2017-2018 GROUNDFISH HARVEST SPECIFICATIONS AND MANAGEMENT MEASURES INCLUDING CHANGES TO GROUNDFISH STOCK DESIGNATIONS (AMENDMENT 27 TO THE PACIFIC COAST GROUNDFISH FISHERY MANAGEMENT PLAN)

DESCRIPTION AND ANALYSIS FOR COUNCIL DECISION-MAKING

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Table of Contents

Tables

Figures

1. Introduction

1.1 Purpose of this Document

This document contains information to allow the Council to make informed decisions consistent with the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Administrative Procedures Act, National Environmental Policy Act (NEPA), and other applicable law. The information in this document may be used by National Marine Fisheries Service (NMFS) to prepare documents required by applicable law, including NEPA.

Information on baseline conditions—the affected environment—is contained in the Groundfish SAFE. (The SAFE document may be downloaded at http://www.pcouncil.org/groundfish/safe-documents/.)

1.1 Proposed Actions, Purpose, and Need

This document evaluates two actions related to periodic changes in the management of fisheries under the Pacific Coast Groundfish Fishery Management Plan (PCGFMP).

1.1.1 The Proposed Actions

1.1.1.1 Harvest Specifications and Management Measures

The proposed action is to implement harvest specifications and management measures for the 2017-2018 biennial period and beyond, and revise Federal regulations at 50 CFR 660, Subparts C through G accordingly. Using the "best available scientific information," the Council considers harvest specifications every two years, including the overfishing limits (OFLs), acceptable biological catches (ABCs) and annual catch limits (ACLs) for groundfish stocks (and related management units[1]), consistent with the policies and procedures the Council has established in the Pacific Coast Groundfish FMP (PCGFMP) for these actions and in compliance with applicable law.

The specification of catch limits must be consistent with requirements of the MSA, and particularly the 10 National Standards enumerated in §301(a) of the MSA and related advisory guidelines established pursuant to §301(b). The proposed action needs to be consistent with the optimum yield (OY) harvest management framework described in Chapter 4 of the PCGFMP, which complies with National Standard 1 guidelines (50 CFR 600.310). ACLs are amounts of fish catch that should not be exceeded in a year and must be set at a level that prevents overfishing, according to the best available science. For stocks whose biomass is below the MSY level, ACLs will be set appropriately to return stock biomass to that level. Adopted rebuilding plans need to be evaluated and adjusted, if appropriate, based on the most recent stock assessments for these stocks. ACLs must be set consistent with these rebuilding plans and MSA §304(e).

In the case of groundfish species designated as overfished or rebuilding,[2] harvest specifications are determined so that the stock will rebuild to the target biomass (B_{MSY} or proxy) by the target year (T_{TARGET}) specified in its rebuilding plan, if possible. As part of this biennial process the Council may revise rebuilding plans to meet the objective described in §304(e) of the MSA. This objective is to rebuild the

[1] Management units are stocks occurring throughout the west coast EEZ ("coastwide"), geographic subdivisions of stocks in the EEZ, and geographically subdivided stock complexes composed of more than one managed species.

[2] According to the 2015 Second Quarter Update Summary of Stock Status for FSSI Stocks (Table A) produced by NMFS Office of Sustainable Fisheries, three Pacific Coast groundfish stocks—canary rockfish, Pacific ocean perch, and yelloweye rockfish—are currently designated "overfished." An additional three stocks—bocaccio, cowcod, and darkblotched rockfish—are designated as not overfished but "rebuilding." All six stocks are currently managed under rebuilding plans.

stock in as short a time as possible, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities, recommendations by international organization in which the United States participates, and the interaction of the stock of fish within the marine ecosystem. T_{TARGET} and the underlying harvest control rule are defined in both the rebuilding plan and regulation.[3]

Section 6.2 in the PCGFMP describes procedures for establishing management measures as part of the biennial management cycle. As part of this process new management measures may be established in regulations and classified as routine. Once classified as routine, management measures may be adjusted, and associated regulations revised, through an abbreviated rulemaking process.

1.1.1.1 Amend the PCGFMP to Achieve Purposes Related to Achieving ACLs

In addition to adopting harvest specifications and management measures, the proposed action is to amend the PCGFMP to change stock classifications and implement other management changes beyond the scope of the FMP framework for regulatory adjustments. To implement these changes the PCGFMP must be amended. These actions include:

- Categorize big skate (*Raja binoculata*) as a management unit species "in the fishery" (see 50 CFR § 600.310(d)). Currently big skate is described in the PCGFMP as an ecosystem component (EC) species. The PCGFMP must be amended to accomplish this change.
- Move starry flounder, currently managed separately, into Other Flatfish complex. This action would require changes to the Amendment 21 allocations for either the Other Flatfish complex or starry flounder.

1.1.2 Purpose of and Need for the Proposed Actions

1.1.2.1 Harvest Specifications and Management Measures

The purpose of this proposed action is 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 action is needed to regulate Pacific Coast groundfish fisheries in 2017-2018 so that annual catch limits are not exceeded and in a way that best achieves the purposes outlined above.

1.1.2.2 Amend the PCGFMP to Achieve Purposes Related to Achieving ACLs

The purpose of amending the FMP is to respond to the best available science on the classification of stocks, classify stocks in order to reflect catch patterns in the fishery, and implement measures that better balance conservation objectives and the needs of fishing communities but are outside the scope of the FMP framework for periodic regulatory changes. The action is needed so that the PCGFMP accurately reflects Council policy and remains consistent with the MSA.

1.2 The Fishery Management Area

Federally-managed Pacific groundfish fisheries occurring within the Exclusive Economic Zone (EEZ) off the coasts of Washington, Oregon, and California (WOC) establish the geographic context

[3] "Harvest control rule" means the methods adopted to determine harvest specifications, based on criteria in the MSA and Groundfish FMP. 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.

for the proposed action. West coast communities engaged in these fisheries are also part of the context (see Figure 1-1). Although this is the Federal fishery management area, the states manage the fisheries in the territorial sea to meet the goals and objectives of the Pacific Groundfish FMP.

Figure 1-1. The action area, showing major coastal communities and groundfish management areas.

2. Harvest Specifications and Stock Status

2.1 Description of the Harvest Specifications Alternatives

With the adoption of Amendment 24 to the PCGFMP in February 2015, the Council and NMFS established default harvest control rules (HCRs) that, unless modified by the Council, are used to establish biennial harvest specifications for stocks and stock complexes. Amendment 24 also added new stocks to the FMP and designated some FMP species as ecosystem component (EC) species. New harvest specifications for 2017 and 2018 based on default HCRs reflect the application of the best available science to current harvest management policies. The best available science encompasses new stock assessments, changes in SSC-endorsed stock categories, or changes in Scientific and Statistical Committee- (SSC) endorsed sigma values (i.e., biomass variances used to estimate the uncertainty in estimating OFLs). This information is used to determine the OFLs, ABCs, and ACLs for the 2017-2018 biennial management period and beyond. Once final harvest specifications are decided and adopted, the harvest control rules informing those specifications become the new default for the next biennial management cycle.

The Council considered alternatives to the default harvest control rules for the following stocks:

- Darkblotched rockfish, although currently an overfished species managed under a rebuilding plan, is predicted to be rebuilt before new harvest specifications are implemented in 2017. An alternative HCR is considered in response to this predicted change in status.
- Big skate, currently designated as an EC species, is being considered for active management with its own HCR and harvest specifications.
- A change in the California black rockfish HCR is considered based on information in a new stock assessment. The new HCR is projected to keep the stock above target biomass in the next ten years under a constant catch strategy.
- A change from the default HCR for California scorpionfish is considered due to uncertainty in the stock assessment and to mitigate management risk.
- Canary rockfish status has changed to rebuilt based on new assessment results. More precautionary alternative HCRs are considered to mitigate management risk.
- Widow rockfish is currently managed under a constant catch HCR. An alternative HCR allowing higher harvest is considered.
- A two-year departure from the HCR specified in the Pacific ocean perch rebuilding plan (SPR = 86.4%) to mitigate an emerging bycatch problem in trawl fisheries is considered.

The preferred 2017 and 2018 harvest specifications are provided in Table 2-1. The stocks highlighted in Table 2-1 have new harvest control rules which depart from the default rules used to determine the 2015 and 20-16 harvest specifications.

Table 2-1. Preferred 2017 and 2018 harvest specifications (overfishing limits (OFLs in mt), acceptable biological catches (ABCs in mt), and annual catch limits (ACLs in mt)), as well as the harvest control rules for determining these specifications, for west coast groundfish stocks and stock complexes (overfished stocks in CAPS; stocks with new assessments in bold; component stocks in stock complexes in italics). Stocks where the preferred harvest control rule departs from the default are highlighted.

Stock or Stock Complex	2017			2018			Harvest Control Rule
	OFL	ABC	ACL	OFL	ABC	ACL	
OVERFISHED STOCKS							
BOCACCIO S. of 40^{0}10'	**2,139**	**2,044**	**790**	**2,013**	**1,924**	**741**	**ABC (P* = 0.45), ACL (SPR = 77.7%)**
COWCOD S. of 40^{0}10'	70	63	10	71	64	10	ABCs sum of Con. and Mont. area ABCs, ACLs projected from 2013 rebuilding analysis (SPR = 82.7% (F = 0.007)) + Mont. area ABC contrib., ACT = 4 mt
COWCOD (Conception)	*58*	*53*	*NA*	*59*	*54*	*NA*	*ABC (P* = 0.45)*
COWCOD (Monterey)	*12*	*10*	*NA*	*12*	*10*	*NA*	*ABC (P* = 0.45)*
DARKBLOTCHED ROCKFISH	**671**	**641**	**641**	**683**	**653**	**653**	ACL = ABC (P* = 0.45)
PACIFIC OCEAN PERCH	964	922	281	981	938	281	Updated projections from the 2011 rebuilding analysis using actual catches from 2011-2015 and assumed ACL removals thereafter. ABC (P* = 0.45); 281 mt ACL in 2017 and 2018; ACL (SPR = 86.4%) thereafter
YELLOWEYE ROCKFISH	57	47	20	58	48	20	Catch-only update from the 2011 stock assessment assuming ACL removals; ABC (P* = 0.4), ACL (SPR = 76.0%)
NON-OVERFISHED STOCKS							
Arrowtooth Flounder	16,571	13,804	13,804	16,498	13,743	13,743	ACL = ABC (P* = 0.4)
Big skate	541	494	494	541	494	494	ACL = ABC (P* = 0.45)
Black Rockfish (CA)	**349**	**334**	**334**	**347**	**332**	**332**	**ACL = ABC (P* = 0.45)**
Black Rockfish (OR)	**577**	**527**	**527**	**570**	**520**	**520**	**ACL = ABC (P* = 0.45)**
Black Rockfish (WA)	**319**	**305**	**305**	**315**	**301**	**301**	**ACL = ABC (P* = 0.45)**
Blackgill Rockfish S. of 40°10'	NA	NA	NA	146	133	123	ACL = ABC (P* = 0.45) w/ 40-10 adjustment. Managed in the Southern Slope Rockfish complex in 2017.
Cabezon (CA)	157	150	150	156	149	149	ACL = ABC (P* = 0.45) w/ 40-10 adjustment (ACL rounds to ABC)
Cabezon (OR)	49	47	47	49	47	47	ACL = ABC (P* = 0.45)
California scorpionfish	289	264	150	278	254	150	150 mt constant catch ACL
Canary Rockfish	**1,793**	**1,714**	**1,714**	**1,596**	**1,526**	**1,526**	**ACL = ABC (P* = 0.45)**
Chilipepper S. of 40°10'	2,727	2,607	2,607	2,623	2,507	2,507	ACL = ABC (P* = 0.45)
Dover Sole	89,702	85,755	50,000	90,282	86,310	50,000	ABC (P* 0.45), ACL = 50,000 mt annually
English Sole	10,914	9,964	9,964	8,255	7,537	7,537	ACL = ABC (P* = 0.45)
Lingcod N. of 40°10'	3,549	3,333	3,333	3,310	3,110	3,110	ACL = ABC (P* = 0.45)
Lingcod S. of 40°10'	1,502	1,251	1,251	1,373	1,144	1,144	ACL = ABC (P* = 0.4)
Longnose skate	2,556	2,444	2,000	2,526	2,415	2,000	ABC (P* = 0.45), ACL = 2,000 mt annually
Longspine Thornyhead N. of 34°27'	4,571	3,808	2,894	4,339	3,614	2,747	ACL = 76% of coastwide ABC (P* = 0.4)
Longspine Thornyhead S. of 34°27'			914			867	ACL = 24% of coastwide ABC (P* = 0.4)
Pacific Cod	3,200	2,221	1,600	3,200	2,221	1,600	ABC (P* = 0.4), ACL = 50% of OFL
Petrale Sole	**3,280**	**3,136**	**3,136**	**3,152**	**3,013**	**3,013**	**ACL = ABC (P* = 0.45)**

Stock or Stock Complex	2017			2018			Harvest Control Rule
	OFL	ABC	ACL	OFL	ABC	ACL	
Sablefish N. of 36°	**8,050**	**7,350**	**6,041**	**8,329**	**7,604**	**6,299**	**ACL: 40-10 rule applied to 84.9% of coastwide ABC (P* = 0.4)**
Sablefish S. of 36°			**1,075**			**1,120**	**ACL: 40-10 rule applied to 15.1% of coastwide ABC (P* = 0.4)**
Shortbelly	6,950	5,789	500	6,950	5,789	500	ABC (P* = 0.4), ACL = 500 mt annually
Shortspine Thornyhead N. of 34°27'	3,144	2,619	1,713	3,116	2,596	1,698	ACL = 65.4% of coastwide ABC (P* = 0.4)
Shortspine Thornyhead S. of 34°27'			906			898	ACL = 34.6% of coastwide ABC (P* = 0.4)
Spiny dogfish	2,514	2,094	2,094	2,500	2,083	2,083	ACL = ABC (P* = 0.4)
Splitnose S. of $40^0$10'	1,841	1,760	1,760	1,842	1,761	1,761	ACL = ABC (P* = 0.45)
Starry flounder	1,847	1,282	1,282	1,847	1,282	1,282	ACL = ABC (P* = 0.4)
Widow Rockfish	**14,130**	**13,508**	**13,508**	**13,237**	**12,655**	**12,655**	**ACL = ABC (P* = 0.45)**
Yellowtail N. of $40^0$10'	6,786	6,196	6,196	6,574	6,002	6,002	ACL = ABC (P* = 0.45)
STOCK COMPLEXES							
Nearshore Rockfish North	118	105	105	119	105	105	Sum of component species specifications
Black and yellow	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*ACL = ABC (P* = 0.45)*
Blue (CA)	*34.1*	*31.1*	*30.9*	*34.8*	*31.8*	*31.8*	*ACL = ABC (P* = 0.45) w/40-10 adjustment. The stock is projected to be above target in 2018 under the Expected Catch scenario.*
Blue (OR & WA)	*32.3*	*26.9*	*26.9*	*32.3*	*26.9*	*26.9*	*ACL = ABC (P* = 0.45)*
Brown	*2.0*	*1.8*	*1.8*	*2.0*	*1.9*	*1.9*	*ACL = ABC (P* = 0.45)*
Calico	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
China	***30.2***	***27.5***	***27.5***	***29.3***	***26.8***	***26.8***	***ACL = ABC (P* = 0.45)***
Copper	*11.2*	*10.3*	*10.3*	*11.6*	*10.6*	*10.6*	*ACL = ABC (P* = 0.45)*
Gopher	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Grass	*0.7*	*0.5*	*0.5*	*0.7*	*0.5*	*0.5*	*ACL = ABC (P* = 0.45)*
Kelp	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*ACL = ABC (P* = 0.45)*
Olive	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*ACL = ABC (P* = 0.45)*
Quillback	*7.4*	*6.2*	*6.2*	*7.4*	*6.2*	*6.2*	*ACL = ABC (P* = 0.45)*
Treefish	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*ACL = ABC (P* = 0.45)*
Shelf Rockfish North	2,303	2,049	2,049	2,302	2,048	2,047	Sum of component species specifications
Bronzespotted	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Bocaccio	*284.0*	*236.9*	*236.9*	*284.0*	*236.9*	*236.9*	*ACL = ABC (P* = 0.45)*
Chameleon	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Chilipepper	*205.2*	*196.2*	*196.2*	*197.4*	*188.7*	*188.7*	*ACL = ABC (P* = 0.45)*
Cowcod	*0.4*	*0.3*	*0.3*	*0.4*	*0.3*	*0.3*	*ACL = ABC (P* = 0.45)*
Flag	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*ACL = ABC (P* = 0.45)*
Freckled	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Greenblotched	*1.3*	*1.1*	*1.1*	*1.3*	*1.1*	*1.1*	*ACL = ABC (P* = 0.45)*

Stock or Stock Complex	2017			2018			Harvest Control Rule
	OFL	ABC	ACL	OFL	ABC	ACL	
Greenspotted 40°10' to 42° N. lat.	*9.4*	*8.5*	*8.2*	*9.3*	*8.5*	*8.2*	*ACL: 40-10 rule applied to 22.2% of northern model (CA N of 34°27' N latitude) ABC (P* = 0.45)*
Greenspotted N. of 42 N. lat. (OR & WA)	*6.1*	*5.1*	*5.1*	*6.1*	*5.1*	*5.1*	*ACL = ABC (P* = 0.45)*
Greenstriped	*1,299.6*	*1,186.5*	*1,186.5*	*1,306.4*	*1,192.7*	*1,192.7*	*ACL = ABC (P* = 0.45)*
Halfbanded	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Harlequin	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Honeycomb	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Mexican	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Pink	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*ACL = ABC (P* = 0.45)*
Pinkrose	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Puget Sound	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Pygmy	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Redstripe	*269.9*	*225.1*	*225.1*	*269.9*	*225.1*	*225.1*	*ACL = ABC (P* = 0.45)*
Rosethorn	*12.9*	*10.8*	*10.8*	*12.9*	*10.8*	*10.8*	*ACL = ABC (P* = 0.45)*
Rosy	*3.0*	*2.5*	*2.5*	*3.0*	*2.5*	*2.5*	*ACL = ABC (P* = 0.45)*
Silvergray	*159.4*	*133.0*	*133.0*	*159.4*	*133.0*	*133.0*	*ACL = ABC (P* = 0.45)*
Speckled	*0.2*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*ACL = ABC (P* = 0.45)*
Squarespot	*0.2*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*ACL = ABC (P* = 0.45)*
Starry	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*ACL = ABC (P* = 0.45)*
Stripetail	*40.4*	*33.7*	*33.7*	*40.4*	*33.7*	*33.7*	*ACL = ABC (P* = 0.45)*
Swordspine	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*ACL = ABC (P* = 0.45)*
Tiger	*1.0*	*0.8*	*0.8*	*1.0*	*0.8*	*0.8*	*ACL = ABC (P* = 0.45)*
Vermilion	*9.7*	*8.1*	*8.1*	*9.7*	*8.1*	*8.1*	*ACL = ABC (P* = 0.45)*
Slope Rockfish North	1,897	1,755	1,755	1,896	1,754	1,754	Sum of component species specifications
Aurora (assuming sigma = 0.39)	*17.5*	*16.6*	*16.6*	*17.5*	*16.6*	*16.6*	*ACL = ABC (P* = 0.45)*
Bank	*17.2*	*14.4*	*14.4*	*17.2*	*14.4*	*14.4*	*ACL = ABC (P* = 0.45)*
Blackgill	*4.7*	*3.9*	*3.9*	*4.7*	*3.9*	*3.9*	*ACL = ABC (P* = 0.45)*
Redbanded	*45.3*	*37.7*	*37.7*	*45.3*	*37.7*	*37.7*	*ACL = ABC (P* = 0.45)*
Rougheye/Blackspotted	*210.7*	*192.4*	*192.4*	*214.6*	*195.9*	*195.9*	*ACL = ABC (P* = 0.45)*
Sharpchin	*364.0*	*332.3*	*332.3*	*358.4*	*327.2*	*327.2*	*ACL = ABC (P* = 0.45)*
Shortraker	*18.7*	*15.6*	*15.6*	*18.7*	*15.6*	*15.6*	*ACL = ABC (P* = 0.45)*
Splitnose	*1,026.7*	*981.6*	*981.6*	*1,027.1*	*981.9*	*981.9*	*ACL = ABC (P* = 0.45)*
Yellowmouth	*192.4*	*160.5*	*160.5*	*192.4*	*160.5*	*160.5*	*ACL = ABC (P* = 0.45)*
Nearshore Rockfish South	1,329	1,166	1,163	1,344	1,180	1,179	Sum of component species specifications
Shallow Nearshore Species	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Black and yellow	*27.5*	*23.0*	*23.0*	*27.5*	*23.0*	*23.0*	*ACL = ABC (P* = 0.45)*
China	***13.3***	***12.2***	***10.8***	***13.8***	***12.6***	***11.5***	*ACL = ABC (P* = 0.45) w/ 40-10 adjustment*

Stock or Stock Complex	2017			2018			Harvest Control Rule
	OFL	ABC	ACL	OFL	ABC	ACL	
Gopher (N of Pt. Conception)	*144.0*	*120.1*	*120.1*	*144.0*	*120.1*	*120.1*	*ACL = ABC (P* = 0.45)*
Gopher (S of Pt. Conception)	*25.6*	*21.4*	*21.4*	*25.6*	*21.4*	*21.4*	*ACL = ABC (P* = 0.45)*
Grass	*59.6*	*49.7*	*49.7*	*59.6*	*49.7*	*49.7*	*ACL = ABC (P* = 0.45)*
Kelp	*27.7*	*23.1*	*23.1*	*27.7*	*23.1*	*23.1*	*ACL = ABC (P* = 0.45)*
Deeper Nearshore Species	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Blue (assessed area)	*234.5*	*214.1*	*212.8*	*239.4*	*218.6*	*218.6*	*ACL = ABC (P* = 0.45) w/40-10 adjustment. The stock is projected to be above target in 2018 under the Expected Catch scenario.*
Blue (S of 34°27' N. lat.)	*72.9*	*60.8*	*60.8*	*72.9*	*60.8*	*60.8*	*ACL = ABC (P* = 0.45)*
Brown	*170.0*	*155.2*	*155.2*	*174.0*	*158.8*	*158.8*	*ACL = ABC (P* = 0.45)*
Calico	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Copper	*310.9*	*283.8*	*283.8*	*316.7*	*289.2*	*289.2*	*ACL = ABC (P* = 0.45)*
Olive	*224.6*	*187.4*	*187.4*	*224.6*	*187.4*	*187.4*	*ACL = ABC (P* = 0.45)*
Quillback	*5.4*	*4.5*	*4.5*	*5.4*	*4.5*	*4.5*	*ACL = ABC (P* = 0.45)*
Treefish	*13.2*	*11.0*	*11.0*	*13.2*	*11.0*	*11.0*	*ACL = ABC (P* = 0.45)*
Shelf Rockfish South	1,917	1,624	1,623	1,918	1,625	1,624	Sum of component species specifications
Bronzespotted	*3.6*	*3.0*	*3.0*	*3.6*	*3.0*	*3.0*	*ACL = ABC (P* = 0.45)*
Chameleon	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Flag	*23.4*	*19.5*	*19.5*	*23.4*	*19.5*	*19.5*	*ACL = ABC (P* = 0.45)*
Freckled	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Greenblotched	*23.1*	*19.3*	*19.3*	*23.1*	*19.3*	*19.3*	*ACL = ABC (P* = 0.45)*
Greenspotted	*78.9*	*72.0*	*70.9*	*78.5*	*71.7*	*70.7*	*ACL: 40-10 rule applied to77.8% of northern model (CA N of 34°27' N latitude) ABC plus the southern model ABC (P* = 0.45)*
Greenstriped	*238.4*	*217.7*	*217.7*	*239.6*	*218.8*	*218.8*	*ACL = ABC (P* = 0.45)*
Halfbanded	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Harlequin	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Honeycomb	*9.9*	*8.2*	*8.2*	*9.9*	*8.2*	*8.2*	*ACL = ABC (P* = 0.45)*
Mexican	*5.1*	*4.2*	*4.2*	*5.1*	*4.2*	*4.2*	*ACL = ABC (P* = 0.45)*
Pink	*2.5*	*2.1*	*2.1*	*2.5*	*2.1*	*2.1*	*ACL = ABC (P* = 0.45)*
Pinkrose	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Pygmy	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Redstripe	*0.5*	*0.4*	*0.4*	*0.5*	*0.4*	*0.4*	*ACL = ABC (P* = 0.45)*
Rosethorn	*2.1*	*1.8*	*1.8*	*2.1*	*1.8*	*1.8*	*ACL = ABC (P* = 0.45)*
Rosy	*44.5*	*37.1*	*37.1*	*44.5*	*37.1*	*37.1*	*ACL = ABC (P* = 0.45)*
Silvergray	*0.5*	*0.4*	*0.4*	*0.5*	*0.4*	*0.4*	*ACL = ABC (P* = 0.45)*
Speckled	*39.4*	*32.8*	*32.8*	*39.4*	*32.8*	*32.8*	*ACL = ABC (P* = 0.45)*
Squarespot	*11.1*	*9.2*	*9.2*	*11.1*	*9.2*	*9.2*	*ACL = ABC (P* = 0.45)*
Starry	*62.6*	*52.2*	*52.2*	*62.6*	*52.2*	*52.2*	*ACL = ABC (P* = 0.45)*
Stripetail	*23.6*	*19.7*	*19.7*	*23.6*	*19.7*	*19.7*	*ACL = ABC (P* = 0.45)*

Stock or Stock Complex	2017			2018			Harvest Control Rule
	OFL	ABC	ACL	OFL	ABC	ACL	
Swordspine	*14.2*	*11.9*	*11.9*	*14.2*	*11.9*	*11.9*	*ACL = ABC (P* = 0.45)*
Tiger	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*ACL = ABC (P* = 0.45)*
Vermilion	*269.3*	*224.6*	*224.6*	*269.3*	*224.6*	*224.6*	*ACL = ABC (P* = 0.45)*
Yellowtail	*1,064.4*	*887.7*	*887.7*	*1,064.4*	*887.7*	*887.7*	*ACL = ABC (P* = 0.45)*
Slope Rockfish South	827	718	707	683	586	586	Sum of component species specifications
Aurora (assuming sigma = 0.39)	*74.4*	*70.9*	*70.9*	*74.5*	*71.0*	*71.0*	*ACL = ABC (P* = 0.45)*
Bank	*503.2*	*419.7*	*419.7*	*503.2*	*419.7*	*419.7*	*ACL = ABC (P* = 0.45)*
Blackgill	*143.0*	*130.6*	*120.2*	*NA*	*NA*	*NA*	*ACL = ABC (P*=0.45) w/ 40-10 adjustment. Managed with stock-specific specifications in 2018.*
Pacific ocean perch	-	-	-	-	-	-	*ACL = ABC (P* = 0.45)*
Redbanded	*10.4*	*8.7*	*8.7*	*10.4*	*8.7*	*8.7*	*ACL = ABC (P* = 0.45)*
Rougheye/Blackspotted	*4.3*	*3.9*	*3.9*	*4.4*	*4.0*	*4.0*	*ACL = ABC (P* = 0.45)*
Sharpchin	*91.0*	*83.1*	*83.1*	*89.6*	*81.8*	*81.8*	*ACL = ABC (P* = 0.45)*
Shortraker	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*ACL = ABC (P* = 0.45)*
Yellowmouth	*0.8*	*0.7*	*0.7*	*0.8*	*0.7*	*0.7*	*ACL = ABC (P* = 0.45)*
Other Flatfish	11,165	8,510	8,510	9,690	7,281	7,281	Sum of component species specifications
Butter sole	*4.6*	*3.2*	*3.2*	*4.6*	*3.2*	*3.2*	*ACL = ABC (P* = 0.4)*
Curlfin sole	*8.2*	*5.7*	*5.7*	*8.2*	*5.7*	*5.7*	*ACL = ABC (P* = 0.4)*
Flathead sole	*35.0*	*24.3*	*24.3*	*35.0*	*24.3*	*24.3*	*ACL = ABC (P* = 0.4)*
Pacific sanddab	*4,801.0*	*3,331.9*	*3,331.9*	*4,801.0*	*3,331.9*	*3,331.9*	*ACL = ABC (P* = 0.4)*
Rex sole	*5,476*	*4,562*	*4,562*	*4,001*	*3,333*	*3,333*	*ACL = ABC (P* = 0.4)*
Rock sole	*66.7*	*46.3*	*46.3*	*66.7*	*46.3*	*46.3*	*ACL = ABC (P* = 0.4)*
Sand sole	*773.2*	*536.6*	*536.6*	*773.2*	*536.6*	*536.6*	*ACL = ABC (P* = 0.4)*
Other Fish	537	474	474	501	441	441	Sum of component species specifications
Cabezon (WA)	*4.5*	*3.8*	*3.8*	*4.8*	*4.0*	*4.0*	ACL = ABC (P* = 0.45)
Kelp greenling (CA)	*118.9*	*99.2*	*99.2*	*118.9*	*99.2*	*99.2*	ACL = ABC (P* = 0.45)
Kelp greenling (OR) assuming sigma = 0.44	***239.1***	***226.2***	***226.2***	***203.2***	***192.2***	***192.2***	***Preferred ACL = ABC (P* = 0.45)***
Kelp greenling (WA)	*7.1*	*5.9*	*5.9*	*7.1*	*5.9*	*5.9*	*Preferred ACL = ABC (P* =0.45)*
Leopard shark	*167.1*	*139.4*	*139.4*	*167.1*	*139.4*	*139.4*	ACL = ABC (P* = 0.45)

2.1.1 No Action Alternative

Harvest specifications based on default HCRs are considered "No Action," because the Council has not departed from the current harvest management policies under the harvest specification framework described in Chapter 4 of the PCGFMP. Default harvest specifications reflect the application of the best available science to the default HCRs. The following aspects of No Action merit special attention:

- Stocks where the default HCR is applied but alternatives to No Action are being considered
- Stocks where default policies are applied but the HCR differs from that used for 2015-2016 harvest specifications

The reasons for changes in default HCRs within the scope of the PCGFMP policy framework and stock classifications are summarized below.

Darkblotched rockfish is managed under a rebuilding plan with a prescribed SPR of 64.9% to determine ACLs (i.e., the No Action alternative). The Council considered changing the HCR to ACL = ABC (P* = 0.45) to mitigate negative fishery effects and in response to the prediction by Gertseva et al. (2015) that the stock would be rebuilt by the start of 2016.

Pacific ocean perch is managed under a rebuilding plan with a prescribed SPR of 86.4% to determine ACLs. The Council considered a two-year departure from the rebuilding plan to mitigate an emergent bycatch problem in current trawl fisheries. While there are no changes to the target rebuilding year or the long term HCR from what is prescribed in the rebuilding plan, a change in the HCR for 2017 and 2018 ACLs is contemplated.

Big skate is currently designated an EC species so there is no default HCR and related default harvest specifications for this stock. New information shows that it should be actively managed and thus classified as an FMP management unit species. Harvest specifications are required for an actively managed species.

The default HCR for **black rockfish in California and Oregon** is a 1,000 mt annual catch unless new assessments or projections from the most recent assessments indicate the ABCs are less than 1,000 mt, which is the case based on the most recent stock assessment. In this case, the ACL equals the ABC with an overfishing probability (P*) of 0.45. The long-term projections for black rockfish analyzed in the 2015-2016 harvest specifications and management measures Environmental Impact Statement (EIS) analyzed this harvest control rule for black rockfish. The OFLs and ABCs using new 2015 assessments of black rockfish in California and Oregon (Cope, *et al.* 2015) sum to less than 1,000 mt, so the default harvest control rule for both stocks described under the No Action alternative are ACL = ABC (P* = 0.45). The only difference in preferred management of black rockfish in California and Oregon in 2017 and beyond is to manage these stocks with state-specific harvest specifications rather than state-specific harvest guidelines under a shared ACL as was done from 2009-2016. Both stocks are projected to be above target biomass in 2017 and 2018.

The No Action ACL for **California scorpionfish** is ACL = ABC under a P* of 0.45. The ACLs of 264 and 261 mt for 2017 and 2018, respectively, are over twice as large as the 111 mt 2016 ACL based on the catch-only update of the 2005 assessment (Maunder, *et al.* 2006) done in 2015.

Canary rockfish was managed under a rebuilding plan in 2015 and 2016 with the ACL based on a spawning potential ratio (SPR) harvest rate of 88.7 percent. The new 2015 canary rockfish assessment (Thorson and Wetzel 2015) indicates the stock has rebuilt. When new science indicates a stock is newly rebuilt, the default harvest control rule under Amendment 24 is to manage the stock with the ACL equal to

the ABC under the default P* value. For canary rockfish, the default harvest control rule is ACL = ABC (P* = 0.45).

Starry flounder was managed with stock-specific harvest specifications in 2015-2016, but the Council considered a new management measure that would manage starry flounder within the Other Flatfish complex beginning in 2017. Since default harvest control rules were used to determine the harvest specifications of starry flounder, these are included under the No Action alternative. The 2017 and 2018 OFL is equal to the 2016 OFL since the 2005 assessment (Ralston 2006) is considered out of date.

The No Action ACL for **widow rockfish** is a constant catch ACL of 2,000 mt. The Council considered a new HCR of ACL = ABC (P* = 0.45) based on the healthy status of the stock and the reduction in overall uncertainty in estimating biomass in the new 2015 assessment (Hicks and Wetzel 2015).

Oregon kelp greenling and Washington kelp greenling, stocks managed in the Other Fish complex, did not have 2015 and 2016 harvest specification contributions since the SSC did not approve any of the proposed methodologies to determine OFLs for those stocks. The SSC endorsed a new Oregon kelp greenling stock assessment (Berger, *et al.* 2015) and a new depletion-based stock reduction analysis (DB-SRA) for Washington kelp greenling to inform 2017 and 2018 OFLs. The default HCR of P* = 0.45 to inform ABCs for these stocks and an ACL control rule of ACL = ABC is specified for these stocks. The updated harvest specification values then contribute to the specifications for the Other Fish complex.

2.1.2 Alternative 1

Alternative 1 incorporates the default harvest specifications (see No Action) for all stocks and stock complexes except for the stocks and stock complexes shown in Table 2-2. The changes from No Action are:

- Darkblotched harvest specifications would be based on an ACL HCR equal to the ABC under a P* of 0.45. This departure from the rebuilding plan is based on the projection in the 2015 assessment (Gertseva, *et al.* 2015) that the stock would attain its rebuilding target by the start of 2016.
- Big skate would be actively managed by removing the EC designation and applying a stock-specific ACL HCR equal to the ABC under a P* of 0.45.
- The HCR for California black rockfish would be a constant catch ACL predicted to maintain the stock above the 40 percent depletion target in the next ten years.
- The HCR for California scorpionfish is a 150 mt constant catch ACL.
- The canary rockfish HCR is a 50 percent reduction from the default (No Action) ACL.
- The HCR for widow rockfish is ACL = ABC under a P* of 0.45. These harvest specifications are determined from the 2015 widow rockfish assessment (Hicks and Wetzel 2015).

Table 2-2. Alternative 1 2017 and 2018 harvest specifications (overfishing limits (OFLs in mt), acceptable biological catches (ABCs in mt), and annual catch limits (ACLs in mt)), for select west coast groundfish stocks (overfished stocks in CAPS; stocks with new assessments in bold; component stocks in status quo stock complexes in italics).

Stock	2017			2018			ACL Basis
	OFL	ABC	ACL	OFL	ABC	ACL	
DARKBLOTCHED ROCKFISH	**671**	**641**	**641**	**683**	**653**	**653**	**ACL = ABC (P* = 0.45)**
Big Skate	541	494	494	541	494	494	ACL= ABC (P* = 0.45)
Black Rockfish (CA)	**349**	**334**	**319**	**348**	**333**	**319**	**Constant catch ACL which maintains stock depletion above 40% in the next 10 years**
California scorpionfish	289	264	150	278	254	150	150 mt constant catch
Canary Rockfish	**1,793**	**1,714**	**857**	**1,735**	**1,659**	**763**	**50% of No Action ACL**
Widow Rockfish	**14,130**	**13,508**	**13,508**	**13,237**	**12,655**	**12,655**	**ACL = ABC (P* = 0.45)**

2.1.3 Alternative 2

Alternative 2 harvest specifications are the same as Alternative 1 (including No Action default specifications for all stocks except those listed under Alternative 1) except that the canary rockfish ACL is 33 percent of the No Action ACL.

Table 2-3. Alternative 2 2017 and 2018 harvest specifications (overfishing limits (OFLs in mt), acceptable biological catches (ABCs in mt), and annual catch limits (ACLs in mt)), for select west coast groundfish stocks (overfished stocks in CAPS; stocks with new assessments in bold; component stocks in status quo stock complexes in italics).

Stock	2017			2018			ACL Basis
	OFL	ABC	ACL	OFL	ABC	ACL	
Canary Rockfish	**1,793**	**1,714**	**566**	**1,760**	**1,526**	**504**	**33% of No Action ACL**

2.1.4 Alternative 3 - Preferred

The harvest specifications for all stocks and stock complexes in Table 2-1 are preferred. The preferred HCRs are the default for all stocks except those shown for darkblotched rockfish, Pacific ocean perch, big skate, California scorpionfish, and widow rockfish. The preferred alternative for these stocks was decided in June 2016.

The preferred alternative for managing big skate is to remove the EC designation and to actively manage the species with stock-specific harvest specifications.

The preferred alternative for Pacific ocean perch is to depart from the default HCR for the next two years and specify a 281 mt ACL in each year. The default HCR (SPR = 86.4%) would be re-specified for fisheries in 2019 and thereafter.

2.2 Stock-Specific Impacts of Alternative Harvest Specifications

Harvest specifications establish objectives for stock management and as a consequence do not have direct impacts on the environment. Most environmental impacts result from the implementation of management

measures intended to allow harvests to equal but not exceed ACLs. For that reason, most environmental impacts are evaluated in Sections 3 through 5, which encompass the management program to be implemented for the 2017-2018 biennial period. Impacts of harvest specifications are evaluated with respect to whether management reference points will be exceeded over the long term. The management reference points are the maximum fishing mortality threshold, equal to the OFL, and the minimum stock size threshold, which is $B_{12.5\%}$ for flatfish and $B_{25\%}$ for stocks other than flatfish.[4]

2.2.1 Big Skate Impacts

The preferred alternative for managing big skate is to remove the EC designation and to actively manage the species with stock-specific harvest specifications. The rationale for this action is based on new evidence that big skate are targeted in trawl fisheries and retained for sale in greater amounts than previously understood. When the Council considered designating all skates except longnose skate as EC species, the GMT estimated that catches of big skate averaged 95 mt from 2007–2011 with large landings of Unspecified Skate (see Table 4-33 in the 2015-2016 Harvest Specifications and Management Measures Final Environmental Impact Statement). Subsequent analysis of Oregon port sampling data not available when the Council considered the EC designation indicated about 98 percent of the recent Unspecified Skate landings in Oregon were comprised of big skate. The GMT revised the total mortality estimates of big skate coastwide using these new data (Table 2-4). Such large landings indicates targeting of big skate has occurred and an EC designation was not warranted.

The SSC-endorsed OFL of 541 mt is calculated by applying approximate MSY harvest rates to estimates of stock biomass from the Northwest Fisheries Science Center (NWFSC) West Coast Bottom Trawl Survey (see Agenda Item H.6.a, Supplemental Attachment 6, November 2013). The survey-based biomass estimate is likely underestimated since big skate are distributed to the shore and no west coast trawl surveys have been conducted shallower than 55 m. This adds a level of precaution to the management of big skate with stock-specific management reducing management uncertainty and the risk of overfishing the stock. There was consideration for managing big skate in a complex with longnose skate, the other actively managed west coast skate species, but the two species have disparate distributions and fishery interactions (longnose is much more deeply distributed than big skate) and that option was not endorsed. The Council chose to set the ACL equal to the ABC with a P* of 0.45.

[4] Biomass reference points and projections are scaled to unfished spawning biomass and referred to as the *depletion ratio*, which is the biomass estimate divided by the unfished biomass estimate for a particular stock. (In this document references to stock biomass generally refer to spawning stock biomass.)

Table 2-4. 2010-2015 total mortality (mt) of big skate by sector in west coast fisheries.

Sector	2010	2011	2012	2013	2014	2015
Incidental OA						
Landings	3.0	5.2	1.1	3.8	2.0	3.8
Discards	0.0	0.6	0.1	0.0	0.0	0.0
Total	3.0	5.7	1.1	3.8	2.1	3.8
Non-Trawl						
Landings	16.2	9.7	3.3	6.4	8.9	3.3
Discards	1.6	2.7	6.7	5.1	3.3	3.3
Total	17.8	12.4	10.1	11.5	12.2	6.6
Trawl						
Landings	173.2	236.1	227.7	123.6	354.3	276.7
Discards	28.8	35.9	30.6	36.5	43.8	43.8
Total	202.0	272.0	258.3	160.1	398.1	320.4
Tribal						
Landings	3.8	5.5	12.4	10.3	9.7	16.9
Discards	0.1	0.1	0.0	0.0	0.0	0.0
Total	3.8	5.5	12.4	10.3	9.7	16.9
Total All Sectors	226.6	295.7	281.8	185.8	422.1	347.8

2.2.2 California Black Rockfish Impacts

The No Action ACL for black rockfish off California is based on the ACL being set equal to the ABC with a P* of 0.45. Application of this harvest control rule for the next ten years is predicted to maintain the stock above its $B_{40\%}$ target (Table 2-5).

The Alternative 1 ACL for black rockfish off California is calculated as a constant catch limit that is predicted to maintain the stock above its $B_{40\%}$ target and projected ABCs (using a P* of 0.45) for the next ten years. The 319 mt ACL is projected using the 2015 assessment base model (Cope, *et al.* 2015) and achieves both conditions. While the Alternative 1 ACL is smaller than the No Action ACL in 2017 and 2018, it does provide a measure of management stability. The Alternative 1 harvest control rule, if maintained in the next ten years, provides a slightly higher ACL than the No Action harvest control rule after 2023 (Table 2-5 and Table 2-6). Both alternatives are predicted to have the same impact after ten years with a predicted depletion of 50% (Figure 2-1). The Council adopted the No Action alternative as preferred for California black rockfish.

Table 2-5. Harvest projection in mt of OFLs and ACLs, summary biomass (age-3 and older), spawning output, and depletion for the California black rockfish base case model under No Action harvest control rules projected with total projected catch equal to a harvest rate of SPR = 64.9% in 2017 and beyond.

Year	OFL	ACL	Age 3+ biomass	Spawning output	Depletion (%)
2015	354	420	5,773	353	33%
2016	354	420	5,800	396	37%
2017	349	334	5,754	450	42%
2018	347	332	5,747	503	47%
2019	344	329	5,716	538	51%
2020	341	326	5,677	555	52%
2021	338	323	5,640	558	53%
2022	336	321	5,608	554	52%
2023	334	319	5,583	547	52%
2024	333	318	5,565	539	51%
2025	332	318	5,550	532	50%
2026	332	317	5,540	526	50%

Table 2-6. Harvest projection in mt of OFLs and ACLs, summary biomass (age-3 and older), spawning output, and depletion for the California black rockfish base case model under Alternative 1 harvest control rules projected with total projected catch equal to the 319 mt in 2017 and beyond.

