accounts for 6.2 percent of angler trips, Oregon 12.1 percent, and California 81.7 percent

6.6 Summation of the Alternatives with Respect to Net Benefit to the Nation

Note on estimated costs on entities: Potential costs from the proposed rule would be unlikely, and only in the event of unexpected closures or management restrictions on groundfish sectors. Closures and restrictions are not anticipated by either managers or participants, who monitor their own catch inseason, and in many cases use coop structures and information sharing to limit bycatch.

This harvest specifications, routine management measures, and other new management measures of this rule are not expected to result in additional regulatory costs for any directly regulated entity. Specifically, there are no impact direct compliance, reporting, or recordkeeping costs; changes in market competition between entity types/sizes; taxes or fees required, or other administrative costs associated with this rulemaking. Estimated benefits may vary by entity type and size as defined and described in the IRFA below.

Preliminary analysis indicates the action is expected to provide an estimated total of $326.7 million in income impacts and 5,400 jobs coastwide. This is an increase of +$3.7 million and +54 jobs from commercial fisheries under the Preferred Alternative compared to No Action, with recreational effort, income impact, and employment impacts are assumed to be the same as under No Action.

A detailed analysis of the expected effects of the selected Alternative relative to the No Action alternative is available in the Environmental Assessment Section 4.2.6 above. The following section condenses the above discussion into nine categories

6.6.1 Commercial Fishery

6.6.1.1 Ex-vessel Revenue Impacts

Table 6-3 displays the estimated combined ex-vessel revenue. Under No Action and action Alternatives 1 and 2, annual average coastwide ex-vessel revenue, including the at-sea sectors, ranges from $150.7 million to $151.0 million. Under the Preferred Alternative annual average coastwide ex-vessel revenue, including the at-sea sectors, is projected to exceed No Action by $2.3 million, Alternative 1 by $1.3 million, and Alternative 2 by $2.0 million Projected ex-vessel shoreside sector (including shoreside whiting revenues under the three Alternatives from a low (No Action) of $99.9 million to a high (Alternative 1) of $100.9 million. The Preferred Alternative annual average coastwide shoreside ex-vessel revenue is projected to be $102.2 million. The at-sea sector ex-vessel revenue remains static across all alternatives and the Preferred Alternative at $50.8 million. Revenues in the Tribal groundfish sector (including shorebased whiting) are projected to increase over Status Quo by the same amount, under No Action, Alternative 1, Alternative 2 and the Preferred Alternative (approximately $2.1 million). Table 4-188 above displays a sector specific breakdown of the ex-vessel revenue. Overall, the Preferred Alternative provides the highest ex-vessel revenue.

Table 6-3. Comparison table of sector-combined coastwide economic effects of the Alternatives ($2019 dollars).

	No Action	Alternative 1	Alternative 2	Preferred Alternative
Ex-Vessel Revenue	$150.7	$151.7	$151.0	$153.0
Net Revenue	$19.6	$19.9	$19.6	$20.5
Income Impacts	$165.4	$166.7	$165.6	$169.1

6.6.1.2 Estimated Of Crew and Captain Wages.

Combined net revenue for crew and captain per year range from a low under No Action at $19.6 million to a high of $20.5 million under the Preferred Alternative (Table 6-3). Table 4-193 displays the breakdown of wages by sector. Shoreside whiting sector net revenue is estimated between $8.5 and $8.6 million across the Alternatives, with the Preferred Alternative an estimated $8.6 million. The relatively small differences in net revenue estimates are the result of slight variations in projections of catch of non-whiting groundfish species while targeting whiting. The non-whiting trawl/IFQ sector net revenue range from $8.4 million to $8.7 million across the three Alternatives, with the Preferred Alternative estimated at $9.2 million. LEFG sector net revenue is estimated to range from a low of $2.3 million under No Action to a high of $2.7 million under both Alternative 1 and Alternative 2. The Preferred Alternative estimate is the same as Alternatives 1 and 2 at $2.7 million. Overall, the highest wages occur under the Preferred Alternative .

6.6.1.3 Estimated Coastal Region Income Impacts

As displayed in Table 6-3, coastwide estimated personal income impacts from commercial groundfish fishing are estimated to be $165.4 million under No Action and projected to increase by between $2.3

million under Alternative 1 and by $1.2 million under Alternative 2. Under the Preferred Alternative , Washington ports are estimated to see personal income impacts totaling $36.4 million; Oregon ports an estimated $103.6 million; and California ports an estimated $28.9 million. Detail by region is provided above in TABLE The highest coastwide total income impacts and also the highest levels for each community occur under the Preferred Alternative ., which is an estimated coastwide total of $169.1 million.

6.6.1.4 Estimated Coastal Region Employment Impacts

Coastwide estimated employment impacts from commercial groundfish fishing range from an estimated 2,598 jobs under No Action to 2,622 jobs under Alternative 1 (Table 6-4). Under the Preferred Alternative , the estimate is 2,652 jobs. The highest coastwide total increase in employment impacts and also the highest levels for each community occur under the Preferred Alternative . Under the Preferred Alternative , Washington jobs are estimated at 479, Oregon at 1,449 jobs, and California at 723 jobs.

Table 6-4. Coastwide estimated employment (number of jobs) impacts across the Alternatives.

	No Action	Alternative 1	Alternative 2	Preferred Alternative
Employment Impact	2,598	2,622	2,607	2,652

6.6.2 Recreational Fisheries

6.6.2.1 Estimated Recreational Effort Impacts

Coastwide recreational effort is projected to be the same as 850.4 thousand angler trips under No Action, Alternative 1, and the Preferred Alternative . Under Alternative 2, effort increases by 181.3 thousand angler trips to 1,031.7 thousand angler trips (Table 6-5). The highest effort impact is generated under Alternative 2.

Table 6-5. Coastwide estimated recreational angler trips under the Alternatives, state data combined (in thousands)

	No Action	Alternative 1	Alternative 2	Preferred Alternative
Effort Impact	850.4	850.4	1,031.7	850.4

6.6.2.2 Estimated Recreational Groundfish Fisheries Income Impacts

Coastwide recreational fishing income impacts range from an estimated $157.6 million under No Action and Alternative 1 to $195.8 million under Alternative 2 (Table 6-6). The Preferred Alternative estimate is $157.6 million. Overall, Alternative 2 produces the highest estimate recreational groundfish income impacts. However, these impacts appear limited to California. Oregon and Washington income impacts to not changed across all Alternatives, including the Preferred Alternative .

Table 6-6. Coastwide estimated income impacts in the recreational fishery across the Alternatives, data combined. (2019 dollars)

	No Action	Alternative 1	Alternative 2	Preferred Alternative
Income Impact	$157.6	$157.6	$195.8	$157.6

6.6.2.3 Estimated Recreational Groundfish Fisheries Employment

Coastwide recreational fishing employment impacts range from an estimated 2,748 jobs under No Action and Alternative 1 to 3,352 jobs under Alternative 2 (Table 6-7). The Preferred Alternative estimate is $157.6 million. Overall, Alternative 2 produces the highest number of jobs, though the increase is limited to California. Under Alternative 2, the estimated total of jobs is approximately +600 jobs (~ +22 percent) more than the other Alternatives Oregon and Washington estimated number of jobs do not change across all Alternatives, including the Preferred Alternative .