Year	OFL	ACL	Age 3+ biomass	Spawning output	Depletion (%)
2015	354	420	5,773	353	33%
2016	354	420	5,800	396	37%
2017	349	319	5,754	450	42%
2018	348	319	5,762	505	48%
2019	346	319	5,744	541	51%
2020	343	319	5,714	559	53%
2021	340	319	5,682	564	53%
2022	338	319	5,652	561	53%
2023	337	319	5,628	554	52%
2024	336	319	5,608	546	51%
2025	335	319	5,591	539	51%
2026	334	319	5,578	533	50%

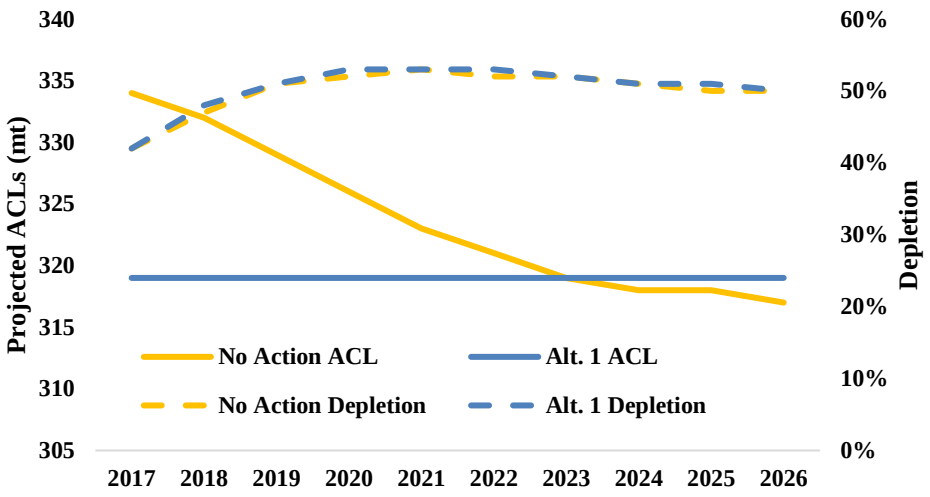


Figure 2-1. Ten-year projections of annual catch limits and predicted depletions for black rockfish off California under alternative harvest control rules.

2.2.3 California Scorpionfish Impacts

Harvest specifications for California scorpionfish are determined using catch-only projections based on the 2005 assessment model (Maunder, *et al.* 2006) and estimates of recent catches by California Department of Fish and Wildlife (Table 2-7). The SSC designated California scorpionfish a category 2 stock, since the assessment was conducted over ten years ago. The SSC noted that the increase in the OFL relative to the 2015-2016 values (289 and 256 mt for 2017-2018 OFLs, relative to 114 and 111 mt for 2015-2016 OFLs) is a consequence of using realized catches in the 2005-2014 period, rather than the projected catches in the 2005 model. Specifically, the 2005 model projected a 2015 depletion level of 48 percent if total catches were realized, but as actual catches in that period were lower than the 2005 projections, the revised projection led to an estimated 2014 depletion of 72 percent. This more optimistic (albeit, considerably uncertain given the age of the assessment) perception of stock status is the primary contributing factor to the increase in estimated OFL relative to the ten-year projections from the 2005 model. The expected total mortality of 111 mt from 2017-2026 in Table 2-7 is based on an annual catch target (ACT) recommended by the Council.

The Alternative 1 ACL of 150 mt was recommended by the GAP as a more precautionary interim measure until a new assessment is conducted. The GAP recommended this ACL should provide sufficient amounts to support satisfactory seasons for the recreational and commercial sectors. The Council endorsed the GAP recommendation for Alternative 1 by adopting this ACL as their preferred alternative.

Table 2-7. Estimated total mortality and depletion of California scorpionfish with projected 2017-2026 harvest specifications based on the default harvest control rule and expected total mortality after 2014.

Year	Depletion	OFL	ABC/ACL	Total Mortality
2007	86.5%			138
2008	84.0%			102
2009	82.6%			112
2010	80.7%			105
2011	79.1%			104
2012	77.6%			120
2013	75.6%			115
2014	74.0%			124
2015	72.2%	119	114	114
2016	71.1%	117	111	111
2017	70.3%	289	264	111
2018	69.6%	286	261	111
2019	69.0%	283	259	111
2020	68.5%	281	256	111
2021	68.0%	279	255	111
2022	67.6%	277	253	111
2023	67.2%	276	252	111
2024	66.9%	274	250	111
2025	66.6%	273	249	111
2026	66.4%	272	248	111

2.2.4 Canary Rockfish Impacts

The 2015 canary rockfish assessment estimated depletion of canary rockfish to be 55.5 percent at the start of 2015 (Thorson and Wetzel 2015), which represents a substantial improvement in status from previous canary rockfish assessments. The primary factors driving the improvement in stock status are the use of a higher steepness value, the reduction in harvest due to the rebuilding plan, and above-average recruitments in 2001-2003, 2007, and 2010. The relatively strong effect of steepness on estimated stock status is a reason for concern about the reliability of model results, since steepness is a relatively uncertain parameter value. However it should be noted that even a relatively low steepness of 0.6 (e.g., the low state of nature in the steepness decision table) results in a biomass estimate above the rebuilding target (Table 2-8).

The uncertainty in steepness and the unexpectedly improved status compelled the Council to explore more precautionary harvest control rule alternatives. The GMT also pointed out that stock depletion was predicted to drop below the $B_{40\%}$ biomass target by 2019 under the less likely low state of nature (Table 2-8). The Alternative 1 and 2 canary harvest control rules are 50 percent and 33 percent of the No Action ACL, respectively. All three alternatives estimate depletion will remain above the $B_{40\%}$ target in the next ten years under the 2015 assessment base model (Table 2-9 and Figure 2-2). However, under the less likely and more pessimistic low state of nature model, the stock is predicted to remain healthy only under the Alternative 1 and 2 harvest control rules; the stock is predicted to fall below the biomass target within ten years to 32% by 2026 under the Preferred No Action Alternative (Table 2-8 and Figure 2-3).

The Council's preferred alternative is the No Action alternative. The stock is predicted to be healthy in ten years under the preferred alternative assuming the base model with a depletion in 2026 of 45.4% (Table 2-8, Table 2-9, and Figure 2-2).

Table 2-8. Projected spawning biomass and depletion of canary rockfish under the low state of nature and base models in the 2015 assessment assuming removals under default harvest control rules.

			State of nature			
			Low h = 0.60		Base case h=0.773	
Relative probability of ln(SB_2015)			0.25		0.5	
Default Harvest Control Rule	Year	ACL (mt)	Spawning biomass (mt)	Depletion	Spawning biomass (mt)	Depletion
ACL = ABC (P* = 0.45)	2017	1,714	3,259	42.8%	4,261	56.9%
	2018	1,526	3,135	41.2%	4,147	55.4%
	2019	1,415	3,017	39.6%	4,037	53.9%
	2020	1,346	2,895	38.0%	3,916	52.3%
	2021	1,297	2,771	36.4%	3,787	50.6%
	2022	1,260	2,656	34.9%	3,662	48.9%
	2023	1,231	2,565	33.7%	3,557	47.5%
	2024	1,210	2,501	32.8%	3,480	46.5%
	2025	1,194	2,462	32.3%	3,429	45.8%
	2026	1,180	2,445	32.1%	3,402	45.4%

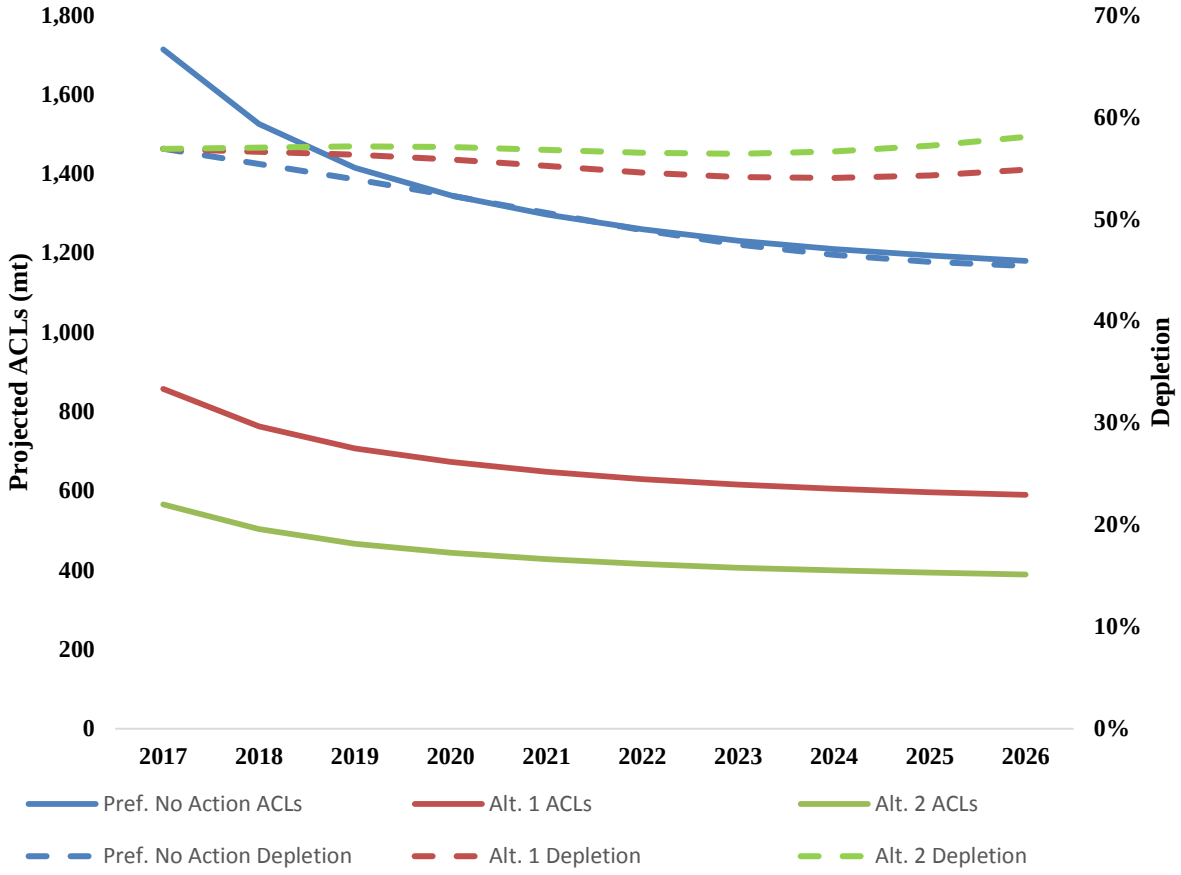


Figure 2-2. Ten-year projections of annual catch limits and depletions for canary rockfish under alternative harvest control rules assuming the base model in the 2015 assessment.

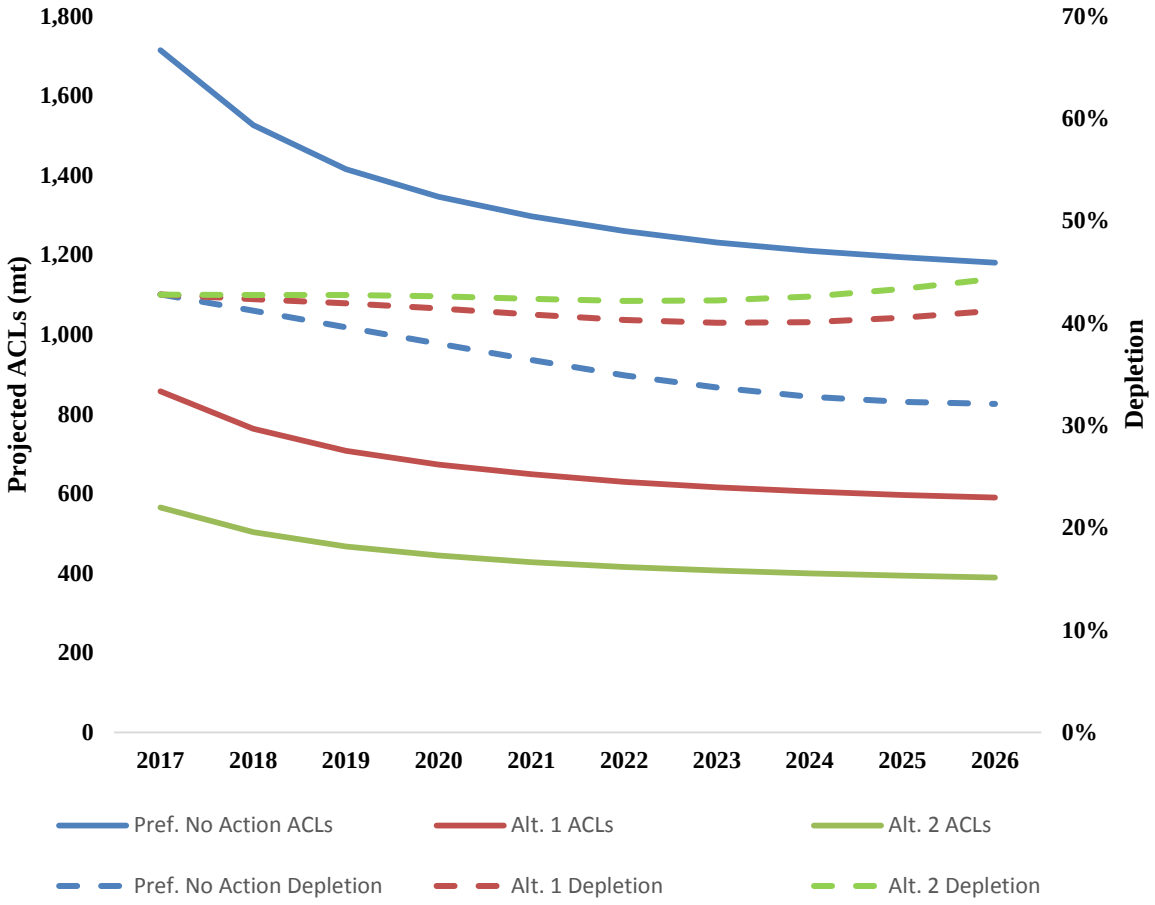


Figure 2-3. Ten-year projections of annual catch limits and depletions for canary rockfish under alternative harvest control rules assuming the low state of nature model in the 2015 assessment.

Table 2-9. Projected harvest specifications, spawning biomass and depletion under the alternatives analyzed for canary rockfish using the base case model in the 2015 assessment.

Year	No Action (Default HCR)				Alt. 1 (50% of No Action ACL)				Alt. 2 (33% of No Action ACL)			
	OFL (mt)	ACL (mt)	Spawning biomass (mt)	Depletion	OFL (mt)	ACL (mt)	Spawning biomass (mt)	Depletion	OFL (mt)	ACL (mt)	Spawning biomass (mt)	Depletion
2017	1,793	1,714	4,261	56.9%	1,793	857	4,261	56.9%	1,793	566	4,261	56.9%
2018	1,661	1,526	4,147	55.4%	1,735	763	4,240	56.6%	1,760	504	4,272	57.0%
2019	1,579	1,415	4,037	53.9%	1,714	707	4,219	56.3%	1,761	467	4,281	57.1%
2020	1,532	1,346	3,916	52.3%	1,725	673	4,184	55.9%	1,791	444	4,275	57.1%
2021	1,502	1,297	3,787	50.6%	1,751	649	4,136	55.2%	1,836	428	4,255	56.8%
2022	1,480	1,260	3,662	48.9%	1,783	630	4,087	54.6%	1,884	416	4,232	56.5%
2023	1,461	1,231	3,557	47.5%	1,815	616	4,055	54.1%	1,932	406	4,225	56.4%
2024	1,445	1,210	3,480	46.5%	1,847	605	4,048	54.0%	1,979	399	4,242	56.6%
2025	1,429	1,194	3,429	45.8%	1,878	597	4,067	54.3%	2,024	394	4,285	57.2%
2026	1,413	1,180	3,402	45.4%	1,909	590	4,108	54.8%	2,068	389	4,349	58.1%

2.2.5 Darkblotched Rockfish Impacts

The 2015 darkblotched rockfish assessment (Gertseva, *et al.* 2015) estimated a spawning stock depletion of 39.3 percent at the start of 2015 or just under the target biomass depletion ratio of 40 percent of unfished biomass. The 2015 assessment projects the stock will be rebuilt by the start of 2016 before new harvest specifications are implemented in 2017. This is the rationale for the higher ACL alternative for darkblotched. The HCR of setting the ACL equal to the ABC under a P* of 0.45 is the highest ACL that can be considered given the harvest specification framework outlined in the FMP.

The predicted status of darkblotched rockfish in the next ten years associated with the alternative harvest control rules analyzed for 2017 and beyond indicate the stock will remain healthy with depletion above 40% (Figure 2-4). Depletion in 2026 under the No Action ACL alternative is predicted to be 55% and that under the Alternative 1 ACL alternative is 50%. The Council's preferred alternative is Alternative 1.

The optimistic projection the stock would rebuild by the start of 2016 may compel consideration of changing the target rebuilding year of 2025 in the current darkblotched rebuilding plan. While it is highly probable the stock will rebuild much sooner than 2025 given its current status, the darkblotched assessment has always been highly uncertain and sensitive to trends in the NMFS trawl survey. The NMFS trawl survey tends to provide highly variable catch per unit of effort (CPUE) trends for darkblotched and other slope rockfish and is not a particularly reliable survey of relative interannual biomass of these species. Further, estimated darkblotched biomass and stock depletion are sensitive to changes in assumed steepness and natural mortality in the assessment. However, given the stock is so close to the rebuilding target and the SSC's recommendation to conduct an update darkblotched assessment next year, it is likely the next stock assessment will indicate successful stock rebuilding. Changes in the structure of the stock assessment model, which are not allowed in an update, will not influence a different model result in this case. In general, the SSC has recommended against continuing to chase noise in an assessment or rebuilding analysis by always setting the target year to the predicted median time to rebuild (i.e., the year predicted for the stock to reach the rebuilding target with a 50 percent probability), especially as the predicted target rebuilding year is approached. The extreme outcome of such a strategy when considering rebuilding plan amendments is that there would be a 50 percent probability of succeeding or failing to attain the rebuilding target in the year specified as the target year. In this case, the probability of darkblotched not confirmed to be rebuilt in an update assessment next year is low. The Council decided not to change the target year in the darkblotched rebuilding plan under their preferred alternative. ‘

The Council's preference for the Alternative 1 harvest control rule (i.e., ACL = ABC (P* = 0.45)) is rationalized to mitigate potential negative fishery impacts in 2017 and 2018 given increasing fishery encounters of darkblotched in trawl fisheries. This was considered a reasonable action in light of the optimistic rebuilding prospects for darkblotched (rebuilding probabilities are 100% for all harvest control rule alternatives). The Council also wanted to see the results of a 2017 assessment before changing T_{TARGET} in the darkblotched rebuilding plan. If the stock is still not successfully rebuilt, the Council may consider a further amendment to the rebuilding plan during the 2019-2020 specifications process.

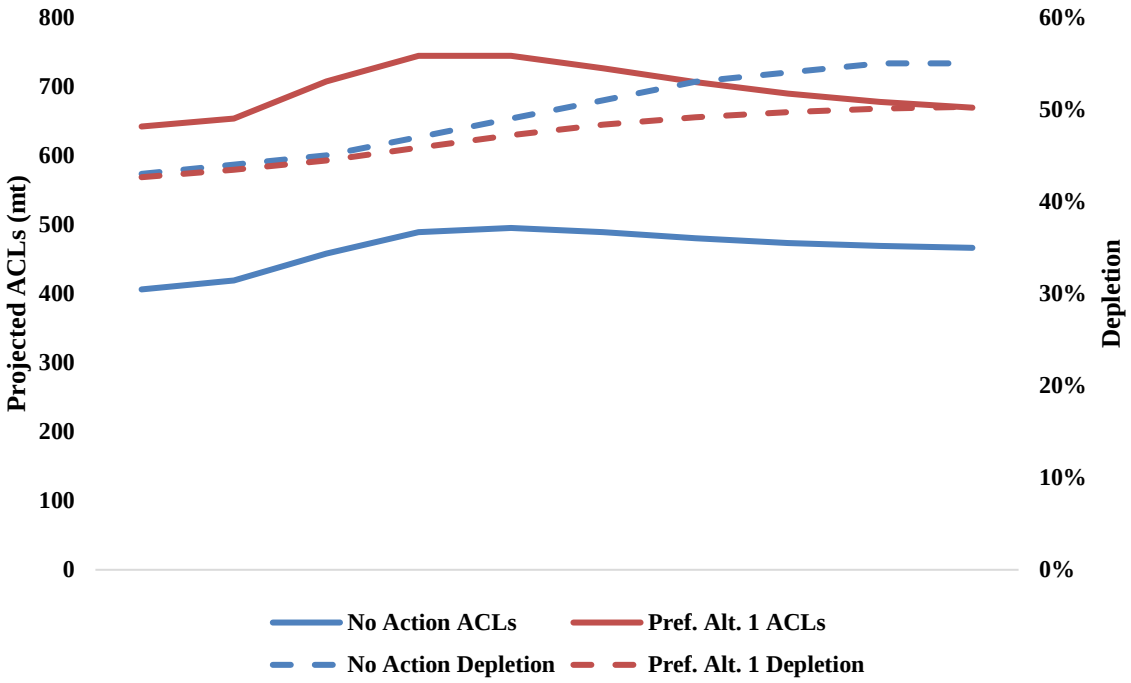


Figure 2-4. Ten-year projections of annual catch limits and predicted depletions for darkblotched rockfish under alternative harvest control rules.

2.2.6 Deacon Rockfish Impacts

Deacon rockfish (*Sebastes diaconus*) was recently described and adopted as a new *Sebastes* species by the American Fisheries Society based on evidence of the presence of two genetically distinct cryptic species in central California (Burford, *et al.* 2011). Deacon rockfish is therefore automatically acknowledged as an actively managed FMP species based on the FMP provision, "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."

Frable et al. (2015) describe how catch histories of deacon and blue rockfish are conflated since they were not distinguished until recently. Therefore, it can be concluded that deacon rockfish have always been managed in the Nearshore Rockfish complexes with a harvest contribution blended with that of blue rockfish. It is recommended regulations be updated to include deacon rockfish with blue rockfish when specifying harvest specifications and management measures. This is considered a "housekeeping" regulatory amendment since no new harvest specifications or management measures are needed.

2.2.7 Pacific Ocean Perch Impacts

The Council's preferred alternative is to depart from the default HCR in the POP rebuilding plan for the next two years by specifying a 281 mt ACL in 2017 and 2018 before resuming with the default HCR in 2019. This decision was based on an emerging bycatch problem that disrupted 2016 trawl fisheries.

The two alternatives indicate very slight decreases in 2019-2025 ACLs under the Preferred alternative relative to No Action with a consequent slight increase (<1%) in rebuilding probabilities (Table 2-10 and Figure 2-5). The target year and long term (i.e., 2019-2051) HCR prescribed in the current POP rebuilding

plan remains unchanged; only the HCR is changed in 2017-2018). A new assessment will be conducted for this stock next year.

Table 2-10. Annual catch limit projections for Pacific ocean perch under alternative harvest control rules, 2017-2026.

Year	ACLs (mt)	
	No Action	Pref.
2017	171	281
2018	176	281
2019	179	178
2020	182	182
2021	185	185
2022	189	188
2023	192	192
2024	195	195
2025	199	198
2026	203	203

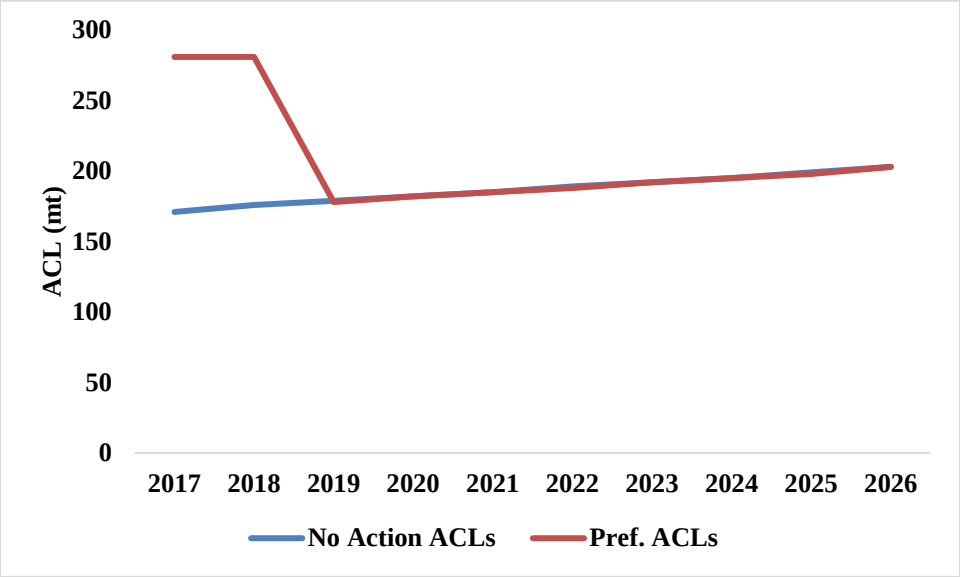


Figure 2-5. Trends in the annual catch limits for Pacific ocean perch under alternative harvest control rules.

2.2.8 Widow Rockfish Impacts

The 2015 widow rockfish assessment estimated depletion to be at 75.1 percent at the start of 2015 and has increased steadily since a low of 37.3 percent depletion in 1998 (Hicks and Wetzel 2015). Increases in stock size are due to the low level of harvest and strong recruitments in 2008 and 2010. A number of revisions were made to the data used for the current stock assessment, including 1) a new method of index standardization for NWFSC trawl survey using a geo-statistical delta-GLMM model, 2) a new steepness

value (0.798) based on an updated meta-analysis of steepness, 3) a prior distribution developed for the natural mortality parameter from an analysis of a maximum age of 54 years, 4) updated methods of expanding fishery length and age composition, and survey conditional age at length, and 5) new ageing error tables. For this assessment, there was a more thorough investigation of available age and length data, increasing the amount of these data relative to previous assessments. In addition, Washington historical landings were reconstructed. The SSC recommended this as a category 1 assessment and the proxy category 1 sigma of 0.36 be used to determine the ABC buffer. The previous 2011 assessment (He, *et al.* 2011) results were considered relatively less certain, and the previously assigned sigma value was 0.41.

The No Action ACL of 2,000 mt per year was previously adopted due to the uncertainty in the 2011 assessment. The 2015 assessment results indicate a much more certain and optimistic perception of current stock depletion (Figure 2-5). The risk to the stock of changing the harvest control rule to the highest ACL allowed in the FMP harvest specification framework (i.e., Alternative 1; ACL = ABC under a P* of 0.45) is estimated to be low with a predicted depletion in 2026 of 56% (Table 2-10 and Figure 2-6). The stock is projected to remain healthy (i.e., at or above the $B_{40\%}$ biomass target) for the next ten years even under the more pessimistic and less likely low state of nature model provided in the 2015 assessment (Table 2-10). For this reason, the Council adopted Alternative 1 as their preferred alternative for widow rockfish.

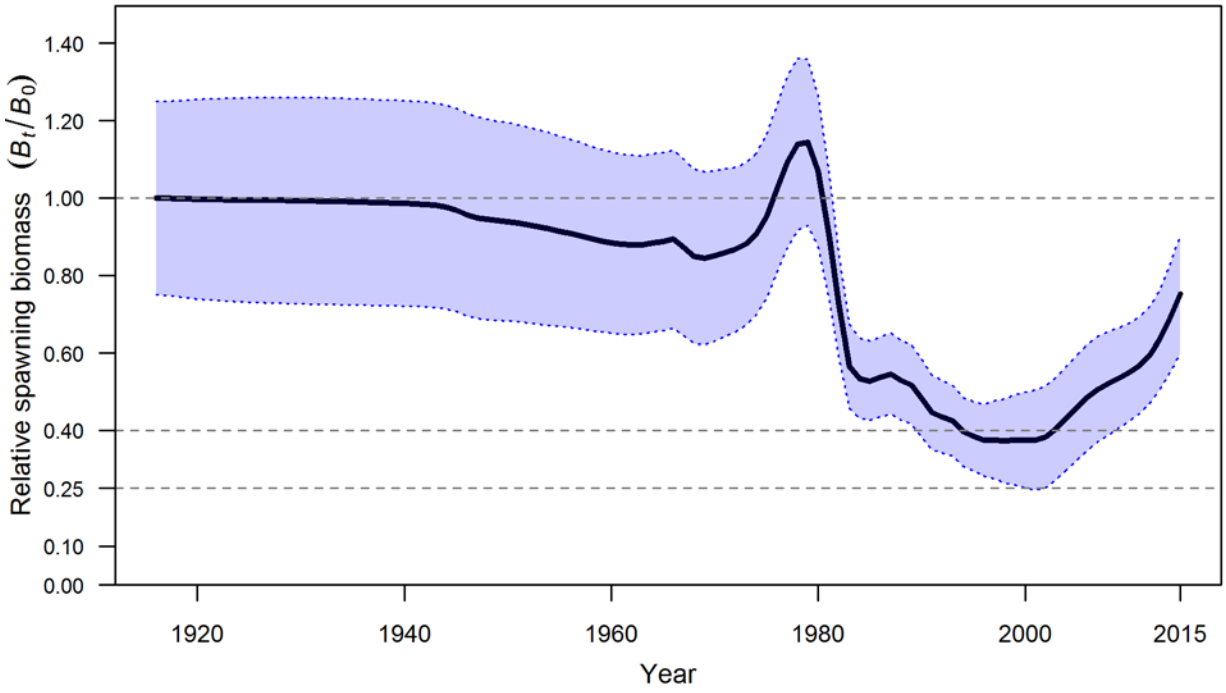


Figure 2-6. Estimated relative spawning biomass (depletion) with approximate 95 percent asymptotic confidence intervals (filled area) for the base case widow rockfish assessment model.

Table 2-11. Projected spawning biomass and depletion of widow rockfish under the low state of nature and base models in the 2015 assessment assuming removals under alternative harvest control rules.

				State of nature			
				Low		Base case	
Relative probability of ln(SB_2013)				0.25		0.5	
Harvest Control Rule	Year	OFL (mt)	ACL (mt)	Spawning biomass (mt)	Depletion	Spawning biomass (mt)	Depletion
No Action (ACL = 2,000 mt)	2015	12,259	2,000	48,360	59%	60,608	75%
	2016	13,368	2,000	51,094	62%	64,599	80%
	2017	14,130	2,000	53,178	64%	67,674	84%
	2018	14,511	2,000	54,831	67%	69,856	87%
	2019	14,746	2,000	56,417	68%	71,533	89%
	2020	14,966	2,000	58,025	70%	72,892	90%
	2021	15,132	2,000	59,510	72%	73,866	92%
	2022	15,200	2,000	60,750	74%	74,413	92%
	2023	15,179	2,000	61,745	75%	74,604	92%
	2024	15,108	2,000	62,549	76%	74,556	92%
	2025	15,017	2,000	63,222	77%	74,369	92%
	2026	14,924	2,000	63,805	77%	74,110	92%
Alt. 1 (ACL = ABC (P* =0.45))	2015	12,259	2000	48,360	59%	60,608	75%
	2016	13,368	2000	51,094	62%	64,599	80%
	2017	14,130	13,508	53,178	64%	67,675	84%
	2018	13,237	12,655	48,794	59%	63,900	79%
	2019	12,375	11,830	45,047	55%	60,314	75%
	2020	11,714	11,198	42,188	51%	57,284	71%
	2021	11,181	10,689	39,951	48%	54,659	68%
	2022	10,691	10,221	38,060	46%	52,260	65%
	2023	10,235	9,784	36,431	44%	50,080	62%
	2024	9,835	9,402	35,056	43%	48,173	60%
	2025	9,502	9,083	33,908	41%	46,561	58%
	2026	9,232	8,826	32,943	40%	45,225	56%

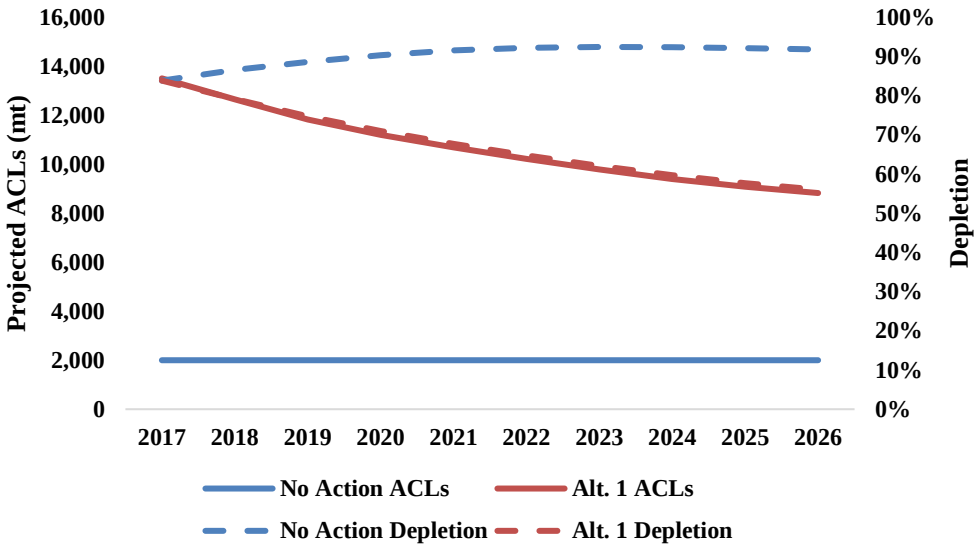


Figure 2-7. Ten-year projections of annual catch limits and depletions for widow rockfish under alternative harvest control rules assuming the base model in the 2015 assessment.

2.2.9 Summary of the Impacts of the Harvest Specifications Alternatives to Groundfish Stocks

Both the MSA and the optimum yield framework described in Chapter 4 of the PCGFMP establish a framework intended to achieve the purpose of the proposed action, which is to prevent overfishing, to rebuild overfished stocks, to ensure conservation, to facilitate long-term protection of EFH, and to realize the full potential of the Nation's fishery resources (MSA §2(a)(6)). Since the alternatives described in Section 2 are consistent with this framework, the available scientific information shows that the proposed harvest specifications will not result in overfishing (catch exceeding the OFL) or result in the stock becoming overfished within the foreseeable future. Section 4.4 in the PCGFMP describes how scientific uncertainty and management risk tolerance are used to compute a precautionary reduction from the OFL to determine the ABC. The default policy for healthy stocks (biomass above the biomass target / B_{MSY} proxy) is to set the ACL equal to the ABC. For some stocks, a further reduction below the ABC may be applied to mitigate risk or rebuild stock biomass to the target. Fisheries are then managed to attain but not exceed the ACL. These reductions substantially reduce the risk that overfishing will occur. Furthermore, because the biennial process is an adaptive management process, as new information becomes available adjustments can be made to catch limits and harvest policies to minimize the likelihood of a stock becoming overfished and to end overfishing if it has occurred.

The Environmental Impact Statement (EIS) evaluating the 2015-2016 harvest specifications and Amendment 24 also evaluated the long-term impacts of different harvest policies and related HCRs. The preferred alternative in that EIS – use the HCRs in place during the previous biennial period as the default HCRs – is the method used to determine harvest specifications under the No Action alternative. The impact evaluation in that EIS projected stock status over a 10-year period for different states of nature, assuming the full ABC value is harvested in each year. States of nature represent alternative values of a key stock assessment parameter in order to capture uncertainty about its true value. In the impact assessment, these alternative states of nature were used to explore the risk of overfishing and overfished status occurring. This analysis showed that the harvest policies in the PCGFMP have a low risk of resulting in overfishing and overfished status for any managed groundfish stock. As noted, the analysis assumed that the ABC is harvested, while for most stocks the actual harvest is below the ABC. This means that in practice the risk is even lower.

As discussed above, the status of canary rockfish has changed and it will no longer be managed under a rebuilding plan. Under the default policy (ACL=ABC, P*=0.45) there is a risk that the stock could decline below the target reference point (the B_{MSY} proxy of $B_{40\%}$) over the next ten years if 1) the ACL is fully harvested in each year, and 2) the steepness parameter is actually lower than the expected value (see Table 2-8). However, if new information indicated that the stock had declined below $B_{40\%}$ the precautionary reduction (in this case the 40-10 rule) would be applied to determine ACLs in future management cycles. This reduction is intended to return stock size to the target biomass level.

Based on the impact evaluation in the Amendment 24 EIS and relevant new information, the risk that overfishing will occur, or that a stock will become overfished over the long term, is very low when default HCRs are applied under the No Action Alternative.

The proposed harvest specifications under Alternative 1 are the same as No Action with the exception of six stocks as shown in Table 2-11. The HCRs under Alternative 1 are consistent with the optimum yield framework in the PCGFMP and present a low risk of overfishing or decline to overfished status for these six stocks. The ACLs for darkblotched rockfish and widow rockfish would be higher than those under No Action based on the application of alternative HCRs while the ACLs for three stocks would be lower than under No Action. The ACLs for these stocks are even more precautionary than Alternative 1 in terms of the impact of fishing on stock status. As discussed previously, big skate is proposed for reclassification as a managed stock with associated harvest specifications under Alternative 1. The application of stock-specific harvest specifications lowers the risk of fishing impairing stock status compared to the previous EC designation.

Table 2-12. Comparison of alternative harvest specifications. (No Action default specifications proposed for all other stocks under all three alternatives.)

Stock	No Action		Alternative 1		Alternative 2	
	2017-18 ACLs	ACL Basis	2017-18 ACLs	ACL Basis	2017-18 ACLs	ACL Basis
Darkblotched Rockfish	406/419	SPR = 64.9%	641/653	ACL = ABC	Same as Alternative 1	
Big Skate	N/A	N/A	494/494	ACL = ABC	Same as Alternative 1	
Black Rockfish (CA)	334/332	ACL = ABC	319/319	Constant catch ACL	Same as Alternative 1	
California scorpionfish	264/261	ACL = ABC	150/150	Constant catch ACL	Same as Alternative 1	
Canary Rockfish	1,714/1,588	ACL = ABC	763/857	50% of No Action ACL	566/504	33% of No Action ACL
Widow Rockfish	2,000/2,000	Contstant catch ACL	13,508/12,655	ACL = ABC	Same as Alternative 1	

Note: For alternatives where the ACL basis is ACL = ABC a P* value of 0.45 is applied.

As discussed in Section 2.2.5, the alternative HCR for darkblotched rockfish is based on the projection that darkblotched rockfish will achieve rebuilt status before the next biennial period begins. The default HCR for healthy stocks (at or above the target reference point) would be implemented under this alternative. This represents a moderately higher risk that the stock could again fall below the target.

As in Section 2.2.6, widow rockfish was declared rebuilt in 2010, but the Council adopted a constant catch HCR that was more precautionary than the default HCR for healthy stocks. The most recent stock assessment shows that stock biomass is well above the target and projections show that even under the more pessimistic state of nature, stock biomass would decline to the target over 10 years. Widow rockfish was historically a

target species, and a higher ACL would allow the development of fisheries for this and co-occurring stocks such as yellowtail rockfish.

Alternative 1 is consistent with the optimum yield framework described in the PCGFMP and present a low risk that any managed stock will be subject to overfishing or become overfished in the foreseeable future.

Alternative 2 is the same as Alternative 1 for all managed groundfish stocks except for canary rockfish. For this stock, which has just been declared rebuilt, a still more precautionary HCR is proposed. As shown in Table 2-8, there is a risk, assuming that the steepness parameter is overestimated, that stock biomass could decline below the biomass target and approach the minimum stock size threshold of $B_{20\%}$. This is the reason for considering the precautionary reduction under both Alternative 1 (50 percent reduction from the default ACL) and Alternative 2 (67 percent reduction from the default ACL).

Alternative 2 is consistent with the optimum yield framework described in the PCGFMP and presents a low risk that any managed stock will be subject to overfishing or become overfished in the foreseeable future and the lowest risk for the recently rebuilt canary rockfish stock.

3. New Management Measures

New management measures may be adopted during the biennial specifications process and include those measures where the impacts have not been previously analyzed and/or have not been previously implemented in regulation. The Council recommended several new management measures (Table 3-1) for implementation in 2017-2018 under the preferred alternative (Alternative 3 in Section 4.1.4). Additionally, some changes to management measures require additional analysis compared to the routine measures, and are highlighted in Table 3-1. Detailed analysis of new management measures and enhanced analysis for selected existing measures is provided in Appendix B. Summary impacts are described in Chapter 4 Integrated Alternatives.

Table 3-1. New Management Measures Recommended for Implementation in 2017-2018.

Management Measure	Description	Category	FMP Change
Update RCA Coordinates	Update selected RCA coordinates in California, including recommendations from the Enforcement Consultants (see Agenda Item G.4.a, Supplemental EC Report, June 2016), to better approximate depth	Correction to regulations, updated analysis requested	No
Canary Rockfish Retention for Limited Entry and Open Access Fixed Gears	Allow retention of canary rockfish and provide trip limits that keep mortality within the fishery shares	Existing routine measure, additional analysis requested	No
Adjustments to the Trawl RCA North of Cape Alava	Modify area closures to provide greater access to target species while staying within the overfished species limits	Existing routine measure, additional analysis requested	No
Adjustments to the Non-Trawl RCA in California	Modify area closures to provide greater access to target species while staying within the overfished species limits	Existing routine measure, additional analysis requested	No
Big Skate FMP Classification	Change classification from EC to "in the fishery"	New	Yes
Flatfish Retention in the Oregon Recreational Fisheries at any Depth During the Seasonal Depth Closure	Allow recreational targeting of flatfish species, other than Pacific halibut, seaward of the seasonal depth restriction in Oregon	New	No
New Inseason Process for California	Grant NMFS authority to change routine management measures in the recreational and commercial fisheries based upon attainment or projected attainment of a Federal harvest limit for black rockfish, canary rockfish, and yelloweye rockfish	New	Yes
Petrale Sole and Starry Flounder Retention in the California Recreational Fisheries at any Depth During the Seasonal Depth Closure	Allow petrale sole and starry flounder to be retained in the California recreational fisheries, along with species in the Other Flatfish complex (currently allowed), at any depth during the seasonal depth closures	New	No

3.1 Considered but Rejected

Appendix B, Section B.3, contains detailed analysis for three measures that were analyzed but were excluded from the preferred alternative (Alternative 3, see Section 4.1.4). A summary of the measures and rationale for excluding them in the preferred alternative are summarized below.

3.1.1 Manage Starry Flounder in the Other Flatfish Complex

The most recent assessment of starry flounder does not contain an OFL or ABC projection beyond 2016. At the 2015 mop-up Stock Assessment Review (STAR) Panel, it was recommended that 2016 harvest specifications be carried forward for 2017 and 2018, and starry flounder be changed from a Category 2 to a Category 3 stock. The STAR panel questioned whether starry flounder should continue to be managed as a stand-alone stock or would be better included in the Other Flatfish complex.

The proposal to manage starry flounder in the Other Flatfish complex turned out to be more complicated than anticipated, due to a mismatch between the Amendment 21 allocations of starry flounder and the Other Flatfish complex. The Other Flatfish complex is allocated 90 percent to trawl and 10 percent to non-trawl, while starry flounder is allocated 50 percent to trawl and non-trawl.

Annual catches of starry flounder in 2012-2014 were 1-2 percent of the ACL, therefore there would be little risk that the mortality would exceed the stock-specific harvest specifications whether it is managed in a complex or with stock-specific harvest specifications. The Council rejected the proposal to manage starry flounder within the Other Flatfish complex since there were no conservation issues with status quo management. Further, initial scoping of the measure indicated there would be a high workload to reconfigure allocations and quota shares.