Table 6-7. Coastwide estimated recreational employment (in jobs) across the Alternatives, data combined.

	No Action	Alternative 1	Alternative 2	Preferred Alternative
Employment Impact	2,748	2,748	3,352	2,748

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7. Initial Regulatory Flexibility Analysis

For any rule subject to notice and comment rulemaking, the Regulatory Flexibility Act (RFA) requires Federal agencies to prepare, and make available for public comment, both an initial and final regulatory flexibility analysis, unless the agency can certify that the proposed and/or final rule would not have a "significant economic impact on a substantial number of small entities". These analyses describe the impact on small businesses, non-profit enterprises, local governments, and other small entities as defined by the RFA (5 U.S.C. § 603). This analysis is to inform the agency and the public of the expected economic effects of the alternatives, and aid the agency in considering any significant regulatory alternatives that would accomplish the applicable objectives and minimize the economic impact on affected small entities. The RFA does not require the alternative with the least cost or with the least adverse effect on small entities be chosen as the preferred alternative.

The IRFA must only address the effects of a proposed rule on entities subject to the regulation (i.e., entities to which the rule will directly apply) rather than all entities affected by the regulation, which would include entities to which the rule will indirectly apply.

Part 121 of Title 13, Code of Federal Regulations (CFR), sets forth, by North American Industry Classification System (NAICS) categories, the maximum number of employees or average annual gross receipts a business may have to be considered a small entity for RFAA purposes. See 13 C.F.R. § 121.201. Under this provision, the U.S. Small Business Administration established criteria for businesses in the fishery sector to qualify as small entities. Standards are expressed either in number of employees, or annual receipts in millions of dollars. The number of employees or annual receipts indicates the maximum allowed for a concern and its affiliates to be considered small (13 C.F.R. § 121.201).

- A fish and seafood merchant wholesaler (NAICS 424460) primarily engaged in servicing the fishing industry is a small business if it employs 100 or fewer persons on a full time, part time, temporary, or other basis, at all its affiliated operations worldwide.
- A business primarily engaged in Seafood Product Preparation and Packaging (NAICS 311710) is a small business if it employs 750 or fewer persons on a full time, part time, temporary, or other basis (13 CFR § 121.106), at all its affiliated operations.

In addition to small businesses, the RFA recognizes and defines two other kinds of small entities: small governmental jurisdictions and small organizations. A small governmental jurisdiction is any government or district with a population of less than 50,000 persons. A small organization is any not-for-profit enterprise that is independently owned and operated and not dominant in its field, while. (5 U.S.C. § 601). There is no available guidance beyond this statutory language regarding how to determine if non-profit organizations are "small" for RFA purposes. The Small Business Administration (SBA) does have provisions for determining whether a business is "small" for RFA purposes and whether it is "dominant in its field," and those provisions can inform how NMFS classifies non-profit organizations for the purposes of RFA analyses in rulemaking. After consultation with the SBA, NOAA Fisheries has decided to use SBA's size standards for non-profit organizations to determine whether a non-profit organization is "small" and, in turn, whether it is "dominant in its field," to apply the statutory definition of a "small organization" in practice:

A nonprofit organization is determined to be "not dominant in its field" if it is considered "small" under SBA size standards:

- Environmental, conservation, or professional organizations (NAICS 813312, 813920): Combined annual receipts of $15 million or less.
- Other organizations (NAICS 813319, 813410, 813910, 813930, 813940, 813990): Combined annual receipts of $7.5 million or less.

Provision is made under SBA's regulations for an agency to develop its own industry-specific size standards after consultation with Advocacy and an opportunity for public comment (see 13 CFR 121.903(c)). NMFS has established a small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing (80 FR 81194, December 29, 2015). This standard is only for use by NMFS and only for the purpose of conducting an analysis of economic effects in fulfillment of the agency's obligations under the RFA.

NMFS' small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing is $11 million in annual gross receipts. This standard applies to all businesses classified under North American Industry Classification System (NAICS) code 11411 for commercial fishing, including all businesses classified as commercial finfish fishing (NAICS 114111), commercial shellfish fishing (NAICS 114112), and other marine fishing (NAICS 114119) businesses. (50 C.F.R. § 200.2; 13 C.F.R. § 121.201).

7.1 Description of why action by agency is being considered

The reasons why this agency action is being considered are explained in the "Statement of the Problem" Section of the RIR and in Chapter 1, Section 1.1 titled "Purpose and Need" of the EA above.

7.2 Statement of the objectives of, and the legal basis for, the proposed rule.

The reasons why agency action is being considered and legal basis for the proposed rule are explained in the "Description of the Management Goals and Objectives" section in the RIR above.

7.3 A description and, where feasible, estimate of the number of small entities to which the proposed rule will apply; and a description and estimate of economic effects on entities, by entity size and industry.

Part 121 of Title 13, Code of Federal Regulations (CFR), sets forth, by North American Industry Classification System (NAICS) categories, the maximum number of employees or average annual gross receipts a business may have to be considered a small entity for RFAA purposes. *See* 13 CFR 121.201. Under this provision, the U.S. Small Business Administration established criteria for businesses in the fishery sector to qualify as small entities. Standards are expressed either in number of employees, or annual receipts in millions of dollars. The number of employees or annual receipts indicates the maximum allowed for a concern and its affiliates to be considered small (13 CFR 121.201).

A business primarily engaged in seafood product preparation and packaging (NAICS 311710) is a small business if it employs 750 or fewer persons on a full time, part time, temporary, or other basis (13 CFR 121.106), at all its affiliated operations.[30]

[30] For purposes of rulemaking, NMFS West Coast Region is applying the seafood processor standard to catcher processors (C/Ps) and mothership processor ships, which earn the majority of their revenue from selling processed seafood product.

As the harvest specifications process determines the amount of quota pounds available in the catch share (limited entry trawl permit Individual Fishing Quota) sector, this proposed rule will impact quota share owners. Thirty-one non-whiting quota share permits owned by ten entities are estimated, based on holdings of first receiver permit affiliation in the non-public West Coast Region permits database, to be primarily engaged in seafood "product preparation and packaging." According to the size standard defined above, six of the entities that own ten of these permits are considered small. These small processing entities were issued 4.6 percent of the non-whiting quota pounds issued in 2020. Some of these small processing entities also own groundfish permits, required on both catcher vessels and catcher processors, which would be regulated by the proposed rule; four small entities primarily engaged in seafood processing own nine groundfish permits.

Thirty groundfish vessel permits are owned by four entities who are considered large both estimated independently using the definition above, as well as through ownership affiliation to self-reported size on groundfish permit and first receiver site license permits (self-reported using the definition above). Four of these five large processing entities were issued 7.6 percent of the non-whiting quota pounds issued in 2020 across 21 quota share permits. In addition to increasing benefits from recently rebuilt overfished species, participants are expected to benefit from recent changes to EFH designations as specified in Amendment 28 (PFMC and NMFS, 2019).

A business primarily engaged in charter fishing boat operation (NAICS 487210) is a small business if it has annual receipts of less than $7.5 million.

All three states have an active charter for-hire/Commercial Passenger Fishing Vessels (aka 'party boats') fishery engaged in recreational groundfish fishing. In 2018, there were an estimated total 400 of active vessels that took at least one groundfish trip (Table 7-1). Regarding Oregon, there is not a Oregon license or tracking of "six pack" or party fishing vessel businesses. These business are likely to be impacted by the Action. All of these vessels are likely to be impacted by changes in recreational catch guidelines for groundfish in their respective states. Additionally, these operations are expected to benefit from changes to season structure, removal of the Washington YRCAs, and modification to the recreational RCA boundaries in California

Table 7-1. Number of Charter/Commercial Passenger Fishing Vessels (CPFV) with at least one groundfish trip by state as of 2019.

State	Number CPFV/Charter Boats
Washington	43
Oregon	45
California	300

NMFS's small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing is $11 million in annual gross receipts.[31] *This standard applies to all businesses classified under North American Industry Classification System (NAICS) code 11411 for commercial fishing, including all businesses classified as commercial finfish fishing (NAICS 114111), commercial*

[31] Provision is made under SBA's regulations for an agency to develop its own industry-specific size standards after consultation with Advocacy and an opportunity for public comment (see 13 CFR 121.903(c)). NMFS has established a small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing (80 FR 81194, December 29, 2015). This standard is only for use by NMFS and only for the purpose of conducting an analysis of economic effects in fulfillment of the agency's obligations under the RFA.

shellfish fishing (NAICS 114112), and other commercial marine fishing (NAICS 114119) businesses. (50 C.F.R. § 200.2; 13 C.F.R. § 121.201).

Entities that are not registered as trusts, estates, governments, or non-profits are assumed to earn the majority of their revenue from commercial fishing. The definition above is thus used for 141 quota share permit owners, who collectively received 93.1 percent of the quota pounds (86.7 percent of non-whiting quota pounds) issued in 2020. Note that 17 QS accounts received zero non-whiting QPs in 2020. Benefits are expected to increase for quota share owners proportional with the increase in ACLs for most IFQ species. Limited entry groundfish vessels are required to self-report size across all affiliated entities; of the business who earn the majority of their revenue from commercial fishing, none self-reported as large. 209 entities owning 360 permits self-reported as small. The average small entity owns 1.7 permits, with 42 small entities owning between three and twelve permits each. Open access groundfish vessel owners are assumed to earn the majority of their revenue from fishing and would thus fall into this SBA definition. 191 non-limited entry vessels harvested at least $10,000 worth of groundfish in 2019; these are likely to be impacted by the proposed rule. This number is likely an upper bound as some entities may own more than one vessel, however, these generally small operations are assumed to be independent entities; with the top three vessels having coastwide (including non-groundfish) revenues averaging $529,567 in 2019. Median revenues were $36,279 per vessel.

In addition to benefits from increasing ACLs in the harvest specifications, several of the new management measures contained in the proposed rule are likely to benefit vessels. Trawl vessels, notably in California South of 40°10’ N. lat are expected to benefit from the increased AVL for cowcod. This change should reduce the regulatory burden on vessels and improve operational flexibility. Non-trawl vessels are expected to benefit from modification to the non-trawl Rockfish Conservation Area boundaries as well as the recommended changes to specific RCA coordinates that better reflect isobath contours.

Salmon trollers

This action primarily impacts entities in the groundfish fishery; however, two management measures will likely benefit vessels primarily involved in the salmon troll fishery, through a modification in the incidental yellowtail rockfish retention ratio in that fishery. The first measure would increase the trip limit amount of yellowtail rockfish relative to the amount of salmon onboard for trollers north of 40°10’ N. lat. The second measure would establish a trip limit of yellowtail rockfish relative to the number of Chinook salmon on-board south of 40°10’ N. lat. The subsector of the fleet expected to benefit from the proposed rule is much smaller; however, as historically a small proportion has elected to land yellowtail within the previously allowed limits. In order to land yellowtail rockfish, the vessel would need to have a VMS installed in order to retain groundfish in Federal waters, which may deter some salmon trollers, among other factors.

Vessels fishing north of 40°10’ N. lat could fish of all three states. Based on the analysis in Agenda Item G.6.a Attachment 6, April 2020, the 2015-2019 average participation in commercial salmon trolling has been 18.4 boats in Washington, 60.2 in Oregon, and 6.4 in California. In 2019, there were 1,053 vessels permitted to land salmon in California, of which 570 vessels participated in the commercial salmon fishery (all gears) and 89 of vessels had 50 percent of the landings. Approximately, 920 vessels have a home port south of 40°10’ N. lat., of which 527 vessels participated in the salmon troll fishery and landed south of 40°10’ N. lat., and 82 of those vessels had 50 percent of the landings from the salmon troll fishery, Given that only 53 salmon permitted vessels landed yellowtail rockfish in 2019 and the requirement for VMS, the overall number of vessels that will participate in this fishery will likely be less than that.

This small positive benefit is not expected to be a substantial impact, nor are the entities likely to be impacted a substantial number of the overall salmon troll fishery. Notably, north of 40°10’ N. lat, the 2015-2019 average was landings of yellowtail rockfish by salmon trollers was $4,709. Under the industry

scenario described in Section 4.2.5 of Agenda Item F.1., Attachment 8, June 2020, where 80 vessels encounter yellowtail for three months and take the 200 lb maximum trip limit, this would average out to approximately $1,901 per vessel. This compares to an average of $6.6 million in revenue earned from salmon in the same area.

As detailed in Review of 2019 Ocean Salmon Fisheries (PFMC 2020), the average price per pound in 2019 of West Coast ocean harvest Chinook salmon was $6.58, coho salmon was $2.85 per pound, and pink salmon was $2.11. Total coastwide ex-vessel revenue of the Council managed non-Indian commercial salmon troll was $21.2 million dollars, with more than 99 percent derived from Chinook salmon. The trip limit value for yellowtail rockfish per pound ($3.13/lb south vs. $1.69/lb north;) is less than half of the average price per pound for Chinook.

In addition to small businesses, the RFA recognizes and defines other kinds of small entities. *A small governmental jurisdiction is any government or district with a population of less than 50,000 persons.*

According to the public IFQ Account database as of 7/01/2020, the City of Monterey owns quota shares of ten species. The U.S. Census estimates the population to be 28,178 as of July 1, 2020, so would be considered a small governmental jurisdiction by the RFA standard above. The City of Monterey received 0.09 percent of the quota pounds issued for 2020 according to the public IFQ Account database.