During discussions, CDFW mentioned that some anglers would like to the opportunity to retain starry flounder year-round; however current regulations do not provide for such an allowance. In 2016, starry flounder is restricted to the same months and depths as the groundfish season; however, species in the Other Flatfish complex are allowed to be targeted and retained year round. If starry flounder were included in the Other Flatfish complex, they would then be allowed to be targeted and retained year round in the California recreational fishery. In order to facilitate year round starry flounder fishing, the Council added starry flounder to the new management measure analysis for allowing petrale sole year round and all depths in the California recreational fishery.

3.1.2 Transfer of Shorebased QP to the Mothership Sector

This management measure would allow limited transfer of canary rockfish, darkblotched rockfish, POP, and widow rockfish quota pounds from the shorebased IFQ sector to mothership co-ops. The measure is intended to reduce the risk of the mothership sector not attaining their whiting allocation, based on the incidental catch of these species. The Council excluded the measure from the preferred alternative based on the complexities of the analysis, implementation challenges, and other matters raised by NMFS (see Agenda Item F.6.a, NMFS Report, April 2016). Additionally, the Council is considering a measure outside of the harvest specifications and management measures process that proposes to change the Amendment 21 allocations and management (from quota to set-asides) for darkblotched and POP for both the mothership and catcher-processor sectors.

3.1.3 Overfished Species Hotspot Closures in California

Nine new area closures in California were analyzed to mitigate increased overfished species impacts, which may occur as a result of the proposed 2017-2018 California recreational season structures. The proposed

season structures allow access to deeper depths than what has been allowed in nearly a decade. As such, there is uncertainty in angler behavior and the model projections for overfished species. If catch was tracking higher than anticipated, the overfished species hotspot closures could be implemented to reduce catch.

The Council excluded the overfished species hotspot closures from the preferred alternative based changes in outreach, inseason tracking and management, current fishery performance, and other matters raised by CDFW (see Agenda Item G.4.a, Supplemental CDFW Report 1, June 2016). The Council decision to exclude this measure was also related to the management measure that would grant NMFS authority to change routine management measures in the recreational and commercial fisheries based upon attainment or projected attainment of a Federal harvest limit for black rockfish, canary rockfish, and yelloweye rockfish. That is, the ability to control catch inseason would increase with the ability to take action outside a Council meeting. As such, the hotspot closures may no longer be needed.

4. Integrated Alternatives

Integrated alternatives incorporate harvest specifications and routine management measures into discrete management programs in order to facilitate evaluation of environmental impacts. 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. Many of these allocations are specified in the PCGFMP, others are specified as part of the biennial management process. Before these allocations are made, amounts may be deducted from ACLs to account for tribal fishery catch, research catch, and catch under exempted fishing permits (EFPs). Routine management measures are intended to regulate catch so that ACLs may be met but not exceeded. New management measures described in Chapter 3 and analyzed in Appendix B could be added to any alternative.

4.1.1 No Action

The No Action alternative analyzes ACLs established by using the default harvest control rules as described in Section 2.1.1.

The No Action alternative was analyzed using the 2018 canary rockfish ACL value of 1,588 mt, which was derived from Agenda Item I.4, Supplemental REVISED Attachment 2, November 2015. However, it was later identified that the 2018 canary rockfish ACL should have been 1,526 mt (see Agenda Item F.3, Supplemental REVISED Attachment 2, April 2016). The No Action integrated alternatives analysis was not redone using the revised canary rockfish ACL for 2018.

4.1.1.1 Deductions from the ACL

Deductions from most groundfish ACLs, called off-the-top deductions, are made to account for groundfish mortality in the Pacific Coast treaty Indian tribal fisheries, scientific research, non-groundfish target fisheries (hereinafter incidental open access fisheries), and, as necessary, EFPs. Off-the-top deductions from the sablefish north of 36° N. latitude ACL are slightly different due to the sablefish allocation framework and include groundfish mortality in tribal fisheries, research, recreational fisheries, and EFPs. Sufficient yield must be available to accommodate the anticipated groundfish mortality from the aforementioned activities to increase the probability that catches will remain at or below the ACLs.

Amounts deducted from the ACL to accommodate groundfish mortality from scientific research, incidental open access fisheries, and EFPs can be modified inseason based on the best available information. The amount estimated to go unharvested could be reapportioned back to the groundfish fishery according to

sector needs. The reapportionment can be done through an inseason action published in the *Federal Register* following a Council meeting. At a Council meeting, the Council would review the off-the-top deductions from the ACL and recommend full reapportionment, partial reappointment, or no reapportionment, based on the allocation framework criteria and objectives outlined in the FMP and managing the risk of exceeding an ACL. The specified amount of groundfish would be reapportioned in proportion to the original allocations for the calendar year, modified to account for Council recommendations with respect to sector needs. Reapportionment would be based on best available information, but would most likely occur later in the year after the September or November Council meetings.

Table 4-1 and Table 4-3 detail the deductions from the ACLs under the No Action Alternative for 2017 and 2018, respectively. The following paragraphs describe how off-the-top deductions were calculated under No Action. Table 4-2 and Table 4-4 detail the allocations analyzed under the No Action Alternative for 2017 and 2018, respectively. Table 4-5 details the deductions from the sablefish ACLs for the No Action Alternative. Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018 can be found in Table 4-6.

Tribal Fishery: Tribal fisheries consist of trawl (bottom, midwater, and whiting), fixed gear, and troll. The requested tribal amounts under No Action are based on those in the 2016 regulations, modified based on tribal requests (Agenda Item I.9.a, Supplemental Tribal Report, November 2015 and Agenda Item I.9.a, Supplemental Tribal Report 2, November 2015).

Research: Research activities include the NMFS trawl survey, International Pacific Halibut Commission longline survey, and other Federal and state research. The Council approach would be that off-the-top deductions should be equal to the maximum historical scientific research catch from 2005 to 2014, except for yelloweye rockfish. For yelloweye rockfish, the Council adopted a 3.3 mt research deduction based on anticipated research needs of the International Pacific Halibut Commission (1.1 mt), Washington Department of Fish and Wildlife (1 mt), Oregon Department of Fish & Wildlife (1 mt), and other projects (0.2 mt). If data are available to determine that a deduction for research has been exceeded during the fishing year, it would be evaluated by the Council and NMFS. Adjustments could be made to prevent the harvest specifications from being exceeded.

Incidental Open Access: Deductions from ACLs are made to account for groundfish mortality in the incidental open access fisheries. The off-the-top deductions for all species, except longnose skate, were derived from the maximum historical values in the 2007 to 2014 West Coast Groundfish Observer Program (WCGOP) Groundfish Mortality reports (see http://tinyurl.com/nv3pddm). The recommended deduction for longnose skate was based on data from the 2009 to 2014 WCGOP Groundfish Mortality reports, the years in which longnose skate were reported separately from the Other Fish category.

Exempted Fishing Permits: The Council adopted the Nature Conservancy EFP that uses selective pot gear to harvest lingcod (Agenda Item I.2, Supplemental Attachment 6, November 2015), with the condition that activity be limited to those waters seaward of a line approximating the 75 fathom depth contour. No off-the-top deductions are required for this EFP, since those catches will be covered using QP allocated in the shorebased IFQ fishery or trip limits for non-IFQ species.

Recreational (sablefish north of 36° N. latitude only): The allocation framework for sablefish north of 36° N. latitude specifies that anticipated recreational catches of sablefish be deducted from the ACL prior to the commercial limited entry and open access allocations. The deduction would be the maximum historical value from recreational fisheries from 2004 to 2014 (Table 4-37).

4.1.1.2 Allocating the Fishery HG

The fishery HGs for most species are further allocated between the trawl and non-trawl fisheries. The trawl and non-trawl allocations are based on the percentages adopted under Amendment 21 to the groundfish FMP or decided during the 2017-2018 biennium. Sablefish north of 36° N. latitude is allocated under the Amendment 6 framework, which allocates the commercial HG between the limited entry (trawl and fixed gear) and open access sectors. Further, the FMP outlines criteria for allocating Pacific whiting, darkblotched, POP, and widow between the shorebased IFQ, catcher-processor, and mothership sectors.

For some species, no allocations are necessary since ACL attainment has historically been low due to the lack of market demand, limited access as a result of the RCA configurations, or the need to limit overfished species interactions. Additionally, some species are managed and allocated by the west coast states (e.g., nearshore species).

For any stock that has been declared overfished, the formal trawl/non-trawl and open access/limited entry allocation established under provisions of the FMP and regulations (50 CFR 660.50) may be temporarily revised for the duration of the rebuilding period.

Two-year trawl and non-trawl allocations are decided during the biennial process for those species without long-term allocations or species where the long-term allocation is suspended. The ACLs and allocations for species subject to short-term allocations are indicated in Table 4-2 and Table 4-4. A summary of the basis for the two-year allocations are as follows

- Overfished species allocations were based on the September 2015 scorecard.
- Canary rockfish allocations were based on the September 2015 scorecard.
- Longnose skate was allocated 90 percent to the trawl fishery and 10 percent to the non-trawl fishery, based historical catch (see 2013-2014 EIS Appendix C, Table C-54).
- Big skate was allocated 95 percent to the trawl fishery and 5 percent to the non-trawl fishery, based historical catch from 2000-2015 (Agenda Item I.9.a, Supplemental GMT Report 3, November 2015)
- Shelf rockfish north was allocated 60.2 percent to the trawl fishery and 39.8 percent to the non-trawl fishery, based historical catch from 2005-2008 (see 2011-2012 EIS, Appendix B)
- Shelf rockfish south was allocated 12.2 percent to the trawl fishery and 87.8 percent to the non-trawl fishery, based historical catch from 2005-2008 (see 2011-2012 EIS, Appendix B)

Table 4-1. No Action Alternative. Estimates of tribal, EFP, research (Res.), and incidental OA groundfish mortality in metric tons, used to calculate the fishery HG in 2017.

Species	Area	ACL	Tribal	EFP	Research	OA	Fishery HG
Arrowtooth flounder	Coastwide	13,804	2,041.0		16.4	40.8	11,705.9
Black (WA)	Washington	305	18.0		-	-	287.0
Black (OR)	Oregon	527			-	0.6	526.4
Black (CA)	California	334					334.0
BOCACCIO	S of 40º10' N. lat.	790			4.6	0.8	784.6
Cabezon (OR)	46º16' to 42º N. lat.	47			-		47.0
Cabezon (CA)	S of 42º N. lat.	150			-	0.3	149.7
California scorpionfish	S of 34°27' N. lat.	264			0.2	2.0	261.8
Canary rockfish	Coastwide	1,714	35.0		7.2	1.2	1,670.6
Chilipepper	S of 40º10' N. lat.	2,607			10.9	5.0	2,591.1
COWCOD	S of 40º10' N. lat.	10			2.0	0.0	8.0
DARKBLOTCHED	Coastwide	406	0.2		2.5	24.5	378.9
Dover sole	Coastwide	50,000	1,497.0		41.9	54.8	48,406.3
English sole	Coastwide	9,964	200.0		5.8	7.0	9,751.2
Lingcod	N of 40'10º N. lat.	3,333	250.0		11.7	16.0	3,055.3
Lingcod	S of 40'10º N. lat.	1,251			1.1	6.9	1,243.0
Longnose skate	Coastwide	2,000	130.0		13.2	3.8	1,853.0
Longspine thornyhead	N of 34º27' N. lat.	2,894	30.0		13.5	3.3	2,847.2
Longspine thornyhead	S of 34º27' N. lat.	914			1.4	1.8	910.8
Nearshore rockfish north	N of 40º10' N. lat.	105	1.5		-	0.3	103.2
Nearshore rockfish south	S of 40º10' N. lat.	1,163			2.7	1.4	1,158.9
Shelf rockfish north	N of 40º10' N. lat.	2,049	30.0		24.8	26.0	1,968.2
Shelf rockfish south	S of 40º10' N. lat.	1,623			8.6	8.6	1,605.8
Slope rockfish north	N of 40º10' N. lat.	1,755	36.0		9.5	18.6	1,690.9
Slope rockfish south	S of 40º10' N. lat.	707			2.0	17.2	687.8
Other fish	Coastwide	474					474.0
Other flatfish	Coastwide	8,510	60.0		19.0	125.0	8,306.0
Pacific cod	Coastwide	1,600	500.0		7.0	2.0	1,091.0
Pacific whiting a/	Coastwide	325,072	56,888.0			1,500.0	266,684.0
Petrale sole	Coastwide	3,136	220.0		17.7	3.2	2,895.1
POP	N of 40º10' N. lat.	171	9.2		5.2	10.0	146.6
Sablefish	N of 36º N. lat.	6,041	See Table 4-5				
Sablefish	S of 36º N. lat.	1,075			3.0	2.0	1,070.0
Shortbelly rockfish	Coastwide	500			2.0	8.9	489.1
Shortspine thornyhead	N of 34º27' N. lat.	1,713	50.0		7.2	1.8	1,654.0
Shortspine thornyhead	S of 34º27' N. lat.	906			1.0	41.3	863.7
Spiny dogfish	Coastwide	2,094	275.0		12.5	49.5	1,757.0
Splitnose rockfish	S of 40º10' N. lat.	1,760			9.0	0.2	1,750.8
Starry flounder	Coastwide	1,282	2.0			8.3	1,271.7
Widow rockfish	Coastwide	2,000	200.0		8.2	0.5	1,791.3
YELLOWEYE	Coastwide	20	2.3		3.3	0.4	14.0
Yellowtail rockfish	N of 40º10' N. lat.	6,196	1,000.0		16.6	3.4	5,176.1

a/ The Pacific whiting total allowable catch was unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-2. No Action. Stock-specific fishery HGs or ACTs and allocations for 2017 (in mt).

Species	Area	Fishery HG	Allocation Type	Trawl		Non-trawl	
				%	Mt	%	Mt
Arrowtooth flounder	Coastwide	11,705.9	Amendment 21	95%	11,120.6	5%	585.3
Black (WA)	N of 46º16'	287.0	None				
Black (OR)	46º16' to 42º N. lat.	526.4	None				
Black (CA)	S of 42º N. lat.	334.0	None				
BOCACCIO	S of 40º10' N. lat.	784.6	Biennial	N/A	188.6	N/A	596.0
Cabezon (OR)	46º16' to 42º N. lat.	47.0	None				
Cabezon (CA)	S of 42º N. lat.	149.7	None				
California scorpionfish a/	S of 34°27' N. lat.	111.0	None				
Canary rockfish	Coastwide	1,670.6	Biennial	N/A	890.0	N/A	780.6
Chilipepper	S of 40º10' N. lat.	2,591.1	Amendment 21	75%	1,943.3	25%	647.8
COWCOD b/	S of 40º10' N. lat.	4.0	Biennial	N/A	1.4	N/A	2.6
DARKBLOTCHED	Coastwide	378.9	Amendment 21	95%	359.9	5%	18.9
Dover sole	Coastwide	48,406.3	Amendment 21	95%	45,986.0	5%	2,420.3
English sole	Coastwide	9,751.2	Amendment 21	95%	9,263.6	5%	487.6
Lingcod	N of 40'10º N. lat.	3,055.3	Amendment 21	45%	1,374.9	55%	1,680.4
Lingcod	S of 40'10º N. lat.	1,243.0	Amendment 21	45%	559.4	55%	683.7
Longnose skate	Coastwide	1,853.0	Biennial	90%	1,667.7	10%	185.3
Longspine thornyhead	N of 34º27' N. lat.	2,847.2	Amendment 21	95%	2,704.8	5%	142.4
Longspine thornyhead	S of 34º27' N. lat.	910.8	None				
Nearshore rockfish north	N of 40º10' N. lat.	103.2	None				
Nearshore rockfish south	S of 40º10' N. lat.	1,158.9	None				
Shelf rockfish north	N of 40º10' N. lat.	1,968.2	Biennial	60.2%	1,184.9	39.8%	783.3
Shelf rockfish south	S of 40º10' N. lat.	1,605.8	Biennial	12.2%	195.9	87.8%	1,409.9
Slope rockfish north	N of 40º10' N. lat.	1,690.9	Amendment 21	81%	1,369.6	19%	321.3
Slope rockfish south	S of 40º10' N. lat.	687.8	Amendment 21	63%	433.3	37%	254.5
Other fish	Coastwide	474.0	None				
Other flatfish	Coastwide	8,306.0	Amendment 21	90%	7,475.4	10%	830.6
Pacific cod	Coastwide	1,091.0	Amendment 21	95%	1,036.4	5%	54.5
Pacific whiting c/	Coastwide	266,684	Amendment 21	100%	266,684	0%	0.0
Petrale sole	Coastwide	2,895.1	Amendment 21	95%	2,750.3	5%	144.8
POP	N of 40º10' N. lat.	146.6	Amendment 21	95%	139.3	5%	7.3
Sablefish	N of 36º N. lat.	0.0	See Table 4-5				
Sablefish	S of 36º N. lat.	1,070.0	Amendment 21	42%	449.4	58%	620.6
Shortbelly rockfish	Coastwide	489.1	None				0.0
Shortspine thornyhead	N of 34º27' N. lat.	1,654.0	Amendment 21	95%	1,571.3	5%	82.7
Shortspine thornyhead	S of 34º27' N. lat.	863.7	Amendment 21	NA	50.0	NA	813.7
Spiny dogfish	Coastwide	1,757.0	None				
Splitnose rockfish	S of 40º10' N. lat.	1,750.8	Amendment 21	95%	1,663.3	5%	87.5
Starry flounder	Coastwide	1,271.7	Amendment 21	50%	635.9	50%	635.9
Widow rockfish	Coastwide	1,791.3	Amendment 21	91%	1,630.1	9%	161.2
YELLOWEYE	Coastwide	14.0	Biennial	N/A	1.1	N/A	12.9
Yellowtail rockfish	N of 40º10' N. lat.	5,176.1	Amendment 21	88%	4,554.9	12%	621.1

a/ The California scorpionfish fishery harvest guideline (261.8 mt) would be further reduced to an annual catch target (ACT) of 111 mt.

b/ The cowcod fishery harvest guideline (8 mt) would be further reduced to an ACT of 4 mt.

c/ The Pacific whiting total allowable catch was unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-3. No Action. Estimates of tribal, EFP, research (Res.), and incidental OA groundfish mortality in metric tons, used to calculate the fishery HG in 2018.

Species	Area	ACL	Tribal	EFP	Research	OA	Fishery HG
Arrowtooth flounder	Coastwide	13,743	2,041.0		16.4	40.8	11,644.9
Black (WA)	Washington	301	18.0		-	-	283.0
Black (OR)	Oregon	520			-	0.6	519.4
Black (CA)	California	332					332.0
Blackgill rockfish	S of 40º10' N. lat.	123			0.5	0.1	122.4
BOCACCIO	S of 40º10' N. lat.	741			4.6	0.8	735.6
Cabezon (OR)	46º16' to 42º N. lat.	47			-		47.0
Cabezon (CA)	S of 42º N. lat.	149			-	0.3	148.7
California scorpionfish	S of 34°27' N. lat.	261			0.2	2.0	258.8
Canary rockfish	Coastwide	1,588	35.0		7.2	1.2	1,544.6
Chilipepper	S of 40º10' N. lat.	2,507			10.9	5.0	2,491.1
COWCOD	S of 40º10' N. lat.	10			2.0	0.0	8.0
DARKBLOTCHED	Coastwide	419	0.2		2.5	24.5	391.9
Dover sole	Coastwide	50,000	1,497.0		41.9	54.8	48,406.3
English sole	Coastwide	7,537	200.0		5.8	7.0	7,324.2
Lingcod	N of 40'10º N. lat.	3,110	250.0		11.7	16.0	2,832.3
Lingcod	S of 40'10º N. lat.	1,144			1.1	6.9	1,136.0
Longnose skate	Coastwide	2,000	130.0		13.2	3.8	1,853.0
Longspine thornyhead	N of 34º27' N. lat.	2,747	30.0		13.5	3.3	2,700.2
Longspine thornyhead	S of 34º27' N. lat.	867			1.4	1.8	863.8
Nearshore rockfish north	N of 40º10' N. lat.	105	1.5		-	0.3	103.2
Nearshore rockfish south	S of 40º10' N. lat.	1,179			2.7	1.4	1,174.9
Shelf rockfish north	N of 40º10' N. lat.	2,047	30.0		24.8	26.0	1,966.2
Shelf rockfish south	S of 40º10' N. lat.	1,624			8.6	8.6	1,606.8
Slope rockfish north	N of 40º10' N. lat.	1,754	36.0		9.5	18.6	1,689.9
Slope rockfish south	S of 40º10' N. lat.	586			2.0	17.2	566.8
Other fish	Coastwide	441					441.0
Other flatfish	Coastwide	7,281	60.0		19.0	125.0	7,077.0
Pacific cod	Coastwide	1,600	500.0		7.0	2.0	1,091.0
Pacific whiting a/	Coastwide	325,072	56,888.0			1,500.0	266,684.0
Petrale sole	Coastwide	3,013	220.0		17.7	3.2	2,772.1
POP	N of 40º10' N. lat.	176	9.2		5.2	10.0	151.6
Sablefish	N of 36º N. lat.	6,299	See Table 4-5				
Sablefish	S of 36º N. lat.	1,120			3.0	2.0	1,115.0
Shortbelly rockfish	Coastwide	500			2.0	8.9	489.1
Shortspine thornyhead	N of 34º27' N. lat.	1,698	50.0		7.2	1.8	1,639.0
Shortspine thornyhead	S of 34º27' N. lat.	898			1.0	41.3	855.7
Spiny Dogfish	Coastwide	2,083	275.0		12.5	49.5	1,746.0
Splitnose rockfish	S of 40º10' N. lat.	1,761			9.0	0.2	1,751.8
Starry flounder	Coastwide	1,282	2.0			8.3	1,271.7
Widow rockfish	Coastwide	2,000	200.0		8.2	0.5	1,791.3
YELLOWEYE	Coastwide	20	2.3		3.3	0.4	14.0
Yellowtail rockfish	N of 40º10' N. lat.	6,002	1,000.0		16.6	3.4	4,982.1

[a/] The Pacific whiting total allowable catch was unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-4. No Action. Stock specific fishery HGs or ACTs and allocations for 2018 (in mt).

Species	Area	Fishery HG		Trawl		Non-trawl	
			Allocation Type	%	Mt	%	Mt
Arrowtooth flounder	Coastwide	11,644.9	Amendment 21	95%	11,062.6	5%	582.2
Black (WA)	N of 46º16'	283.0	None				
Black (OR)	46º16' to 42º N. lat.	519.4	None				
Black (CA)	S of 42º N. lat.	332.0	None				
Blackgill rockfish	S of 40º10' N. lat.	122.4	Amendment 26	41%	50.2	59%	72.2
BOCACCIO	S of 40º10' N. lat.	735.6	Biennial	N/A	176.8	N/A	558.8
Cabezon (OR)	46º16' to 42º N. lat.	47.0	None				
Cabezon (CA)	S of 42º N. lat.	148.7	None				
California scorpionfish a/	S of 34°27' N. lat.	111.0	None				
Canary rockfish	Coastwide	1,544.6	Biennial	N/A	822.9	N/A	721.7
Chilipepper	S of 40º10' N. lat.	2,491.1	Amendment 21	75%	1,868.3	25%	622.8
COWCOD b/	S of 40º10' N. lat.	4.0	Biennial	N/A	1.4	N/A	2.6
DARKBLOTCHED	Coastwide	391.9	Amendment 21	95%	372.3	5%	19.6
Dover sole	Coastwide	48,406.3	Amendment 21	95%	45,986.0	5%	2,420.3
English sole	Coastwide	7,324.2	Amendment 21	95%	6,958.0	5%	366.2
Lingcod	N of 40'10º N. lat.	2,832.3	Amendment 21	45%	1,274.5	55%	1,557.8
Lingcod	S of 40'10º N. lat.	1,136.0	Amendment 21	45%	511.2	55%	624.8
Longnose skate	Coastwide	1,853.0	Biennial	90%	1,667.7	10%	185.3
Longspine thornyhead	N of 34º27' N. lat.	2,700.2	Amendment 21	95%	2,565.2	5%	135.0
Longspine thornyhead	S of 34º27' N. lat.	863.8	None				
Nearshore rockfish north	N of 40º10' N. lat.	103.2	None				
Nearshore rockfish south	S of 40º10' N. lat.	1,174.9	None				
Shelf rockfish north	N of 40º10' N. lat.	1,966.2	Biennial	60.2%	1,183.7	39.8%	782.5
Shelf rockfish south	S of 40º10' N. lat.	1,606.8	Biennial	12.2%	196.0	87.8%	1,410.8
Slope rockfish north	N of 40º10' N. lat.	1,689.9	Amendment 21	81%	1,368.8	19%	321.1
Slope rockfish south	S of 40º10' N. lat.	566.8		91%	515.8	9%	51.0
Other fish	Coastwide	441.0	None				
Other flatfish	Coastwide	7,077.0	Amendment 21	90%	6,369.3	10%	707.7
Pacific cod	Coastwide	1,091.0	Amendment 21	95%	1,036.4	5%	54.5
Pacific whiting c/	Coastwide	266,684	Amendment 21	100%	266,684	0%	0.0
Petrale sole	Coastwide	2,772.1	Amendment 21	95%	2,663.5	5%	138.6
POP	N of 40º10' N. lat.	151.6	Amendment 21	95%	144.0	5%	7.6
Sablefish	N of 36º N. lat.			See Table 4-5			
Sablefish	S of 36º N. lat.	1,115.0	Amendment 21	42%	468.3	58%	646.7
Shortbelly rockfish	Coastwide	489.1	None				0.0
Shortspine thornyhead	N of 34º27' N. lat.	1,639.0	Amendment 21	95%	1,557.0	5%	81.9
Shortspine thornyhead	S of 34º27' N. lat.	855.7	Amendment 21	NA	50.0	NA	805.7
Spiny dogfish	Coastwide	1,746.0	None				
Splitnose rockfish	S of 40º10' N. lat.	1,751.8	Amendment 21	95%	1,664.2	5%	87.6
Starry flounder	Coastwide	1,271.7	Amendment 21	50%	635.9	50%	635.9
Widow rockfish	Coastwide	1,791.3	Amendment 21	91%	1,630.1	9%	161.2
YELLOWEYE	Coastwide	14.0	Biennial	N/A	1.1	N/A	12.9
Yellowtail rockfish	N of 40º10' N. lat.	4,982.1	Amendment 21	88%	4,384.2	12%	597.8

a/ The California scorpionfish fishery harvest guideline (258.8 mt) would be further reduced to an ACT of 111 mt.
b/ The cowcod fishery harvest guideline (8 mt) would be further reduced to an ACT of 4 mt.
c/ The Pacific whiting TAC was unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-5. 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. latitude for 2017 and 2018.

Stock	Year	ACL (mt)	Tribal Share (mt) [a/]	Research (mt)	Rec. (mt)	EFP (mt)	Commercial HG (mt)
Sablefish N. of 36° N. lat.	2017	6,041	604	26	6.1	0	5,405
	2018	6,299	630	26	6.1	0	5,637

[a/] The sablefish allocation to Pacific coast treaty Indian Tribes would be 10 percent of the sablefish ACL for the area north of 36° N. lat. This allocation represents the total amount available to the treaty Indian fisheries before deductions for discard mortality.

Table 4-6. No Action. Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018.

2017										
Fishery	**Bocaccio b/**		**Cowcod b/**		**Dkbl**		**POP**		**Yelloweye**	
	Allocation a/	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**
Off the Top Deductions	5.4	5.4	2.0	2.0	27.2	27.2	24.4	24.4	6.0	6.0
EFPc/										
Research d/	4.6	4.6	2.0	2.0	2.5	2.5	5.2	5.2	3.3	3.3
Incidental OA e/	0.8	0.8	0.0	0.0	24.5	24.5	10.0	10.0	0.4	0.4
Tribal f/					0.2	0.2	9.2	9.2	2.3	2.3
Trawl Allocations	188.6	57.3	1.4	0.2	359.9	106.7	139.3	45.5	1.1	0.1
--SB Trawl	188.6	57.3	1.4	0.2	341.0	97.6	121.9	39.1	1.1	0.1
--At-sea whiting MS					7.8	4.3	7.2	1.8		
--At-sea whiting CP					11.0	4.8	10.2	4.6		
Non-Trawl Allocation	596.0	169.8	2.6	2.2	18.9	7.2	7.3	0.5	12.9	12.5
Non-Nearshore	182.1	0.0		0.0		7.0		0.5	0.7	0.8
LE FG										
OA FG										
Directed OA: Nearshore	2.3	0.5		0.0		0.2		0.0	2.0	2.0
Recreational Groundfish										
WA h/						--		--	3.3	3.1
OR						--		--	3	2.9
CA i/	411.6	169.3		2.2		--		--	3.9	3.7
TOTAL	790.0	232.5	6.0	4.4	406.0	141.1	171.0	70.4	20.0	18.6
2017 Harvest Specification	**790**	**790**	**10.0**	**10.0**	**406**	406	**171**	171	**20**	20
Difference	0.0	557.5	4.0	5.6	0.0	264.9	0.0	100.6	0.0	1.4
Percent of ACL	100.0%	29.4%	60.0%	43.7%	100.0%	34.8%	100.0%	41.2%	100.0%	92.9%
Key			= not applicable							
	--		= trace, less than 0.1 mt							
			= Fixed Values							
			= Projection from GMT Model							
			= off the top deductions							

a/ Formal allocations are represented in the black shaded cells and are specified in regulation in Tables 1b and 1e. The other values in the allocation columns are 1) off the top deductions, 2) set asides from trawl allocation, 3) ad-hoc allocations recommended in the biennial process, 4) HG for the recreational fisheries for bocaccio, canary, and YE.

b/ South of 40°10' N. lat. The cowcod fishery HG (8 mt) is further reduced to an ACT of 4 mt.

c/ EFPs are amounts set aside to accommodate anticipated operations

d/ Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.

e/ The GMT's best estimate of impacts based on historical mortality.

f/ Tribal values represent the the values requested by the tribes.

g/ Values based on the 50 percentile (average) projection from the bootstrap model.

h/ Based on Bag Limit Option 1.

2018										
Fishery	**Bocaccio b/**		**Cowcod b/**		**Dkbl**		**POP**		**Yelloweye**	
	Allocation a/	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**
Off the Top Deductions	5.4	5.4	2.0	2.0	27.2	27.2	24.4	24.4	6.0	6.0
EFPc/										
Research d/	4.6	4.6	2.0	2.0	2.5	2.5	5.2	5.2	3.3	3.3
Incidental OA e/	0.8	0.8	0.0	0.0	24.5	24.5	10.0	10.0	0.4	0.4
Tribal f/					0.2	0.2	9.2	9.2	2.3	2.3
Trawl Allocations	176.8	53.7	1.4	0.2	372.3	107.0	144.0	45.7	1.1	0.1
--SB Trawl	176.8	53.7	1.4	0.2	353.0	97.9	126.6	39.3	1.1	0.1
--At-sea whiting MS					8.0	4.3	7.2	1.8		
--At-sea whiting CP					11.4	4.8	10.2	4.6		
Non-Trawl Allocation	558.8	169.8	2.6	2.2	19.6	7.5	7.6	0.5	12.9	12.1
Non-Nearshore	170.7	0.0		0.0		7.3		0.5	0.7	0.8
LE FG										
OA FG										
Directed OA: Nearshore	2.2	0.5		0.0		0.2		0.0	2.0	2.0
Recreational Groundfish										
WA h/						--		--	3.3	2.7
OR						--		--	3	2.9
CA i/	385.9	169.3		2.2		--		--	3.9	3.7
TOTAL	741.0	228.9	6.0	4.4	419.1	141.7	176.0	70.6	20.0	18.2
2018 Harvest Specification	**741**	**741**	**10.0**	**10.0**	**419**	419	**176**	176	**20**	20
Difference	0.0	512.1	4.0	5.6	0	277.3	0.0	105.4	0.0	1.8
Percent of ACL	100.0%	30.9%	60.0%	43.7%	100.0%	33.8%	100.0%	40.1%	100.0%	91.1%
Key			= not applicable							
	--		= trace, less than 0.1 mt							
			= Fixed Values							
			= Projection from GMT Model							
			= off the top deductions							

a/ Formal allocations are represented in the black shaded cells and are specified in regulation in Tables 1b and 1e. The other values in the allocation columns are 1) off the top deductions, 2) set asides from trawl allocation, 3) ad-hoc allocations recommended in the biennial process, 4) HG for the recreational fisheries for bocaccio, canary, and YE.

b/ South of 40°10' N. lat. The cowcod fishery HG (8 mt) is further reduced to an ACT of 4 mt.

c/ EFPs are amounts set aside to accommodate anticipated operations

d/ Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.

e/ The GMT's best estimate of impacts based on historical mortality.

f/ Tribal values represent the the values requested by the tribes.

g/ Values based on the 50 percentile (average) projection from the bootstrap model.

h/ Based on bag limit option 1.

i/ Based on Season Option 3.

4.1.1.3 Harvest Guidelines

Accountability measures that increase the likelihood that total catch stays within the ACL include HGs, which are a specified numerical harvest objective that is not a quota. Attainment of an HG does not require closure of a fishery.

Blackgill Rockfish South of 40°10' N. Latitude

In 2017, blackgill rockfish is a component stock that would be managed within the Slope Rockfish complexes north and south of 40°10' N. latitude. In the south, blackgill rockfish is a precautionary zone stock and a 40:10 adjusted HG is established in the amount of 120 mt. The HG is subject to trawl/non-trawl allocations implemented under Amendment 21 (63 percent to trawl and 37 percent to non-trawl). The 44.5 mt blackgill rockfish share for the non-trawl sector is further allocated 60 percent to limited entry (27 mt) and 40 percent to open access fixed gears (18 mt). Analyses of these trip limits can be found in Section 4.1.1.6. This apportionment reflects the historical distribution of catch between the limited entry and open access fixed gear sectors from 2005 to 2010 (Table 3 in Agenda Item E.9.b, GMT Report 2, November 2011).

In November 2015, the Council recommended removing blackgill rockfish from the Slope Rockfish complex south of 40°10' N. latitude and establishing new Amendment 26 allocations for blackgill rockfish (41 percent to trawl and 59 percent to non-trawl) and the remaining species in the Slope Rockfish complex south of 40°10' N. latitude (91 percent to trawl and 9 percent to non-trawl). If the Council recommendation is approved by NMFS, the new configurations and allocations would begin in 2018, but would be implemented through a separate action. The Council also chose to examine two apportionment approaches for the 2018 fixed gear trip limits: the status quo (2016 approach) of 60 percent for limited entry and 40 percent for open access, and 70 percent for limited entry and 30 percent for open access. Analyses of these trip limits can be found in Section 4.1.1.6 and Table 4-28.

Blue Rockfish South of 42° N. Latitude

The blue rockfish harvest guideline for the area south of 42° N. latitude is the sum of three components: 1) the assessed stock's contribution to the Nearshore Rockfish complex ABC (south of 40° 10' N. latitude), 2) the contribution for the unassessed portion south of Point Conception, and 3) the contribution to the Nearshore Rockfish complex ABC for the area between 40° 10' N. latitude 42° N. latitude. For 2017 and 2018, this results in a 305 and 311 mt HG, respectively, for blue rockfish south of 42° N. latitude. The OFLs were derived from the 2007 assessment (Key et al. 2008), which was conducted for the portion of the stock in waters off California north of Point Conception at 34º27' N. latitude, plus the contribution for the unassessed area south of Point Conception. The ABCs were derived using a P* of 0.45 for category 2 stocks, which was then adjusted using the 40-10 default harvest policy, as specified in the FMP for species in the precautionary zone. The HG contribution for the unassessed portion of the stock south of Point Conception was calculated by first estimating an OFL using the depletion-corrected average catch (DCAC) methodology and then applying an ABC adjustment (using a P* of 0.45 for a category 3 stock). The HG contribution for the unassessed area was set equal to the ABC, since the stock is assumed to be above B_{MSY}.

Canary Rockfish

As described in Section 2.2.4, the latest canary rockfish assessment indicates that the stock is rebuilt. In addition to the two-year trawl and non-trawl allocations, state-specific HGs are established for the Washington, Oregon, and California recreational fisheries. Additionally, shares have been identified for the nearshore and non-nearshore fisheries. Table 4-7 summarizes the canary rockfish allocations under No Action.

Table 4-7. No Action. Canary rockfish allocations, HGs, and shares.

Sector	2017	2018
Fishery Harvest Guideline	1,670.6	1,544.6
Trawl Allocation	**890.0**	**822.9**
Shorebased IFQ	*676.1*	*625.1*
Catcher Processor	*124.9*	*115.5*
Mothership	*89.0*	*82.3*
Non-Trawl Allocation	**780.6**	**721.7**
Non-Nearshore	*59.4*	*55.0*
Nearshore Fixed Gear	*104.8*	*96.9*
Washington Recreational a/	*53.2*	*49.2*
Oregon Recreational a/	*183.0*	*169.2*
California Recreational a/	*380.1*	*351.4*

Nearshore Rockfish North of 40°10' N. Latitude

The West Coast states propose to monitor and manage catches of Nearshore Rockfish north of 40° 10' N. latitude using state-specific HGs. If harvest levels in a particular state approach 75 percent of the state-specific HGs, the states will consult via a conference call and determine whether inseason action would be needed. The HGs for Washington and Oregon would be state HGs and not established in Federal regulations. In California, the HG would be specified in Federal regulation and would apply only in the area between 42° N. latitude to 40°10' N. latitude. If inseason action were needed, the states of Washington and Oregon would take action through state regulation. California would propose changes through Federal regulations. Inseason updates would be provided to the Council at the September and November meetings.

The Council requested analysis of a range of state-specific Nearshore Rockfish HGs north of 40° 10' N. latitude (Table 4-8). The status quo methodology for calculating the HG would use the same proportions of the state-specific HG as in 2016. That is, the northern Nearshore Rockfish commercial HG would be allocated 12.7 percent to Washington, 58.6 percent to Oregon, and 28.7 percent to California. Under Option 1, the states would equally share the ACL contributions for the stocks without state assessment boundaries. For stocks that have state-specific stock assessment boundaries, the states would receive 100 percent of the ACL contribution. For example, Washington would receive 100 percent of the ACL contribution of the Washington China rockfish assessment. Under Option 2, status quo proportions were used to allocate stocks without state-specific assessment boundaries. For stocks that have state-specific stock assessment boundaries, the states would receive 100 percent of the ACL contribution. Analysis of the range of Nearshore Rockfish HG can be found in the description of the Nearshore Commercial, Washington Recreational, Oregon Recreational, and California Recreational fisheries that follows.

Table 4-8. Range of Nearshore Rockfish north of 40° 10' N. latitude HGs.

		Option		
Stock	**State**	**No Action**	**Option 1**	**Option 2**
Nearshore Rockfish North of 40°10´ N. Lat.	WA	13.1	25.6	16.9
	OR	60.5	36.2	46.1
	CA	29.6	41.4	40.2

Range of Canary Rockfish Trawl and Non-Trawl Allocations

The 53 percent trawl and 47 percent non-trawl allocations of canary rockfish used in the integrated alternatives analysis are based on the biennial allocations for 2015-2016. The Council requested a range of allocations be explored including moving 5 to 15 percent of the canary rockfish allocation from the non-trawl sector to the trawl sector or establishing allocations that reflect historical allocations percentages from 1990 to present.

Range of Bocaccio Rockfish Trawl and Non-Trawl Allocations

The 24 percent trawl and 76 percent non-trawl allocations of bocaccio rockfish used in the integrated alternatives analysis are based on the biennial allocations for 2015-2016. The Council requested an analysis that would move from 5 to 15 percent of the bocaccio rockfish allocation to the trawl sector. The analysis indicates that the maximum amount (15 percent) could be moved from the non-trawl sector without disrupting current fishery operations. That is, no additional management measures would be necessary to keep catch within the non-trawl allocation even if the allocation were reduced by 15 percent.

State Quotas

In addition to Federal HGs, there are state quotas for nearshore species that further limit harvest in the commercial nearshore and recreational fisheries. In Oregon, the decision to allocate nearshore species between the commercial and recreational fisheries is made by the Oregon Fish and Wildlife Commission (Commission). The nearshore species that are allocated between the commercial and recreational fisheries by the Commission include kelp greenling, cabezon, black rockfish, and the rockfish species within the Federal Nearshore Rockfish complex. Decisions made by the Commission occur after final Council action to adopt the Federal harvest specifications and are implemented through state regulation only. To facilitate the analysis of the Federal action to establish harvest specifications (i.e., to ensure that the combined removals from the sport and commercial fisheries did not exceed Federal allocations to Oregon as a whole), assumptions were made about the possible state allocations of these nearshore species to the commercial and recreational fisheries (i.e., status quo percentages). These values are placeholders and do not presuppose future action by the Commission.

In California, allocations between the commercial and recreational fisheries are made by the Fish and Game Commission, with the authority to allocate nearshore rockfish, cabezon, and kelp greenling. These allocations were used to support analyses in development of management measures for Federal action.

HG Summary

Yield set-asides and HGs, including quotas established by state entities, are accountability measures that increase the probability that catches will remain at or below the ACLs. Table 4-9 summarizes the HGs proposed for use in management in 2017-2018.

Table 4-9. Harvest Guidelines for 2017-2018.

Species	Description	2017 (mt)	2018 (mt)
Blackgill S. of 40° 10' N. lat. [a/]	HG within the Slope Rockfish complex South of 40° 10´ N. lat.	120.2	N/A
	HG within the Non-Trawl Slope Rockfish Allocation South of 40° 10´ N. lat.	44.5	N/A
	--Limited Entry Share (60%)	*26.7*	*43.3*
	--Open Access Share (40%)	*17.8*	*28.9*
Blue Rockfish S. of 42° N. lat.	HG within the Nearshore Rockfish complex North and South of 40° 10´ N. lat.	304.5	311.1
Nearshore Rockfish 40° 10' N. lat. to 42° N.	HG within the Nearshore Rockfish complex North and South of 40° 10´ N. lat.	29.6	29.6

a/ In 2018 Amendment 26 is expected to be implemented and a blackgill HG within the non-trawl allocation is no longer needed. The non-trawl allocation would continue to be divided between the limited entry and open access sectors.

4.1.1.4 Shorebased Individual Fishing Quota (IFQ) – No Action

Principle management measures for the shorebased IFQ fishery include:

- Catch Controls: IFQ and individual bycatch quota (IBQ) for Pacific halibut north of 40° 10' N. latitude are the primary catch control tools in the shorebased IFQ fishery. South of 40° 10' N. latitude, Pacific halibut would be managed with a set-aside. The 2014 IFQ and IBQ used in the analysis of No Action can be found in Table 4-10 and 4-2. Additionally, cumulative monthly landing limits (hereinafter trip limits) for non-IFQ species and Pacific whiting outside the primary season dates apply to each vessel (see regulations Table 1 North and South to Part 660, Subpart D). Once a vessel reaches a limit, the species or species complex can no longer be retained and sold.
- Accumulation limits: The maximum number of quota shares (QS) and quota pounds (QP) an entity may control in the shorebased IFQ fishery is limited by accumulation limits (defined in regulation at 50 CFR 660.111). These limits vary according to the management unit for the stock or stock complex and are intended to prevent the consolidation of quota holdings by just a few entities.
- Carryover provision: The carryover provision allows a limited amount of surplus QP or IBQ pounds in a vessel account to be carried over from one year to the next or allows a deficit in a vessel account in one year to be covered with QP or IBQ pounds from a subsequent year, up to a carryover limit. The carryover provision is anticipated to increase individual flexibility for harvesters, improve economic efficiency, and achieve OY while preserving the conservation of stocks. The eligible percentages used for the carryover provision may be modified during the biennial specifications and management measures process or based on a Council inseason recommendation, pending NMFS approval. Species eligible for potential issuance of surplus carryover include those where the ABC is larger than the ACL.
- Monitoring and Reporting: All trips in the shorebased IFQ fishery are monitored at sea by the WCGOP and landings are tracked by electronic fish tickets, verified by catch monitors. Together, these two programs provide robust, near-real time tracking and reporting of IFQ species and Pacific halibut IBQ.