A small organization is any not-for-profit enterprise that is independently owned and operated and not dominant in its field (5 U.S.C. § 601). A nonprofit organization is determined to be "not dominant in its field" if it is considered "small" under SBA size standards.[25] *Environmental, conservation, or professional organizations (NAICS 813312, 813920) are considered not dominant in its field (small for the purposes of NMFS rulemaking) if they have combined annual receipts of $15 million or less. Other organizations (NAICS 813319, 813410, 813910, 813930, 813940, 813990) are considered not dominant in their fields with combined annual receipts of $7.5 million or less.*

According to the public IFQ Account database, six not-for-profit organizations own quota share in the catch share program and would thus be impacted by the trawl sector allocation under this proposed rule. All six would be considered small by the definition above (2017 annual receipts as reported on IRS form 990 of $52-53 thousand dollars). Collectively, the six small not-for-profit organizations received 7.9 percent of the non-whiting quota pounds issued in 2020. Four of the six non-profit entities owned 11 limited entry trawl permits which would be impacted by the management measures of the rule.

A small trust, estate, and agency account (NAICS 525920) is defined at 13 C.F.R. § 121.201 as having annual receipts of less than $32.5 million (including affiliates).

Seven personal or family trusts/estates owned quota share permits and would thus potentially be impacted by the trawl sector allocation under this proposed rule. All of these are assumed to be smaller than the size standard above. Collectively, these seven small entities owned eight quota share permits and received 3.7 percent of the non-whiting quota pounds issued for 2020.

7.4 An explanation of the criteria used to evaluate whether the rule would impose "significant" economic effects.

NMFS considers two criteria to consider in determining the significance of adverse regulatory effects, disproportionality, and profitability.

Disproportionality compares the effect of the regulatory action between small and large entities. These regulations related to harvest specifications, with inter and intra-sector allocations largely fixed within the

PCGFMP framework and not impacted by biennial determination of ACLs. Management measures are created for each commercial and state recreational fishery independently; with all but the trawl sector made up of exclusively small entities. Regulations in the trawl sector are anticipated to benefit all entities, and are not expected to place any of the small entities described above at a significant competitive disadvantage to large entities.

Profitability: There are no compliance costs to entities associated with this rule anticipated for the 2021-2022 biennium. It is assumed, based on available analyses in the supporting EA document that there will not be any explicit costs associated with this rule, with the exception of unlikely implementation of ACTs for cowcod and accountability measures for shortbelly rockfish in the trawl fishery.

Total/variable/operating costs are not available for most sectors, however analyses summarized in the EA above indicate either neutral or positive changes in expected total gross revenue in both the commercial sectors and, through an increase in number of angler trips, the recreational sector. These increases in total revenue would overstate the likely impacts to profits, as they do not take into account variable operating costs. With management measures and increased harvest levels expected to allow for increased opportunity, it is possible that annual variable costs may increase for harvesters and charter boat operators increasing their days at sea, however they are not predicted to increase as a proportion of revenue. It is rational to assume that entities will only take additional trips if doing so increases their profits, thus, with no compliance costs, the rule is expected to be either neutral or positive for profitability. The harvest levels and management measures will be reevaluated for subsequent bienniums, so any unanticipated costs would be able to be addressed in future biennium specification rulemakings.

7.5 A description of, and an explanation of the basis for, assumptions used.

Data used to inform this analysis come primarily from PacFIN, and RecFIN, which includes data provided by the states of Oregon, California, and Washington on commercial and recreational fishing trips and landings. Other data sources include the California Passenger Fishing Vessel survey, the West Coast Region permit database, and the West Coast Region Individual Fishing Quota Account public database. The number of entities predicted to be impacted is generally based on the level of participation in the previous year (2019), and as noted above is in some cases likely to be an overestimate of the true number of entities likely to be impacted if current trends continue. However, it is possible that environmental or management conditions change in other fisheries that would impact the level of participation in the groundfish fishery beyond what is predicted here

7.6 Reporting and recordkeeping requirements

There are no reporting or recordkeeping requirements associated with this action.

7.7 Relevant Federal rules that may duplicate, overlap, or conflict with the proposed rule:

There are no Federal rules that duplicate, overlap, or conflict with the proposed rule.

7.8 A description of any significant alternatives to the proposed rule that accomplish the stated objectives of applicable statutes and that minimize any significant economic impact of the proposed rule on small entities

The Alternatives are specified and analyzed above in Chapter2 and Chapter 4. The economic impact of these measures are detailed at Chapter 4.8 and in Chapter 6 (RIR) above.

This rule is not expected to result in adverse impacts to small entities. The Council did consider alternatives to the proposed rule which would have had a lower level of benefits to small entities, the Council did not consider alternatives that would have had greater benefits to small entities as these would not have met several primary objectives of the rule (prevent overfishing, rebuild overfished stocks, ensure conservation).

Under No Action, the default harvest specifications and associated routine management measures would be implemented using best scientific information available to stablish default harvest control rules for all groundfish stocks. The Council considered alternative specifications for Oregon black rockfish, cowcod, petrale sole, shortbelly rockfish, and sablefish. In each case, the Council selected the harvest control rule that resulted in the maximum benefits to both large and small directly regulated entities. Routine management measures are adjusted according to harvest specifications, which also impact the new management measures available for implementation.

7.9 Certification statement by the head of the agency

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8. Magnuson-Stevens Act National Standards and FMP Considerations

8.1 Magnuson-Stevens Act National Standards

Below are the 10 National Standards as contained in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), and a brief discussion of how each alternative is consistent with the National Standards, where applicable. In recommending a preferred alternative, the Council must consider how to balance the national standards.

National Standard 1 — Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

MSA section 303(a)(3) requires that each FMP include an estimate of MSY and OY for the fishery. OY is the amount of fish that will provide the greatest overall benefit to the U.S., particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems. OY is prescribed as such on the basis of the MSY from the fishery as reduced by any relevant economic, social, or ecological factor; and in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the MSY in such fishery. The harvest specification action alternatives are consistent with the OY harvest management framework described in Chapter 4 of the Groundfish FMP. The FMP Chapter 4 describes OY as "a decisional mechanism for resolving the Magnuson Stevens Act's multiple purposes and policies, implementing an FMP's objectives and balancing the various interests that comprise the national welfare." The OYs are based on MSY or MSY as reduced in consideration of social, economic, or ecological factors.

The most important limitation on the specification of OY is that the choice of OY and the conservation and management measures proposed to achieve it must prevent overfishing (50 CFR Section 600.310(b)). In establishing OYs, the interim step of calculating OFLs, ABC, and ACLs is taken (PCGFMP Section 4.1). OFL is the MSY harvest levels associated with the current stock abundance. Over the long term, if OFLs are fully harvested, the average of the OFLs would be MSY. ABC is a threshold below the OFL, which accounts for scientific uncertainty in the estimate of OFL. ACL is a harvest specification set at or below ABC, and it is intended to prevent overfishing. The ACLs are established to achieve OY. The OY for a stock or stock complex is the long- term average of the stock or stock complex ACLs.