- Gear Restrictions: IFQ species may be harvested with groundfish trawl or legal groundfish non-trawl gear. Trawl gear restrictions prohibit certain types of gear that may be used in rocky habitat, reducing habitat impacts and also limiting overfished species bycatch for those species that inhabit rocky substrate. Further, gear restrictions minimize catch of overfished species while allowing sufficient access to target species. For example, the selective flatfish trawl net, which is required shoreward of the trawl RCA north of 40° 10' N. latitude, reduces rockfish bycatch while efficiently catching flatfish. Scottish seine gear is exempted from trawl RCA closures in the area between 38° N. latitude and 36° N. latitude and depths less than 100 fm because the gear has demonstrated low bycatch rates of overfished species. IFQ species can also be harvested with legal non-trawl gears.
- RCAs: Vessels harvesting IFQ must abide by RCA closures, which are specified by gear type. For example, vessels fishing with legal groundfish non-trawl gear must abide by the non-trawl RCA, while vessels fishing with bottom trawl gear must abide by the trawl RCA. These RCA features were designed to provide sufficient access to target species while minimizing bycatch of overfished species.
- Bycatch Reduction Areas: Bycatch on Pacific whiting trips can be mitigated by implementing bycatch reduction areas. These area restrictions apply to vessels on Pacific whiting trips using midwater gear during the primary whiting season and limit fishing to depths greater than any of the specified management lines between 75 fm and 150 fm (see regulations at 660.131(c)(4) Subpart D).
- Ocean Conservation Zones: Chinook salmon bycatch on Pacific whiting trips can be mitigated by implementing the ocean salmon conservation zones. These zones apply to vessels on Pacific whiting trips using midwater gear during the primary whiting season and restrict fishing to depths seaward of 100 fm.
- Other Groundfish Conservation Areas (GCA) – Several other GCAs exist and provide overfished species and habitat protection. Though limited bottom trawling occurs south of Point Conception at 34° 27' N. latitude in the Southern California Bight, bottom trawling and other bottom fishing activities are prohibited in two discrete areas called the Cowcod Conservation Areas (CCAs) (Figure 4-1.a). Closed EFH areas are used to protect bottom habitat from the adverse effects of trawl gear (see regulations at 660.75). Three areas off the Washington coast are designed to reduce bycatch of yelloweye rockfish. North Coast Area B and South Coast Area B are closed to commercial fishing (Figure 4-1.a and b). South Coast Area A is a voluntary "area to be avoided" for commercial groundfish fisheries.

Impact (Groundfish Mortality)

The projected groundfish mortality for IFQ species under No Action, as a result of implementing the above-mentioned management measures can be found in Table 4-10 and 4-2, as well as mortality estimates for 2013 and 2014 for comparison. Description of the projection model used for this sector (Matson and Taylor 2015) can be found in Appendix C. Groundfish mortality of non-IFQ species is not projected using a model; however, historical data from 2013 and 2014 are provided for comparison (Table 4-3).

The difference in projected mortality resulting from the No Action Alternative versus the average for 2013 and 2014 varies among species by between a few percent (e.g. Dover sole) to as much as 50 times (for canary rockfish), although projections for most species are quite similar to 2013-2014 estimates. Since the canary rockfish stock was determined to be rebuilt with the new assessment in 2015, allocations under all alternatives have increased dramatically. The projected mortality for widow rockfish and bocaccio has also risen dramatically, coincident with large increases in their allocations under all alternatives including No Action. Total catch of widow rockfish is projected to double (compared with 2013 and 2014) under No Action, while bocaccio catch is projected to increase five times. The 2015 bocaccio stock assessment

predicted the stock would be rebuilt by the start of 2016. The Alternative 1 and 2 widow rockfish ACLs are higher in the 2017-18 cycle, after a lag following its rebuilt status determination (due to reapportionment issues related to its change in status from bycatch to target).

For these species (bocaccio, canary rockfish, and widow rockfish), historical data from the late 1990s (when the OYs and harvest guidelines were in a similar range of the alternatives, the stocks were not overfished, and species-specific tracking and management were in use) were used to supplement the model reference data, since the alternatives were well out of range of any allocations under IFQ years. The addition of supplemental historical data was necessary to reasonably inform projections, and it also added uncertainty. Allocation levels under the alternatives are much higher for these species than under IFQ management. During the most recent time period when the amount of fish available to the trawl fishery was in the same range as the alternatives (late 1990s), a much higher proportion of the amount available to the trawl fishery was taken (formal trawl allocations did not exist in the 1990s). An assumption made when using these data was that the relevant market conditions and other constraints (e.g. bycatch) will either be similar enough, or surmountable enough in the current management regime of IFQ, to enable similar proportions of the allocations to be harvested in 2017 and 2018, as informed by the historical data. All data were year-weighted, and model sensitivity was evaluated. Uncertainty and use of historical data are both explained further in Appendix A, Model Descriptions.

Pacific halibut IBQ north of 40° 10′ N. latitude
The shorebased IFQ program keeps this sector's bycatch of Pacific halibut IBQ (north of 40° 10′N. latitude) within expectations by requiring that trawlers account for their total mortality of all halibut in round weight (legal- and sublegal-sized). Therefore, to determine a trawl bycatch mortality limit, the amount of halibut pounds available to the trawl fleet is determined annually by converting the expected legal-sized halibut mortality (net weight) into a round weight legal + sublegal-sized amount. To achieve this, the following conversions are applied.

- Net weight to round weight conversion: multiply by the IPHC net weight to round weight conversion factor in use at the time of each year's calculation.
- Legal to legal + sublegal-sized conversion factor: multiply by the ratio of legal-sized halibut to legal + sublegal-sized halibut from the most up-to-date NMFS analysis of trawl fishery bycatch available at the time of each year's calculation.

After these conversions, 10 mt is subtracted to cover bycatch mortality in the at-sea whiting fishery and trawl fishery south of 40° 10' N. lat., and the remainder is issued as IBQ, used by vessels operating in the program.

The formula used to calculate the Pacific halibut trawl bycatch mortality limit and allocation for this sector is specified in the Groundfish FMP at Section 6.3.2.3 under "Allocation of Pacific Halibut" and in the U.S. Codified Federal Regulations (CFR) for groundfish at 50 CFR part 660.55(m). From 2015 forward, 15 percent of the Area 2A total catch exploitation yield (TCEY) for legal-sized halibut (net weight), not to exceed 100,000 pounds, is subtracted from the TCEY to account for expected trawl bycatch mortality of legal-sized halibut (net weight). This means the cap is evaluated before conversions are applied, and is the same under all alternatives. Under the current cap level and 2016 conversion rates, the result is that any TCEY for Area 2A higher than 666,667 pounds yields no further increase to the annual Pacific halibut IBQ mortality limit for the IFQ program. The TCEY used in the calculation is determined by the IPHC annually. The bycatch allocation percent can be adjusted downward or upward (above or below 15 percent) through the biennial specifications and management measures process but the upper bound on the maximum allocations can only be changed though an FMP amendment.

Non-IFQ species

Recent catches (2013 and 2014) for non-IFQ species are shown in Table 4-3, to serve as guidance in lieu of projections, since no model exists for these species. Under No Action, big skate is classified as an EC species and is managed with trip limits (Table 4-13).

Table 4-10. No Action – Shorebased IFQ. Projected mortality for IFQ species and Pacific halibut IBQ under No Action (2017 values), compared to the allocations or set-asides. Year-end estimates of mortality for 2013 and 2014 are provided for reference (right panel).

IFQ Species	Area	No Action 2017		Historical Mortality a/	
		Projected Mortality (mt)	SB IFQ Allocation (mt)	2013 SB IFQ Mortality (mt)	2014 SB IFQ Mortality (mt)
Arrowtooth flounder	Coastwide	2,302.2	11,050.6	2,433.9	1,734.8
BOCACCIO	South of 40°10' N. lat.	57.3	188.6	12.9	9.0
Canary rockfish	Coastwide	538.6	676.1	10.2	10.5
Chilipepper	South of 40°10' N. lat.	353.8	1,943.3	395.0	312.3
COWCOD	South of 40°10' N. lat.	0.17	1.44	0.22	0.20
DARKBLOTCHED	Coastwide	97.6	341.1	116.3	97.8
Dover sole	Coastwide	7,062.1	45,981.0	7,975.6	6,495.1
English sole	Coastwide	240.7	9,258.6	220.6	237.5
Lingcod	North of 40°10' N. lat.	315.4	1,359.9	340.2	239.2
Lingcod	South of 40°10' N. lat.		559.4	16.7	18.7
Longspine thornyheads	North of 34°27' N. lat.	942.7	2,699.8	1,089.0	898.6
Shelf Rockfish	North of 40°10' N. lat.	66.5	1,149.9	29.8	34.1
Shelf Rockfish	South of 40°10' N. lat.	15.5	195.9	20.2	9.7
Slope Rockfish	North of 40°10' N. lat.	260.6	1,269.6	195.6	184.1
Slope Rockfish	South of 40°10' N. lat.	119.5	433.3	117.4	99.1
Other Flatfish	Coastwide	1,549.2	7,455.4	801.7	840.2
Pacific cod	Coastwide	156.5	1,031.4	154.1	166.0
Pacific halibut b/	North of 40°10 N. lat.	26.1	84.5	33.0	27.5
PACIFIC OCEAN PERCH	North of 40°10' N. lat.	39.1	121.9	49.0	40.5
Pacific whiting c/	Coastwide	83,693.1	112,007.3	97,621.3	98,714.1
Petrale sole	Coastwide	2,620.2	2,745.3	2,130.0	2,313.5
Sablefish	North of 36° N. lat.	2,660.0	2,790.1	1,850.8	1,884.3
Sablefish	South of 36° N. lat.	143.9	449.4	90.7	206.2
Shortspine thornyheads	North of 34°27' N.	695.0	1,551.3	828.1	683.2
Shortspine thornyheads	South of 34°27' N	2.5	50.0	3.7	2.7
Splitnose rockfish	South of 40°10' N. lat.	64.1	1,663.3	46.2	67.1
Starry flounder	Coastwide	10.0	630.9	3.5	14.7
Widow rockfish	Coastwide	1,078.8	1,340.1	411.6	654.0
YELLOWEYE ROCKFISH	Coastwide	0.08	1.15	0.06	0.06
Yellowtail rockfish	North of 40°10' N. lat.	1,401.5	4,254.9	719.3	1,163.6

a/ Historical estimates of mortality were generated using the NMFS Pacific Coast IFQ Program Database (January 2015). Pacific whiting values include inseason allocation reapportionments.

b/ Pacific halibut is managed using IBQ, see regulations at §660.140. The 2016 Pacific halibut TAC was unavailable during the preparation of the analysis; therefore, the 2015 values were used.

c/ The 2016 Pacific whiting TAC was unavailable during the preparation of the analysis, therefore the 2015 values were used.

Table 4-11. No Action – Shorebased IFQ. Projected mortality for IFQ species and Pacific halibut IBQ under No Action (2018 values), compared to the allocations or set-asides. Year-end estimates of mortality for 2013 and 2014 are provided for reference.

IFQ Species	Area	No Action 2018		Historical Mortality a/	
		Projected Mortality (mt)	SB IFQ Allocation (mt)	2013 SB IFQ Mortality (mt)	2014 SB IFQ Mortality (mt)
Arrowtooth flounder	Coastwide	2,299.8	10,992.6	2,433.9	1,734.8
BOCACCIO	South of 40°10' N. lat.	53.7	176.8	12.9	9.0
Canary Rockfish	Coastwide	498.0	625.1	10.2	10.5
Chilipepper	South of 40°10' N. lat.	353.8	1,868.3	395.0	312.3
COWCOD	South of 40°10' N. lat.	0.17	1.4	0.22	0.20
DARKBLOTCHED	Coastwide	97.9	352.8	116.3	97.8
Dover sole	Coastwide	7,062.1	45,981.0	7,975.6	6,495.1
English sole	Coastwide	220.2	6,953.0	220.6	237.5
Lingcod	North of 40°10' N. lat.	291.0	1,259.5	340.2	239.2
Lingcod	South of 40°10' N. lat.		511.2	16.7	18.7
Longspine thornyheads	North of 34°27' N. lat.	939.5	2,560.2	1,089.0	898.6
Shelf Rockfish	North of 40°10' N. lat.	66.4	1,148.7	29.8	34.1
Shelf Rockfish	South of 40°10' N. lat.	15.5	196.0	20.2	9.7
Slope Rockfish	North of 40°10' N. lat.	260.5	1,268.8	195.6	184.1
Slope Rockfish	South of 40°10' N. lat.	101.5	357.1	117.4	99.1
Other Flatfish	Coastwide	1,319.3	6,349.3	801.7	840.2
Pacific cod	Coastwide	156.5	1,031.4	154.1	166.0
Pacific halibut b/	North of 40°10 N. lat.	26.1	84.5	33.0	27.5
PACIFIC OCEAN PERCH	North of 40°10' N. lat.	39.3	126.6	49.0	40.5
Pacific whiting c/	Coastwide	83,693.1	112,007.3	97,621.3	98,714.1
Petrale sole	Coastwide	2,508.7	2,628.5	2,130.0	2,313.5
Sablefish	North of 36° N. lat.	2,776.3	2,912.1	1,850.8	1,884.3
Sablefish	South of 36° N. lat.	149.9	468.3	90.7	206.2
Shortspine thornyheads	North of 34°27' N.	694.5	1,537.0	828.1	683.2
Shortspine thornyheads	South of 34°27' N	2.5	50.0	3.7	2.7
Splitnose rockfish	South of 40°10' N. lat.	64.1	1,664.2	46.2	67.1
Starry flounder	Coastwide	10.0	630.9	3.5	14.7
Widow rockfish	Coastwide	1,078.8	1,340.1	411.6	654.0
YELLOWEYE ROCKFISH	Coastwide	0.08	1.1	0.06	0.06
Yellowtail rockfish	North of 40°10' N. lat.	1,347.9	4,084.2	719.3	1,163.6

a/ Historical estimates of mortality were generated using the NMFS Pacific Coast IFQ Program Database (January 2015). Pacific whiting values include inseason allocation reapportionments.
b/ Pacific halibut is managed using IBQ, see regulations at §660.140. The 2016 Pacific halibut TAC was unavailable during the preparation of the analysis; therefore, the 2015 values were used.
c/ The 2016 Pacific whiting TAC was unavailable during the preparation of the analysis, therefore the 2015 values were used.

Table 4-12. Recent mortality estimates for non-IFQ stocks in the shorebased IFQ fishery (mt).

Stock	2013	2014
Big Skate	138	388
California Skate	6	2
Grenadier Unidentified	105	61
Groundfish Unidentified	0	0
Longnose skate	985	901
Pacific Flatnose	8	2
Pacific Grenadier	218	85
Shortbelly rockfish	25	17
Skate Unidentified	17	21
Soupfin Shark	2	5
Spiny Dogfish Shark	638	613
Spotted Ratfish	109	96

Table 4-13. Big skate trip limits coastwide for shorebased IFQ fishery for 2017-2018.

JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
5,000	25,000	30,000	35,000	10,000	5,000

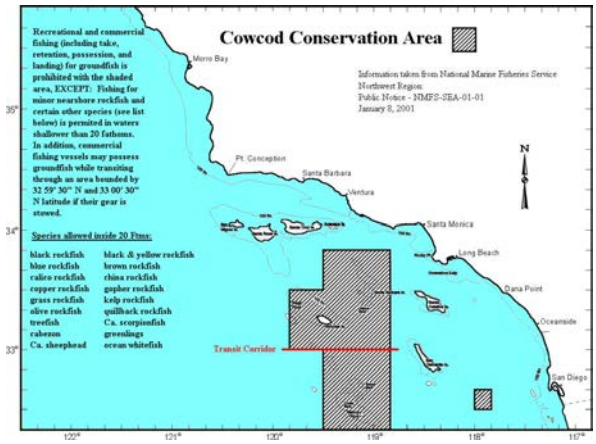
Table 4-14. Trawl RCA configuration in regulation as of February 3, 2016.

Area	JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
North of 48°10' N. lat.	shore - modified/ 200 fm line	shore - 200 fm line	shore - 150 fm line		shore - 200 fm line	shore - modified 200 fm line
48°10' N. lat. - 45°46' N. lat.	100 fm line - 150 fm line					
45°46' N. lat. - 40°10' N. lat.	100 fm line - modified 200 fm line					
South of 40°10' N. lat.	100 fm line - 150 fm line					

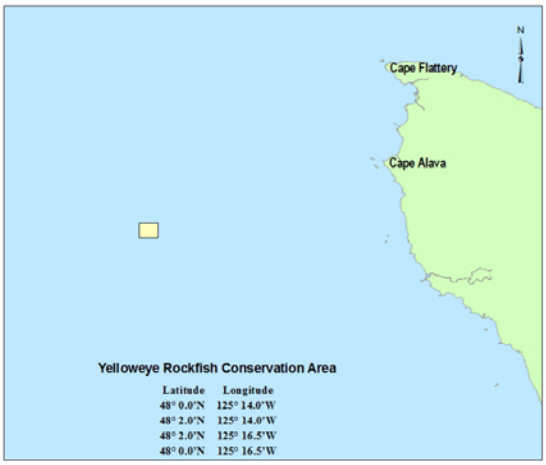
Table 4-15. Non-Trawl RCA configuration in regulation as of February 3, 2016.

Area	JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
North of 46°16' N. lat.	shoreline - 100 fm line					
46°16' N. lat. - 42°00' N. lat.	30 fm line - 100 fm line					
42°00' N. lat. - 40°10' N. lat.	30 fm depth contour - 100 fm line[/]					
40°10' N. lat. - 34°27' N. lat.	30 fm line - 150 fm line					
South of 34°27' N. lat.	60 fm line - 150 fm line					

a.



b.



c.

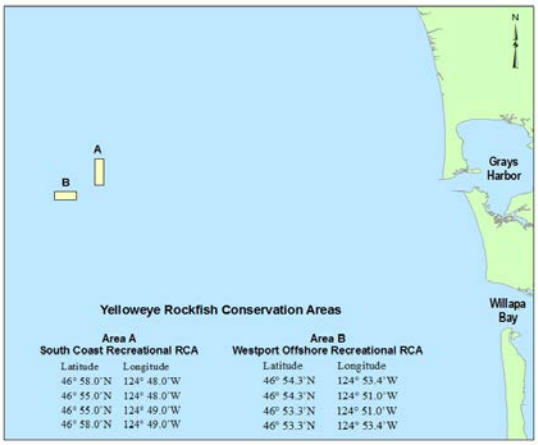


Figure 4-1. No Action – Selected GCAs. a. The current Cowcod Conservation Areas located in the Southern California Bight; b. North Coast Area B, a Yelloweye Rockfish Conservation Area in northern Washington; c. South Coast Area A and B, Yelloweye Rockfish Conservation Areas in southern Washington. South Coast Area A is an area to be voluntarily avoided.

4.1.1.5 At-Sea Whiting Co-ops – No Action

The at-sea sector is composed of catcher-processors and motherships that target Pacific whiting with midwater trawl gear and process at sea. Management measures include allocations for Pacific whiting,

canary rockfish, darkblotched rockfish, Pacific ocean perch (POP), and widow rockfish, and set-asides for bycatch species. Further, measures are established that restrict the Pacific whiting season dates and provide for bycatch reduction areas and ocean salmon conservation zones (see regulations at 660.131).

The at-sea sector is managed under a system of cooperatives (co-ops) that are similar to IFQs except that the harvest privilege is assigned to a group, the co-op, instead of an individual. The members of the group then decide how and when the collectively-held harvest privilege would be used. The trawl rationalization program establishes a set of rules for the formation of co-ops in the at-sea mothership sector that provide a strong incentive for catcher vessels to form co-ops associated with a mothership processor (see regulations at 50 CFR 660.150). In the case of the catcher-processor sector, a single, voluntary co-op has been in existence for some time. In that instance, the allocation to the sector is essentially an allocation to the co-op. Further, a catcher-processor permit endorsement is required, which essentially closes this sector to new entrants; a move intended to lend greater stability to the functioning of the current, voluntary co-op. Regulations at 50 CFR 660.160 further outline the catcher-processor co-op provisions.

Impact (Groundfish Mortality)

Under No Action, the 2017-2018 ACLs for non-whiting species would be established using default harvest control rules (Section 2.1.1). The catcher-processor and mothership co-op allocations for darkblotched rockfish, POP, and widow rockfish would be derived based on the percentages outlined in section 6.3.2.3 of the FMP and regulations at 660.55 (Table 4-16). For canary, two-year allocations are established. For Pacific whiting, the 2015 TAC and associated allocations were used as a proxy for the analysis since the 2017-2018 TAC is established in another process and is not yet available. The allocations may be considered the highest estimate of groundfish mortality since the fishery is managed to stay within the allocations. Alternatively, groundfish mortality in the at-sea sectors can be projected by using a bycatch rate approach or a bootstrap simulation (see Appendix A for model documentation). Table 4-17 shows projections for both catcher-processors and motherships using the average historical bycatch rate from 2011-2014, positively weighted for more recent years, applied to the 2015 whiting TAC as a proxy. Table 4-18 and Table 4-19 use a bootstrap simulation to determine the distribution of bycatch compared to the allocations (Table 4-16) as well the risk of not attaining the whiting TAC. The bootstrap simulation uses individual whiting haul data from 2000-2015. 10,000 simulations were run on the data, with each individual simulated season first randomly selecting a year (e.g., 2003) and then resampling from all individual non-zero (i.e., at least some whiting was caught) hauls within the selected year until a season closure occurred. A closure was only simulated if a sector was projected to either: 1) attain the whiting TAC, or 2) exceed the POP, widow, or darkblotched allocation. Note that due to the wide range of canary allocation alternatives, canary harvest was not restricted during the bootstrap simulation. Historically, canary catches have been quite low in both the mothership and catcher-processor sectors and have not been constraining. Unless behavior were to shift dramatically, the bootstrap simulation should inform the allocation that would not constrain the at-sea fleet. In the projections below, it can be understood that a certain percentage of the time, the sector is projected to land the corresponding value or less as these are a distribution of results. In other words, in Table 4-18, the column labeled 90 percent means that 90 percent of the simulations would land 10.3 mt or less of POP, or that 10 percent of the simulations exceed 10.3 mt and therefore the POP allocation.

Set-asides for bycatch species would be established based on values present in 2016 regulations and if needed, increased to cover the highest of 2014 and 2015 catches (Table 4-20). The Other Fish complex contains nearshore species which are not typically encountered in the at-sea whiting sectors. As such, the Council determined it was not necessary to specify an Other Fish complex set-aside. A range of spiny dogfish set-asides from 163 mt to 725 mt was analyzed in the 2015-2016 EIS along with a risk analysis for all sectors of exceeding the spiny dogfish ACL (see Section B.16, Appendix B). Given the low risk of

exceeding the spiny dogfish ACL, the Council did not recommend spiny dogfish set-asides for the at-sea sectors. A similar approach was used for the 2017-2018 cycle.

Table 4-16. No Action – At-Sea. Allocations for the catcher-processor (CP) and mothership sectors (MS) under the No Action Alternative for 2017-2018. Historical mortality for 2013 and 2014 by sector is provided (right panel) for reference.

		No Action Allocation				Historical Mortality for CPs and MS b/			
Stock	Area	2017 CP (mt)	2018 CP (mt)	2017 MS (mt)	2018 MS (mt)	2013 CP (mt)	2014 CP (mt)	2013 MS (mt)	2014 MS (mt)
Canary rockfish	Coastwide	124.9	115.5	89.0	82.3	0.2	0.3	0.3	0.4
DARKBLOTCHED	Coastwide	11	11.4	7.8	8.0	2.1	3.4	4.2	7.2
POP	N of 40º10' N. lat.	10.2	10.2	7.2	7.2	4.3	0.3	0.5	3.6
Pacific whiting a/	Coastwide	90,673	90,673	64,004	64,004	78,041	103,266	52,522	62,038
Widow rockfish	Coastwide	170	170	120	120	15.7	4.1	15.5	39.6

a/ The 2017 and 2018 Pacific whiting TACs were unavailable during the preparation of the analysis; therefore, the 2015 values were used.

b/ Pacific whiting mortality estimates were derived from the WCGOP GM Reports and include inseason reapportionments of whiting from the tribal sectors.

Table 4-17: No Action- At-Sea. Projections for the CP and MS sectors under the No Action Alternative for 2017-2018 using average historical bycatch rates (positively weighted for more recent years). No Action allocations are provided on the right for reference.

		No Action Allocation a/				2017/2018 Projection	
Stock	Area	2017 CP (mt)	2018 CP (mt)	2017 MS (mt)	2018 MS (mt)	CP (mt)	MS (mt)
Canary rockfish	Coastwide	124.9	115.5	89.0	82.3	0.3	0.4
DARKBLOTCHED	Coastwide	11	11.4	7.8	8.0	3.7	5.2
POP	N of 40º10' N. lat.	10.2	10.2	7.2	7.2	3.4	2.5
Pacific whiting	Coastwide	90,673	90,673	64,004	64,004	90,673	64,004
Widow rockfish	Coastwide	170	170	120	120	28.2	36.1

a/ The 2017 and 2018 Pacific whiting TACs were unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-18: No Action- At-Sea- Catcher-Processor. Landing projections for the CP sector under the No Action Alternative for 2017-2018 using the bootstrap methodology. No Action allocations are provided on the right for reference. Bolded text indicates values that are higher than the allocations.

Stock	CP All. (mt)	Percentage of Simulated Seasons									
		1%	5%	10%	25%	50%	75%	90%	95%	99%	99.99%
Whiting	90,673	20,699	35,393	53,388	89,201	90,673	90,673	90,673	90,673	90,673	90,673
DARKBLOTCHED	11	0.3	1.2	1.7	2.6	4.8	7.1	9.4	**11**	**12.1**	**13.6**
POP	10.2	0.1	0.2	0.3	1	4.6	8.1	**10.3**	**10.8**	**12.4**	**14.4**
Widow rockfish	170	3.5	5.7	8.4	14.1	30.5	67	97.2	119	**195.3**	**248.4**
Canary rockfish	124.9	0	0.1	0.1	0.2	0.4	0.6	1.1	2.1	3.8	7.3

Table 4-19: No Action- At-Sea- Mothership. Projections for the MS sector under the No Action Alternative for 2017-2018 using the bootstrap method sampling hauls from 2000-2015. No Action allocations are provided on the right for reference. Bolded text indicates values that are higher than the allocations.

Stock	MS All. (mt)	Percentage of Simulated Seasons									
		1%	5%	10%	25%	50%	75%	90%	95%	99%	99.99%
Whiting	64,004	14,536	26,272	39,460	59,164	64,004	64,004	64,004	64,004	64,004	64,004
DARKBLOTCHED	7.8	0.2	0.5	1	2.2	4.3	6.1	7.8	7.9	**9.1**	**10.7**
POP	7.2	0.1	0.1	0.3	0.9	1.8	3.4	5.3	**7.2**	**8.1**	**9.7**
Widow rockfish	120	1.6	11.7	15.4	22.7	46	70.1	96	**120.2**	**126.2**	**143.6**
Canary rockfish	89.0	0.1	0.1	0.1	0.3	0.6	1.1	1.9	2.2	12.3	31.9

Table 4-20. No Action – At-Sea. At-sea whiting set-asides and allocations under the No Action Alternative (adopted by the Council in November 2015). Historical mortality for the catcher-processor (CP) and mothership sectors (MS) and the 2016 set-asides in regulations are provided for reference.

No Action Set-Asides			2016 Total Set-Asides	Historical Mortality for CPs and MS a/		
Stock	Area	Total Set-Asides (mt)		2013 (mt)	2014 (mt)	Average 2011-2014 (mt)
Petrale sole	Coastwide	5	5	0.0	0.0	0.0
YELLOWEYE	Coastwide	0	0	0.0	0.0	0.0
Arrowtooth flounder	Coastwide	70	45	14.5	10.7	27.8
Dover sole	Coastwide	5	5	1.1	0.9	0.8
English sole	Coastwide	5	5	0.1	0.0	0.0
Lingcod	N of 40º10' N. lat.	15	15	1.5	0.9	0.7
Longnose skate	Coastwide	5	5	0.6	0.8	0.5
Longspine thornyhead	N of 34º27' N. lat.	5	5	0.0	0.0	0.1
Pacific cod	Coastwide	5	5	0.0	0.0	0.0
Pacific halibut b/	Coastwide	10	10	0.0	0.2	0.3
Sablefish	N of 36º N. lat.	50	50	12.7	16.1	9.7
Shortspine thornyhead	N of 34º27' N. lat.	20	20	0.3	20.4	8.8
Starry flounder	Coastwide	5	5	0.0	0.0	0.0
Yellowtail rockfish	N of 40º10' N. lat.	300	300	269.4	44.5	109.5
Shelf Rockfish north	N of 40º10' N. lat.	35	35	1.8	0.3	1.0
Slope Rockfish north	N of 40º10' N. lat.	100	100	44.6	25.4	59.0
Other Fish	Coastwide	N/A	N/A	12.1	8.2	7.3
Other Flatfish	Coastwide	20	20	0.0	0.0	0.0

a/ WCGOP Groundfish Mortality Reports.
b/ As stated in §660.55 (m), the Pacific halibut set-aside is 10 mt, to accommodate bycatch in the at-sea Pacific whiting fisheries and in the shorebased trawl sector south of 40°10' N. latitude (estimated to 5 mt each).

4.1.1.6 Limited Entry and Open Access Fixed Gear Management – No Action

Table 4-21 and Table 4-22 summarizes the principle management measures for the limited entry and open access fixed gear vessels. The sablefish stock is the primary target, in terms of volume and revenue, for both the limited entry and open access fixed gear sectors. A variety of nearshore species (e.g., black rockfish, Nearshore Rockfish complex, cabezon, lingcod, and kelp greenling) are targeted by a large number of vessels, but in relatively low volume.

One non-trawl RCA is implemented for the limited entry and open access fixed gear fisheries (Table 4-21 and Table 4-22). Routine RCA adjustments can be made for four northern subareas bounded by Cape Mendocino at 40° 10' N. latitude, 43° N. latitude, Cascade Head, Point Chehalis at 46.888° N. latitude, and the U.S.-Canada border. These adjustments may be necessary inseason to reduce projected catches of non-target species, typically yelloweye rockfish, while providing access to target species. RCA adjustments can also be accommodated to provide greater access to target species when overfished species mortality is projected to be within the non-nearshore share or non-trawl allocation (e.g., changing from 125 to 100 fm).

The non-trawl RCA seaward boundary south of 40° 10' N. latitude under the No Action Alternative is defined by management lines specified with waypoints at roughly 150 fathoms (fm) to avoid areas where bocaccio, canary rockfish, and yelloweye rockfish are most abundant.

Other GCAs include the North Coast Area B Yelloweye Rockfish Conservation Area (YRCA) in Washington, which has been closed to limited entry and open access fixed gears since 2007 (Figure 4-1.b). Additionally, the South Coast Areas A and B YRCAs and the "C-shaped" YRCA in waters off northern Washington are voluntary "areas to be avoided" (Figure 4-1.c and Figure 4-2). Fishing is not allowed in the CCAs (Figure 4-1.a) under the No Action Alternative, except for some nearshore commercial fishing opportunities described in Section 4.1.1.6 under the Nearshore section.

The models used project overfished species catches in the limited entry and directed open access fisheries and inform management measures are stratified by area of fishing shoreward (nearshore) or seaward (non-nearshore) of the non-trawl RCA (see Appendix A) . Therefore, the estimates of groundfish mortality under No Action and the action alternatives are presented using the same strata.

Table 4-21. No Action – Limited Entry Fixed Gear. Summary of limited entry fixed gear fishery management measures under the No Action Alternative.

Cumulative limits	• Cumulative trip limits for most species, specific to geographic area (See regulations Table 2 North and South to Part 660, Subpart E). Changes to the 2016 trip limits include sablefish in Table 4-26 and Table 4-27, blackgill rockfish in Table 4-28, yellowtail rockfish in Table 4-30, Shelf Rockfish complex in Table 4-31, black rockfish in Table 4-50, California scorpionfish in Table 4-52, bocaccio in Table 4-34, and canary rockfish in Table 4-47. • Primary sablefish fishery managed with tier limits in Table 4-23. • YELLOWEYE ROCKFISH landings prohibited coastwide • South of 40°10' N. latitude landings of cowcod and bronzespotted rockfish prohibited
Size limits	Lingcod • North of 42° N. lat. minimum size limit 22 inches total length • South of 42° N. lat. minimum size limit 24 inches total length
Gear restrictions	• Longline, trap or pot marked at the surface, at each terminal end, with a pole, flag, light, radar reflector, and a buoy • Must be attended at least once every 7 days • Traps must have biodegradable escape panels
Seasons	• Primary sablefish fishery from 4/1 to 10/31 • Permit stacking of up to 3 permits is allowed in primary sablefish fishery • Additional seasonal restrictions may be implemented via routine action or the fishery may "close" for some species or some areas during the year through inseason action
GCAs	YRCA • North Coast Commercial YRCA (WA) closed to commercial fixed gears • North Coast Recreational YRCA (WA) is a voluntary area to be avoided • Westport Offshore Recreational YRCA (WA) is a voluntary area to be avoided
	CCA Fishing is prohibited in CCAs with the following exceptions: • Fishing for "Other Flatfish" when using no more than 12 hooks, #2 or smaller • Fishing for rockfish and lingcod shoreward of 20 fm
	• Farallon Islands commercial fishing for groundfish is prohibited shoreward of 10 fm with the following exceptions: Fishing for "Other Flatfish" when using no more than 12 hooks, #2 or smaller • Cordell Banks Commercial fishing for groundfish is prohibited in depths less than 100 fm
	EFH Fishing with all bottom contact gear, including longline and pot/trap gear, is prohibited within the following EFH conservation areas: Thompson Seamount, President Jackson Seamount, Cordell Bank (50 fm (91 m) isobath), Harris Point, Richardson Rock, Scorpion, Painted Cave, Anacapa Island, Carrington Point, Judith Rock, Skunk Point, Footprint, Gull Island, South Point, and Santa Barbara. Fishing with bottom contact gear is also prohibited within the Davidson Seamount
Limited Entry Non-trawl RCAs	• North of 46°16' N. lat. Shoreline to 100 fm • 46°16'- 42° N. lat. 30 to 100 fm • 42°-40°10' N. lat. 30 fm depth contour to 100 fm • 40°10'-34°27' N. lat. – 30 to 150 fm • South of 34°27' N. lat. – 60 to 150 fm Fishing is prohibited in non-trawl RCAs with the following exception: Fishing for "Other Flatfish" when using no more than 12 hooks, #2 or smaller
Monitoring	• VMS required • WCGOP observer coverage when requested
Reporting	• VMS declarations

Table 4-22. No Action – Open Access. Summary of open access fishery management measures under the No Action Alternative based on regulations.

Cumulative limits	• Cumulative trip limits for most species, specific to gear type and geographic area (See regulations Table 3 North and South to Part 660, Subpart E) Changes to existing trip limits include sablefish in Table 4-26 and Table 4-27, blackgill rockfish in Table 4-28, yellowtail rockfish in Table 4-30, Shelf Rockfish complex in Table 4-31, black rockfish in Table 4-50, California scorpionfish in Table 4-52, bocaccio in Table 4-35and canary rockfish in Table 4-47. • YELLOWEYE ROCKFISH landings prohibited coastwide • South of 40°10' N. latitude landings of cowcod and bronzespotted rockfish prohibited
Gear restrictions	• Longline, trap, pot, hook-and-line (fixed or mobile), setnet (anchored gillnet or trammel net (south of 38° N. lat. only), spear, and non-groundfish trawl gear for: pink shrimp, ridgeback prawn, and California halibut or sea cucumbers (south of Pt. 38°57.50' N. lat.) <u>Non-groundfish trawl gear:</u> • Is exempt from the limited entry trawl gear restrictions • Footrope (>19") prohibited in EFH closed areas <u>Fixed gear:</u> • Must be marked at the surface, at each terminal end, with a pole, flag, light, radar reflector, and a buoy; vertical hook-and-line gear that is closely tended may be marked only with a single buoy of sufficient size to float the gear • Must be attended at least once every 7 days • Fishing for groundfish with set nets is prohibited in the fishery management area north of 38°00.00' N. lat. • Traps must have biodegradable escape panels • Spears may be propelled by hand or by mechanical means
Seasons	Seasonal restrictions may be implemented via routine action or the fishery may "close" for some species or some areas during the year through inseason action
GCAs	<u>YRCA</u> • North Coast Commercial YRCA (WA) closed to commercial fixed gears • North Coast Recreational YRCA (WA) is a voluntary area to be avoided • Westport Offshore Recreational YRCA (WA) is a voluntary area to be avoided • Salmon Troll YRCA. Fishing for salmon is prohibited
	<u>CCA</u> Fishing is prohibited in CCAs with the following exceptions: • Fishing for "Other Flatfish" when using no more than 12 hooks, #2 or smaller • Fishing for rockfish and lingcod shoreward of the 20 fm
Open Access non-trawl RCAs	• <u>North of 46°16' N. lat</u>. Shoreline to 100 fm • <u>46°16'- 42° N. lat.</u> 30 to 100 fm • <u>42°-40°10' N. lat.</u> 30 fm to 100 fm • <u>40°10'-34°27' N. lat.</u> – 30 to 150 fm • <u>South of 34°27' N. lat</u>. – 60 to 150 fm Fishing is prohibited in non-trawl RCAs with the following exception: Fishing for "Other Flatfish" when using no more than 12 hooks, #2 or smaller
Monitoring	• VMS required • WCGOP observer coverage when requested
Reporting	• VMS declarations

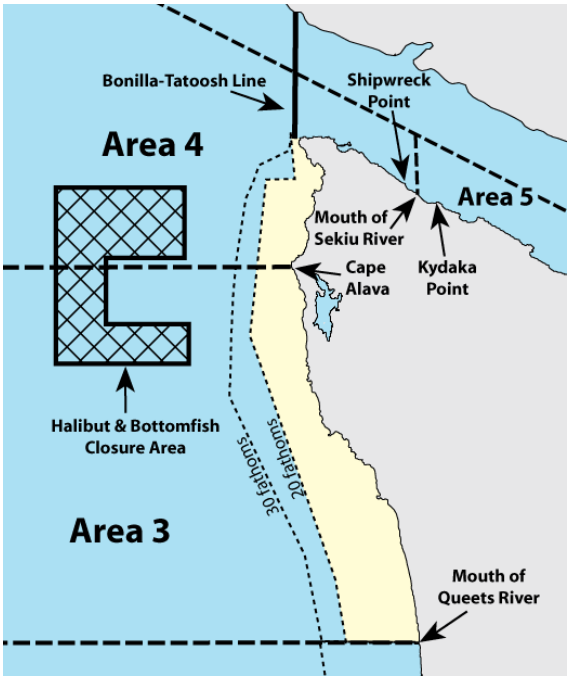


Figure 4-2. No Action. The current "C-shaped" Yelloweye Rockfish Conservation Area in waters off northern Washington where recreational groundfish and Pacific halibut fishing is prohibited.

Trip Limit Analysis

Sablefish

Table 4-23 and Table 4-24 summarize the FMP allocations of sablefish for limited entry and open access north of 36° N. latitude under No Action. South of 36° N. latitude, the FMP allocation of sablefish is 42 percent to the trawl sector and 58 percent to the non-trawl sector. A short-term allocation between the limited entry and open access fixed gear sectors of 55 percent and 45 percent, respectively, would be established. An alternative allocation between sectors of 75 percent to limited entry and 25 percent to open access is also being considered under No Action (Table 4-25). Trip limits intended to attain the allocations under No Action can be found in Table 4-26 for north of 36° N. latitude and Table 4-27 for both two-year allocation alternatives for south of 36° N. latitude.

Table 4-23. No Action - Limited entry sablefish FMP allocations north of 36° N. latitude, based on the default harvest control rule.

Year	Sablefish Com. HG	LE Share	LEFG Share (mt)				Estimated Tier Limits (lbs) a/		
			LE FG Total Catch Share	Landed Catch Share a/	Primary Season Share	LEFG DTL Share	Tier 1	Tier 2	Tier 3
2017	5,405	4,897	2,057	1,983	1,685	297	51,956	23,616	13,495
2018	5,637	5,107	2,145	2,068	1,758	310	54,188	24,631	14,075

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 2013. In 2017-2018, 18 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

Table 4-24. No Action - Open access FMP allocations north of 36° N. latitude, based on the default harvest control rule.

Year	OA Total Catch Share (mt)	Directed OA Landed Catch Share (mt) a/
2017	508	490
2018	530	511

a/ The open access total catch share is reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2013. In 2017-2018, 18 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

Table 4-25. No Action - Short-term sablefish allocations south of 36° N. latitude for the non-trawl sector, limited entry and open access under no action sharing alternative (55 percent to limited entry; 25 percent to open access) and alternative sharing of 75 percent to limited entry; 25 percent to open access.

Year	Commercial HG	Non-Trawl Allocation	Ratio of Limited Entry: Open Access	LE FG Total Catch Share	Directed OA Total Catch Share	LE FG Landed Catch Share a/	Directed OA Landed Catch Share
2017	1,070	621	55:45	341	279	329	269
			75:25	465	155	449	150
2018	1,143	647	55:45	356	291	343	281
			75:25	485	162	468	156

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 2013. In 2017-2018, 18 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

Table 4-26. No Action. Sablefish trip limits (lbs) north of 36° N. latitude for limited entry and open access fixed gears.

Fishery	Jan-Feb	Mar-Apr	May-Jun	July-Aug	Sept-Oct	Nov-Dec
Limited Entry	1,125 lbs./week, not to exceed 3,375 lbs. bimonthly					
Open Access	300 lbs. daily, or one landing per week up to 1,400 lbs., not to exceed 2,800 lbs. bimonthly					

Table 4-27. No Action . Sablefish trip limits (lbs) south of 36° N. latitude for limited entry and open access fixed gears with informal share noted in parenthesis.

Fishery	Jan-Feb	Mar-Apr	May-Jun	July-Aug	Sept-Oct	Nov-Dec
Limited Entry (55%)	1,500 lbs./week					
Limited Entry (75%)	1,700 lbs./week					
Open Access (45%)	300 lbs. daily, or 1 landing per week up to 1,600 lbs., not to exceed 3,200 lbs. bimonthly					
Open Access (25%)	300 lbs. daily, or 1 landing per week up to 1,600 lbs., not to exceed 3,200 lbs. bimonthly					

Blackgill Rockfish

In November 2015, the Council recommended removing blackgill rockfish from the Slope Rockfish complex south of 40°10' N. latitude and manage it with its own separate stock specific specifications beginning in 2018. Amendment 21 allocations (63 percent to trawl and 37 percent to non-trawl) apply to the entire Slope Rockfish complex south of 40°10' N. latitude for 2017. In 2018, Amendment 26 allocations apply for blackgill rockfish (41 percent to trawl and 59 percent to non-trawl) and the Slope Rockfish complex south of 40°10' N. latitude (91 percent to trawl and 9 percent to non-trawl) individually. The Council also chose to examine two apportionment approaches for the 2018 trip limits: the status quo (2016 approach) 60 percent for the LE fixed-gear sector and 40 percent for the OA sector, and a 70 percent/30 percent apportionment for the LE and OA sectors, respectively. Trip limits for 2017 will remain at the status quo amounts which are the 2016 values in regulation (Table 4-28).