The OFL is the estimate of catch level above which overfishing is occurring, or the estimate of MFMT applied to a stock's abundance. The ABC is a level of annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty. Chapter 4 in the PCGFMP describes an ABC control rule; ABC values described in this document were determined following that control rule. The ACL is the level of annual catch that serves as the basis for invoking accountability measures. The ACL may equal, but may not exceed, the ABC. The ACL may be set lower than the ABC to account for a wide range of factors. The application of the OY harvest management framework to the specifications described in this document should result in ACLs that reduce the likelihood of overfishing.

A new feature in harvest specifications for west coast groundfish fisheries proposed to be implemented in 2021 are larger sigma values endorsed by the SSC and adopted by the Council, which resulted in larger ABC buffers for all stocks and stock complexes. The SSC's motivation for larger sigmas and ABC buffers

was to better characterize the uncertainty in estimating OFLs. Further, the time-varying sigmas where sigma values and ABC buffers progressively increase with the increasing age of the assessment for category 1 and 2 stocks recognizes the inherent interannual variation in recruitment of stocks in the California Current ecosystem, which are not taken into account until changes in stock productivity are considered in a new assessment. These changes were compelled by the Magnuson-Stevens Act mandate to prevent overfishing as recommended in the National Standard 1guidelines

National Standard 2 — Conservation and management measures shall be based upon the best scientific information available.

The best available science standard applies to the following areas relative to this proposed action: stock assessments, rebuilding analyses, and methods for determining management reference points (OFL, ABC, ACL, etc.); these areas form the basis for determining harvest levels and the evaluation of socioeconomic impacts. Harvest specifications for 2021 and 2022 were updated and based on default or, for four actively managed stocks, alternative HCRs analyzed in this EA. These values reflect the application of the best scientific information available to current harvest management policies. The supporting science is discussed below.

The 2020 Groundfish SAFE document reviews the basis for alternative harvest specifications and references the stock assessments that were used. It also describes the methods that were used to determine reference points for harvest specifications (OFL, ABC, ACL, etc.) for stocks and stock complexes. The harvest specifications considered under the proposed action (the action alternatives, including the Preferred Alternative), are based on the most recent stock assessments and developed through the peer-review STAR process.

As part of the management cycle, the Council recommends which stocks should be assessed in advance of current decision-making. Only a small proportion of the more than 80 managed groundfish species are regularly assessed, because of a combination of factors. For many stocks, there may not be enough data to support a full assessment (the FMP describes a classification system based on the availability of data). Additionally, there is a limit on the institutional resources needed to carry out the assessments (i.e., fishery scientists). In some cases, a previous assessment may be updated; this means that the underlying model is not reevaluated, but the model is re-run with the addition of more recent data from the period since the last full assessment. For unassessed stocks, proxy methods must be used to determine reference points. Stocks may be subjected to little or no fishing pressure, or determined to have low vulnerability, and, thus, be less in need of regular assessment.

Socioeconomics are a critical component to fishery management. The NWFSC has developed a model application, called the Input-Output Model for Pacific Coast Fisheries (IOPAC), for estimating personal income impacts of commercial fishing on the West Coast. Outputs from this model are used by the Council in its decision-making process.

National Standard 3 — To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

The Council develops and designates management units for groundfish, which include stocks, stock complexes, or geographic subdivisions thereof. Groundfish ACLs are set for these management units. The Groundfish SAFE document details the process by which ACLs for each management unit are developed.

In general, stocks, stock complexes, and geographic subdivisions are managed through the methods in the following discussion. Stocks with their own ACLs are managed throughout the range of that stock (as

opposed to the species), although issues do arise in the case of stocks straddling international borders. For this reason, allocation of the harvestable surplus of Pacific whiting between the U.S. and Canada is subject to international agreement.

Stock complexes group co-occurring species (e.g., Other Flatfish), many of which have not been formally assessed. The 2020 Groundfish SAFE document describes how ACLs for stock complexes are developed, based on ABC and ACL estimates of component stocks. Stocks within these complexes are not managed individually for a variety of reasons including the lack of assessments, lack of reliable catch data at the species level, or the fact that they constitute a small portion of catches. If a stock within a complex is individually assessed, it may be managed under a separate harvest limit, when practicable.

Separate ACLs may be set for geographic subcomponents of a stock for management purposes. However, the development of subcomponent ACLs is based on managing these stocks throughout their range within U.S. waters. For example, lingcod (*Ophiodon elongatus*) is divided into two management units; one unit is for lingcod north of 40°10' N lat. and the other for lingcod south of 40°10' N lat. The Council can designate separate ACLs for geographic subcomponents of a stock for management purposes.

National Standard 4 — Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be; (A) fair and equitable to all such fishermen, (B) reasonably calculated to promote conservation, and (C) carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

Chapter 4 describes allocation decisions made during this biennial harvest specification process. The proposed measures will not discriminate between residents of different states. Decision-making on allocations occurs through the Council process, which facilitates substantial participation by state representatives and the public. Generally, state proposals are brought forward when alternatives are crafted and integrated to the degree practicable. Emphasis is placed on equitable division, while achieving conservation goals. Allocation decisions are also made as part of the Council's biennial harvest specifications process for those stocks that do not, at present, have established formal allocations under the PCGFMP.

National Standard 5 — Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources, except that no such measure shall have economic allocation as its sole purpose.

None of the Alternatives in this document were designed solely for the purpose of economic allocation. Measures have been taken to reduce fishing capacity in the limited entry trawl fleet and non-trawl fleets. These measures include the fixed gear permit stacking program implemented by FMP Amendment 14, the trawl vessel buyback program, and catch share management implemented by FMP Amendment 20. Reducing excess capacity is expected to improve the efficiency in the utilization of fishery resources as well as reduce the levels of incidental catch. Catch share management in the at-sea whiting sectors and the shorebased IFQ fishery promote efficiency of utilization by reducing regulatory discards. Vessels in these fisheries are subject to 100 percent observer coverage, which improves catch accounting.

National Standard 6 — Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

The harvest specifications and management measures proposed in this EA reflect differences in catch and, in particular, bycatch of overfished species. Management measures include adjustments to spatial and temporal closures, catch controls, and trip limits by area. For example, spatial adjustments to the RCA

boundaries in California are established specific to fishery e.g., recreational, and commercial. Temporal adjustments are reflected in both commercial trip limits by area as well as recreational season length by state management areas. Catch control can be specific to fishery, at-sea whiting fisheries are managed by co-ops, the shorebased IFQ fishery by IFQs, and limited entry fixed gear fishery for sablefish by vessel-level allocations (permit stacking). Within these fisheries, and in the OA sector, cumulative trip limits are used for particular management units and/or during certain times of the year. Input control can be used as a recreational fishery management tool, for example area closures and bag limits can be proposed by the states and are appropriate to the catches and characteristics of each state's recreational fishery.

National Standard 7 — Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

Costs and duplication are generally minimized through by the three West Coast states coordinating management, monitoring, and enforcement activities,

National Standard 8 — Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirements of National Standard 2, in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

The 2015 EIS evaluating the 2015-2016 harvest specifications and management measures and Amendment 24 to the PCGFMP (PFMC and NMFS 2015) evaluates the long-term impacts of alternatives harvest management policies of fishing communities. The short-term impacts of the current proposed actions do not differ substantially in context or intensity from the impacts disclosed in the 2015 EIS (see Chapter 4). These effects were taken into account by adopting the preferred alternative. Target species catch estimates for each alternative is projected based on the management measures. The catch estimates provide the base information for estimating ex-vessel revenue and personal income impacts at the community level (with the port group area the unit of analysis for community impacts).

West Coast fishing communities depend on a diverse portfolio of commercial and recreational fisheries to support year-round operations. The proposed changes to the default harvest control rules for cowcod, shortbelly rockfish, Oregon black rockfish, sablefish, and petrale sole were selected to appropriately account for the needs of fishing communities. The management measures selected as preferred maximize positive economic impacts on the communities and could improve participation over time. These changes may provide increased opportunity for both commercial and recreational sectors and may, concomitantly, improve stability of many fishing communities.

Commercial fisheries, overall, should see increased opportunity and flexibility under the proposed actions. For example, in the commercial trawl communities, this proposed action to restructure certain Amendment 21 allocated species (e.g., widow rockfish, petrale sole, etc.) may provide improved economic conditions as they were designed to maximize benefits to the community without constraining non-trawl fisheries. In commercial fixed gear, changes to the Rockfish Conservation areas to target underutilized species. Additionally, trip limit increases should provide positive economic benefits to the fixed gear community. Recreational fisheries proposed changes to the RCA off of California, season structure/depth changes off of Oregon, and removal of two YRCAs off of Washington allow for anglers to target a broader suite of species (e.g., yellowtail rockfish, lingcod, etc.) while reducing pressure on nearshore stocks. Proposed changes in ACL research deductions for cowcod would allow for additional research opportunities to collect much-needed data to better inform stock assessments and management decisions. Which, in turn, could provide for sustained participation and positive economic impacts for groundfish fishing communities.

National Standard 9 — Conservation and management measures shall, to the extent practicable, (A) minimize bycatch, and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

Minimizing bycatch, of overfished species in particular, is an important component of the alternatives. Through the use of GCAs, fishing effort is reduced in areas where overfished species are most abundant, thereby reducing potential bycatch. Under the preferred alternative, increases to the seaward boundary of the RCA off of California and elimination of two YRCAs off of Washington may increase bycatch of yelloweye rockfish; however, the impacts of these depth changes are not expected to put the ACL of this species at risk. Further, catch monitoring rates are such that the Council and NMFS are notified in a timely manner regarding bycatch and can act either through routine inseason action or automatic action.

Catch share management, particularly in the shorebased IFQ fishery, has reduced bycatch by eliminating most regulatory discards (some non-target species are managed with cumulative trip limits, which may induce some level of regulatory discards) Non-trawl sectors use cumulative trip limits as the principal catch control tool. Because trip limits are based on landings, setting them at a low level to discourage directed and incidental catch of overfished species can result in regulatory discards.

The at-sea whiting sectors are managed under bycatch limits for selected overfished species. Mandatory co-ops in the mothership sector are allocated a portion of these sector bycatch limits and are accountable for keeping catch of these species within their allocation. The CP sector operates as a single, voluntary co-op responsible for the bycatch limit assigned to the sector.

As noted above, the at-sea whiting sectors and shorebased IFQ fishery are subject to 100 percent observer coverage. While necessary for catch accounting under IFQ/co-op management, observers also allow complete monitoring of total catch (including bycatch). The limited entry fixed gear sector and directed OA fisheries are subject to partial observer coverage. The observer data are used to develop bycatch rate estimates, which can be used to forecast and account for total catch of all managed species.

Shortbelly rockfish are a noted bycatch species in the midwater trawl fishery (particularly in the whiting sector). Under the preferred alternative, shortbelly rockfish ACL are to be designated an ecosystem component species. As detailed in the above EA, there is low probability that this designation will negatively impact this species. It is neither targeted and nor does a market exist for it (or is one in development). Industry, especially the at-sea sectors, actively attempt to avoid this species and minimize mortality to the extent practicable. They utilize cooperative agreements to share catch data in a timely manner to the fleet, agencies, and the Council. Further, the observer program also provides data in a timely manner to NOAA Fisheries regarding bycatch. These factors allow the Council to address shortbelly bycatch through inseason action, as necessary.

Noting the importance of this species as forage in the CCE, the Council recommended that should bycatch of exceed 2,000 mt in a calendar year, the Council will investigate the reason(s) and, if necessary, issue additional management measures, including reconsideration of the EC designation, for shortbelly. Additionally, the Council will monitor this species as part of the routine inseason management agenda item via the groundfish scorecard and the GMT. The Council could take precautionary action prior to the 2,000 mt trigger, if necessary, to curtail bycatch of shortbelly. This guidance is consistent with National Standard 9, §303(b)(12) and other applicable MSA sections, whereby management measures can be adopted to collect data on EC species, minimize bycatch or bycatch mortality of EX species, protect the role of EC species in the ecosystem, and/or to address other ecosystem issues

National Standard 10 — Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

The increases to ACLs and trip limits may encourage additional effort for target species. Adjustments to the seaward boundaries of the RCA may result in more vessels venturing further offshore to target deeper water species. However, these changes may induce fishermen to increase investment in vessels and vessel equipment to harvest the resource more efficiently. Upgrades to the operational ability of the vessel could likely result in enhanced safety. Vessels that fish in the groundfish fishery are required to have an operational Vessel Monitoring System CFR 50 §660.14. This device provides real-time vessel position data and its use may aid in search and rescue operations. Further, vessels that are required to carry observers must have a Commercial Fishing Vessel Safety Decal that certifies compliance with regulations found in 33 CFR chapter I and 46 CFR chapter I, a certificate of compliance issued pursuant to 46 CFR 28.710 or a valid certificate of inspection pursuant to 46 U.S.C. 3311. Maintain safe conditions on the vessel for the protection of observer(s) including adherence to all USCG and other applicable rules, regulations, or statutes pertaining to safe operation of the vessel, and provisions at §§600.725 and 600.746 These requirements promote improved vessel safety. Additionally, USCG requirements to carry safety equipment (e.g., functional life rafts with up-to-date EPIRBs, at least one personal floatation device and/or an immersion suit per person, etc.) promote safety and could assist with survival at-sea should the vessel sink.

8.2 Consistency of the Proposed Actions with Other Applicable MSA Provision

Section 303(a)(9) of the Magnuson-Stevens Act requires that a fishery impact statement be prepared for each FMP or FMP amendment. A fishery impact statement is required to assess, specify, and analyze the likely effects, if any, including the cumulative conservation, economic, and social impacts, of the conservation and management measures on, and possible mitigation measures for (a) participants in the fisheries and fishing communities affected by the plan amendment; (b) participants in the fisheries conducted in adjacent areas under the authority of another Council; and (c) the safety of human life at sea, including whether and to what extent such measures may affect the safety of participants in the fishery.