Table 4-28. No Action: Blackgill rockfish trip limits, south of 40° 10' N. latitude for 2017 and 2018 for non-trawl fixed gear sectors.

2017 Trip Limits (pounds)						
	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec
LE	1,375	1,375	1,375	1,600	1,600	1,600
OA	475	475	475	550	550	550
2018 LE Trip Limits (pounds)						
LE at 60%	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec
No Action	1,375	1,375	1,375	1,600	1,600	1,600
Option 2a	2,500	2,500	2,500	2,500	2,500	2,500
Option 3a	2,750	2,750	2,750	2,750	2,750	2,750
LE at 70%						
Option 2b	3,000	3,000	3,000	3,000	3,000	3,000
Option 3b	3,250	3,250	3,250	3,250	3,250	3,250
2018 OA Trip Limits (pounds)						
OA at 40%	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec
No Action	475	475	475	550	550	550
Option 2a	1,000	1,000	1,000	1,000	1,000	1,000
Option 3a	1,500	1,500	1,500	1,500	1,500	1,500
OA at 30%						
Option 2b	900	900	900	900	900	900
Option 3b	1,200	1,200	1,200	1,200	1,200	1,200

Canary Rockfish

Under No Action, the canary rockfish share to the non-nearshore fishery for 2017 and 2018 is 59.4 mt and 55 mt, respectively. The proposed trip limits for canary rockfish, described within the Nearshore Section (below) and Appendix B Section B.1.2, of 300 lbs per two months for LE and 100 lbs per two months for OA are projected to be sufficient to allow non-nearshore fishermen the opportunity to retain the majority of their bycatch. While these trips limits could also accommodate the non-nearshore fleet to begin targeting canary rockfish, this is not expected to happen since historical catch rates (landings) of canary rockfish when targeting could occur in the 1990s are similar to the recent catch rates (bycatch) from which retention was prohibited; thus indicating that when they were allowed to target, they did not.

Yellowtail Rockfish

Yellowtail rockfish is managed as a single stock north of 40°10' N. latitude and is subject to Amendment 21 allocations for the trawl and non-trawl sectors of 88 percent and 12 percent, respectively. Yellowtail rockfish is not formally allocated within non-trawl sectors; that is, the non-trawl commercial LE and OA sectors, as well as the recreational sector, share the non-trawl allocation. The 2017 and 2018 non-trawl allocations north of 40°10' N. latitude are expected to decrease slightly (621.1 mt and 597.8 mt, respectively) compared to the 2016 allocation of 637.7 mt.

Historically, yellowtail rockfish was a target species for both the LE and OA sectors, but landings declined dramatically with implementation of the RCAs to protect overfished rockfish species. From 2011 to 2014, landings in the non-trawl LE and OA sectors have been minimal, averaging less than 1.3 mt per year per vessel. The recreational sector accounted for the majority of yellowtail rockfish mortality in the non-trawl sector, averaging 44.4 mt from 2011-2014 (Table 4-29). Between 2013-2014, only one OA vessel landed

between 30 and 35 percent of the annual maximum amount allowed (2,400 pounds), with all other vessels (LE and OA) landing approximately 10 percent or less of their theoretical maximum amount.

Table 4-29. Total mortality (mt) of yellowtail rockfish in the non-trawl sector north of 40°10' N. latitude, 2011-2014. (data sources: WCGOP)

Year	Commercial Non-trawl (LE and OA)	Recreational	Total	Non-trawl allocation	% Non-trawl allocation
2011	2.4	51.8	54.2	463.8	11.7%
2012	2.4	36.01	38.41	464.6	8.3%
2013	2.1	35.78	37.88	441.2	8.6%
2014	2. 9	45.8	48.7	441.7	11.0%

Note: The above commercial values include discard mortality estimates.

Table 4-30 summarizes monthly trip limits and projected impacts for LE and OA sectors north of 40°10' N. latitude under a range of trip limit options. Trip limits range from 400-1,000 lb per month for LE and 300-500 lb per month for OA. Because the non-trawl allocation for yellowtail rockfish applies to the entire area north of 40°10' N. latitude, modifications to trip limits north of 40°10' N. latitude were investigated that would apply to the three states. Recreational estimates in Table 4-30 are the average catch from 2011-2014, derived from the annual groundfish mortality reports produced by WCGOP. 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 fm 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 while avoiding or minimizing interactions with overfished rockfish species. Supplemental analysis is underway to inform revised yellowtail rockfish mortality estimates for the Oregon recreational fisheries and Table 4-30 will be updated accordingly. Commercial landings assume an estimate discard mortality using a proxy calculated from 2011 and 2014 (WCGOP data). For analytical and managerial ease, monthly limits are assumed the same in each month. The years 2011 through 2014 were chosen as the basis for this model because they may better represent current and future fishing behavior, since the 2015 data aren't available. Projected landings also assume that no or very few additional vessels will participate in the fishery, and those that have participated in the recent fishery will continue to do so.

Table 4-30. Summary of Limited Entry and Open Access monthly trip limits (in lbs) and projected impacts (mt) for non-trawl yellowtail rockfish north of 40°10' N. latitude. Also included is the average recreational mortality from 2011-2014 as a proxy for the projection.

Option	LE/OA Trip limits (pounds)	Projected mortality (mt)			Total projected mortality (mt) a/	Percent of 2017 non-trawl allocation
		LE	OA	Recreational		
No Action	200/200	0.6	1.8	42.4	44.8	7.2%
Opt. 1	400/300	0.9	2.3		45.6	7.3%
Opt. 2	500/400	1.1	2.8		46.3	7.5%
Opt. 3	1,000/500	1.9	3.3		47.6	7.7%

a/ Projected mortalities are based on average landings during 2011-2014. For the combined recreational estimate, a four-year average was derived from the 2011-2014 West Coast Groundfish Observer Program annual groundfish mortality reports.

Although there could be a minor increase in the bycatch of overfished species as a result of increasing trip limits, the amount cannot be quantified. An increase in trip limits could increase some fishing effort but associated overfished species impacts are expected to be minimal because yellowtail rockfish is a schooling fish that tends to be found higher in the water column than those overfished species. Other species typically caught with yellowtail rockfish include sablefish, black rockfish, lingcod, rougheye rockfish, and blue

rockfish. Of these top five species caught with yellowtail rockfish from 2011 to 2014, black rockfish is one that could experience increased catches which may cause it to exceed its harvest limit.

Accurately predicting the effects (e.g., effort, fishing behavior, latent capacity) of increased trip limits is difficult in the OA sector because the fishery is unrestricted. These same uncertainties are eliminated or are much lower in the LE sector where effort is limited and fishing behavior is somewhat more easily predicted.

Shelf Rockfish between 40°10' N. latitude and 34°27' N. latitude

Although shelf rockfish are managed as a complex for the entire area south of 40°10' N. latitude, trip limit options analyzed herein are only for the management area between 40°10' N. latitude and 34°27' N. latitude for the OA non-trawl fixed-gear sector. Shelf rockfish are not formally allocated within non-trawl sectors, that is, the non-trawl commercial LE and OA sectors, as well as the recreational sector, share the non-trawl allocation. The 2017 and 2018 non-trawl allocations (1,383.6 mt and 1,384.4 mt, respectively) are similar to the 2016 allocation of 1,384 mt.

Table 4-31 summarizes bi-monthly trip limits for the OA sector between 40°10' and 34°27' N. latitude and corresponding projected impacts for the entire non-trawl sector south of 40°10' N. latitude. For analytical and managerial ease, bi-monthly limits are assumed the same in each period for options 1 and 2. The years 2013 and 2014 were chosen as the basis for this model because they may better represent current and future fishing behavior. Projected mortality resulting from the proposed trip limit options, along with commercial landings south of 34°27' N. latitude from 2015 and the highest recreational mortality in recent years (2015) south of 40° 10’ N. latitude from RecFIN, were added to the analytical options to project mortality for the entire area south of 40° 10’ N latitude. Note that in all trip limit options, Period 2 is closed.

Table 4-31. No Action bi-monthly trip limits options (pounds) for the Shelf Rockfish between 40°10' and 34°27' N. latitude for the open access sector and overall non-trawl impacts (mt) for the entire area south of 40° 10’ N. latitude.

	Commercial				Rec. South of 40°10´ N lat.	**Total**	**Non-trawl allocation**	**% of Non-trawl allocation**
	40°10' and 34°27' N. latitude			S. of 34°27´ N lat.				
Alternative	Trip limits	OA est. mort.	LE est. mort.	LE+ OA				
No Action/a	200/300	17.9	2.24	19.3	491.3	530.7	1,383.6	38.4%
Opt. 1	400	27.3				540.1		39.0%
Opt. 2	500	33.8				546.6		39.5%

a/ Trip limits are 200 lb/period for Periods 3 and 4 and 300 lb/period for Periods 1, 5, and 6.

Although no effort shift occurred during previous inseason actions, participation in the OA sector has traditionally been more unpredictable than LE, making it difficult to predict catch and fleet behavior; therefore, it is possible that projected landings could be higher than expected if the trip limit is increased sufficiently enough to encourage entry into the fishery by new participants.

Because the OA shelf rockfish trip limit also includes vermilion, and widow rockfishes and chilipepper, consideration was given to the projected impacts to those species, which are well below allowable limits. Vermilion rockfish mortality under No Action is estimated to be 10.7 mt, with that estimate to increase to 21.3 mt under the proposed 500 pound trip limit. For widow rockfish, the No Action estimate is 14.0 mt,

with an estimated increase to 27.8 mt at the proposed 500 pound trip limit amount. For chilipepper, the No Action estimate is 0.6 mt, with an estimated increase to 1.1 mt at the proposed 500 pound trip limit. It is likely that the trip limit increase will have an effect on canary rockfish, although the exact amount cannot be quantified. The Council is considering allowing retention of canary rockfish in commercial fixed gear fisheries and the amount of additional impacts to canary rockfish as a result of allowing higher trip limits for shelf rockfish will likely be dependent on those decisions. In other words, depending on the trip limits chosen for canary rockfish, there may be no additional impacts to canary rockfish as a result of allowing higher shelf rockfish trip limits.
There may be a small increase in the bycatch of overfished species, but at present, no quantifiable method has been explored to determine how much this may be. Any increase in trip limits is expected to increase fishing effort for Shelf Rockfish species, but the amount of the increase is uncertain and cannot be estimated at this time. As noted in prior trip limit analyses, accurately predicting the effects (e.g., effort, fishing behavior, latent capacity) of increased trip limits is difficult in the OA sector because the fishery is unrestricted.

Bocaccio

Bocaccio is managed as a single stock for the entire area south of 40°10' N. latitude under two-year trawl and non-trawl allocations. The non-trawl allocation is further sub-divided between the fixed gear sectors and the recreational sector, which is managed under a harvest guideline. Trip limits for limited entry and open access sectors have historically been divided north and south of 34°27' N. latitude - presumably due to differences in encounter rates.

The No Action trip limits for the limited entry fishery between 40°10' – 34°27' N latitude have been in place since June 2007. Prior to 2007, differential trip limits were in effect for shelf rockfish species that caused high discard levels in an attempt to reach all the individual limits (Agenda Item E.7.b, Supplemental GMT Report, June 2007). Combining the limits was done to allow more flexibility in retention opportunities and reduce overall discard. Since that time, widow rockfish has rebuilt and bocaccio is nearly rebuilt. Allowing for higher individual limits for bocaccio (i.e., removing it from the aggregate shelf rockfish trip limits between 40°10' – 34°27' N. latitude) will help reduce discarding as this stock continues to rebuild and encounters increase.

The 2017 non-trawl allocation for bocaccio south of 40°10' N. latitude is expected to be 790.0 mt and for 2018, 741.0 mt. The No Action bi-monthly cumulative trip limits are summarized in Table 4-32 and Table 4-33. This trip limit analysis proposes to provide trip limits for the LE and OA sectors independent of having bocaccio trip limits as part of the Shelf Rockfish complex.

Recent participation (2013 and 2014) in the LE fixed-gear fishery between 40°10' N. latitude and 34°27' N. latitude was limited, with only three vessels making any bocaccio landings during this time period. A total of 16 LE vessels made landings south of 34°27' N. latitude, with only one vessel landing more than 1,000 pounds total for either year. In the OA sector, 59 vessels landed bocaccio between 40°10' N. latitude and 34°27' N. latitude and 35 made landings south of 34°27' N. latitude. All commercial landings data are derived from PacFIN.

Table 4-32. No Action limited entry trip limits (in pounds) for bocaccio south of 40°10' N. latitude.

	Period 1 Jan/Feb	Period 2 Mar/Apr	Period 3 May/Jun	Period 4 Jul/Aug	Period 5 Sept/Oct	Period 6 Nov/Dec
Shelf Rockfish, Shortbelly, Widow rockfish (including Bocaccio and Chilipepper between 40°10' – 34°27' N. lat.)						
40°10' – 34°27'	Shelf rockfish, shortbelly, widow rockfish, bocaccio & chilipepper: 2,500 lb/2 mo, of which no more than 500 lb may be species other than chilipepper.					
Bocaccio						
40°10' – 34°27'	Bocaccio included under shelf rockfish, shortbelly, widow rockfish & chilipepper limits - see above					
South of 34°27'	750lb/2 months	Closed	750 lb/2 months			

Table 4-33. No Action open access trip limits (in pounds) for bocaccio south of 40° 10' N. latitude.

	Period 1 Jan/Feb	Period 2 Mar/Apr	Period 3 May/Jun	Period 4 Jul/Aug	Period 5 Sept/Oct	Period 6 Nov/Dec
40°10' – 34°27'	200 lb/2 mo	Closed	100 lb/2 mo		200 lb/2 mo	
South of 34°27'	250 lb/2 mo	Closed	250 lb/ 2 mo			

Table 4-34 summarizes bi-monthly trip limits (in pounds) for the LE sector between 40° 10' and 34° 27' N. latitude and south of 34° 27' N. latitude and corresponding projected impacts for the sector. Bi-monthly trip limits range from 500 to 1,500 lb per two months. For analytical and managerial ease, bi-monthly limits are assumed the same in each period with the exception of the closed period 2 (March/April) south of 34° 27' N. latitude. The years 2013 and 2014 were chosen as the basis for this model because they may better represent current and future fishing behavior. Because there were so few data to model for the LE sector between 40° 10' N. latitude and 34° 27' N. latitude, no real mortality estimates could be generated by model runs. Therefore, only one proposed trip limit option is provided (Option 1), and that is to double the No Action amount of 500 pounds to 1,000 pounds per two-month period. Because the No Action mortality estimate is so low (0.3 mt), it can be reasonably assumed that even with a trip limit that is doubled to 1,000 pounds, the estimated mortality will still be so low that even when combined with the other sectors' mortality it will remain within prescribed levels. This is due, in part, to the low number of vessels that are expected to participate in this fishery.

Table 4-34. Bocaccio bi-monthly trip limits (in pounds) for the LE sector for the two regions of California south of 40° 10' N. latitude and estimated mortality (mt).

40°10' – 34°27'	Trip limit	Estimated mortality
No Action	500	0.3
Option 1	1,000	NA
South of 34°27'	Trip limit	Estimated mortality
No Action	500	3.0
Option 1	1,250	5.0
Option 2	1,500	5.9

Note: Commercial data from PacFIN.

Table 4-35 summarizes bi-monthly trip limits for the OA sector between 40° 10' and 34° 27' N. latitude and south of 34° 27' N. latitude and corresponding projected impacts for the sector. Bi-monthly trip limits range from 100 to 800 lb per two months. For analytical and managerial ease, bi-monthly limits are assumed the same in each period with the exception of the closed period 2 (March/April). The years 2013 and 2014 were chosen as the basis for this model because they may better represent current and future fishing behavior.

Table 4-35. Bocaccio bi-monthly trip limits (in pounds) for the OA sector for the two regions of California south of 40°10' N. latitude and estimated mortality (mt).

40°10' – 34°27'	Trip limit	Estimated mortality
No Action	200/100	1.6
Option 1	500	4.9
Option 2	800	7.8
South of 34°27'	Trip limit	Estimated mortality
No Action	250	2.8
Option 1	400	4.4
Option 2	800	8.8

Note: Commercial data from PacFIN.

Table 4-36 provides a summary of all the sectors' mortality estimates (mt) combined by sector and area compared to the 2018 non-trawl allocation of 558.8 mt. This table essentially combines the mortality estimates from Table 4-34 and Table 4-35 and provides an overall total mortality estimate.

Table 4-36. Summary mortality estimates (mt) for bocaccio rockfish by sector and area compared to the 2018 non-trawl commercial LE and OA allocation.

Location and Options	LE	OA	Total	2018 Non-Trawl Allocation	% of allocation
40°10' – 34°27'				558.8	
No Action	0.3	1.6	1.9		0.3%
Option 1	NA	4.9	NA		NA
Option 2	NA	7.8	NA		NA
South of 34°27'					
No Action	3.0	2.8	5.8		1.0%
Option 1	5.0	4.4	9.4		1.7%
Option 2	5.9	8.8	14.7		2.6%

Note: Commercial data from PacFIN.

Although very little effort shift occurred during previous inseason actions, participation in the OA sector has traditionally been more unpredictable than LE, making it difficult to predict catch and fleet behavior; therefore, it is possible that projected landings could be higher than expected if the trip limit is increased sufficiently enough to encourage entry into the fishery by new participants.

It is likely that trip limit increases can have an effect on canary rockfish and cowcod, although the exact amount cannot be quantified. The Council is considering allowing retention of canary rockfish in commercial fixed gear fisheries and the amount of additional impacts to canary rockfish as a result of allowing higher trip limits for bocaccio will likely be dependent on those decisions. In other words, depending on the trip limits chosen for canary rockfish, there may be no additional impacts to this species

as a result of allowing higher bocaccio trip limits. As noted in prior trip limit analyses, accurately predicting the effects (e.g., effort, fishing behavior, latent capacity) of increased trip limits is difficult in the OA sector because the fishery is unrestricted.

Impact (Groundfish Mortality) – Non-Nearshore North of 36° N. latitude

The non-nearshore model projects mortality of overfished and non-overfished species for the limited entry fixed gear and the open access sectors north of 36° N. latitude 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 limited entry and open access allocations for sablefish are completely harvested.

Historically, interactions with overfished species, primarily yelloweye rockfish and canary rockfish, have required adjustments to management measures in the non-nearshore fisheries. Seaward adjustments of the non-trawl RCA boundary are the main management measure for reducing catches of these two stocks. Changes to the shoreward boundary (e.g., changing from 150 to 100 fm) can also be accommodated to provide greater access to target species when overfished species mortality is projected to be within the non-nearshore share or non-trawl allocation. Furthermore, if our assumptions about canary rockfish are incorrect (i.e. greater amounts are targeted compared to the past), trip limit adjustments and changes to the RCA boundary can be made even though not considered overfished.

Management measures and projected mortality for the non-nearshore fishery north of 36° N. latitude under No Action is largely influenced by the sablefish ACL, which would be calculated with a P* of 0.40 with a 40:10 adjustment (Section 2.1.1, Table 2-1), and the resulting sablefish allocations (Table 4-23 and Table 4-24). Current trip limits (Table 4-26) would be routinely adjusted to achieve the limited entry and open access sablefish allocations (Table 4-23 and Table 4-24). Trip limits for other species (e.g., Slope Rockfish, Shelf Rockfish, etc.) may also be adjusted to attain the ACL or achieve other conservation goals.

The projected species mortality, as a result of harvesting the sablefish allocations, was evaluated using 2002-2013 WCGOP data in the non-nearshore model (Table 4-39 and Table 4-40). However, canary projections were developed by examining a 300 pound bimonthly trip limit for limited entry and a 100 pound bimonthly trip limit for open access, which was intended to allow the fixed gear fleet to retain previously discarded canary rockfish (Appendix B, Section B.1.2). Under No Action, trawl and non-trawl allocations were established for overfished species. Further, the non-nearshore fishery was also allocated a share of the non-trawl allocation for bocaccio and yelloweye (Table 4-38). Routine adjustments of the seaward non-trawl RCA (Table 4-21 and Table 4-22) would occur in the event the projected overfished species mortality is expected to exceed the non-nearshore share or non-trawl allocation (Table 4-38). Projected mortality for yelloweye is 0.8 mt for 2017 and 2018 compared to the 0.7 mt share (Table 4-38). By moving the RCA from 100 fm to 125 fm, the projected mortality for yelloweye is reduced to 0.45 mt for 2017 and 0.47 mt for 2018.

However, the non-nearshore fishery has historically not attained or come close to attaining its share. Table 4-37 shows the actual mortality (with discard mortality rates applied), projected mortality, and the non-nearshore share for yelloweye rockfish in the non-nearshore fishery from 2011-2014 (Source: WCGOP GEMM Product). During those years, the fishery has caught less than the 2015/2016 shares (0.5 mt), which are the lowest in recent history due to a transfer of 0.6 mt from the non-nearshore to the nearshore fishery share for the 2015-2016 biennial harvest specifications cycle. Furthermore, the fishery has actually caught less than 70 percent of projected impacts. If trends were to continue, the fishery can be estimated to actually take approximately 0.5 mt of the 0.7 mt share.

Table 4-37. Comparison of actual vs. projected mortality of yelloweye rockfish in the non-nearshore.

Year	Actual	Projected	Percentage of Actual/Projected	Non-Nearshore Share (mt)
2011	0.30	0.9	33%	2.4
2012	0.39	0.7	55%	2.4
2013	0.27	0.5	54%	1.1
2014	0.48	0.7	69%	1.1

RCA changes can also be accommodated to provide greater access to target species when overfished species mortality is projected to be within the non-nearshore share or non-trawl allocation (e.g., changing from 125 to 100 fm). Table 4-39 and Table 4-10 contain the projected mortality groundfish for the non-nearshore fishery for 2017 and 2018, respectively.

Table 4-38. No Action – Non-Nearshore fishery: Overfished species shares for the non-nearshore fixed gear fishery under No Action (mt), based on Default Harvest Control Rule.

Stock	Area	Total Projected OFS Mortality 2017/2018 (mt)	Shares 2017/2018 (mt)	Non-Trawl Allocation 2017/2018 (mt)
BOCACCIO	S. 40°10’ N. lat.	0.0	182.1/170.7	596.0/558.8
COWCOD	S. 40°10’ N. lat.	0.0		2.6/2.6
DARKBLOTCHED	Coastwide	7.0/7.3		18.9/19.6
POP	N. 40°10’ N. lat.	0.5/0.5		7.3/7.6
YELLOWEYE	Coastwide	0.8/0.8	0.7/0.7	12.9/12.9

Table 4-39. No Action. Projected groundfish mortality for the limited entry and open access fixed gear fisheries north of 36° N. latitude (in mt) for 2017 compared to the non-trawl allocation.

Stock	Management Area	Limited Entry	Open Access	Total	Non-Trawl Allocation
Arrowtooth flounder	Coastwide	60.3	10.9	71.2	585.3
Big Skate		7.8	1.4	9.3	
Black rockfish	South of 46°16` N. lat.	0.0	0.0	0.0	
Cabezon	California	0.0	0.0	0.0	
Cabezon	Oregon	0.0	0.0	0.0	
California scorpionfish	South of 34°27` N. lat.	0.0	0.0	0.0	
Canary rockfish b/	Coastwide	0.26	0.07	0.33	780.6
Chilipepper	South of 40°10` N. lat.	0.0	0.0	0.1	647.8
Dover sole	Coastwide	8.3	1.5	9.8	2,420.3
Ecosystem Component Species		82.7	20.8	103.5	
English sole	Coastwide	0.0	0.0	0.0	487.6
Lingcod	North of 40°10` N. lat.	18.6	2.9	21.5	1,680.4
Lingcod	South of 40°10` N. lat.	1.5	2.1	3.6	683.7
Longnose skate	Coastwide	81.5	16.4	98.0	192.7
Longspine Thornyhead	North of 34°27` N. lat.	2.9	0.7	3.6	142.4
Nearshore rockfish	North of 40°10` N. lat.	0.1	0.0	0.2	
Nearshore rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shelf rockfish	North of 40°10` N. lat.	5.6	1.0	6.7	783.3
Shelf rockfish	South of 40°10` N. lat.	0.1	0.0	0.1	1,409.9
Slope rockfish	North of 40°10` N. lat.	73.0	13.1	86.1	321.3
Slope rockfish	South of 40°10` N. lat.	17.9	7.5	25.4	254.5
Mixed thornyheads		1.4	0.4	1.8	
Other flatfish	Coastwide	0.5	0.1	0.6	830.6
Other groundfish		0.0	0.0	0.0	
Pacific cod	Coastwide	2.3	0.4	2.7	54.5
Pacific hake	Coastwide	0.6	0.1	0.7	0
Rockfish Unid	North of 40°10` N. lat.	1.3	0.2	1.5	
Rockfish Unid.	South of 40°10` N. lat.	1.3	0.4	1.8	
Rougheye Rockfish	North of 40°10` N. lat.	35.6	6.4	42.0	
Rougheye Rockfish	South of 40°10` N. lat.	1.2	0.4	1.6	
Shortbelly rockfish		0.0	0.0	0.0	0
Shortraker Rockfish	North of 40°10` N. lat.	7.5	1.4	8.9	
Shortraker Rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shortraker/Rougheye Rockfish	North of 40°10` N. lat.	10.5	1.9	12.4	
Shortraker/Rougheye Rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shortspine Thornyhead	North of 34°27` N. lat.	23.4	5.5	28.9	82.7
Spiny dogfish	Coastwide	204.9	38.2	243.1	
Splitnose rockfish	South of 40°10` N. lat.	0.1	0.0	0.1	87.5
Starry flounder	Coastwide	0.0	0.0	0.0	635.9
Widow rockfish	Coastwide	0.0	0.0	0.0	161.2
Yellowtail rockfish	North of 40°10` N. lat.	0.6	0.1	0.8	621.1

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.
b/ The non-nearshore share for canary rockfish under No Action is 59.4 mt in 2017.
c/ Includes blackgill rockfish.

Table 4-40. No Action. Projected groundfish mortality for the limited entry and open access fixed gear fisheries north of 36° N. latitude (in mt) for 2018 compared to the non-trawl allocation.

Stock	Management Area	Limited Entry	Open Access	Total	Non-Trawl Allocation
Arrowtooth flounder	Coastwide	62.9	11.3	74.3	582.2
Big Skate		8.2	1.5	9.7	
Black rockfish	South of 46°16` N. lat.	0.0	0.0	0.0	
Cabezon	California	0.0	0.0	0.0	
Cabezon	Oregon	0.0	0.0	0.0	
California scorpionfish	South of 34°27` N. lat.	0.0	0.0	0.0	
Canary rockfish b/	Coastwide	0.26	0.07	0.33	721.7
Chilipepper	South of 40°10` N. lat.	0.0	0.0	0.1	622.8
Dover sole	Coastwide	8.6	1.6	10.2	2,420.3
Ecosystem Component Species		86.3	21.7	108.0	
English sole	Coastwide	0.0	0.0	0.0	366.2
Lingcod	North of 40°10` N. lat.	19.4	3.1	22.5	1,557.8
Lingcod	South of 40°10` N. lat.	1.5	2.2	3.7	624.8
Longnose skate	Coastwide	85.0	17.1	102.2	192.7
Longspine Thornyhead	North of 34°27` N. lat.	3.0	0.7	3.7	135
Nearshore rockfish	North of 40°10` N. lat.	0.1	0.0	0.2	
Nearshore rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shelf rockfish	North of 40°10` N. lat.	5.9	1.1	7.0	782.5
Shelf rockfish	South of 40°10` N. lat.	0.1	0.0	0.1	1,410.8
Slope rockfish	North of 40°10` N. lat.	76.2	13.6	89.8	321.1
Slope rockfish c/	South of 40°10` N. lat.	18.7	7.8	26.5	51.0
Mixed thornyheads		1.4	0.4	1.8	
Other flatfish	Coastwide	0.5	0.1	0.6	707.7
Other groundfish		0.0	0.0	0.0	
Pacific cod	Coastwide	2.4	0.4	2.8	54.5
Pacific hake	Coastwide	0.6	0.1	0.7	0
Rockfish Unid	North of 40°10` N. lat.	1.3	0.2	1.5	
Rockfish Unid.	South of 40°10` N. lat.	1.4	0.4	1.8	
Rougheye Rockfish	North of 40°10` N. lat.	37.1	6.7	43.8	
Rougheye Rockfish	South of 40°10` N. lat.	1.2	0.4	1.7	
Shortbelly rockfish		0.0	0.0	0.0	0
Shortraker Rockfish	North of 40°10` N. lat.	7.9	1.4	9.3	
Shortraker Rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shortraker/Rougheye Rockfish	North of 40°10` N. lat.	10.9	2.0	12.9	
Shortraker/Rougheye Rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shortspine Thornyhead	North of 34°27` N. lat.	24.4	5.7	30.1	81.9
Spiny dogfish	Coastwide	213.7	39.9	253.6	
Splitnose rockfish	South of 40°10` N. lat.	0.1	0.0	0.1	87.6
Starry flounder	Coastwide	0.0	0.0	0.0	635.9
Widow rockfish	Coastwide	0.0	0.0	0.0	161.2
Yellowtail rockfish	North of 40°10` N. lat.	0.7	0.1	0.8	597.8

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.
b/ The non-nearshore share for canary rockfish under No Action is 55 mt for 2018.
c/ Includes blackgill rockfish in projected impacts, but non-trawl allocation reflects complex without blackgill rockfish.

Impact (Groundfish Mortality) – Non-Nearshore South of 36° N. latitude

Management measures and projected groundfish mortality for the non-nearshore fishery south of 36° N. latitude under No Action is largely influenced by the sablefish ACL, which would be calculated with a P* of 0.40 with a 40:10 adjustment (Section 2.1.1 and Table 2-1). Anticipated catch of sablefish south of 36° N. latitude under No Action would be approximately equal to the 2017-2018 sablefish allocations and resulting landed catch shares for limited entry and open access fixed gears (Table 4-25). Trip limits (Table 4-26 and Table 4-27) would be routinely adjusted to achieve the limited entry and open access sablefish allocations (Table 4-25). Trip limits for other species (e.g., Slope Rockfish, Shelf Rockfish, etc.) may also be adjusted to attain the ACL or achieve other conservation goals.

Under No Action, trawl and non-trawl allocations would be established for overfished species. Further, the non-nearshore fishery would be allocated a share of the non-trawl allocation for bocaccio and yelloweye rockfish (Table 4-38). Routine adjustments of the non-trawl RCA (Table 4-21 and Table 4-22) would occur in the event the projected overfished species mortality is expected to exceed the non-nearshore share or non-trawl allocation (Table 4-38). Changes can also be accommodated to provide greater access to target species when overfished species mortality is projected to be within the non-nearshore share or non-trawl allocation (e.g., changing from 125 to 100 fm).

Projected species mortality for the area south of 36° N. latitude was estimated by using the three-year (2012-2014) average of estimated mortality from the WCGOP groundfish mortality reports (Table 4-41). Due to the lack of a model to predict the mortality in this area, it is assumed that 2017 and 2018 mortalities are the same.

Table 4-41. No Action. Projected groundfish mortality for the limited entry and open access fixed gear fisheries south of 36° N. latitude (in mt) for 2017/2018 compared to the non-trawl allocation.

Stock	Management Area	Limited Entry (mt)	Open Access (mt)	Total (mt)	Non-Trawl Allocation a/ (mt)
Arrowtooth flounder	Coastwide		1.9	1.9	585.3
Big Skate		3.0	0.2	3.3	
Chilipepper	South of 40°10` N. lat.	0.1	0.2	0.3	647.8
Dover sole	Coastwide	1.7	0.1	1.9	
Ecosystem Component Species		92.3	2.9	95.2	
Lingcod	South of 40°10` N. lat.	0.2	4.9	5.1	683.7
Longnose skate	Coastwide	4.5	2.5	7.0	185.3
Longspine Thornyhead	North of 34°27` N. lat.	5.3	0.0	5.3	142.4
Longspine Thornyhead	South of 34°27` N. lat.	15.9	0.8	16.6	
Nearshore rockfish	South of 40°10` N. lat.		0.1	0.1	
Shelf rockfish	South of 40°10` N. lat.	3.3	10.7	14.1	1409.9
Slope rockfish b/	South of 40°10` N. lat.	16.5	21.3	37.8	254.5
Mixed thornyheads		0.2	0.0	0.2	
Other flatfish	Coastwide	1.8	1.6	3.4	830.6
Other groundfish		1.1	0.3	1.4	
Pacific cod	Coastwide	0.1	0.1	0.1	54.5
Pacific hake	Coastwide	1.0	0.0	1.0	0
Rockfish Unid.	South of 40°10` N. lat.	0.4	1.0	1.4	
Shortspine Thornyhead	North of 34°27` N. lat.	24.0	1.0	25.1	82.7
Shortspine Thornyhead	South of 34°27` N. lat.	104.5	4.1	108.6	813.7
Spiny dogfish	Coastwide	0.6	3.4	4.0	
Splitnose rockfish	South of 40°10` N. lat.	0.1	0.2	0.2	87.5
Widow rockfish	Coastwide	0.1	0.2	0.3	161.2

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.
b/ Includes blackgill rockfish; in 2018, blackgill rockfish will be pulled from the complex. The 2018 non-trawl allocation for slope rockfish is 51.0 mt.

Impact (Groundfish Mortality) - Nearshore – No Action

The nearshore model projects mortality of overfished species based on the expected landings of nearshore species by the limited entry and opens access sectors shoreward of the non-trawl RCA coastwide. The majority of vessels participating in nearshore commercial fisheries do not hold Federal limited entry permits. The most common gear used is jig gear; however, some vessels use longline gear to target nearshore species and, in fewer instances, pots or traps are used in the nearshore fishery.

California and Oregon limit entry to the nearshore groundfish fishery by requiring a state limited entry permit to take nearshore groundfish species (Washington does not allow a nearshore commercial fishery). Therefore, while these fisheries are considered open access federally, participation is limited by the states. In Oregon, more conservative state quotas than those specified in Federal regulations exist for most nearshore species, and state trip limits apply in these cases. State trip limits are designed to stay within nearshore species quotas while providing a year-round opportunity, if possible. Detailed descriptions of the state nearshore fisheries can be found in the 2015-2016 EIS (PFMC and NMFS 2015). Federal

management measures for west coast nearshore commercial groundfish fisheries are typically stratified north and south of 40° 10' N. latitude, with some measures stratified north and south of 42° N. latitude and others stratified south of 34° 27' N. latitude.

There are state quotas (Section 4.1.1.3) as well as Federal limits (Table 4-6, Table 4-7, and Table 4-42) that restrict landings in the commercial nearshore fishery. In the event the projected overfished species mortality is expected to exceed the nearshore share or non-trawl allocation, routine adjustments of the shoreward non-trawl RCA (Table 4-21 and Table 4-22) or reduced trip limits for nearshore species could occur. RCA changes can also be accommodated to provide greater access to target species when overfished species mortality is projected to be within the nearshore share or non-trawl allocation (e.g., changing from 20 to 30 fm).

The No Action Alternative is based on the expectation that landings in the nearshore fishery will be similar to recent historical average landings from 2010-2014 (Table 4-43 and Table 4-44), which are lower than most of the state quotas with the following exceptions: (1) California north of 40°10' N. latitude black rockfish landings reflect the estimated 2015 landings (Table 4-49, 108 mt); (2) Oregon will attain their full nearshore rockfish allocations by liberalizing the conservative state trip limits that were adopted in 2015; (3) Oregon landings of kelp greenling will increase to better utilize the allocation; and (4) lingcod landings in Oregon will continue to linearly increase from year to year.

Nearshore fishery landings are influenced by a variety of factors, including weather and market conditions, and can vary annually (Table 4-44). As such, there is substantial uncertainty surrounding the estimated landings under No Action and the action alternatives, which in turn may influence the projected overfished species mortality and socioeconomic analysis. In the event fishery performance is better than the five-year average, mortality of groundfish species will be higher; however, the fishery will still be managed to ensure combined commercial and recreational catches stay within the non-trawl allocation.

The following trip limit adjustments are proposed for the nearshore fishery under No Action: reductions for black rockfish in California north of 40°10' N. latitude (Table 4-50), increases for canary rockfish coastwide (see discussion below), and increases for California scorpionfish south of 34°27' N. latitude (Table 4-52). The remaining management measures would be the same as in the 2016 Federal regulations (Table 4-21 and Table 4-22). The nearshore fishery is projected to attain their yelloweye rockfish share of the non-trawl allocation (Table 4-45). Accordingly, deviations in any of the factors that affect bycatch (e.g., catch, effort, bycatch rates) could result in the fishery exceeding their share. In the event the projected overfished species 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.

Table 4-42. No Action. Non-Trawl Allocations, Nearshore Shares, and State Shares under No Action.

2017				State Shares	
Stock	Area	Non-Trawl Allocation	Nearshore Share	OR	CA
BOCACCIO	South of 40°10´ N. Lat.	596	2.3	N/A	
YELLOWEYE	Coastwide	12.9	2	1.4	0.6
Canary rockfish	Coastwide	780.6	104.8	28	76.8

2018				State Shares	
Stock	Area	Non-Trawl Allocation	Nearshore Share	OR	CA
BOCACCIO	South of 40°10´ N. Lat.	558.8	2.2	N/A	
YELLOWEYE	Coastwide	12.9	2	1.4	0.6
Canary rockfish	Coastwide	721.7	96.9	25.9	71

Table 4-43. No Action. Expected landings under the No Action Alternative, which are the average landings for the commercial nearshore fishery from 2010-2014 unless noted. Target species landings by area are also shown in the far right panel. The 2017 quotas (or HGs) for Oregon are provided in parenthesis. Quotas for Oregon are the state partition of Federal allocations to the Oregon "commercial nearshore fishery," with the remainder to the Oregon sport fisheries.

Stock	Area	Total (mt) 2017-2018	By Area for 2017-2018			
			OR Total (mt)	CA Total (mt)	40°10'-42° N lat. (mt)	S. of 40°10' N. lat. (mt)
Black rockfish	OR	126	126 (126)a/			
Black rockfish	CA	100		100	95	5
Cabezon	OR	23.6	23.6 (30)			
Cabezon	CA	65.5	N/A	65.5	2.5	63
Canary Rockfish b/	OR&CA	12.5	1.9	10.6	2	8.6
Kelp greenling	OR	30	30 c/			
Kelp greenling	CA	3.8	N/A	3.8	0.4	3.4
Lingcod	N. 40°10' N. lat.	68.6	65 d/	3.6	3.6	
Lingcod	S. 40°10' N. lat.	21.2	N/A	21.2		21.2
Nearshore Rockfish N. e/	N. 40°10' N. lat.	22.7	17.5 (17.5)a/	5.2	5.2	
--*Blue rockfish*		10.6	7	3.6	3.6	
--*Other Nearshore Rockfish*		12.1	10.5	1.6	1.6	
Nearshore Rockfish S.	S. 40°10' N. lat.	80.7	N/A		N/A	
--*Blue rockfish*		2.7	N/A	2.7		2.7
--*Shallow Nearshore Rockfish f/*		49	N/A	49	N/A	49
--*Deeper Nearshore Rockfish g/*		29	N/A	29	N/A	29

a/ The nearshore commercial fishery Oregon is projected to catch their entire allocations of black rockfish and nearshore rockfish, which are not federal allocations rather presumptive state allocation (to the Oregon nearshore fishery) from within the federal Oregon allocations ACL (for black rockfish) or HG for nearshore rockfish

b/ Canary rockfish landings are projections based on trip limits of 100 lbs for OA and 300 lbs for LE. These are not preferred trip limits by the states, rather a middle-ground starting point for analysis.

c/ Oregon landings of kelp greenling are expected to rise beyond average since the 2015 assessment found that stock to be more robust than previously thought, and that historical harvests have been below target. In response, Oregon is expected to increase state trip limits of kelp greenling to better utilize the stock.

d/ Lingcod landings in Oregon have shown a constant yearly increase and are expected to increase in the future at the same rate.

e/ Nearshore Rockfish totals consists of black-and-yellow, blue, China, gopher, grass, kelp, brown, olive, copper, treefish, calico, and quillback rockfish. These species are part of the Nearshore Rockfish complex north and south of 40°10' N. latitude.

f/ Shallow Nearshore Rockfish consists of black-and-yellow rockfish, China rockfish, gopher rockfish, grass rockfish, and kelp rockfish south of 40°10' N. latitude. These species are part of the Nearshore Rockfish complex south of 40°10' N. latitude.

g/ Deeper Nearshore Rockfish consists of black rockfish, 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. latitude.

Table 4-44. Annual landings and averages for nearshore species from 2010-2014.

Stock	Area	2010	2011	2012	2013	2014	Avg.
Black rockfish	OR	100.1	96.7	95.7	106.0	121.6	104.0
Black rockfish	CA	51.5	26.4	24.0	35.3	40.2	35.5
Calif scorpionfish	CA	2.8	3.1	3.0	1.7	0.9	2.3
Cabezon	OR	23.5	29.4	28.8	19.8	15.4	23.4
Cabezon	CA	21.5	30.6	28.4	27.8	29.3	27.5
Kelp greenling a/	OR	18.3	20.8	19.0	21.8	15.4	19.0
Kelp greenling	CA	1.6	2.0	5.0	5.5	4.6	3.7
Lingcod	N. 40°10' N. lat.	24.1	33.6	38.5	48.7	46.2	38.2
--OR b/		20.2	30.1	35.2	45.5	42.1	34.6
--CA		3.9	3.5	3.3	3.2	4.1	3.6
Lingcod	S. 40°10' N. lat.	13.8	17.0	18.2	24.8	31.6	21.1
Nearshore Rockfish N. c/	N. 40°10' N. lat.	15.7	24.9	24.4	18.7	12.8	19.3
--Blue rockfish (OR)		4.0	6.6	6.8	5.0	3.9	5.3
--Blue rockfish (CA)		3.4	5.1	2.8	2.1	1.4	3.0
--Other Nearshore Rockfish (OR)		6.5	11.3	12.0	10.5	6.9	9.4
--Other Nearshore Rockfish (CA)		1.8	1.9	2.8	1.1	0.6	1.6
Nearshore Rockfish S. c/	S. 40°10' N. lat.	84.8	91.0	79.7	87.3	89.0	86.4
--Blue rockfish		1.4	2.0	1.3	3.5	5.1	2.7
--Shallow Nearshore Rockfish d/		52.8	55.8	46.5	47.6	49.2	50.4
--Deeper Nearshore Rockfish e/		30.7	33.3	32.0	36.2	34.7	33.4

a/ Oregon landings of kelp greenling are expected to rise beyond average (19 mt, Table 4-44) since the 2015 assessment found that stock to be more robust than previously thought, and that historical harvests have been below target. In response, Oregon is expected to increase state trip limits of kelp greenling to better utilize the stock.

b/ Lingcod landings in Oregon have shown a constant yearly increase (Table 4-44a/ The nearshore commercial fishery Oregon is projected to catch their entire allocations of black rockfish and nearshore rockfish, which are not federal allocations rather presumptive state allocation (to the Oregon nearshore fishery) from within the federal Oregon allocations ACL (for black rockfish) or HG for nearshore rockfish

b/ Canary rockfish landings are projections based on trip limits of 100 lbs for OA and 300 lbs for LE. These are not preferred trip limits by the states, rather a middle-ground starting point for analysis.

c/ Oregon landings of kelp greenling are expected to rise beyond average since the 2015 assessment found that stock to be more robust than previously thought, and that historical harvests have been below target. In response, Oregon is expected to increase state trip limits of kelp greenling to better utilize the stock.

d/ Lingcod landings in Oregon have shown a constant yearly increase and are expected to increase in the future at the same rate.

e/ Nearshore Rockfish totals consists of black-and-yellow, blue, China, gopher, grass, kelp, brown, olive, copper, treefish, calico, and quillback rockfish. These species are part of the Nearshore Rockfish complex north and south of 40°10' N. latitude.

f/ Shallow Nearshore Rockfish consists of black-and-yellow rockfish, China rockfish, gopher rockfish, grass rockfish, and kelp rockfish south of 40°10' N. latitude. These species are part of the Nearshore Rockfish complex south of 40°10' N. latitude.

g/ Deeper Nearshore Rockfish consists of black rockfish, 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. latitude.

) and are expected to increase in the future at the same rate.

c/ Nearshore Rockfish totals consists of black-and-yellow, blue, China, gopher, grass, kelp, brown, olive, copper, calico, and quillback rockfish and treefish. These species are part of the Nearshore Rockfish complex north and south of 40°10' N. latitude.

d/ Shallow Nearshore Rockfish consist of black-and-yellow, China, gopher, grass, and kelp rockfish south of 40°10' N. latitude. These species are part of the Nearshore Rockfish complex south of 40°10' N. latitude.

e/ Deeper nearshore consists of black, blue, brown, calico, copper, olive, and quillback rockfish, and treefish south of 40°10' N. latitude. These species are part of the Nearshore Rockfish complex south of 40°10' N. latitude.

Table 4-45. No Action - Nearshore. Projected overfished species (OFS) mortality (mt) compared to the overfished species shares for 2017-2018 (mt).

Stock	Area	Total Projected OFS Mortality 2017-2018	Projected OFS Mortality and shares by Area for 2017-2018			
			Oregon Total (Share)	CA Total (Share)	40°10' – 42° N. lat.	S. of 40°10' N. lat.
BOCACCIO	S. 40°10' N. lat.	0.5	N/A	0.5	N/A	0.5
COWCOD	S. 40°10' N. lat.	0	N/A	0	N/A	0
DARKBLOTCHED	Coastwide	0.2	0.1	0.1	0	0.1
POP	N. 40°10' N. lat.	0	0	0	0	0
Petrale sole	Coastwide	0	0	0	0	0
YELLOWEYE	Coastwide	2.0	1.4 (1.4)	0.6 (0.6)	0.5	0.1

Additional Management Measures Analyzed

Range of Nearshore Rockfish HGs

The Council requested analysis of a range of state-specific Nearshore Rockfish HGs north of 40°10´ N. latitude (Table 4-8). The state-specific HGs for Oregon and California are further allocated within the state processes between the commercial and recreational fisheries (Section 4.1.1.3). Projections in Table 4-43 assume status quo sharing (i.e., same proportions as in 2015-2016) of the Nearshore Rockfish HG north of 40° 10' N. latitude to each of the states.

Option 1

Under Option 1, the states equally share the ACL contributions for the stocks without state assessment boundaries. For stocks that have state-specific stock assessment boundaries, the states receive 100 percent of the ACL contribution (e.g., WA receives 100 percent of the ACL contribution of the WA China rockfish assessment). For the nearshore commercial fishery, the projected mortality for all species, except Nearshore Rockfish north of 40°10' N. latitude, remains the same as displayed in Table 4-43 and Table 4-45 under Option 1. In Oregon, the allocation and associated landings of Nearshore Rockfish north of 40°10' N. latitude would be 10.3 mt, which is 58 percent of landings under the status quo sharing option (17.5 mt). The California HG is higher under Option 1, compared to No Action; however increased trip limits for the commercial fishery are not proposed because no additional mortality of yelloweye can be accommodated (Table 4-45).

Option 2

Under Option 2, status quo proportions were used to allocate stocks without state-specific assessment boundaries (not equal shares as with Option 1). For stocks that have state-specific stock assessment boundaries, the states receive 100 percent of the ACL contribution (e.g., WA receives 100 percent of the ACL contribution of the WA China rockfish assessment). For the nearshore commercial fishery, the projected mortality for all species, except Nearshore Rockfish north of 40°10' N. latitude, remains the same as displayed in Table 4-43 and Table 4-45 under Option 2. In Oregon, the allocation and associated landings

of Nearshore Rockfish north of 40°10' N. latitude would be 13.0 mt, which is 74 percent of landings under the status quo sharing option (17.5 mt). The California HG is higher under Option 1, compared to No Action; however increased trip limits for the commercial fishery are not proposed because no additional mortality of yelloweye rockfish can be accommodated (Table 4-45).

Table 4-46. Allocations of nearshore rockfish north of 40° 10' N. to Oregon and California nearshore fisheries for the three allocation alternatives, projected landings for blue rockfish species and the other nearshore rockfish, and total mortality of yelloweye rockfish. All other impacts are the same as in Table 4-43. Allocations for Oregon are not Federal allocations, rather the presumptive state allocations of the Oregon Federal HG to the "Oregon commercial nearshore fishery."

	Status Quo a/	Option 1 b/	Option 2 c/
Oregon HG Commercial and Recreational	60.5	36.2	46.1
Estimated Total Nearshore Rockfish Landings OR d/	17.5	10.3	13
--Blue rockfish (OR)	*7*	*4.1*	*5.2*
--Other Nearshore Rockfish (OR)	*10.5*	*6.2*	*7.8*
California HG Commercial and Recreational	29.6	41.4	40.2
Estimated Total Nearshore Rockfish Landings CA e/	5.2	5.2	5.2
--Blue rockfish (CA)	*3.6*	*3.6*	*3.6*
--Other Nearshore Rockfish (CA)	*1.6*	*1.6*	*1.6*

a/ Same proportions (status quo) of the total fishery HG applied to each of the states.
b/ For stocks with state-specific assessment boundaries, states receive their entire respective component ACL. For stocks without, the states equally share (33.3 percent to each).
c/ For stocks with state-specific assessment boundaries, states receive their entire respective component ACL. For stocks without, the same proportions (status quo) are used.
d/ Estimated landings for Oregon do not represent Federal allocations, rather the presumptive state allocations of the Oregon Federal HG to the Oregon commercial nearshore fishery.
e/ Estimated landings for California do not represent Federal allocations, rather the presumptive landings under a given HG.

Canary Rockfish Trip Limits

Canary rockfish was declared rebuilt in 2016 and therefore trip limits, in lieu of a prohibition on retention as in 2016, are proposed for the 2017-2018 management cycle and beyond. These trip limit would apply north and south of 40° 10' N. latitude for both the limited entry and open access sectors. The same set of limits would also apply to both the non-nearshore and nearshore fisheries; however, given that the highest density of canary rockfish occurs from 50 to 100 fm (PFMC 2014), the majority of the catch is expected in the nearshore fishery. For California, the trip limit structure would apply to north and south of the 40° 10' N. latitude management line for both the limited entry and open access non-trawl fixed-gear sectors in each management area, with the fishery open to the limited entry sector year-round between 42° N. latitude and 34° 27' N. latitude and closed March/April south of 34° 27' N. latitude, and open year-round to the open access sector north of 40° 10' N. latitude and closed March/April south of 40° 10' N. latitude. The limited entry and open access closure south of 34° 27' N. latitude is being proposed because it would match the existing trip limit structure now in place for the Shelf Rockfish complex. By establishing a canary rockfish bi-monthly trip limit structure that matches the Shelf Rockfish complex, it would provide for a uniform approach for monitoring, management, and law enforcement. It would also be least likely to alter the current fishing behavior of the fleet.

The starting point for the trip limit analysis was to establish limits at a level to accommodate incidental bycatch while not establishing a target fishery. For limited entry, a 300 lb/two month limit was used because it would allow the relatively few vessels that participate in the nearshore fishery to retain most or all their canary bycatch. Further, the limit would allow the limited entry non-nearshore vessels to retain most or all their canary bycatch, which is near zero (i.e., typically less than 1 mt for the primary and DTL fisheries combined, and with 99.2 percent of observed limited entry non-nearshore trips catching zero canary rockfish). A range of limits from 0 to 300 lb/two month period for the open access sector were analyzed (see Appendix A) since canary rockfish encounters are relatively prevalent by these vessels (i.e., total nearshore impacts are typically 5-15 mt per year, and ~20 percent of trips encounter canary).

A two-stage bootstrap projection model was used to project landings and discard mortality of canary rockfish in the nearshore fishery under the range of open access trip limits (left panels in Table 4-47). Outcomes include a non-targeting scenario and a 14 percent targeting scenario, which is hypothesized to be the potential targeting rate based on the level of targeting that was presumed to have occurred in the historical fishery when targeting was permitted (Appendix A). Only the 14 percent targeting scenario is presented in Table 4-47 because it is expected that some targeting will occur, even under the lower trip limit scenarios. The estimated mortality in the open access fishery was then combined with the expected mortality from the limited entry sector, under a 300 lb/two month limit, to estimate total mortality of canary for the entire fixed gear sector (right panel in Table 4-47). The range of fixed gear mortality of canary rockfish (6.1 to 18.9 mt, Table 4-47) under the trip limits is well within the nearshore share (104.8 and 96.8 mt, Table 4-42).

Based on the bootstrap analysis, open access trip limits of 100 and 150 lb/two months are expected to be the most effective for maximizing retention of bycatch (Table 4-47, 89 percent and 95 percent retention, respectively) while limiting potential impacts from targeting. Trip limits below 100 lb per month would result in greater discarding of bycatch, but would also result in the lowest total mortality.

To streamline the economic analysis (Section 4.2), a single projection of canary rockfish landings was requested, and, as such, a single trip limit had to be selected from the nine presented in Table 4-47. The 100 lb/two month limit for open access was selected because it closely meets the goal of allowing fishermen to retain a majority of their canary rockfish bycatch (i.e., 89.3 percent).

Table 4-47. Projected impacts to canary rockfish in the nearshore fishery for open access trip limits ranging from 0-300 lbs per period and with LE fixed at 300 lbs for all (except non-retention). Open access trip limits assume 14 percent targeting, based on historical practices.

Open Access Estimates						Nearshore Total Mortality (mt) a/	Regional Landings (lbs.) b/		
OA Trip Limit	Landings (lbs.)	Discarded (lbs.)	Total (lbs.)	% Landed	% Discarded		N 42^0	$40^0$10'- 42^0	S $40^0$10'
0	0	25550	25550	0.0%	100.0%	6.1	0	0	0
10	6,205	19,894	26,099	23.8%	76.2%	7.6	953	995	4,257
25	12,637	14,288	26,925	46.9%	53.1%	9.2	1,941	2,027	8,669
50	19,928	8,372	28,300	70.4%	29.6%	11.1	3,062	3,196	13,671
100	27,714	3,336	31,050	89.3%	10.7%	13.4	4,258	4,444	19,012
150	32,055	1,745	33,800	94.8%	5.2%	15.0	4,925	5,140	21,990
200	35,322	1,227	36,549	96.6%	3.4%	16.3	5,427	5,664	24,231
250	38,310	989	39,299	97.5%	2.5%	17.6	5,886	6,144	26,281
300	41,105	945	42,050	97.8%	2.2%	18.9	6,315	6,592	28,198

a/ Totals are for LE and OA vessels combined for the nearshore fishery and assume a 300 lb/two month limit for limited entry. The canary rockfish mortality in the non-nearshore fishery is expected to be approximately 1 mt.
b/ Regional values were partitioned from the total based on average (2010-2014) total mortality (15.4% to N 42^0; 16.0% to $40^0$10'- 42^0; 68.6% to S $40^0$10')

Black Rockfish Trip Limits

Black rockfish is managed as a single stock south of 42° N. latitude. Trip limit options analyzed herein are for California's management area north of 40° 10' N. latitude for the LE and OA non-trawl fixed-gear sectors. The 2017 black rockfish ACL is 334 mt and is 332 mt for 2018. Prior to 2017 (2015 and 2016) black rockfish was managed under an ACL harvest control rule constant catch strategy shared with Oregon at 1,000 mt. In California, black rockfish is shared by the commercial and recreational sectors. The 2015-2016 commercial trip limits (in pounds) for black rockfish north of 40° 10' N. latitude are described in Table 4-48, which would remain in effect absent the routine adjustments proposed here.

Participation in the northern nearshore fishery, of which black rockfish is a component, is relatively small with approximately 20 individuals who hold a deeper nearshore fish species permit allowing them to catch and land black rockfish. Landings in 2015 (preliminary) were substantially greater than in previous years and even exceeded those in the late 2000s (Table 4-49).

Table 4-48. 2016 bi-monthly cumulative trip limits (in lbs) for limited entry and open access fixed-gear black rockfish north of 40° 10' N. latitude.

Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
8,500	8,500	8,500	6,000	6,000	6,000

Note: Federal trip limit regulations stipulate that of the above amounts, no more than 1,200 lb of which may be species other than black rockfish.

Table 4-49. Commercial black rockfish landings (mt) in California north of 40° 10' N. latitude from 2005 to 2015 by the limited entry and open access fixed-gear sector. Note that the 2015 landings total is a preliminary projection.

Year	Landings (mt)
2005	69.7
2006	58.0
2007	79.4
2008	80.9
2009	86.7
2010	48.2
2011	22.2
2012	16.9
2013	27.1
2014	34.0
2015	108.5

(Data source: PacFIN)

Table 4-50 summarizes bi-monthly trip limits for the LE and OA sectors north of 40° 10' N. latitude, proposed for the 2017-2018 management cycle, and corresponding projected impacts. Bi-monthly trip limits range from 6,000 to 8,500 lb per two months. For analytical and managerial ease, bi-monthly limits are assumed the same in each period for the two action alternatives. Commercial landings north of 40° 10' N. latitude during this time period were adjusted by including discard mortalities to the analytical options to project mortality for this area.

Table 4-50. Summary of black rockfish bi-monthly trip limits (in pounds) for the limited entry and open access fixed-gear sectors north of 40°10' N. latitude and corresponding projected mortality impacts (mt).

	Trip Limits (pounds)						Projected mortality (mt)
	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	
No Action	8,500 lb/2 mo			6,000 lb/2 mo			108.5
Option 1	7,000 lb/2 mo						94.1
Option 2	6,000 lb/2 mo						80.6

Participation in the black rockfish fishery has been unpredictable in recent years in northern California. After the 2011 tsunami event, fishery infrastructure in some northern California ports was damaged and landings were severely curtailed. However, since then, the fishery is rebounding with steadily increasing landings. Preliminary data suggest that the 2015 fishing season may be an anomaly - excellent fishing conditions, coupled with a poor Dungeness crab season in the first part of the year contributed to higher than expected landings. Although the non-trawl RCA shoreward boundary was adjusted in 2015 from 20 fathoms to 30 fathoms, fishing continued to take place in waters shallower than 20 fathoms to better accommodate the live fish market.

Since the total amount of black rockfish that is available to the fishery in 2017 and 2018 was decreased by approximately 80 mt from the previous two-year cycle, the Council is considering the possibility of decreased trip limits for black rockfish to keep the mortality within acceptable limits.

California Scorpionfish Trip Limits

California scorpionfish is managed as a single stock, with trip limit options analyzed for both the LE and OA non-trawl fixed-gear sectors combined. Proposed trip limit increases are examined in an effort to provide the commercial sector a modest increase in its harvest opportunity. The bi-monthly trip limits for LE and OA sectors in 2016, which would be in effect absent any routine adjustment proposed by the Council, are described in Table 4-51. For 2015-2016, California scorpionfish south of 34° 27' N. latitude was not managed to sector-specific allocations, and this will carry through to 2017 and 2018. California scorpionfish are not formally allocated between the trawl or non-trawl sectors, nor are they formally allocated within the non-trawl sector (i.e., the non-trawl sector is shared among LE, OA, and recreational). The 2017 and 2018 ACLs, south of 34° 27' N. latitude are expected to increase to 150 mt per year, with a Council-adopted ACT of 111 mt.

Table 4-51. Summary of limited entry and open access bi-monthly trip limits (in pounds) for California scorpionfish in 2016.

Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
1,200	Closed	1,200	1,200	1,200	1,200

Despite an increased ACL for 2017 and 2018, participation in the commercial California scorpionfish fishery south of 34° 27' N. latitude is limited and is expected to continue as such, with the 2011-2014 annual average of 27 vessels operating in all commercial sectors combined. Within the commercial sectors, hook-and-line and trap vessels averaged 0.13 mt per year with trawlers averaging 0.16 mt annually. Data indicate that no participants attained greater than 35 percent of their annual limit, with all but two vessels taking less than five percent of the allowable annual limit. Historically, the recreational sector has accounted for the majority of the take of California scorpionfish.

A range of higher trip limits was explored for LE and OA sectors (Table 4-52). Cumulative bi-monthly trip limits are the amounts (pounds) that each vessel may land during a given two-month period when fishing is allowed. Projected landings mortality are based on average landings during 2012-2013 and factor in a proxy discard mortality from the 2014 WCGOP estimate. The recreational projected mortality uses the 2015 estimate from RecFIN.

Table 4-52. Summary of limited entry and open access bi-monthly trip limits (in lbs) and projected impacts (mt) for California scorpionfish south of 34° 27' N. latitude.

	Commercial				
Options	Trip limit (pounds)	Projected mortality (mt)	Recreational projected mortality (mt)	Total	Percent of 2017 ACT
No Action	1,200	4.7	96.7	101.4	91.4%
Opt. 1	1,500	5.5		102.2	92.1%
Opt. 2	1,700	6.1		102.8	92.6%

All of the trip limits analyzed are expected to keep overall mortality within allowable limits. Given the low proportion of total mortality originating from the commercial fishery, and the small number of participants capped by the requirement to hold a nearshore fishery permit, it is believed that increasing the commercial trip limit will not pose a significant risk of exceeding the ACT.

4.1.1.7 Tribal Fisheries – No Action

Tribal fisheries consist of trawl (bottom, midwater, and whiting), fixed gear, and troll. Principle management controls in the tribal fisheries include allocations, set-asides, HGs, and trip limits. Tribal set-asides are outlined in Table 4-1 and Table 4-3. The Washington coastal tribes (Makah, Quileute, Hoh, and Quinault) would conduct their groundfish fisheries in 2017-2018 with the allocations and management measures as described in Table 4-53.

Table 4-53. The No Action : Tribal fishery based on current regulations and those proposed for 2017-2018.

Management Measures	Black Rockfish For the commercial harvest of black rockfish off Washington State, a treaty Indian tribes' harvest guideline is set at 30,000 lb for the area north of Cape Alava, WA (48°09.50' N. lat.) and 10,000 lb for the area between Destruction Island, WA (47°40' N. lat.) and Leadbetter Point, WA (46°38.17' N. lat.). This harvest guideline applies and is available to the Pacific Coast treaty Indian tribes. There are no tribal harvest restrictions for black rockfish in the area between Cape Alava and Destruction Island. Sablefish The sablefish allocation to Pacific coast treaty Indian Tribes is 10 percent of the sablefish ACL for the area north of 36° N. lat. and is reduced by 1.5 percent (decreased from 1.6 percent in 2016) for estimated discard mortality. Lingcod are subject to an overall catch of 250 mt for all treaty fishing. Pacific whiting -The tribal allocation for 2015 is 56,888 mt. Pacific cod - Managed to the tribal HG of 500 mt. Petrale sole – are subject to a fleetwide harvest target of 220 mt. Trawl vessels are restricted to small footrope trawl gear. Yellowtail rockfish – in the directed midwater trawl fisheries are subject to annual catch of 1,000 mt for the entire fleet, per year. Spiny dogfish – are subject to an expected total catch of 275 mt per year. Rockfish - Full retention. Rockfish taken during open competition tribal commercial fisheries for Pacific halibut would not be subject to trip limits. Thornyheads • Shortspine thornyhead cumulative trip limits are 17,000-lb per 2 months, limited to 50 mt annually. • Longspine thornyhead cumulative trip limits are 22,000-lb per 2 months, limited to 30 mt annually. Canary rockfish 300 lb per trip YELLOWEYE ROCKFISH 100 lb per trip Makah Tribe midwater trawl fisheries:

	Landings of widow rockfish will be managed to the tribal harvest guideline of 200 mt per year. Yellowtail rockfish will be managed not exceed 1,000 mt for the fleet. Nearshore rockfish, 300 lb per trip limit per species or species group, or to the non-tribal limited entry trip limit for those species if those limits are less restrictive than 300 lb per trip. Shelf Rockfish and Slope Rockfish. Redstripe rockfish are subject to an 800 lb trip limit. Shelf (excluding redstripe rockfish), and Slope Rockfish groups are subject to a 300 lb trip limit per species or species group, or to the non-tribal limited entry fixed gear trip limit for those species if those limits are less restrictive than 300 lb per trip. Limited entry fixed gear trip limits are specified in the regulations (Table 2 (North) in 660.00 Subpart E) Other rockfish 300 lb per trip limit per species or species group, or to the non-tribal limited entry trip limit for those species if those limits are less restrictive than 300 lb per trip. Flatfish and Other Fish (small footrope bottom trawl) For Dover sole, English sole, Other Flatfish, and arrowtooth flounder trip limits will be established in tribal regulation only and adjusted in-season to stay within the overall harvest targets and overfished species limits. This is a change from 2016 where the following limits were in place: Dover sole, English sole, Other Flatfish had 110,000 lbs per 2 months and arrowtooth flounder was 150,000 lbs per 2 months. Spiny dogfish are managed within the limited entry trip limits for non-tribal fisheries.
EFH	• EFH closures in tribal U&A fishing areas do not apply to tribal fisheries
RCA	• RCA closures in tribal U&A fishing areas do not apply to tribal fisheries
Monitoring	• The Makah Tribe shoreside observer program to monitor and enforce Makah limits
Reporting	• VMS declarations for trawl only

Impact (Groundfish Mortality)

For the 2017-18 fishing seasons all tribal fisheries will be managed not to exceed set-asides, and HGs. Trip limits will be subject to in-season adjustments in order to utilize tribal set-asides, and HGs.

All midwater landing limits were subject to inseason adjustments to minimize the take of both canary and widow rockfish. Full rockfish retention programs, where all overfished and marketable rockfish are retained, as well as a Makah trawl observer program, were in place to provide catch accountability.

Sablefish Discard Mortality

The tribes have a sablefish discard model that looks at the changing size distribution between a restricted longline fishery (trip limits) for sablefish and an unrestricted longline fishery (no trip limits) for sablefish. It is assumed that the change in size by the fisheries is caused by discard of small fish in the restricted fishery. With the most current data inputs the data shows the total mortality for sablefish discard has changed from 1.6% of the tribal allocation to 1.5% of the total tribal allocation.

4.1.1.8 Washington Recreational – No Action

Primary catch controls for the Washington recreational fishery are season dates, depth closures, bag limits, and GCAs, including YRCAs. Yelloweye rockfish is the overfished stock primarily caught in the Washington recreational fishery. Seaward adjustments of the recreational RCAs, which focuses fishing effort in the nearshore area where yelloweye rockfish encounters and mortality of discarded fish are lower, are the main management measure for reducing catches of this stock. Under the No Action Alternative, Washington recreational fisheries would operate under the ACLs that are generated by applying the default HCR from the 2015-2016 cycle (Section 2.1.1) including a 20 mt ACL for yelloweye rockfish and 1,714 and 1,588 mt canary rockfish ACLs for 2017 and 2018 respectively, and the associated Washington recreational HGs of 3.3 mt for yelloweye rockfish and 53.2 and 49.2 for canary rockfish in 2017 and 2018 respectively (Table 4-54).

The west coast states will be responsible for tracking and managing catches of Nearshore Rockfish north of 40°10´ N. latitude. If harvest levels in Washington approach 75 percent of the state-specific HG (Table 4-54), the state of Washington will consult with the other west coast states via a conference call and determine whether inseason action is needed. The HG for Washington would be a state HG and not established in Federal regulations (Table 4-54). In the event inseason action is needed, the state of Washington would take action through state regulation. Inseason updates would be provided to the Council at the September and November meetings.

Table 4-54. No Action – Washington Recreational. Harvest guidelines (HG) for the Washington recreational fisheries under the No Action Alternative.

Species	HG (mt)	
	2017	**2018**
Canary Rockfish	53.2	49.2
YELLOWEYE ROCKFISH	3.3	3.3
Black Rockfish	287	283
Nearshore Rockfish	13.1	13.1

Groundfish Seasons and Area Restrictions

Season Structure

Under the No Action Alternative, two options for groundfish seasons would be considered. The status quo Washington recreational season would be open year-round for groundfish (Table 4-55), except lingcod (see the Section on Lingcod Seasons and Size Limits). The Option 1 groundfish season would be open from March 15 through October 15 and closed from October 16 through March 14 (Table 4-56). Note that although the groundfish fishery dates would be modified under Option 1, the status quo lingcod season dates would remain in effect for each Marine Area. The Option 1 recreational groundfish season is not expected to result in significant changes to groundfish mortality because very little fishing effort occurs in Marine Areas 1-4 from October through February. The primary purpose of this option is to cap groundfish fishing effort at current levels and minimize additional effort that could potentially develop in the future.

Depth restrictions are the primary tool used to keep recreational mortality of yelloweye rockfish within specified HGs. Because the 2017-2018 yelloweye rockfish HG for Washington recreational fisheries changes very little from what was in place in the previous management period, no changes to depth restrictions are being proposed. Under the No Action Alternative, two rockfish sub-limit options are being

considered. Option 2 would allow retention of one canary rockfish due to the need to minimize encounters with yelloweye rockfish, which continues to drive management measures for Washington recreational fisheries. Projected mortality for canary rockfish does increase as a result of allowing retention under Option 2 but falls well below the HG under the No Action Alternative. However, projected mortality estimates do not account for changes to angler behavior resulting from allowing canary rockfish retention after many years of prohibiting retention of canary rockfish. See the section entitled Inseason Management Response below for tools that could be implemented if necessary to keep total mortality within specified HGs.

Restrictions limiting the depth where groundfish fisheries are permitted are more severe in the area north of the Queets River (Marine Areas 3 and 4) where yelloweye and canary rockfish abundance is higher and therefore caught incidentally at a higher rate. Depth restrictions are fewer in the south coast where incidental catch of yelloweye and canary becomes progressively less. Washington coastal management areas are shown in Figure 4-3. Table 4-55 summarizes key features of the Washington recreational regulations under the No Action Alternative status quo option. Table 4-56 summarizes key features of the Washington recreational regulations under the No Action Alternative Option 1.

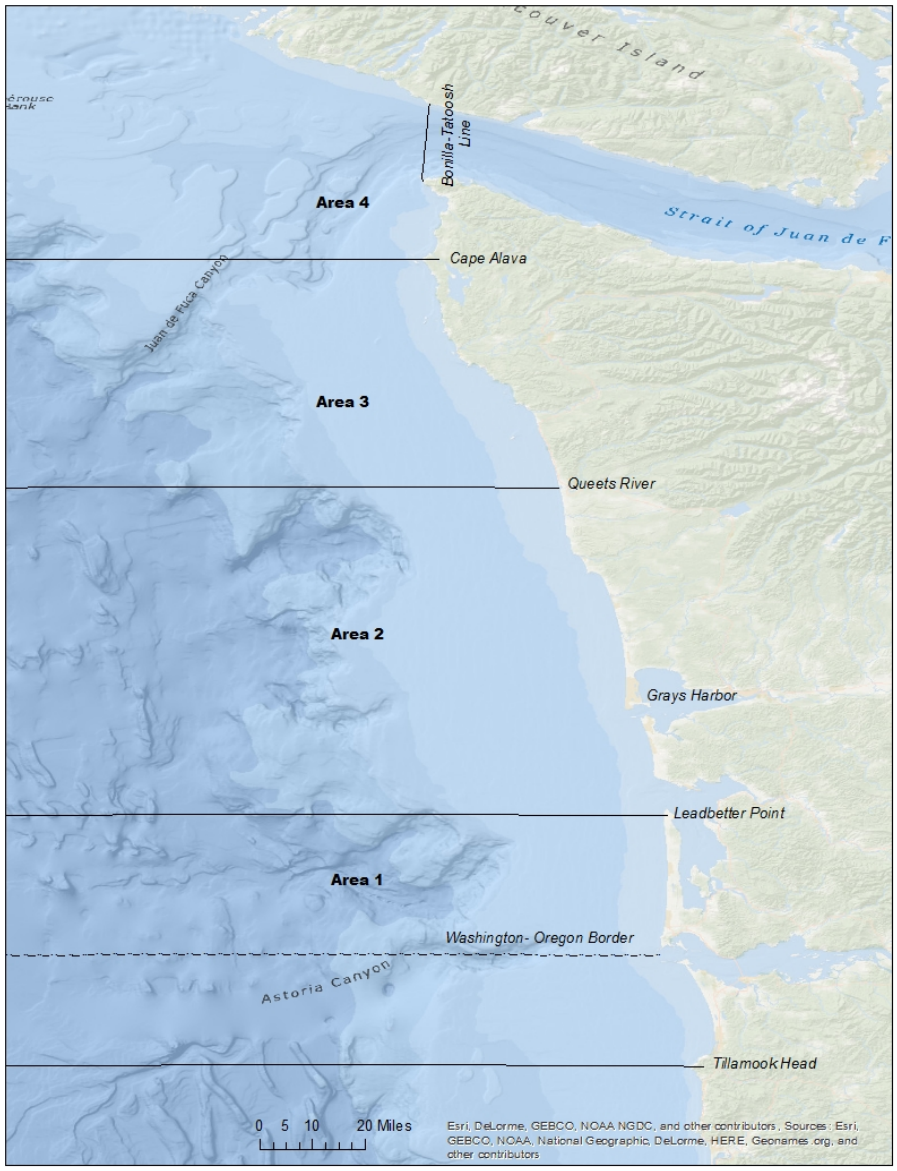


Figure 4-3. No Action. Washington Recreational Management Areas.

Table 4-55. No Action. Status Quo 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 Open				BF Open <20 fm May 9 - Labor Day a/				BF Open			
2 (S. Coast)	BF Open b/		BF Open <30 fm Mar 15 - June 15 b/ c/ d/ e/		BF Open b/							
1 (Col. River)	BF Open g/				BF Open f/g					BF Open g/		

a/ Retention of lingcod, Pacific cod and sablefish allowed >20 fm on days when Pacific halibut is open.
b/ Retention of lingcod 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.) year round except on days open to the primary halibut fishery.
c/ Retention of sablefish and Pacific cod allowed > 30 fm from May 1- June 15.
d/ Retention of rockfish allowed > 30 fathoms
e/ Retention of lingcod allowed > 30 fathoms on days that the primary halibut season is open.
f/ Retention of groundfish, except sablefish, flatfish other than halibut, and Pacific cod, prohibited during the all-depth Pacific halibut fishery
g/ Retention of lingcod prohibited seaward of line drawn from Leadbetter Point (46° 38.17' N. Lat. 124°21.00' W. Lon.) to (46° 28.00' N. Lat. 124°21.00' W. Lon.) year round.

Table 4-56. No Action. Option 1 Washington Recreational Seasons and Groundfish Retention Restrictions, which includes a bottomfish closure from October 16 through March 14.

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 May 9 - Labor Day a/				BF Open		BF Closed	
2 (S. Coast)	BF Closed		BF Open <30 fm Mar 15 - June 15 b/ c/ d/ e/		BF Open b/						BF Closed	
1 (Col. River)	BF Closed		BF Open		BF Open f/g						BF Closed	

a/ Retention of lingcod, Pacific cod and sablefish allowed >20 fm on days when Pacific halibut is open.
b/ Retention of lingcod 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.) year round except on days open to the primary halibut fishery.
c/ Retention of sablefish and Pacific cod allowed > 30 fm from May 1- June 15.
d/ Retention of rockfish allowed > 30 fathoms
e/ Retention of lingcod allowed > 30 fathoms on days that the primary halibut season is open.
f/ Retention of groundfish, except sablefish, flatfish other than halibut, and Pacific cod, prohibited during the all-depth Pacific halibut fishery
g/ Retention of lingcod prohibited seaward of line drawn from Leadbetter Point (46° 38.17' N. Lat. 124°21.00' W. Lon.) to (46° 28.00' N. Lat. 124°21.00' W. Lon.) March 15 - Oct 15.

North Coast (Marine Areas 3 and 4)

The retention of bottomfish is prohibited seaward of a line approximating 20 fm from May 9th through the first Monday in September (Labor Day), except lingcod, Pacific cod and sablefish can be retained seaward of 20 fm on days that Pacific halibut fishing is open. Outside of this time period, two options are under consideration. The status quo option (Table 4-55) provides 150 days more fishing opportunity compared to Option 1 (Table 4-56). Fishing for, retention, or possession of groundfish and Pacific halibut is prohibited in the C-shaped YRCA (Figure 4-4).

South Coast (Marine Area 2)

The retention of bottomfish, except rockfish, is prohibited seaward of 30 fm from March 15 through June 15, except sablefish and Pacific cod retention is allowed May 1 through June 15. Retention of lingcod is allowed seaward of 30 fm on days open to the primary Pacific halibut season. Fishing for, retention, or possession of lingcod is prohibited in deepwater areas seaward of a line extending from 47°31.70' N. latitude, 124°45.00' W. longitude to 46°38.17' N. latitude, 124°30.00' W. longitude year-round, except as allowed on days open to the Pacific halibut fishery (Figure 4-4). Fishing for, retention or possession of bottomfish or Pacific halibut is prohibited in the South Coast YRCA and Westport Offshore YRCA (Figure 4-4). Outside of this time period, two options are under consideration. The status quo option (Table 4-55) provides 150 days more fishing opportunity compared to Option 1 (Table 4-56).

Columbia River (Marine Area 1)

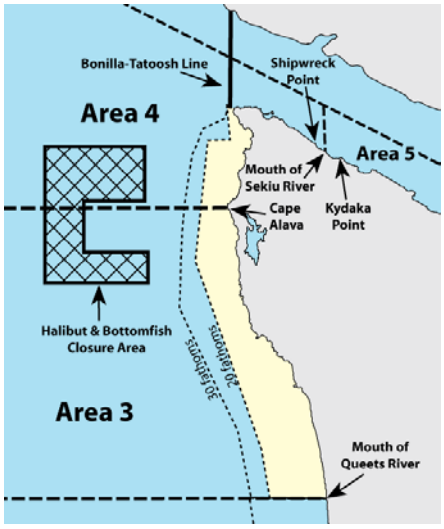
Retention of bottomfish, except sablefish, flatfish other than halibut, and Pacific cod, is prohibited with halibut onboard from May 1 through September 30, and fishing for, retention, or possession of lingcod in deepwater areas seaward of a line extending from 46°38.17 N. latitude, 124°21.00' W. longitude to 46°28.00' N. latitude, 124°21.00' W. longitude is prohibited year-round (Figure 4-4). Outside of this time period, two options are under consideration. The status quo option (Table 4-55) provides 150 days more fishing opportunity compared to Option 1 (Table 4-56).

Area Restrictions

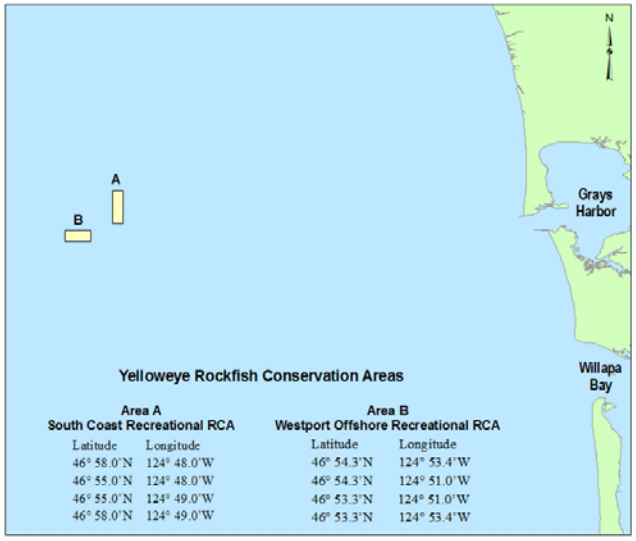
Under the No Action Alternative, fishing for, retention, or possession of groundfish and halibut during the Washington recreational groundfish and Pacific halibut fisheries would be prohibited in the C-shaped YRCA in the north coast and the South Coast and Westport YRCAs in the south coast (Figure 4-4.a and b).

Fishing for, retention, or possession of lingcod would be prohibited seaward of a line connecting the following coordinates from the Queets River (47°31.70' N. latitude, 124° 45.00' W. longitude) to 46°28.00' N. latitude, 124°21.00' W. longitude, year-round except as allowed in Washington Marine Area 2 on days open to the primary Pacific halibut fishery (Figure 4-4.c).

a.



b.



c.

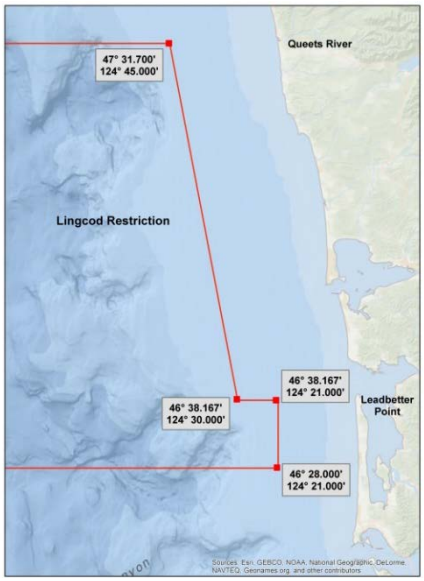


Figure 4-4. No Action Washington recreational area restrictions. a. C-Shaped YRCA; b. Washington South Coast and Westport YRCAs; c. Lingcod Restricted Area.

Groundfish Bag Limits

Under the No Action Alternative, two rockfish sub-bag limit options would be considered in addition to status quo. The two options differ from status quo by having reduced rockfish sub-limits. Option 1 would reduce the rockfish sub-bag limit from 10 to 8 rockfish per angler per day. Option 2 would reduce the rockfish sub-bag limit from 10 to 7 rockfish per angler per day which could include up to one canary rockfish.

- Status Quo: The recreational groundfish bag limit, including rockfish and lingcod, would be 12 fish per day. Of the 12 recreational groundfish allowed to be landed per day, sub-limits of 10 rockfish, and two lingcod would apply. Retention of canary and yelloweye rockfish would continue to be prohibited. The recreational bag limit would also include a sub-limit of two cabezon in Marine Areas 1-3 and one cabezon in Marine Area 4.
- Option 1: The recreational groundfish bag limit, including rockfish and lingcod, would be 12 fish per day. Of the 12 recreational groundfish allowed to be landed per day, sub-limits of 8 rockfish, and two lingcod apply. Retention of canary and yelloweye rockfish would continue to be prohibited. The recreational bag limit also includes a sub-limit of two cabezon in Marine Areas 1-3 and one cabezon in Marine Area 4.
- Option 2: The recreational groundfish bag limit, including rockfish and lingcod, would be 12 fish per day. Of the 12 recreational groundfish allowed to be landed per day, sub-limits of 7 rockfish including up to 1 canary rockfish, and two lingcod apply. Retention of yelloweye rockfish would continue to be prohibited. The recreational bag limit also includes a sub-limit of two cabezon in Marine Areas 1-3 and one cabezon in Marine Area 4.

Lingcod Seasons and Size Limits

The lingcod season in Marine Areas 1 through 3 (Washington-Oregon border at 46°16' N. latitude to Cape Alava at 48°10' N. latitude) would be open from the Saturday closest to March 15 through the Saturday closest to October 15. Marine Area 4 (Cape Alava to the U.S. Canadian border) would be open from April 16 through October 15, or the Saturday closest to October 15; whichever is earlier.

Under the No Action Alternative, the lingcod seasons and size limits by area would be as follows:

- Marine Areas 1-3: March 18 through October 14 in 2017 and March 17 through October 13 in 2018. Minimum size, 22 inches.
- Marine Area 4: April 16 through October 14 in 2017 and April 16 to October 13 in 2018. Minimum size, 22 inches.

Cabezon Size Limit

Under the No Action Alternative, there is an 18 inch minimum size limit for cabezon in Marine Area 4 (Cape Alava to the U.S. Canadian border).

Pacific Halibut Seasons

It is expected that the Pacific halibut seasons in 2017-2018 would be similar to the halibut seasons in 2015-2016. There are no changes to the restrictions on groundfish retention during the Pacific halibut season proposed under the No Action Alternative.

Additional Management Measures Analyzed

Season dates, lingcod closed areas, and rockfish sub-bag limits, in addition to status quo management measures, would be used to keep recreational harvests of overfished species within specified HGs.

Under the No Action Alternative, three Nearshore Rockfish HGs are being considered. The Washington HG options are 13.12 mt (Status Quo methodology), 25.6 mt (Option 1), and 16.93 mt (Option 2) for both 2017 and 2018. Under management measures being considered for the No Action Alternative, Nearshore Rockfish mortality is projected to be lower than the all of HG options (Table 4-57). See Inseason Management Response below for tools that could be implemented if necessary to keep total mortality within specified HGs.

Under the No Action Alternative, changes to the lingcod closure will be considered. Changes being considered would refine the current closed area by moving the southern boundary of the closed area to the north to increase access to healthy rockfish stocks while still minimizing encounters with yelloweye rockfish.

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 in Recreational Fishery Information Network (RecFIN). It should be noted that the precision of recreational groundfish catch estimates based upon previous seasons would continue to be influenced by factors such as the length and success of salmon and halibut seasons, weather and unforeseen factors.

Washington's OSP is able to produce estimates of groundfish catch with a one month lag time. Management measures such as more restrictive depth closures, area closures, groundfish retention restrictions, or changes to seasons can be considered and implemented 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 are at risk of being exceeded.

Impact (Groundfish Mortality)

Projected mortality for overfished and non-overfished species under the No Action Alternative is summarized in Table 4-57. The No Action Alternative includes rockfish sub-bag limit options and a recreational season option. Only the rockfish sub-bag limit options impact projected mortality for yelloweye, canary, and black rockfish. The recreational season option that would close the groundfish fishery from October 15 through March 14 is expected to have no effect on projected mortality because there is very little fishing effort and catch during this period. Fishing effort that would normally occur during the closed period may shift to months adjacent to the closed period (March and October) and result in little impact compared to recent years but may prevent future winter fishing effort from increasing.

The rockfish sub-bag limits had the most impact on projected mortality of black rockfish as the proportion of black rockfish caught is very high compared to other species of rockfish. Under the rockfish sub-bag limit Option 1, where the sub-bag limit would be reduced from 10 to 8 rockfish, canary rockfish retention would not be permitted. Under this Option, projected canary mortality is 1.6 mt. Under the Option 2, the rockfish sub-bag limit would be reduced from 10 to 7 rockfish, including the retention of up to one canary rockfish. Option 2 results in an increase in projected impacts for canary rockfish (2.60 mt) and a further reduction in projected impacts to black rockfish. Canary rockfish projected impacts under both rockfish sub-bag limit options are substantially lower than the recreational HG of 53 mt and 49 mt for canary rockfish

in 2017 and 2018, respectively. As stated above, management measures in place for the Washington recreational fishery continue to be driven by the need to keep yelloweye mortality under small harvest guidelines. These measures limit access to canary rockfish and keep projected impacts low even under rockfish bag limit alternatives that allow the retention of canary rockfish after many years of being a prohibited species. Projected canary rockfish impacts do not take into account changes in angler behavior that may lead to targeting; however, inseason management responses are available to control catch.

Yelloweye rockfish mortality is projected to be reduced slightly from status quo under both of the bag limit options (Table 4-57). It is difficult to know how yelloweye mortality will be affected under Option 2 which allows retention of canary rockfish, since canary rockfish retention has been prohibited for several years. Anglers may mistake yelloweye rockfish for canary rockfish and the lower projected impacts may not be realized or could be higher than projected. For these reasons, a precautionary approach is being taken with changes to rockfish bag limits that allow the retention of canary rockfish.