The EA/RIR prepared for this plan amendment constitutes the fishery impact statement. The likely effects of the proposed action are analyzed and described throughout the EA/RIR. The effects on participants in the fisheries and fishing communities are analyzed in the RIR chapter of the analysis (Chapters 6). The effects of the proposed action on safety of human life at sea are evaluated below in Chapter 8 under National Standard 10, Based on the information reported in this section, there is no need to update the Fishery Impact Statement included in the FMP.

The proposed action affects the groundfish fisheries in the EEZ off the West Coast, which are under the jurisdiction of the Pacific Fishery Management Council. Impacts on participants in fisheries conducted in adjacent areas under the jurisdiction of other Councils are not anticipated as a result of this action.

Harvest specifications are set based on targets established in overfished species rebuilding plans, which conform to Section 304(e) Rebuild Overfished Fisheries. Rebuilding plans contain the elements required by Section 304(e)(4) and discussed in the NS1 Guidelines (50 CFR 600.310).

NMFS prepared an EIS evaluating programmatic measures designed to identify and describe West Coast groundfish EFH (NMFS 2005) and to minimize potential fishing impacts on West Coast groundfish EFH. The Council took final action amending the PCGFMP to incorporate new EFH provisions in November 2005. NMFS partially approved the amendment in March 2006. Implementing regulations became effective in June 2006.

The effects of the proposed actions on groundfish EFH are within the scope of effects evaluated in the programmatic groundfish EFH EIS. The Council commenced a 5-year review of its groundfish EFH designation in December 2010 and the Council chose a preferred alternative in April 2018 (Amendment 28). The current proposed actions are unlikely to result in adverse impacts to EFH outside those disclosed in Section 4.1.4 in the 2015 EIS. That EIS describes impacts of the groundfish management program on EFH, consistent with the EFH assessment requirements of 50 CFR 600.920 (e)(3).

MSA Section 600.305

Section 600.305 of the MSA is the precursor section to the National Standards. While this section is not, in and of itself, a National Standard, it is applicable to this action in that shortbelly rockfish is recommended to be designated an ecosystem component species. While discussed in the above EA, it is important to note how the Council recommended this designation. The GMT provided a detailed discussion on the merits of classifying shortbelly rockfish as an EC species in their Agenda F.1.a, Supplemental GMT Report 3, June 2020 (GMT Report 3) that provided a basis from which the Council initiated their decision making process on this species. This report is incorporated by reference, but is summarized below.

Under §§600.305(d)(13) and 600.310(d)(1)), National Standard guidance allows Council to identify stocks to manage within their FMPs as EC species. As expressed §600.305(c)(4), Councils should give due consideration to the ten factors listed at §600.305(c)(1) and any additional considerations that maybe relevant to the stock. As detailed in the above EA (see Sections 2.2.2, 4.1, and 4.24 in particular) and in GMT Report 3, shortbelly rockfish are an abundant and healthy stock that is neither targeted nor considered an important stock to commercial, recreational, and subsistence users. The amount and type of catch that occurs in Federal waters is not expected to significantly affect this stock's status. As noted by industry, there is little to no incentive to target this species as it provides negative economic return and industry actively attempts to avoid this species. Based on input from industry, there is a low likelihood that a market will develop within the biennium and it is not anticipated that industry behaviour will change in response to the stock being designated as an EC species. The Council concluded that shortbelly rockfish are not in need of conservation and management in the 2021-2022 biennium and is a species that could be designated as an ecosystem component. Further, the Council adopted a precautionary policy on the stock that world trigger a review process of the EC designation based on catch amounts. Should catches exceed 2,000 mt, the Council will investigate the factors relevant to why it occurred and consider management measures, including reconsidering EC designation, to recommend.

8.3 Amendment 28: PCGFMP

Under this action, the PCGFMP would be amended to reflect changes to the shortbelly rockfish management designation of an ecosystem component species and the changes to the trawl/non-trawl allocations for widow rockfish, petrale sole, lingcod north of 40°10 N. lat., and the Slope Rockfish complex south of 40°10' N. lat. from Amendment 21 percentages to biennial allocations. In summary, three tables would be updated to show these changes.

1) Shortbelly rockfish would be removed from Section 3.1, Table 3-1, which displays the list of species actively managed under the PCGFMP
2) Shortbelly rockfish would be added to Section 3.1, Table 3-2, which displays the groundfish species designated as ecosystem component species.
3) Section 6.3.2.3, Table 6-1, which displays the allocations percentages for limited entry trawl and non-trawl sectors specified for FMP groundfish stocks and stock complexes under Amendment 21, would have widow rockfish, petrale sole, lingcod south of 40°10 N. lat., and the Slope Rockfish complex south of 40°10' N. lat removed. Note that for lingcod, the Amendment 21 allocations

were for stocks north and south of 40°10 N. lat, so the table is updated to reflect the allocations for the north remain in place.

These changes are reflected in the following excerpted sections of the PCGFMP below. Red strikeout text is used for removals and red bold text is used for additions. The complete PCGFMP with these changes is attached to this EA as Appendix A.

3.1 Species Managed by this Fishery Management Plan

Table 3-1 is the listing of species actively managed under this FMP.

Table 3-8-1. Common and scientific names of species actively managed in this FMP.

Common Name	Scientific Name
ELASMOBRANCHS	
Big skate	*Raja binoculata*
Leopard shark	*Triakis semifasciata*
Longnose skate	*Raja rhina*
Spiny dogfish	*Squalus suckleyi*
ROUNDFISH	
Cabezon	*Scorpaenichthys marmoratus*
Kelp greenling	*Hexagrammos decagrammus*
Lingcod	*Ophiodon elongatus*
Pacific cod	*Gadus macrocephalus*
Pacific whiting (hake)	*Merluccius productus*
Sablefish	*Anoplopoma fimbria*
ROCKFISH[a/]	
Aurora rockfish	*Sebastes aurora*
Bank rockfish	*S. rufus*
Black rockfish	*S. melanops*
Black and yellow rockfish	*S. chrysomelas*
Blackgill rockfish	*S. melanostomus*
Blackspotted rockfish	*S. melanostictus*
Blue rockfish	*S. mystinus*
Bocaccio	*S. paucispinis*
Bronzespotted rockfish	*S. gilli*
Brown rockfish	*S. auriculatus*
Calico rockfish	*S. dallii*
California scorpionfish	*Scorpaena gutatta*
Canary rockfish	*Sebastes pinniger*
Chameleon rockfish	*S. phillipsi*
Chilipepper rockfish	*S. goodei*
China rockfish	*S. nebulosus*
Copper rockfish	*S. caurinus*
Cowcod	*S. levis*
Darkblotched rockfish	*S. crameri*
Deacon rockfish	*S. diaconus*
Dusky rockfish	*S. ciliatus*
Dwarf-red rockfish	*S. rufinanus*
Flag rockfish	*S. rubrivinctus*
Freckled rockfish	*S lentiginosus*
Gopher rockfish	*S. carnatus*
Grass rockfish	*S. rastrelliger*
Greenblotched rockfish	*S. rosenblatti*
Greenspotted rockfish	*S. chlorostictus*
Greenstriped rockfish	*S. elongatus*
Halfbanded rockfish	*S. semicinctus*