Table 4-57. No Action – Washington Recreational. Projected mortality under the No Action Alternative, including bag limit Options 1 and 2.

Stock	**2017/2018**		
	Status Quo	**Bag Limit Option 1**	**Bag Limit Option 2**
Canary Rockfish	1.60	1.60	2.60
YELLOWEYE ROCKFISH	3.10	2.73	2.56
Black Rockfish	314.95	253.43	215.18
Lingcod	112.00	112.00	112.00
Nearshore Rockfish	5.00	5.00	5.00
Blue Rockfish	*1.17*	*1.17*	*1.17*
Quillback Rockfish	*1.14*	*1.14*	*1.14*
Copper Rockfish	*0.87*	*0.87*	*0.87*
China Rockfish	*1.47*	*1.47*	*1.47*
Brown Rockfish	-	-	-
Grass Rockfish	-	-	-
Yellowtail Rockfish	37.37	37.37	37.37
Vermilion Rockfish	1.00	1.00	1.00
Cabezon	5.00	5.00	5.00
Kelp Greenling	1.20	1.20	1.20

4.1.1.9 Oregon Recreational – No Action

Primary catch controls for the Oregon recreational fishery are season dates, depth closures, bag limits, and GCAs, including YRCAs. The No Action Alternative analyzes the Oregon recreational fishery under the default HCR ACLs and Oregon recreational HGs or presumed state quotas (Table 4-58).

The west coast states will be responsible for tracking and managing catches of Nearshore Rockfish north of 40°10’ N. latitude, as described in Section 4.1.1.3. If harvest levels in Oregon approach 75 percent of the state-specific HG (Table 4-8), the state of Oregon will consult with the other west coast states via a conference call and determine whether inseason action is needed. The HG for Oregon would be a state HG and not established in Federal regulations (Table 4-54). In the event inseason action is needed, the state of

Oregon would take action through state regulation. Inseason updates would be provided to the Council at the September and November meetings.

Table 4-58. No Action. Oregon recreational Federal harvest guidelines (HG) or state quotas under the No Action Alternative (mt).

Stock	2017 HG a/	2018 HG a/
Canary Rockfish	183.0	169.2
YELLOWEYE ROCKFISH	3.0	3.0
Black Rockfish OR b/	400.1	394.7
Greenlings c/	41.1	34.9
Nearshore Rockfish North of 40°10' N. Lat. d/	44.5	44.5

a/ Federal HG are established for canary and yelloweye rockfish only. The state process in Oregon establishes quotas for black rockfish, blue rockfish, other Nearshore Rockfish, and greenlings (all species). The state quotas, which are yet to be determined are not intended to be implemented in Federal regulation, they are only provided as information.
b/ The values shown are the presumptive share based on the 2015 recreational and commercial sharing percentages in Oregon State Regulations.
c/ Includes kelp and other greenlings. The values shown are the presumptive share based on the 2015 recreational and commercial sharing percentages in Oregon State Regulations.
d/ Includes blue rockfish. The state of Oregon has a Federal HG for Nearshore Rockfish North of 40°10' N. Lat. of 50.5 mt, which is shared between the Oregon commercial nearshore and recreational fisheries. The values shown are the presumptive share based on 2015 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, except from April 1 to September 30 when fishing is only allowed shoreward of 40 fathoms, as defined by waypoints (Figure 4-5). This is the season structure in place in 2016. Closing the fishery deeper than 40 fathoms from April 1 to September 30, months when angler effort and yelloweye rockfish encounters are greatest, mitigates mortality of yelloweye rockfish. Canary rockfish and Nearshore Rockfish Complex north species would be part of the ten fish marine bag (no sub-bag limits). Projected mortality of yelloweye and canary rockfish are within the Federal HGs, therefore the shore-based fishery would be open year-round.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bottomfish Season	Open all depths			Open < 40 fm a/						Open all depths		
Marine Bag Limit b/	Ten (10)											
Lingcod Bag Limit	Three (3)											
Flatfish Bag Limit c/	Twenty Five (25)											

a/ From April 1 through September 30, the marine bag limit is Ten (10) fish per day, of which no more than one (1) may be cabezon.
b/ Marine bag limit 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
c/ Flounders, soles, sanddabs, turbots and halibuts except Pacific halibut

Figure 4-5. Oregon recreational groundfish season structure and bag limits under the No Action Alternative.

Area Closures

The Stonewall Bank YRCA has been in place since 2006 and would also remain under the No Action alterative (Figure 4-6). The YRCA is located approximately 15 miles west of the Port of Newport and consists of the high-relief area of Stonewall Bank, an area of high yelloweye rockfish encounters. No recreational fishing for groundfish and Pacific halibut can occur within this YRCA, which is bounded by the waypoints contained in Table 4-58.

Two Options for extending the status quo Stonewall Bank YRCA for 2017-2018 recreational fisheries, should they become necessary, are also shown in Figure 4-6 and are defined by the coordinates in Table 4-59.

Table 4-59. Coordinates for the Stonewall Bank currently as specified in regulation, for the expanding the Stonewall Bank area closure under.

Current		Option 2		Option 3	
Latitude	**Longitude**	**Latitude**	**Longitude**	**Latitude**	**Longitude**
44°37.458’ N.	124°24.918’ W.	44°41.7594’ N.	124°30.018’ W.	44°38.544’ N	124°27.4122’ W
44°37.458’ N.	124°23.628’ W.	44°41.7348’ N.	124°21.603’ W.	44°38.544’ N	124°23.8554’ W
44°28.710’ N.	124°21.798’ W.	44°25.2456’ N.	124°16.944’ W.	44°27.132’ N	124°21.501’ W
44°28.710’ N.	124°24.102’ W.	44°25.2942’ N.	124°30.1404’ W.	44°27.132’ N	124°26.8944’ W
44°31.422’ N.	124°25.500’ W.	44°41.7594’ N.	124°30.018’ W.	44°31.302’ N	124°28.3476’ W

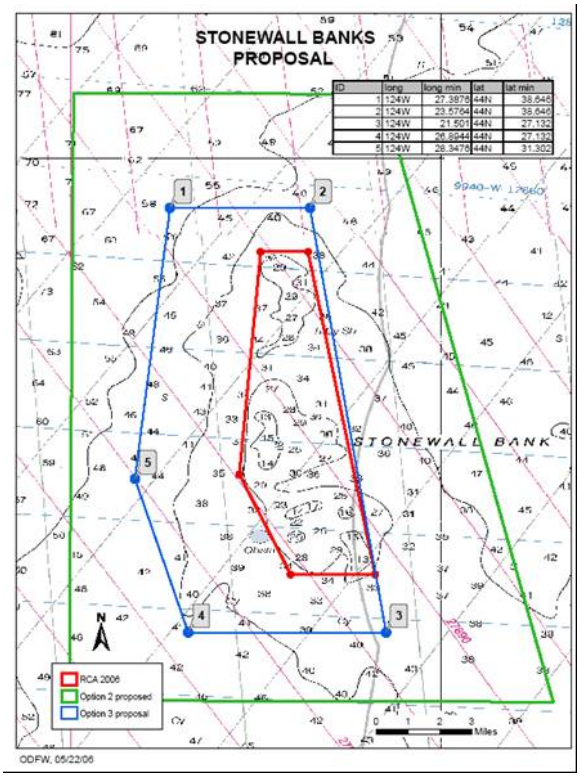


Figure 4-6. The Stonewall Bank Yelloweye Rockfish Conservation Area where recreational fishing for groundfish and Pacific halibut is prohibited with two options for expanding the closed area.

Groundfish Bag Limits and Size Limits

Under the No Action Alternative, the marine fish daily bag limit of 10 fish in aggregate that was allowed in 2016 Oregon recreational fisheries would carry forward for 2017-2018 (Figure 4-5). The marine bag 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. A flatfish daily bag limit of 25, which includes all soles and flounders except Pacific halibut, was allowed in addition to the marine fish daily bag limit. Additionally a three-fish bag limit was allowed for lingcod. Retention of yelloweye rockfish was prohibited in 2016 and would continue to be prohibited under the No Action Alternative. In 2016, a one-fish sub-bag limit of canary rockfish was allowed. With canary rockfish rebuilt and the increased ACL, and Oregon recreational HG, canary rockfish would become part of the 10-fish marine fish daily bag limit, there would be no sub-limit.

The following minimum size limits applied to the 2016 Oregon recreational fisheries and would be carried forward under the No Action Alternative:

- Lingcod – 22 in.
- Cabezon – 16 in.
- Kelp greenling – 10 in.

Pacific Halibut

Under the No Action Alternative, the recreational Pacific halibut fisheries should be able to proceed as in 2016, in regards to days and areas open, etc., depending on the halibut quota. Since 2009, only sablefish

and Pacific cod may be retained in the Pacific halibut fishery at any depth in the area north of Humbug Mountain, Oregon. Beginning in 2015, other flatfish species were also allowed. South of Humbug Mountain, groundfish may be retained in areas open to groundfish (e.g., less than 30 fm) when halibut are onboard the vessel. It is expected that groundfish retention in the all-depth Pacific halibut fishery would be similarly limited in 2017-2018 under the No Action Alternative.

Additional Considerations

Under the No Action Alternative, three Nearshore Rockfish HGs are being considered. The Oregon HG options are 60.5 mt (Status Quo methodology), 36.2 mt (Option 1), and 46.1 mt (Option 2) for both 2017 and 2018. Depending on the sharing of the Nearshore Rockfish complex north of 40°10' N. latitude allocation between the states, reduced bag limits (i.e. species specific sub-bag limits) for species in this complex may be necessary to keep impacts within the Oregon recreational fishery state cap. Currently there is a 3-fish sub-bag limit for blue rockfish and no retention of copper, quillback, or China rockfish specified in state regulations. Adjustments to routine and currently available management measures would be used to keep recreational harvests of overfished species within specified Federal HGs under No Action.

At its March 2016 meeting, the Council took final action regarding the development of a midwater recreational fishery for yellowtail rockfish in Oregon. If the Council recommendation is approved by NMFS and recommend for implementation by Oregon, then increased yellowtail rockfish mortality may occur. This increased mortality would be within the established limits.

New Management Measures

Two additional management measures were analyzed for the Oregon recreational fisheries: removing the kelp greenling minimum size limit and allowing fishing for flatfish (other than Pacific halibut) outside of the 40-fathom seasonal depth restriction (Appendix B, Section B.2.3).

Additionally, a variety of season structure (depths and months) were modeled to determine potential mortality to overfished species.

Inseason Management Tools

Oregon has a responsive port-based monitoring program through ORBS, and regulatory processes in place to track mortality and take actions inseason if necessary. The following are suggested management measures that could be implemented inseason if the fishery does not proceed as expected.

Inseason management tools, designed to mitigate mortality, include bag limit adjustments (including non-retention), length limit adjustments, gear restrictions, and season, days per week, depth, and area closures.

Season, depth, days open per week, and area closures are the primary inseason tools for keeping total impacts within the Oregon recreational sector-specific harvest targets for yelloweye, canary, and black rockfish, and the Nearshore Rockfish complex north of 40°10' N. latitude. If catch rates indicate that the harvest targets for any of these species would be reached prematurely, offshore depth closures may be adjusted inseason at 30, 25, or 20 fathoms depending on species. Additionally, days per week may also be closed to reduce mortality. Regulations would depend upon the timing of the determination for their need.

Adjustments to the marine fish daily bag limit to no more than 10 fish may be implemented to achieve season duration goals in the event of accelerated or decelerated black rockfish or Nearshore Rockfish complex species harvest. The lingcod daily bag limits may be adjusted to no more than 3 fish in the event the marine bag limit changes or the halibut catch limit is reduced from 2015 levels. Season and/or area

closures may also be considered if harvest targets are projected to be attained. Closing one or more days per week is an inseason tool that could be used to limit mortality. Closing certain days each week would help lengthen the duration of a fishery approaching an HG.

Non-retention and length restrictions are the inseason tools used for cabezon and greenling species, as release survival is very high. They may also be used to reduce mortality of nearshore species, such as black rockfish and other Nearshore Rockfish complex species.

Gear restrictions and/or release technique requirements may be implemented to reduce the impact of overfished rockfish since a variety of descending devices are available. The SSC recommended and Council-approved mortality rates for canary and yelloweye rockfish when descending devices are used were implemented in 2014.

Directed yellowtail rockfish and/or flatfish fisheries may be implemented inseason, as were implemented in 2004, in the event of a closure of the recreational groundfish fishery due to attainment Federal or state HGs or targets. Specific gear restrictions may be implemented in the event that yellowtail rockfish fishing remains open during a groundfish closure. Additionally, the fishery may be expanded to waters seaward of the RCA, promoting directed yellowtail rockfish opportunity. Fisheries would be monitored to ensure that mortality of yelloweye rockfish are within the harvest targets/guidelines.

In the event that the duration of total season is reduced from 12 months; the nearshore waters are closed to groundfish fishing due to management of nearshore species; or the Pacific halibut catch limit is reduced from 2015 levels, the fishery may be expanded to waters seaward of the RCA that is in effect at the time, promoting directed yellowtail rockfish and offshore lingcod opportunity. Fisheries would be monitored to ensure that mortality of yelloweye rockfish is not in excess of the HG.

Impacts (Projected Mortality)

The annual projected mortality presented in Table 4-60 is anticipated, given the season structure and bag limits detailed above, with the exception of canary rockfish. The projected impacts for canary rockfish are highly uncertain. All data that is used in the model is for time periods when anglers were encouraged to avoid canary rockfish, and were required to discard when encountered. Limited retention of canary rockfish was allowed beginning in 2015 when a one fish sub-bag limit was put into place. Inseason tracking through November 2015, with a one fish sub-bag limit, estimated the projected mortality to be 14.8 mt, only 2.3 mt less than what the model is projecting for a 10 fish bag limit for the entirety of 2017. With an increased bag limit, mortality would be expected to be greater than under a one fish sub-bag limit; however the model currently does not have enough retention data (only one year with a one fish sub-bag limit) to provide an certain estimate (i.e. the estimate is highly uncertain). Yelloweye rockfish impacts continue to be the most constraining in terms of setting the season structure under No Action.

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 fm 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 while avoiding or minimizing interactions with overfished rockfish species. Supplemental analysis is underway to inform revised groundfish mortality estimates for the Oregon recreational fisheries.

Table 4-60. No Action – Oregon Recreational. Projected Mortality (mt) of species with Oregon recreational specific allocations under the No-Action Alternative.

Stock	Projected Mortality
Canary rockfish	17.1
YELLOWEYE ROCKFISH	2.9
Black Rockfish OR	353.2
Greenlings [a/]	6.4
Nearshore Rockfish North of 40°10' N. lat. [b/]	35.6

[a/] Includes kelp and other greenlings

[b/] Includes blue rockfish. The state of Oregon has a Federal HG of Nearshore Rockfish North of 40°10' N. Lat. of 60.5 mt, which is shared between the Oregon commercial nearshore and recreational fisheries.

Table 4-61 shows the recent mortality of the ten most landed species in the Oregon recreational fishery, including black rockfish. Species in Table 4-61, other than black rockfish, had not been modeled prior to 2015-2016. This table represents recent mortality under similar season structure and bag limits to what will be in place under the No Action Alternative.

Table 4-61. No Action – Oregon Recreational. Recent mortality (mt) of the ten most landed species in the Oregon recreational fishery under the season structure, bag limits, area restrictions, etc. in the No-Action Alternative.

Species	2010	2011	2012	2013	2014	Average
Black Rockfish	302.4	206.1	217.4	312.8	346.7	277.1
Lingcod	82.8	105.9	148.9	215.5	169.3	144.5
Nearshore Rockfish	32.8	36.6	45.9	37.3	26.6	35.8
Blue Rockfish a/	22.0	21.4	26.1	23.9	18.8	22.4
Quillback Rockfish	4.2	5.7	8.8	5.6	3.5	5.6
Copper Rockfish	3.8	5.9	7.2	4.1	2.5	4.7
China Rockfish	2.6	3.4	3.7	3.6	1.7	3.0
Brown Rockfish	0.1	0.1	0.0	0.1	0.0	0.1
Grass Rockfish	0.1	0.0	0.0	0.0	0.0	0.0
Cabezon	16.5	17.5	15.5	12.6	9.3	14.3
Yellowtail Rockfish	7.5	11.6	13.9	15.7	11.6	12.1
Kelp Greenling	6.8	7.4	7.0	7.9	3.9	6.6
Vermillion Rockfish	4.6	6.0	9.2	6.2	3.7	5.9
Canary Rockfish	3.2	3.2	2.7	3.4	3.0	3.1
YELLOWEYE ROCKFISH	2.1	2.1	3.3	3.1	2.6	2.6
Sablefish	0.1	0.5	0.3	0.8	0.8	0.5

a/ Blue Rockfish was managed separately from the rest of the nearshore rockfish complex under Oregon state regulations through 2014

4.1.1.10 California Recreational – No Action

Under No Action, trawl and non-trawl allocations for overfished species and canary rockfish would be established (Table 4-62). The California recreational fishery was allocated a share of the non-trawl allocation, through use of a HG, for bocaccio, canary rockfish, and yelloweye rockfish to ensure that total non-trawl catches remained within the non-trawl allocations for these species. Further, there is a 198.3 mt Federal HG for blue rockfish south of 42° N. latitude within the Nearshore Rockfish complex which is shared by both commercial and recreational sectors. Additionally, a HG would be in place for Nearshore Rockfish north of 40°10' N latitude; the Council is considering three HG options which range from 29.6 mt (Option 1) to 41.4 mt (Option 2) in 2017. In California these HG's would be shared by both commercial and recreational fisheries.

Table 4-62. No Action – California Recreational: Overfished species allocations (mt) to the non-trawl sector and shares (mt) for the California recreational fisheries under No Action in 2017 and 2018 as in the 2016 in the 2015-2016 FEIS.

Stock	Non-Trawl Allocation	California Recreational HG
BOCACCIO	596.0/558.8	411.6/385.9
Canary rockfish	780.6/721.7	380.1/351.4
COWCOD	2.6	
DARKBLOTCHED	18.9/19.6	
Nearshore rockfish North of 40°10´ N lat.		29.6
POP	7.3/7.6	
PETRALE SOLE	144.8/138.6	
YELLOWEYE ROCKFISH	12.9	3.9

Groundfish Seasons and Area Restrictions

The 2017-2018 California recreational groundfish season structure options and projected mortality are based on CDFW's updated RecFISH model. Model projections were calculated for the five recreational groundfish management areas using updated 2013 and 2014 RecFIN estimates; overfished species mortality are reported statewide. Figure 4-7. California Recreational Management Areas. Figure 4-7 displays the five recreational groundfish management areas in California.

In California, the recreational fisheries for 2017-2018 are constrained by black rockfish and yelloweye rockfish. As a result, four different options were explored to examine possible opportunities and tradeoffs between season length and depth, while remaining within allowable limits. This range of options was in part informed by public input gathered during five public workshops.

The starting date for retaining California scorpionfish aligns with the start date for the RCG seasons (which differ by area); however retention is prohibited in all areas after August 31.

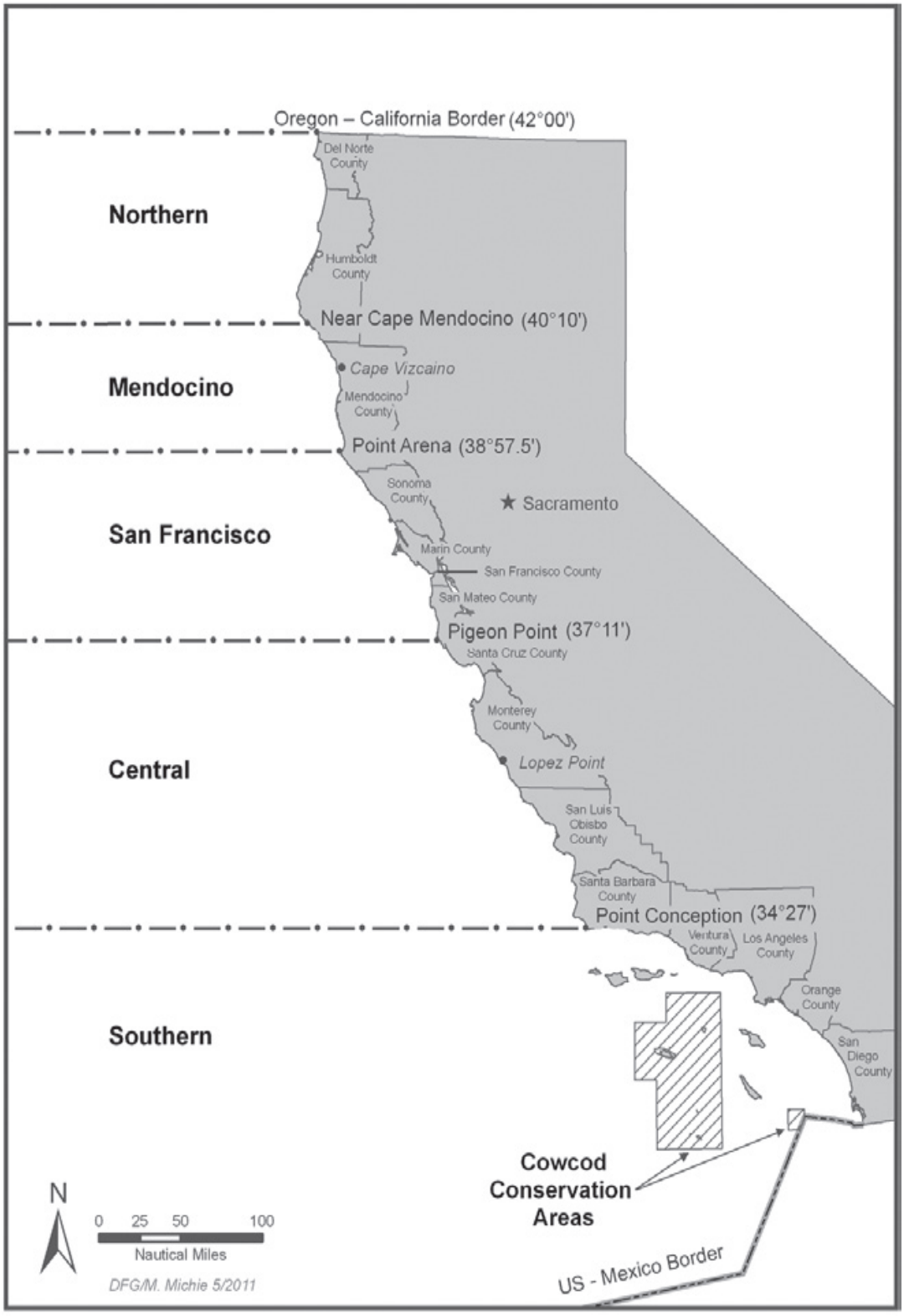


Figure 4-7. California Recreational Management Areas.

Option 1

Option 1 examines projected mortality assuming the same season structure that was in place for 2016 (Figure 4-8). The 2016 season structure for California scorpionfish would remain unchanged (i.e., January 1 through August 31).

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	Closed					May 15 – Oct 31 <20 fm					Closed	
Mendocino	Closed					May 15 – Oct 31 <20 fm					Closed	
San Francisco	Closed				April 15 – Dec 31 <30 fm							
Central	Closed				April 1 – Dec 31 <40 fm							
Southern	Closed			Mar 1 – Dec 31 <60 fm								

Figure 4-8. Option 1: California recreational groundfish season structure assuming the same season structure as in 2016.

Option 2

In the management areas north of Point Arena, Option 2 explores providing additional season length and removing depth restrictions during the winter months. Black rockfish are important to the recreational fishery in the Northern Management Area and this option attempts to provide additional opportunities in light of reductions to the allowable take of black rockfish. While black rockfish historically are less important to the Mendocino Management Area, this area has the shortest season lengths due to high yelloweye rockfish encounters. Providing access to increased depth in the Northern area is intended to reduce pressure on black rockfish, while retaining the 2016 depth restriction during months expected to have higher effort is necessary to minimize yelloweye rockfish impacts (Figure 4-9). The 2016 season structure would remain in place for all management areas south of Point Arena including the season structure for California scorpionfish (i.e., January 1 through August 31).

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	All Depth					May 15 – Sept 30 <20 fm				All Depth		
Mendocino	Closed					May 15 – Sept 31 <20 fm				Nov1-Dec31<30fm		
San Francisco	Closed				April 15 – Dec 31 <30 fm							
Central	Closed				April 1 – Dec 31 <40 fm							
Southern	Closed			Mar 1 – Dec 31 <60 fm								

Figure 4-9. Option 2: California recreational groundfish season structure with length and depth modifications north of Point Arena; 2016 season structure would remain in place south of Point Arena.

Option 3

Under Option 3, the 2016 season structure would remain in place in all management areas, except that the depth restriction would be liberated by 10 fm in all management areas north of Point Conception (Figure 4-10). By increasing the allowable depth in those areas north of Point Conception pressure on black rockfish would likely be reduced while remaining within allowable impacts for yelloweye rockfish. The 2016 season structure for California scorpionfish would also remain unchanged (i.e., January 1 through August 31).

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	Closed					May 15 – Oct 31 <30 fm					Closed	
Mendocino	Closed					May 15 – Oct 31 <30 fm					Closed	
San Francisco	Closed				April 15 – Dec 31 <40 fm							
Central	Closed			April 1 – Dec 31 <50 fm								
Southern	Closed		Mar 1 – Dec 31 <60 fm									

Figure 4-10. Option 3: California recreational groundfish season structure maintaining the 2016 season length, while liberalizing the 2016 depth restriction by 10 fm north of Point Conception.

Option 4

Option 4 explores the tradeoff between season length and an all depth fishery in all management areas (Figure 4-11). Due to yelloweye rockfish impacts, season length must be limited to three months to remain within allowable limits. Impacts to all target species are greatly reduced under Option 4 compared to the other options. The 2016 season structure for California scorpionfish would also remain unchanged (i.e., January 1 through August 31).

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	Closed						All Depth			Closed		
Mendocino	Closed						All Depth			Closed		
San Francisco	Closed						All Depth			Closed		
Central	Closed						All Depth			Closed		
Southern	Closed						All Depth			Closed		

Figure 4-11. Option 4: California recreational groundfish season structure under an all depth fishery statewide.

Additional Considerations

Nearshore Rockfish Harvest Guideline North of 40° 10' N. latitude.

At its September meeting, the Council chose to consider three different options for the Nearshore Rockfish HG north of 40° 10' N latitude. The California HG varies among the options, ranging from a low of 29.6 mt (Option 1) to a high of 41.4 mt (Option 2) in 2017; these values increase in 2018. The Nearshore Rockfish HG is shared between the commercial and recreational fisheries in California. The season structure options presented here would apply under each of the Nearshore Rockfish north of 40° 10' N. latitude HG alternatives.

New Management Measures

Overfished Species Hotspot Closures

Over the winter, CDFW conducted a series of five public workshops, where locations of overfished species (OFS) hotspots were identified by the public. Given that black rockfish constrains opportunities in the recreational fishery, allowing increased opportunity in deeper depths may be a viable option to relieve pressure on black rockfish. However, given that encounters with OFS are likely to increase as effort is

shifted to deeper depths, the OFS Hotspot closures identified by the public are likely a viable method to reduce those impacts.

It should be noted that in 2009, four yelloweye rockfish conservation areas (YRCA) were adopted in the Northern and Mendocino Management Areas for use in management. To date, these YRCAs have not been implemented and would remain available under all alternatives. Utilizing these YRCAs in combination with OFS Hotspot closures could further mitigate OFS impacts, especially if liberalizing depth restrictions are contemplated.

New Inseason Process

A new inseason process is being considered for select species in the event that target amounts are attained, thereby allowing NMFS in consultation with CDFW to modify the season structure, bag limits and/or close portions of the recreational fishery. In addition to OFS hotspot closures, this measure would be another mechanism to keep mortality within allowable limits, especially if access to deeper depths is contemplated.

Exempt Petrale Sole from Season and Depth Restrictions

CDFW received a request to allow retention of petrale sole outside of the groundfish season structure (i.e. similar to Pacific sanddab). Petrale sole are encountered when targeting other species (e.g. Pacific halibut and Pacific sanddabs), therefore allowing year round retention would reduce regulatory discards while fishing for other species.

Groundfish Bag Limits and Size Limits

Under all Alternatives and season structure options, a statewide 10 fish rockfish, cabezon, and greenling (RCG) complex bag limit with a sub-bag limit of 3 cabezon would remain in place. Retention of bronzespotted rockfish, cowcod, and yelloweye rockfish would continue to be prohibited. The following bag limits would also apply:

- California scorpionfish – 5 fish
- Leopard shark – 3 fish (state regulations only)
- Soupfin shark – 1 fish (state regulations only)

There is no bag limit for Pacific sanddab, petrale sole and starry flounder. A bag limit of 10 fish of any one species within the 20 finfish maximum bag limit would apply to the remaining species in the Groundfish FMP.

The following minimum size limits for the California recreational fisheries would remain in place under all Alternatives and season structure options:

- California scorpionfish – 10 inches
- Cabezon – 15 inches
- Kelp greenling – 12 inches
- Leopard shark – 36 inches (state regulations only)
- Lingcod – 22 inches

Additional Considerations

Modifications to sub-bag or bag limits are not expected to impact angler trips and impacts to overfished species are anticipated to be minimal if any.

Black rockfish – In 2016, the black rockfish sub-bag limit was five fish within the 10 fish RCG complex bag limit. However, due to a lower annual catch limit for 2017 and 2018, further reductions to the black rockfish sub-bag limit in some or all areas will likely be required to remain within allowable limits under all season structure options, except Option 4.

A range of sub-bag limits from two to five fish was explored. Projected mortality for the range of bag limits can be found in Table 4-63 through Table 4-66. A three fish sub-bag limit would be needed statewide under season structure Options 1 and 3; while under Option 2 a statewide sub-bag limit of two fish would be needed. Under Option 4 a five-fish sub-bag limit can be accommodated statewide.

Bocaccio – CDFW received a request from industry to increase the sub-bag limit for bocaccio. In 2016, the sub-bag limit for bocaccio was three fish within the 10 fish RCG complex bag limit. Since the recreational HG of bocaccio will be increasing in 2017 and 2018 an increase of the sub-bag limit can be accommodated under all the season structure options.

A range of sub-bag limits from four to 10 fish was explored. Projected mortality for a three and four fish sub-bag limit under the various season structure options can be found in Table 4-63, Table 4-64, Table 4-65, Table 4-66 under Options 1 through 4, respectively.

Canary Rockfish – Canary rockfish was declared rebuilt in 2015. Since the recreational HG will be increasing for 2017 and 2018 allowing limited retention (i.e. sub-bag limit within the 10 fish RCG limit) can be accommodated under all season structure options.

A range of sub-bag limits from one to five fish was explored. Projected mortality for non-retention and a one fish sub-bag limit under the various season structure options can be found in Table 4-63, Table 4-64, Table 4-65, and Table 4-66 under Options 1 through 4, respectively.

Lingcod – CDFW received a request from industry to reduce the lingcod bag limit from three fish to two fish. In recent years lingcod catches in the recreational sector have increased and attainment of the non-trawl allocation for lingcod south of 40° 10' N. latitude has been high.

A range of bag limits from two to three fish was explored. Projected mortality for a two and three fish bag limit under the various season structure options can be found in Table 4-63, Table 4-64, Table 4-65, and Table 4-66 under Options 1 through 4, respectively.

Impact (Groundfish Mortality)

CDFW closely monitors yelloweye rockfish and cowcod – performing weekly tracking using preliminary California Recreational Fisheries Survey (CRFS) field reports. These preliminary CRFS reports are converted into an anticipated catch value in metric tons using catch and effort data from previous years. This weekly "proxy" value is then used to approximate catch during the five to eight week lag time in CRFS catch estimates. In addition to weekly tracking, CDFW also tracks catch of target species inseason once estimates are available. If angler effort or bycatch of overfished groundfish species changes dramatically from prior years, actual mortality can be higher or lower than projected. Based on the inseason tracking, if any allowable limits are projected to be attained inseason, CDFW could take action to slow and/or reduce catches. This could include closing one or more recreational groundfish management areas, restricting recreational fishery seasons, modifying depth restrictions and/or bag limits.

California's RecFISH model is used to project mortality in the recreational fishery and is explained in greater detail in Appendix A. In general, for months and/or depths which have not been open in recent years, the proportion of catch by depth and time during a historic period with a year round, all-depth fishery

is used to back-calculate expected mortality in an unregulated season; the desired months and depths are then selected and the projected mortality summed to determine the projected mortality of a given species for the season structure under consideration. While this is the best available science, there are some known uncertainties, particularly when projecting mortality from deeper depths; further, for species where encounters are relatively rare events (e.g., yelloweye rockfish), data availability is limited in some depth bins.

One assumption is that angler behavior during the historic period will be similar to that of the current fishery. However, anglers during the historic period did not have to avoid or limit interactions with nearshore stocks, as will likely be needed in 2017 and 2018 (e.g. black rockfish). Further, allowing access to previously closed depths may also create an 'opener' effect. As a result, greater than expected effort may shift to deeper depths and while this may likely occur, the amount of effort shifting to deeper depths cannot be quantified. However, utilizing existing YRCAs and implementing additional OFS hotspot closures may be viable options to mitigate uncertainty in the model.

Option 1

Table 4-63 provides projected mortality under season structure Option 1. Season structure under Option 1 is provided in Figure 4-8. A five fish sub-bag limit for black rockfish cannot be accommodated statewide under this season structure option; however a three fish sub-bag limit can.

Model uncertainty is relatively minimal when compared to the other season structure options because the season structure is similar to 2016. Provided behavior does not change dramatically in 2017 and 2018, mortality is expected to be similar to previous years with the same season structure.

Table 4-63. California Recreational Season Structure Option 1: Projected mortality (mt) in the California Recreational fisheries, non-trawl allocations and harvest guidelines under No Action in 2017 and 2018. Values in parenthesis indicate the bag limits other than status quo under consideration and resulting projected mortality.

Stock	Projected Mortality	California Recreational HG	Non-Trawl Allocation a/
BOCACCIO (4)	137.0 (146.3)	411.6/385.9	596.0/558.8
Canary Rockfish (1)	23.6 (30.3)	380.1/351.4	780.6/721.7
COWCOD	2.1		2.6
YELLOWEYE ROCKFISH	1.5	3.9	12.1
Black Rockfish (3)	(226.8)		
Blue Rockfish	138.3	305/311	
Cabezon	33.4		
California Scorpionfish	96.7		
Greenlings	10.1		
Lingcod N. of 40°10' N. lat. (2)b/	74.6		1342.5/1557.8
Lingcod S. of 40°10' N. lat. (2)	482.2 (402.2)		683.7/624.8
Widow Rockfish	25.7		169.2/161.2
Nearshore Rockfish N. of 40°10' N. lat.	5.6		
Nearshore Rockfish S. of 40°10' N. lat.	329.1		

a/ Includes non-nearshore, nearshore, and recreational.
b/ Only includes the area between 42° N. lat. and 40° 10' N. lat., while the non-trawl allocation is applicable for the entire area north of 40° 10' N lat.

Option 2

Table 4-64 provides projected mortality under season structure Option 2. Season structure under Option 2 is provided in Figure 4-9. A five fish sub-bag limit for black rockfish cannot be accommodated statewide under this season structure option; this option can only be accommodated with a two fish sub-bag limit statewide.

Model uncertainty is greater under Option 2 when compared to Option 1. The uncertainty is created by allowing for an all-depth fishery in the Northern Management Area; coupled with allowing an additional 10 fm in the Mendocino Management Area which generally experiences the highest yelloweye rockfish impacts in California. As a result, actual mortality may differ from projections.

Table 4-64. California Recreational Season Structure Option 2: Projected mortality (mt) in the California Recreational fisheries, non-trawl allocations and harvest guidelines under No Action in 2017 and 2018. Values in parenthesis indicate the bag limits other than status quo under consideration and resulting projected mortality.

Stock	Projected Mortality	California Recreational HG	Non-Trawl Allocation a/
BOCACCIO (4)	137.0 (146.3)	411.6/385.9	596.0/558.8
Canary Rockfish (1)	23.5 (30.2)	380.1/351.4	780.6/721.7
COWCOD	2.1		2.6
YELLOWEYE ROCKFISH	1.9	3.9	12.1
Black Rockfish (2)	(152.9)		
Blue Rockfish	135.0	305/311	
Cabezon	33.3		
California Scorpionfish	96.7		
Greenlings	10.5		
Lingcod N. of 40°10' N. lat. (2) b/	94.3 (74.2)		1342.5/1557.8
Lingcod S. of 40°10' N. lat. (2)	469.4 (392.0)		683.7/624.8
Widow Rockfish	26.0		169.2/161.2
Nearshore Rockfish N. of 40°10' N. lat.	9.7		
Nearshore Rockfish S. of 40°10' N. lat.	325.8		

a/ Includes non-nearshore, nearshore, and recreational.
b/ Only includes the area between 42° N. lat. and 40° 10' N. lat., while the non-trawl allocation is applicable for the entire area north of 40° 10' N lat.

Option 3

Table 4-65 provides projected mortality under season structure Option 3. Season structure under Option 3 is provided in Figure 4-10. A five fish sub-bag limit for black rockfish cannot be accommodated statewide under this season structure option; however a three fish sub-bag limit can.

Because Option 3 maintains the 2016 season length, while providing a 10 fm liberalization from the 2016 depth restriction, model uncertainty is less than that of Option 2 which allows for increased depth north of Point Arena.

Table 4-65. California Recreational Season Structure Option 3: Projected mortality (mt) in the California Recreational fisheries, non-trawl allocations and harvest guidelines under No Action in 2017 and 2018. Values in parenthesis indicate the bag limits other than status quo under consideration and resulting projected mortality.

Stock	Projected Mortality	California Recreational HG	Non-Trawl Allocation a/
BOCACCIO (4)	159.3 (169.3)	411.6/385.9	596.0/558.8
Canary Rockfish (1)	33.0 (42.3)	380.1/351.4	780.6/721.7
COWCOD	2.2		2.6
YELLOWEYE ROCKFISH	3.7	3.9	12.1
Black Rockfish (3)	(202.2)		
Blue Rockfish	146.1	305/311	
Cabezon	31.1		
California Scorpionfish	96.7		
Greenlings	9.2		
Lingcod N. of 40°10' N. lat. (2) b/	76.0 (59.9)		1342.5/1557.8
Lingcod S. of 40°10' N. lat. (2)	483.5 (401.8)		683.7/624.8
Widow Rockfish	30.3		169.2/161.2
Nearshore Rockfish N. of 40°10' N. lat.	6.4		
Nearshore Rockfish S. of 40°10' N. lat.	341.8		

a/ Includes non-nearshore, nearshore, and recreational.
b/ Only includes the area between 42° N. lat. and 40°10' N lat., while the non-trawl allocation is applicable for the entire area north of 40°10' N. lat.

Option 4

Table 4-66 provides projected mortality under season structure Option 4. Season structure under Option 4 is provided in Figure 4-11. All bag limits under consideration (including those in place in 2016) can be accommodated under Option 4. A statewide five fish sub-bag limit for black rockfish can be accommodated under this season structure option.

Model projections under Option 4 have the highest uncertainty due to allowing an all-depth fishery statewide.

Table 4-66. California Recreational Season Structure Option 4: Projected mortality (mt) in the California Recreational fisheries, non-trawl allocations and harvest guidelines under No Action in 2017 and 2018. Values in parenthesis indicate the bag limits other than status quo under consideration and resulting projected mortality.

Stock	Projected Mortality	California Recreational HG	Non-Trawl Allocation a/
BOCACCIO (4)	173.3 (80.7)	411.6/385.9	596.0/558.8
Canary Rockfish (1)	35.6 (45.2)	380.1/351.4	780.6/721.7
COWCOD	1.2		2.6
YELLOWEYE ROCKFISH	3.3	3.9	12.1
Black Rockfish (5)	135.9		
Blue Rockfish	64.1	305/311	
Cabezon	13.5		
California Scorpionfish	96.7		
Greenlings	4.1		
Lingcod N. of 40°10' N. lat. (2)b/	35.2 (27.7)		1342.5/1557.8
Lingcod S. of 40°10' N. lat. (2)	287.9 (241.1)		683.7/624.8
Widow Rockfish	19.5		169.2/161.2
Nearshore Rockfish N. of 40°10' N. lat.	5.0		
Nearshore Rockfish S. of 40°10' N. lat.	159.4		

a/ Includes non-nearshore, nearshore, and recreational.
b/ Only includes the area between 42° N. lat. and 40°10' N. lat., while the non-trawl allocation is applicable for the entire area north of 40°10' N. lat.

Projected Petrale Sole Mortality

Currently, petrale sole is allowed to be retained within the groundfish season structure with no size or bag limit. WCGOP total mortality reports indicate mortality of petrale sole has been minimal in the recreational fishery (Table 4-67). While it is likely that some increased effort may be realized by exempting petrale sole from the groundfish season structure, it cannot be quantified. However, if mortality in the California recreational sector were to increase 5 times, the highest mortality in recent years (1.1 mt in 2013), the resulting 5.5 mt, combined with the highest mortality in the remaining non-trawl sectors (2.1 mt in 2013), could be accommodated within the non-trawl allocation (144.8 mt and 138.6 mt in 2017 and 2018, respectively). If inseason tracking indicates that mortality is tracking higher than expected, several actions can be taken, including closing the fishery.

Table 4-67. Total mortality of petrale sole in the California recreational fishery, 2011-2014 from WCGOP Total Mortality Report.

Year	Mortality (mt)
2011	0.5
2012	0.7
2013	1.1
2014	0.9

4.1.2 Alternative 1

Table 4-68 through Table 4-71 contain the harvest specifications, off-the-top deductions, and allocations analyzed under Alternative 1. Notable changes from No Action include higher ACLs for darkblotched and widow rockfish along with lower ACLs for canary rockfish, black rockfish in California, and California scorpionfish. A description of the HCR used to calculate the ACLs can be found in Section 2.1.1. A description of the calculations for the off-the-top deductions can be found in Section 4.1.1.1. Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018 can be found in Table 4-72.

Table 4-68. Alternative 1. 2017 ACLs and estimates of tribal, EFP, research, and incidental open access (OA) mortality (in mt), used to calculate the fishery harvest guideline (HG). All other ACL values are the same as under No Action.