Common Name	Scientific Name
Harlequin rockfish	*S. variegatus*
Honeycomb rockfish	*S. umbrosus*
Kelp rockfish	*S. atrovirens*
Longspine thornyhead	*Sebastolobus altivelis*
Mexican rockfish	*Sebastes macdonaldi*
Olive rockfish	*S. serranoides*
Pink rockfish	*S. eos*
Pinkrose rockfish	*S. simulator*
Pygmy rockfish	*S. wilsoni*
Pacific ocean perch	*S. alutus*
Quillback rockfish	*S. maliger*
Redbanded rockfish	*S. babcocki*
Redstripe rockfish	*S. proriger*
Rosethorn rockfish	*S. helvomaculatus*
Rosy rockfish	*S. rosaceus*
Rougheye rockfish	*S. aleutianus*
Sharpchin rockfish	*S. zacentrus*
~~Shortbelly rockfish~~	~~*S. jordani*~~
Shortraker rockfish	*S. borealis*
Shortspine thornyhead	*Sebastolobus alascanus*
Silvergray rockfish	*Sebastes brevispinis*
Speckled rockfish	*S. ovalis*
Splitnose rockfish	*S. diploproa*
Squarespot rockfish	*S. hopkinsi*
Sunset rockfish	*S. crocotulus*
Starry rockfish	*S. constellatus*
Stripetail rockfish	*S. saxicola*
Swordspine rockfish	*S. ensifer*
Tiger rockfish	*S. nigrocinctus*
Treefish	*S. serriceps*
Vermilion rockfish	*S. miniatus*
Widow rockfish	*S. entomelas*
Yelloweye rockfish	*S. ruberrimus*
Yellowmouth rockfish	*S. reedi*
Yellowtail rockfish	*S. flavidus*
FLATFISH	
Arrowtooth flounder (turbot)	*Atheresthes stomias*
Butter sole	*Isopsetta isolepis*
Curlfin sole	*Pleuronichthys decurrens*
Dover sole	*Microstomus pacificus*
English sole	*Parophrys vetulus*
Flathead sole	*Hippoglossoides elassodon*
Pacific sanddab	*Citharichthys sordidus*
Petrale sole	*Eopsetta jordani*
Rex sole	*Glyptocephalus zachirus*
Rock sole	*Lepidopsetta bilineata*
Sand sole	*Psettichthys melanostictus*
Starry flounder	*Platichthys stellatus*

[a/] The category "rockfish" includes all genera and species of the family Scorpaenidae, even if not listed, that occur in the Washington, Oregon, and California area. The Scorpaenidae genera are *Sebastes, Scorpaena, Sebastolobus, and Scorpaenodes*.

The species in Table 3-2 are designated Ecosystem Component Species (see section 4.4.4 for more details). The inclusion of all endemic skates, except longnose and big skate, and all endemic grenadiers will allow more precise catch monitoring without the need for a sorting requirement for these species since skates and grenadiers are generally landed in unidentified species market categories (e.g., Unidentified Skates).

Table 3-2. Groundfish species designated as Ecosystem Component Species.

Common Name	Scientific Name
Shortbelly rockfish	***Sebastes jordani***
Aleutian skate	*Bathyraja aleutica*
Bering/sandpaper skate	*B. interrupta*
California skate	*R. inornata*
Roughtail/black skate	*Bathyraja trachura*
All other skates	Endemic species in the family *Arhynchobatidae*
Pacific grenadier	*Coryphaenoides acrolepis*
Giant grenadier	*Albatrossia pectoralis*
All other grenadiers	Endemic species in the family *Macrouridae*
Finescale codling (aka Pacific flatnose)	*Antimora microlepis*
Ratfish	*Hydrolagus colliei*
Soupfin shark	*Galeorhinus zyopterus*

6.3.2.3 Limited Entry Trawl Allocations for Amendment 21 Stocks and Stock Complexes

Formal allocations of stocks and stock complexes covered under Amendment 21 support Amendment 20 trawl rationalization measures. Annual OYs/ACLs are established for these stocks and stock complexes the same as for other groundfish stocks and stock complexes. The OYs/ACLs are then reduced by deducting the estimated total mortality of these stocks and stock complexes in research, tribal, and non-groundfish fisheries, and the estimated exempted fishing permits set-asides. The remainder of the OYs/ACLs are then allocated according to the percentages in Table 6-1. The trawl percentage is for the non-treaty trawl fishery managed under Amendment 21. The non-treaty, non-trawl percentage is for the LE fixed gear fishery, the open access fishery, and the recreational fishery. Amendment 6 limited entry and open access allocations are superseded by these allocation percentages. Allocations to the directed non-trawl sectors (i.e., LE fixed gear, directed open access, and recreational) for the species allocated in Table 6-1 are decided, if needed, in the biennial harvest specifications and management measures process.

Trawl/Non-trawl Allocations

Table 6-1. Allocation percentages for limited entry trawl and non-trawl sectors specified for FMP groundfish stocks and stock complexes under Amendment 21 (most percentages based on 2003-2005).

Stock or Complex	All Non-Treaty LE Trawl Sectors	All Non-Treaty Non-Trawl Sectors
Lingcod N. of 40°10' N latitude	45.0%	55.0%
Pacific Cod	95.0%	5.0%
Sablefish S. of 36° N latitude	42.0%	58.0%
Pacific Ocean Perch	95.0%	5.0%
~~Widow~~	~~91.0%~~	~~9.0%~~
Chilipepper S. of 40°10' N latitude	75.0%	25.0%
Splitnose S. of 40°10' N latitude	95.0%	5.0%
Yellowtail N. of 40°10' N latitude	88.0%	12.0%
Shortspine N. of 34°27' N latitude	95.0%	5.0%
Shortspine S. of 34°27' N latitude	50 mt	Remaining Yield

Stock or Complex	All Non-Treaty LE Trawl Sectors	All Non-Treaty Non-Trawl Sectors
Longspine N. of 34°27' N latitude	95.0%	5.0%
Darkblotched	95.0%	5.0%
Minor Slope RF North of 40^{0}10’ N latitude	81.0%	19.0%
~~Minor Slope RF South of 40^{0}10’ N latitude~~	~~63.0%~~	~~37.0%~~
Dover Sole	95.0%	5.0%
English Sole	95.0%	5.0%
~~Petrale Sole~~	~~95.0%~~	~~5.0%~~
Arrowtooth Flounder	95.0%	5.0%
Starry Flounder	50.0%	50.0%
Other Flatfish	90.0%	10.0%

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