Species	Area	ACL	Tribal	EFP	Research	OA	Fishery HG
Arrowtooth flounder	Coastwide	13,804	2,041.0		16.4	40.8	11,705.9
Big skate	Coastwide	494	15.0		4.0	38.4	436.6
Black (WA)	Washington	305	18.0		-	-	287.0
Black (OR)	Oregon	527			-	0.6	526.4
Black (CA)	California	319					319.0
BOCACCIO	S of 40º10' N. lat.	790			4.6	0.8	784.6
Cabezon (OR)	46º16' to 42º N. lat.	47			-		47.0
Cabezon (CA)	S of 42º N. lat.	150			-	0.3	149.7
California scorpionfish	S of 34°27' N. lat.	150			0.2	2.0	147.8
Canary rockfish	Coastwide	857	35.0		7.2	1.2	813.6
Chilipepper	S of 40º10' N. lat.	2,607			10.9	5.0	2,591.1
COWCOD	S of 40º10' N. lat.	10			2.0	0.0	8.0
DARKBLOTCHED	Coastwide	641	0.2		2.5	24.5	613.9
Dover sole	Coastwide	50,000	1,497.0		41.9	54.8	48,406.3
English sole	Coastwide	9,964	200.0		5.8	7.0	9,751.2
Lingcod	N of 40'10º N. lat.	3,333	250.0		11.7	16.0	3,055.3
Lingcod	S of 40'10º N. lat.	1,251			1.1	6.9	1,243.0
Longnose skate	Coastwide	2,000	130.0		13.2	3.8	1,853.0
Longspine thornyhead	N of 34º27' N. lat.	2,894	30.0		13.5	3.3	2,847.2
Longspine thornyhead	S of 34º27' N. lat.	914			1.4	1.8	910.8
Nearshore rockfish north	N of 40º10' N. lat.	105	1.5		-	0.3	103.2
Nearshore rockfish south	S of 40º10' N. lat.	1,163			2.7	1.4	1,158.9
Shelf rockfish north	N of 40º10' N. lat.	2,049	30.0		24.8	26.0	1,968.2
Shelf rockfish south	S of 40º10' N. lat.	1,623			8.6	8.6	1,605.8
Slope rockfish north	N of 40º10' N. lat.	1,755	36.0		9.5	18.6	1,690.9
Slope rockfish south	S of 40º10' N. lat.	707			2.0	17.2	687.8
Other fish	Coastwide	474					474.0
Other flatfish	Coastwide	8,510	60.0		19.0	125.0	8,306.0
Pacific cod	Coastwide	1,600	500.0		7.0	2.0	1,091.0
Pacific whiting	Coastwide	325,072	56,888.0			1,500.0	266,684.0
Petrale sole	Coastwide	3,136	220.0		17.7	3.2	2,895.1
POP	N of 40º10' N. lat.	171	9.2		5.2	10.0	146.6
Sablefish	N of 36º N. lat.	6,041	See Table 4-5				
Sablefish	S of 36º N. lat.	1,075			3.0	2.0	1,070.0
Shortbelly	Coastwide	500			2.0	8.9	489.1
Shortspine thornyhead	N of 34º27' N. lat.	1,713	50.0		7.2	1.8	1,654.0
Shortspine thornyhead	S of 34º27' N. lat.	906			1.0	41.3	863.7
Spiny dogfish	Coastwide	2,094	275.0		12.5	49.5	1,757.0
Splitnose	S of 40º10' N. lat.	1,760			9.0	0.2	1,750.8
Starry flounder	Coastwide	1,282	2.0			8.3	1,271.7
Widow rockfish	Coastwide	13,508	200.0		8.2	0.5	13,299.3
YELLOWEYE	Coastwide	20	2.3		3.3	0.4	14.0
Yellowtail rockfish	N of 40º10' N. lat.	6,196	1,000.0		16.6	3.4	5,176.1

Table 4-69. Alternative 1. Stock specific fishery harvest guidelines (HG) or annual catch targets (ACT) and allocations for 2017 (in mt).

Species	Area	Fishery HG or ACT		Trawl		Non-trawl	
			Allocation Type	%	Mt	%	Mt
Arrowtooth flounder	Coastwide	11,705.9	Amendment 21	95%	11,120.6	5%	585.3
Big skate	Coastwide	436.6	Biennial	95%	414.8	5%	21.8
Black (WA)	N of 46º16'	287.0	None				
Black (OR)	46º16' to 42º N. lat.	526.4	None				
Black (CA)	S of 42º N. lat.	319.0	None				
BOCACCIO	S of 40º10' N. lat.	784.6	Biennial	N/A	188.6	N/A	596.3
Cabezon (OR)	46º16' to 42º N. lat.	47.0	None				
Cabezon (CA)	S of 42º N. lat.	149.7	None				
California scorpionfish a/	S of 34°27' N. lat.	111.0	None				
Canary rockfish	Coastwide	813.6	Biennial	N/A	433.5	N/A	380.1
Chilipepper	S of 40º10' N. lat.	2,591.1	Amendment 21	75%	1,943.3	25%	647.8
COWCOD b/	S of 40º10' N. lat.	4.0	Biennial	N/A	1.4	N/A	2.6
DARKBLOTCHED	Coastwide	613.9	Amendment 21	95%	583.2	5%	30.7
Dover sole	Coastwide	48,406.3	Amendment 21	95%	45,986.0	5%	2,420.3
English sole	Coastwide	9,751.2	Amendment 21	95%	9,263.6	5%	487.6
Lingcod	N of 40'10º N. lat.	3,055.3	Amendment 21	45%	1,374.9	55%	1,680.4
Lingcod	S of 40'10º N. lat.	1,243.0	Amendment 21	45%	559.4	55%	683.7
Longnose skate	Coastwide	1,853.0	Biennial	90%	1,667.7	10%	185.3
Longspine thornyhead	N of 34º27' N. lat.	2,847.2	Amendment 21	95%	2,704.8	5%	142.4
Longspine thornyhead	S of 34º27' N. lat.	910.8	None				
Nearshore rockfish north	N of 40º10' N. lat.	103.2	None				
Nearshore rockfish south	S of 40º10' N. lat.	1,158.9	None				
Shelf rockfish north	N of 40º10' N. lat.	1,968.2	Biennial	60.2%	1,184.9	39.8%	783.3
Shelf rockfish south	S of 40º10' N. lat.	1,605.8	Biennial	12.2%	195.9	87.8%	1,409.9
Slope rockfish north	N of 40º10' N. lat.	1,690.9	Amendment 21	81%	1,369.6	19%	321.3
Slope rockfish south	S of 40º10' N. lat.	687.8	Amendment 21	63%	433.3	37%	254.5
Other fish	Coastwide	474.0	None				
Other flatfish	Coastwide	8,306.0	Amendment 21	90%	7,475.4	10%	830.6
Pacific cod	Coastwide	1,091.0	Amendment 21	95%	1,036.4	5%	54.5
Pacific whiting	Coastwide	266,684.0	Amendment 21	100%	266,684.0	0%	0.0
Petrale sole	Coastwide	2,895.1	Amendment 21	95%	2,750.3	5%	144.8
POP	N of 40º10' N. lat.	146.6	Amendment 21	95%	139.3	5%	7.3
Sablefish	N of 36º N. lat.	See Table 4-5					
Sablefish	S of 36º N. lat.	1,070.0	Amendment 21	42%	449.4	58%	620.6
Shortbelly	Coastwide	489.1	None				0.0
Shortspine thornyhead	N of 34º27' N. lat.	1,654.0	Amendment 21	95%	1,571.3	5%	82.7
Shortspine thornyhead	S of 34º27' N. lat.	863.7	Amendment 21	NA	50.0	NA	813.7
Spiny dogfish	Coastwide	1,757.0	None				
Splitnose	S of 40º10' N. lat.	1,750.8	Amendment 21	95%	1,663.3	5%	87.5
Starry flounder	Coastwide	1,271.7	Amendment 21	50%	635.9	50%	635.9
Widow rockfish	Coastwide	13,299.3	Amendment 21	91%	12,102.4	9%	1,196.9
YELLOWEYE	Coastwide	14.0	Biennial	N/A	1.1	N/A	12.9
Yellowtail rockfish	N of 40º10' N. lat.	5,176.1	Amendment 21	88%	4,554.9	12%	621.1

a/ The California scorpionfish fishery harvest guideline (147.8 mt) is further reduced to an ACT of 111 mt

b/ The cowcod fishery harvest guideline (8 mt) is further reduced to an ACT of 4 mt

c/ Pacific whiting TAC forecasts for 2017-2018 were unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-70. Alternative 1. 2018 ACLs and estimates of tribal, EFP, research, and incidental open access (OA) mortality (in mt), used to calculate the fishery harvest guideline (HG).

Species	Area	ACL	Tribal	EFP	Research	OA	Fishery HG
Arrowtooth flounder	Coastwide	13,743	2,041.0		16.4	40.8	11,644.9
Big skate	Coastwide	494	15.0		4.0	38.4	436.6
Black (WA)	Washington	301	18.0		-	-	283.0
Black (OR)	Oregon	520			-	0.6	519.4
Black (CA)	California	319					319.0
Blackgill	S of 40º10' N. lat.	123			0.5	0.1	122.4
BOCACCIO	S of 40º10' N. lat.	741			4.6	0.8	735.6
Cabezon (OR)	46º16' to 42º N. lat.	47			-		47.0
Cabezon (CA)	S of 42º N. lat.	149			-	0.3	148.7
California scorpionfish	S of 34°27' N. lat.	150			0.2	2.0	147.8
Canary rockfish	Coastwide	763	35.0		7.2	1.2	719.6
Chilipepper	S of 40º10' N. lat.	2,507			10.9	5.0	2,491.1
COWCOD	S of 40º10' N. lat.	10			2.0	0.0	8.0
DARKBLOTCHED	Coastwide	653	0.2		2.5	24.5	625.9
Dover sole	Coastwide	50,000	1,497.0		41.9	54.8	48,406.3
English sole	Coastwide	7,537	200.0		5.8	7.0	7,324.2
Lingcod	N of 40'10º N. lat.	3,110	250.0		11.7	16.0	2,832.3
Lingcod	S of 40'10º N. lat.	1,144			1.1	6.9	1,136.0
Longnose skate	Coastwide	2,000	130.0		13.2	3.8	1,853.0
Longspine thornyhead	N of 34º27' N. lat.	2,747	30.0		13.5	3.3	2,700.2
Longspine thornyhead	S of 34º27' N. lat.	867			1.4	1.8	863.8
Nearshore rockfish north	N of 40º10' N. lat.	105	1.5		-	0.3	103.2
Nearshore rockfish south	S of 40º10' N. lat.	1,179			2.7	1.4	1,174.9
Shelf rockfish north	N of 40º10' N. lat.	2,047	30.0		24.8	26.0	1,966.2
Shelf rockfish south	S of 40º10' N. lat.	1,624			8.6	8.6	1,606.8
Slope rockfish north	N of 40º10' N. lat.	1,754	36.0		9.5	18.6	1,689.9
Slope rockfish south	S of 40º10' N. lat.	586			2.0	17.2	566.8
Other fish	Coastwide	441					441.0
Other flatfish	Coastwide	7,281	60.0		19.0	125.0	7,077.0
Pacific cod	Coastwide	1,600	500.0		7.0	2.0	1,091.0
Pacific whiting a/	Coastwide	325,072	56,888.0			1,500.0	266,684.0
Petrale sole	Coastwide	3,013	220.0		17.7	3.2	2,772.1
POP	N of 40º10' N. lat.	176	9.2		5.2	10.0	151.6
Sablefish	N of 36º N. lat.	6,299	See Table 4-5				
Sablefish	S of 36º N. lat.	1,120			3.0	2.0	1,115.0
Shortbelly	Coastwide	500			2.0	8.9	489.1
Shortspine thornyhead	N of 34º27' N. lat.	1,698	50.0		7.2	1.8	1,639.0
Shortspine thornyhead	S of 34º27' N. lat.	898			1.0	41.3	855.7
Spiny dogfish	Coastwide	2,083	275.0		12.5	49.5	1,746.0
Splitnose	S of 40º10' N. lat.	1,761			9.0	0.2	1,751.8
Starry flounder	Coastwide	1,282	2.0			8.3	1,271.7
Widow rockfish	Coastwide	12,655	200.0		8.2	0.5	12,446.3
YELLOWEYE	Coastwide	20	2.3		3.3	0.4	14.0
Yellowtail rockfish	N of 40º10' N. lat.	6,002	1,000.0		16.6	3.4	4,982.1

[a/] Pacific whiting TAC forecasts for 2017-2018 were unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-71. Alternative 1. Stock specific fishery harvest guidelines (HG) or annual catch targets (ACT) and allocations for 2018 (in mt).

Species	Area	Fishery HG or ACT		Trawl		Non-trawl	
			Allocation Type	%	Mt	%	Mt
Arrowtooth flounder	Coastwide	11,644.9	Amendment 21	95%	11,062.6	5%	582.2
Big skate	Coastwide	436.6	Biennial	95%	414.8	5%	21.8
Black (WA)	N of 46º16'	283.0	None				
Black (OR)	46º16' to 42º N. lat.	519.4	None				
Black (CA)	S of 42º N. lat.	319.0	None				
Blackgill	S of 40º10' N. lat.	122.4	Amendment 26	41%	50.2	59%	72.2
BOCACCIO	S of 40º10' N. lat.	735.6	Biennial	N/A	176.8	N/A	558.8
Cabezon (OR)	46º16' to 42º N. lat.	47.0	None				
Cabezon (CA)	S of 42º N. lat.	148.7	None				
California scorpionfish a/	S of 34°27' N. lat.	111.0	None				
Canary rockfish	Coastwide	719.6	Biennial	N/A	383.4	N/A	336.2
Chilipepper	S of 40º10' N. lat.	2,491.1	Amendment 21	75%	1,868.3	25%	622.8
COWCOD b/	S of 40º10' N. lat.	4.0	Biennial	N/A	1.4	N/A	2.6
DARKBLOTCHED	Coastwide	625.9	Amendment 21	95%	594.6	5%	31.3
Dover sole	Coastwide	48,406.3	Amendment 21	95%	45,986.0	5%	2,420.3
English sole	Coastwide	7,324.2	Amendment 21	95%	6,958.0	5%	366.2
Lingcod	N of 40'10º N. lat.	2,832.3	Amendment 21	45%	1,274.5	55%	1,557.8
Lingcod	S of 40'10º N. lat.	1,136.0	Amendment 21	45%	511.2	55%	624.8
Longnose skate	Coastwide	1,853.0	Biennial	90%	1,667.7	10%	185.3
Longspine thornyhead	N of 34º27' N. lat.	2,700.2	Amendment 21	95%	2,565.2	5%	135.0
Longspine thornyhead	S of 34º27' N. lat.	863.8	None				
Nearshore rockfish north	N of 40º10' N. lat.	103.2	None				
Nearshore rockfish south	S of 40º10' N. lat.	1,174.9	None				
Shelf rockfish north	N of 40º10' N. lat.	1,966.2	Biennial	60.2%	1,183.7	39.8%	782.5
Shelf rockfish south	S of 40º10' N. lat.	1,606.8	Biennial	12.2%	196.0	87.8%	1,410.8
Slope rockfish north	N of 40º10' N. lat.	1,689.9	Amendment 21	81%	1,368.8	19%	321.1
Slope rockfish south	S of 40º10' N. lat.	566.8		91%	515.8	9%	51.0
Other fish	Coastwide	441.0	None				
Other flatfish	Coastwide	7,077.0	Amendment 21	90%	6,369.3	10%	707.7
Pacific cod	Coastwide	1,091.0	Amendment 21	95%	1,036.4	5%	54.5
Pacific whiting c/	Coastwide	266,684.0	Amendment 21	100%	266,684.0	0%	0.0
Petrale sole	Coastwide	2,772.1	Amendment 21	95%	2,663.5	5%	138.6
POP	N of 40º10' N. lat.	151.6	Amendment 21	95%	144.0	5%	7.6
Sablefish	N of 36º N. lat.		See Table 4-5				
Sablefish	S of 36º N. lat.	1,115.0	Amendment 21	42%	468.3	58%	646.7
Shortbelly	Coastwide	489.1	None				0.0
Shortspine thornyhead	N of 34º27' N. lat.	1,639.0	Amendment 21	95%	1,557.0	5%	81.9
Shortspine thornyhead	S of 34º27' N. lat.	855.7	Amendment 21	NA	50.0	NA	805.7
Spiny dogfish	Coastwide	1,746.0	None				
Splitnose	S of 40º10' N. lat.	1,751.8	Amendment 21	95%	1,664.2	5%	87.6
Starry flounder	Coastwide	1,271.7	Amendment 21	50%	635.9	50%	635.9
Widow rockfish	Coastwide	12,446.3	Amendment 21	91%	11,326.1	9%	1,120.2
YELLOWEYE	Coastwide	14.0	Biennial	N/A	1.1	N/A	12.9
Yellowtail rockfish	N of 40º10' N. lat.	4,982.1	Amendment 21	88%	4,384.2	12%	597.8

a/ The California scorpionfish fishery harvest guideline (147.8 mt) is further reduced to an ACT of 111 mt

b/ The cowcod fishery harvest guideline (8 mt) is further reduced to an ACT of 4 mt

c/ Pacific whiting TAC forecasts for 2017-2018 were unavailable during the preparation of the analysis; therefore the 2015 values were used.

Table 4-72. Alternative 1. Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018.

2017										
Fishery	**Bocaccio b/**		**Cowcod b/**		**Dkbl**		**POP**		**Yelloweye**	
	Allocation a/	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**
Off the Top Deductions	5.4	5.4	2.0	2.0	27.2	27.2	24.4	24.4	6.0	6.0
EFPc/										
Research d/	4.6	4.6	2.0	2.0	2.5	2.5	5.2	5.2	3.3	3.3
Incidental OA e/	0.8	0.8	0.0	0.0	24.5	24.5	10.0	10.0	0.4	0.4
Tribal f/					0.2	0.2	9.2	9.2	2.3	2.3
Trawl Allocations	188.6	57.3	1.4	0.2	583.2	108.1	139.3	45.7	1.1	0.1
--SB Trawl	188.6	57.3	1.4	0.2	552.7	98.7	121.9	39.1	1.1	0.1
--At-sea whiting MS					12.6	4.5	7.2	1.9		
--At-sea whiting CP					17.8	4.9	10.2	4.7		
Non-Trawl Allocation	596.0	169.8	2.6	2.2	30.7	7.2	7.3	0.5	12.9	12.1
Non-Nearshore	182.1	0.0		0.0		7.0		0.5	0.7	0.8
LE FG										
OA FG										
Directed OA: Nearshore	2.3	0.5		0.0		0.2		0.0	2.0	2.0
Recreational Groundfish										
WA h/						--		--	3.3	2.7
OR						--		--	3	2.9
CA i/	411.6	169.3		2.2		--		--	3.9	3.7
TOTAL	790.0	232.5	6.0	4.4	641.1	142.5	171.0	70.6	20.0	18.2
2017 Harvest Specification	**790**	**790**	**10.0**	**10.0**	**641**	641	**171**	171	**20**	20
Difference	0.0	557.5	4.0	5.6	0	498.5	0.0	100.4	0.0	1.8
Percent of ACL	100.0%	29.4%	60.0%	43.7%	100.0%	22.2%	100.0%	41.3%	100.0%	91.1%
Key			= not applicable							
	--		= trace, less than 0.1 mt							
			= Fixed Values							
			= Projection from GMT Model							
			= off the top deductions							

a/ Formal allocations are represented in the black shaded cells and are specified in regulation in Tables 1b and 1e. The other values in the allocation columns are 1) off the top deductions, 2) set asides from trawl allocation, 3) ad-hoc allocations recommended in the biennial process, 4) HG for the recreational fisheries for bocaccio, canary, and YE.

b/ South of 40°10' N. lat. The cowcod fishery HG (8 mt) is further reduced to an ACT of 4 mt.

c/ EFPs are amounts set aside to accommodate anticipated operations

d/ Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.

e/ The GMT's best estimate of impacts based on historical mortality.

f/ Tribal values represent the the values requested by the tribes.

g/ Values based on the 50 percentile (average) projection from the bootstrap model.

h/ Based on Bag Limit Option 1.

i/ Based on Season Option 3.

2018										
Fishery	**Bocaccio b/**		**Cowcod b/**		**Dkbl**		**POP**		**Yelloweye**	
	Allocation a/	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**
Off the Top Deductions	5.4	5.4	2.0	2.0	27.2	27.2	24.4	24.4	6.0	6.0
EFPc/										
Research d/	4.6	4.6	2.0	2.0	2.5	2.5	5.2	5.2	3.3	3.3
Incidental OA e/	0.8	0.8	0.0	0.0	24.5	24.5	10.0	10.0	0.4	0.4
Tribal f/					0.2	0.2	9.2	9.2	2.3	2.3
Trawl Allocations	176.8	53.7	1.4	0.2	594.6	108.1	144.0	45.9	1.1	0.0
--SB Trawl	176.8	53.7	1.4	0.2	563.5	98.7	126.6	39.3	1.1	0.0
--At-sea whiting MS					12.8	4.5	7.2	1.9		
--At-sea whiting CP					18.2	4.9	10.2	4.7		
Non-Trawl Allocation	558.8	169.8	2.6	2.2	31.3	7.5	7.6	0.5	12.9	12.1
Non-Nearshore	170.7	0.0		0.0		7.3		0.5	0.7	0.8
LE FG										
OA FG										
Directed OA: Nearshore	2.2	0.5		0.0		0.2		0.0	2.0	2.0
Recreational Groundfish										
WA h/						--		--	3.3	2.7
OR						--		--	3	2.9
CA i/	385.9	169.3		2.2		--		--	3.9	3.7
TOTAL	741.0	228.9	6.0	4.4	653.1	142.8	176.0	70.8	20.0	18.1
2018 Harvest Specification	**741**	**741**	**10.0**	**10.0**	**653**	653	**176**	176	**20**	20
Difference	0.0	512.1	4.0	5.6	0	510.2	0.0	105.2	0.0	1.9
Percent of ACL	100.0%	30.9%	60.0%	43.7%	100.0%	21.9%	100.0%	40.2%	100.0%	90.7%
Key			= not applicable							
	--		= trace, less than 0.1 mt							
			= Fixed Values							
			= Projection from GMT Model							
			= off the top deductions							

a/ Formal allocations are represented in the black shaded cells and are specified in regulation in Tables 1b and 1e. The other values in the allocation columns are 1) off the top deductions, 2) set asides from trawl allocation, 3) ad-hoc allocations recommended in the biennial process, 4) HG for the recreational fisheries for bocaccio, canary, and YE.

b/ South of 40°10' N. lat. The cowcod fishery HG (8 mt) is further reduced to an ACT of 4 mt.

c/ EFPs are amounts set aside to accommodate anticipated operations

d/ Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.

e/ The GMT's best estimate of impacts based on historical mortality.

f/ Tribal values represent the the values requested by the tribes.

g/ Values based on the 50 percentile (average) projection from the bootstrap model.

h/ Based on Bag Limit Option 1.

i/ Based on Season Option 3.

4.1.2.1 Harvest Guidelines and Other Allocations

The canary rockfish recreational HGs as well as the nearshore and non-nearshore shares are lower under Alternative 1 (Table 4-73), compared to No Action (Table 4-7), coincident with the decrease in the ACL. The HGs described under No Action (Section 4.1.1.3) for blackgill rockfish in 2017, blue rockfish south of 42° N. latitude, California scorpionfish south of 34°27' N. latitude, and Nearshore Rockfish north of 40°10' N. latitude would also apply under Alternative 1.

Table 4-73. Alternative 1 Allocations, HGs, and shares of Canary Rockfish.

Sector	2017	2018
Fishery Harvest Guideline	813.6	719.6
Trawl Allocation	433.5	383.4
Shorebased IFQ	*329.3*	*291.2*
Catcher Processor	*60.8*	*53.8*
Mothership	*43.3*	*38.3*
Non-Trawl Allocation	380.1	336.2
Non-Nearshore	*28.9*	*25.6*
Nearshore Fixed Gear	*51.0*	*45.1*
Washington Recreational a/	*25.9*	*22.9*
Oregon Recreational a/	*89.1*	*78.8*
California Recreational a/	*185.1*	*163.7*

a/ Values represent HGs which may be adjusted within the non-trawl allocation.

4.1.2.2 Overview of Management Measures

The following bullet points summarize management measure changes by sector under Alternative 1. A more detailed discussion of management measures by sector follows. New measures, discussed in Chapter 3 and analyzed in Appendix B, could also be implemented.

- Trawl Sectors: Notable changes include higher trawl allocations for darkblotched and widow rockfish and lower allocations for canary rockfish compared to No Action. Accordingly, the shorebased IFQ and allocations to the at-sea whiting co-ops would be higher for darkblotched and widow rockfishes and lower for canary rockfish, compared to No Action.
- Non-Trawl Sector: Notable changes include higher non-trawl allocations for darkblotched and widow rockfishes and lower allocations for canary rockfish, compared to No Action.
    - The non-nearshore and nearshore shares of canary rockfish would decrease, compared to No Action; however, the RCA and trip limit options described under No Action would still apply under Alternative 1.
    - Tribal fisheries would operate under the same management measures as No Action.
    - Washington, Oregon, and California recreational fisheries would have lower canary rockfish HGs under Alternative 1; however the fishery would still operate under the same management measures described under the No Action Alternative.
    - The black rockfish ACL in California is lower under Alternative 1, than under No Action; however management measures remain the same.

4.1.2.3 Shorebased IFQ – Alternative 1

The trawl RCA structure under Alternative 1 is the same as No Action (Tables 4-4 and 4-5). Allocations and projections differ between Alternative 1 and No Action only for three species; canary, darkblotched, and widow rockfishes. The canary rockfish allocation under Alternative 1 is half of the No Action alternative, and so is the projection, since canary rockfish catch has co-varied responsively with changes in the allocation, both under IFQ and trip limit management. The darkblotched rockfish allocation under Alternative 1 is more than 60 percent higher than under No Action; the projection is only slightly higher under Alternative 1, since darkblotched rockfish catch has not shown appreciable responsiveness to changes in the allocation, under IFQ. Both the allocation and the projected catch are more than eight times higher for widow rockfish under Alternative 1 than under No Action, since catch of widow rockfish has been highly responsive to changes in the allocation in both IFQ and historical data.

Table 4-74. Alternative 1 – Shorebased IFQ. Projected mortality for IFQ species under Alternative 1 for 2017 compared to the allocations or set-asides. No action estimates of mortality are provided (right panel).

IFQ Species	Area	Alternative 1 2017		No Action 2017	
		Projected Mortality (mt)	SB IFQ Allocation (mt)	Projected Mortality (mt)	SB IFQ Allocation (mt)
Arrowtooth flounder	Coastwide	2,302.2	11,050.6	2,302.2	11,050.6
BOCACCIO	South of 40°10' N. lat.	57.3	188.6	57.3	188.6
Canary rockfish	Coastwide	262.3	329.3	538.6	676.1
Chilipepper	South of 40°10' N. lat.	353.8	1,943.3	353.8	1,943.3
COWCOD	South of 40°10' N. lat.	0.17	1.44	0.17	1.4
DARKBLOTCHED	Coastwide	98.7	552.7	97.6	341.1
Dover sole	Coastwide	7,062.1	45,981.0	7,062.1	45,981.0
English sole	Coastwide	240.7	9,258.6	240.7	9,258.6
Lingcod	North of 40°10' N. lat.	315.4	1,359.9	315.4	1,359.9
Lingcod	South of 40°10' N. lat.		559.4		559.4
Longspine thornyheads	North of 34°27' N. lat.	942.7	2,699.8	942.7	2,699.8
Shelf Rockfish	North of 40°10' N. lat.	66.5	1,149.9	66.5	1,149.9
Shelf Rockfish	South of 40°10' N. lat.	15.5	195.9	15.5	195.9
Slope Rockfish	North of 40°10' N. lat.	260.6	1,269.6	260.6	1,269.6
Slope Rockfish	South of 40°10' N. lat.	119.5	433.3	119.5	433.3
Other Flatfish	Coastwide	1,549.2	7,455.4	1,549.2	7,455.4
Pacific cod	Coastwide	156.5	1,031.4	156.5	1,031.4
Pacific halibut a/	North of 40°10 N. lat.	26.1	84.5	26.1	84.5
PACIFIC OCEAN PERCH	North of 40°10' N. lat.	39.1	121.9	39.1	121.9
Pacific whiting b/	Coastwide	83,693.1	112,007.3	83,693.1	112,007.3
Petrale	Coastwide	2,620.2	2,745.3	2,620.2	2,745.3
Sablefish	North of 36° N. lat.	2,660.0	2,790.1	2,660.0	2,790.1
Sablefish	South of 36° N. lat.	143.9	449.4	143.9	449.4
Shortspine thornyheads	North of 34°27' N.	695.0	1,551.3	695.0	1,551.3
Shortspine thornyheads	South of 34°27' N	2.5	50.0	2.5	50.0
Splitnose rockfish	South of 40°10' N. lat.	64.1	1,663.3	64.1	1,663.3
Starry flounder	Coastwide	10.0	630.9	10.0	630.9
Widow rockfish	Coastwide	9,178.0	11,400.4	1,078.8	1,340.1
YELLOWEYE ROCKFISH	Coastwide	0.08	1.15	0.08	1.1
Yellowtail rockfish	North of 40°10' N. lat.	1,401.5	4,254.9	1,401.5	4,254.9

a/ Pacific halibut is managed using IBQ, see regulations at §660.140. Starting in 2015, the maximum IBQ allocation is 45 mt, see (§660.55 (m)). There is no projection model for Pacific halibut bycatch. As stated in regulations (§660.55 (m)), a Pacific halibut set-aside of 10 mt, to accommodate bycatch in the at-sea Pacific whiting fisheries and in the shorebased trawl sector south of 40°10' N. latitude (estimated to 5 mt each). There is no projection model for Pacific halibut bycatch.
b/ The Pacific whiting TAC was unavailable during the preparation of the analysis, therefore the 2015 values were used.

Table 4-75. Alternative 1 – Shorebased IFQ. Projected mortality for IFQ species under Alternative 1 for 2018 compared to the allocations or set-asides. No action estimates of mortality are provided (right panel).

IFQ Species	Area	Alternative 1 2018		No Action 2018	
		Projected Mortality (mt)	SB IFQ Allocation (mt)	Projected Mortality (mt)	SB IFQ Allocation (mt)
Arrowtooth flounder	Coastwide	2,299.8	10,992.6	2,299.8	10,992.6
BOCACCIO	South of 40°10' N. lat.	53.7	176.8	53.7	176.8
Canary Rockfish	Coastwide	232.0	291.2	498.0	625.1
Chilipepper	South of 40°10' N. lat.	353.8	1,868.3	353.8	1,868.3
COWCOD	South of 40°10' N. lat.	0.17	1.44	0.17	1.4
DARKBLOTCHED	Coastwide	98.7	563.5	97.9	352.8
Dover sole	Coastwide	7,062.1	45,981.0	7,062.1	45,981.0
English sole	Coastwide	220.2	6,953.0	220.2	6,953.0
Lingcod	North of 40°10' N. lat.	291.0	1,259.5	291.0	1,259.5
Lingcod	South of 40°10' N. lat.		511.2		511.2
Longspine thornyheads	North of 34°27' N. lat.	939.5	2,560.2	939.5	2,560.2
Shelf Rockfish	North of 40°10' N. lat.	66.4	1,148.7	66.4	1,148.7
Shelf Rockfish	South of 40°10' N. lat.	15.5	196.0	15.5	196.0
Slope Rockfish	North of 40°10' N. lat.	260.5	1,268.8	260.5	1,268.8
Slope Rockfish	South of 40°10' N. lat.	101.5	357.1	101.5	357.1
Other Flatfish	Coastwide	1,319.3	6,349.3	1,319.3	6,349.3
Pacific cod	Coastwide	156.5	1,031.4	156.5	1,031.4
Pacific halibut a/	North of 40°10 N. lat.	26.1	84.5	26.1	84.5
PACIFIC OCEAN PERCH	North of 40°10' N. lat.	39.3	126.6	39.3	126.6
Pacific whiting b/	Coastwide	83,693.1	112,007.3	83,693.1	112,007.3
Petrale sole	Coastwide	2,508.7	2,628.5	2,508.7	2,628.5
Sablefish	North of 36° N. lat.	2,776.3	2,912.1	2,776.3	2,912.1
Sablefish	South of 36° N. lat.	149.9	468.3	149.9	468.3
Shortspine thornyheads	North of 34°27' N.	694.5	1,537.0	694.5	1,537.0
Shortspine thornyheads	South of 34°27' N	2.5	50.0	2.5	50.0
Splitnose rockfish	South of 40°10' N. lat.	64.1	1,664.2	64.1	1,664.2
Starry flounder	Coastwide	10.0	630.9	10.0	630.9
Widow rockfish	Coastwide	8,589.3	10,669.2	1,078.8	1,340.1
YELLOWEYE ROCKFISH	Coastwide	0.08	1.15	0.08	1.1
Yellowtail rockfish	North of 40°10' N. lat.	1,347.9	4,084.2	1,347.9	4,084.2

a/ Pacific halibut is managed using IBQ, see regulations at §660.140. Starting in 2015, the maximum IBQ allocation is 45 mt, see (§660.55 (m)). There is no projection model for Pacific halibut bycatch. As stated in regulations (§660.55 (m)), a Pacific halibut set-aside of 10 mt, to accommodate bycatch in the at-sea Pacific whiting fisheries and in the shorebased trawl sector south of 40°10' N. latitude (estimated to 5 mt each). There is no projection model for Pacific halibut bycatch.

b/ The Pacific whiting TAC was unavailable during the preparation of the analysis, therefore the 2015 values were used.

Big Skate

Under Alternative 1, big skate would be reclassified from an ecosystem component species to "in the fishery" with species-specific harvest specifications after new information in 2015 showed that big skate was being targeted within the shorebased IFQ fishery. The Council recommended that a species-specific sorting requirement be implemented for all fisheries, and that trip limits be used in the shorebased IFQ fishery only. Trip limits for the shorebased IFQ fishery under Alternative 1 for both 2017-2018 are found in Table 4-8. Trip limits may be adjusted inseason.

Table 4-8: Big skate trip limits coastwide for shorebased IFQ fishery for 2017-2018.

JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
5,000	25,000	30,000	35,000	10,000	5,000

4.1.2.4 At-Sea Whiting Co-ops – Alternative 1

The at-sea whiting co-ops would operate under the same management measures described under No Action with a few modifications. The 2017-2018 allocations for the catcher-processor and mothership sectors under Alternative 1 are provided in Table 4-76 and compared to No Action. Notable differences from No Action include lower allocations for canary and higher allocations for widow and darkblotched rockfish. Table 4-77 and Table 4-78 shows the probable catches using the bootstrap simulation under Alternative 1 for canary, darkblotched, POP, Pacific whiting, and widow rockfish. The projections under the bycatch rate approach are the same as under No Action since the whiting TAC remains the same (Table 4-17). At-sea whiting set-asides would be the same under Alternative 1 as under No Action (Table 4-20).

Table 4-76. Alternative 1 – At-Sea. Allocations for the catcher-processor (CP) and mothership sectors (MS) under Alternative 1. The No Action allocations are provided (right panel) for reference.

		Alternative 1				**No Action**			
		2017		**2018**		**2017**		**2018**	
Stock	**Area**	**CP All. (mt)**	**MS All. (mt)**	**CP All. (mt)**	**MS All. (mt)**	**CP All. (mt)**	**MS All. (mt)**	**CP All. (mt)**	**MS All. (mt)**
Canary rockfish	Coastwide	60.8	43.3	53.8	38.3	124.9	89.0	115.5	82.3
DARKBLOTCHED	Coastwide	17.8	12.6	18.2	12.8	11	7.8	11.4	8.0
POP	N of 40º10' N. lat.	10.2	7.2	10.2	7.2	10.2	10.2	7.2	7.2
Pacific whiting a/	Coastwide	90,673	64,004	90,673	64,004	90,673	64,004	90,673	64,004
Widow rockfish	Coastwide	411.5	290.5	385.1	271.8	170	170	120	120

a/ The 2017 and 2018 Pacific whiting TACs were unavailable during the preparation of the analysis, therefore the 2015 values were used.

Table 4-77: Alternative 1- At-Sea- Catcher Processor. Projections for the CP sector under Alternative 1 for 2017-2018 using the bootstrap method sampling hauls from 2000-2015. Alternative 1 allocations for 2017 are provided on the right for reference.

Stock	CP All. (mt)	Percentage of Simulated Seasons									
		1%	5%	10%	25%	50%	75%	90%	95%	99%	99.99%
Whiting	90,673	22,478	38,579	63,549	90,673	90,673	90,673	90,673	90,673	90,673	90,673
DARKBLOTCHED	17.8	0.3	1.3	1.7	2.6	4.9	7.1	9.4	12	16.7	**19.7**
POP	10.2	0.1	0.2	0.3	1	4.7	8.6	**10.4**	**10.9**	**12.4**	**14.4**
Widow rockfish	411.5	3.5	5.7	8.4	14.4	31.9	67	97.3	119	317.1	**486.7**
Canary rockfish	60.8	0.1	0.1	0.1	0.2	0.4	0.6	1.2	2.3	4.3	7.3

Table 4-78: Alternative 1- At-Sea- Mothership. Projections for the MS sector under Alternative 1 for 2017-2018 using the bootstrap method sampling hauls from 2000-2015. Alternative 1 allocations for 2017 are provided on the right for reference. Bolded text indicates values that are higher than the allocations.

Stock	MS All. (mt)	Percentage of Simulated Seasons									
		1%	5%	10%	25%	50%	75%	90%	95%	99%	99.99 %
Whiting	64,004	14,713	27,864	64,004	64,004	64,004	64,004	64,004	64,004	64,004	64,004
DARKBLOTCHED	12.6	0.2	0.5	1	2.2	4.5	6.3	8.9	9.7	12	**15.3**
POP	7.2	0.1	0.1	0.3	0.9	1.9	3.6	5.6	**7.3**	**8.2**	**9.7**
Widow rockfish	290.5	1.6	11.9	15.6	24.6	46.8	70.8	103	161.5	212.5	268.1
Canary rockfish	43.3	0.1	0.1	0.1	0.3	0.7	1.1	2.1	2.4	16.1	32

4.1.2.5 Limited Entry and Open Access Fixed Gear– Alternative 1

Non-Nearshore

Alternative 1 is similar to the No Action Alternative, except that the non-trawl allocations for darkblotched and widow rockfish are higher while canary rockfish is lower (Table 4-69 and Table 4-71). Under Alternative 1, the nearshore and non-nearshore trip limits and RCA structure described under No Action would apply. While the nearshore and non-nearshore fishery shares of canary rockfish decrease under Alternative 1 for 2017-2018 (Table 4-73) compared to No Action (Table 4-7), the canary trip limits do not change because they were developed only to allow for retention of previously discarded landings, not to encourage targeting.

Nearshore – Alternative 1

There are three changes for the nearshore fishery under Alternative 1, compared to No Action. The canary rockfish ACL, non-trawl allocation, and nearshore share is lower under Alternative 1 (Table 4-68 and Table 4-70), compared to No Action (Table 4-2 and Table 4-4). Additionally, the California black rockfish and California scorpionfish south of 34°27' N. latitude ACLs, and non-trawl allocations are lower under Alternative 1, compared to No Action. However, the same management measures and trip limit options described under No Action would apply under Alternative 1 since projected mortality is well below the nearshore share (canary rockfish, Table 4-47; black rockfish CA, Table 4-50; and California scorpionfish south of 34°27´ N. latitude Table 4-52).

4.1.2.6 Tribal Fisheries – Alternative 1

Tribal fisheries would operate under the HGs and allocations displayed in Table 4-2 and Table 4-4. Tribal fisheries would be managed using the same measures described under No Action.

4.1.2.7 Washington Recreational – Alternative 1

Alternative 1 is similar to the No Action Alternative, except that the Washington recreational HG for canary rockfish decreases to 25.9 mt in 2017 and 22.9 mt in 2018 (Table 4-79) compared to No Action (Table 4-54). Under Alternative 1, the Washington recreational season structure (Status Quo Table 4-55 and Option 1 Table 4-56) and sub-bag limit options are the same as No Action. Projected mortality is the same as No Action (Table 4-57).

Table 4-79. Alternative 1: Washington recreational HGs for 2017 and 2018.

Stock	2017	2018
Canary Rockfish	25.9	22.9
YELLOWEYE ROCKFISH	3.3	3.3
Black Rockfish	287	283
Nearshore Rockfish	13.1	13.1

4.1.2.8 Oregon Recreational – Alternative 1

Alternative 1 is similar to the No Action Alternative, except that the Oregon recreational HG for canary rockfish decreases to 89.1 mt in 2017 and 78.8 mt in 2018 (Table 4-80) compared to No Action (Table 4-58). Under Alternative 1, the Oregon recreational season structure Figure 4-5 and bag limit options are the same as No Action. Projected mortality is the same as No Action (Table 4-60).

Table 4-80. Oregon recreational Federal HGs (in mt) and state quotas under the Alternative 1 for 2017-2018.

Stock	HGs and State Quotas a/	
	2017	2018
Canary Rockfish	89.1	78.8
YELLOWEYE ROCKFISH	3.0	3.0
Black Rockfish OR b/	400.1	394.7
Greenlings c/	41.1	34.9
Nearshore Rockfish N. of 40°10' N. lat. d/	44.5	44.5

a/ Federal HG are established for canary and yelloweye rockfish only. The state process in Oregon establishes quotas for black rockfish, blue rockfish, other Nearshore Rockfish, and greenlings (all species). The state quotas, which are yet to be determined are not intended to be implemented in Federal regulation, they are only provided as information.
b/ The values shown are the presumptive share, based on the 2015 recreational and commercial sharing percentages in Oregon State Regulations
c/ Includes kelp and other greenlings. The values shown are the presumptive share based on the 2015 recreational and commercial sharing percentages in Oregon State Regulations.
d/ Includes blue rockfish. The state of Oregon has a Federal HG for Nearshore Rockfish North of 40°10' N. Lat. of 60.5 mt, which is shared between the Oregon commercial nearshore and recreational fisheries. The values shown are the presumptive share, based on 2015 recreational and commercial sharing percentages in Oregon State Regulations.

4.1.2.9 California Recreational – Alternative 1

Alternative 1 is similar to the No Action Alternative, except that the California recreational HG for canary rockfish decreases to 185.1 mt in 2017 and 163.7 mt in 2018 and the allowable limit for black rockfish is reduced to 319 mt when compared to No Action. The California scorpionfish HG remains 111 mt and as such the decrease in the ACL under Alternative 1, compared to No Action, does not result in changes to management measures.

Under Alternative 1, the California recreational season structure options are the same as No Action (Option 1 Figure 4-8; Option 2 Figure 4-9; Option 3 Figure 4-10; Option 4 Figure 4-11). Projected mortality for most species is similar to No Action, except for black rockfish (Option 1 Table 4-63; Option 2 Table 4-64; Option 3 Table 4-65; Option 4 Table 4-66).

Given the reduced allowable limits for black rockfish, the sub-bag limit would need to be further reduced statewide to two fish to accommodate season structure Option 1 (Figure 4-8; 123.2 mt) and season structure Option 2 (Figure 4-9; 125.1 mt). A three fish sub-bag limit could be accommodated statewide under season structure Option 3 (Figure 4-10; 202.2 mt). A five fish sub-bag limit could be accommodated statewide under season structure Option 4 (Figure 4-11; 135.9 mt).

4.1.3 Alternative 2

Table 4-81 through Table 4-84 contain harvest specifications, off-the-top deductions, and allocations analyzed under Alternative 2. Notable changes from No Action include higher ACLs for darkblotched and widow rockfishes along with lower ACLs for canary rockfish, black rockfish in California, and California scorpionfish. A description of the HCR used to calculate the ACLs can be found in Section 2.1.3. A description of the calculations for the off-the-top deductions can be found in Section 4.1.1.1. Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018 can be found in Table 4-85.

Table 4-81. Alternative 2. 2017 ACLs and estimates of tribal, EFP, research, and incidental open access (OA) mortality (in mt), used to calculate the fishery harvest guideline (HG). All other ACL values are the same as under No Action.

Species	Area	ACL	Tribal	EFP	Research	OA	Fishery HG
Arrowtooth flounder	Coastwide	13,804	2,041.0		16.4	40.8	11,705.9
Big skate	Coastwide	494	15.0		4.0	38.4	436.6
Black (WA)	Washington	305	18.0		-	-	287.0
Black (OR)	Oregon	527			-	0.6	526.4
Black (CA)	California	319					319.0
BOCACCIO	S of 40º10' N. lat.	790			4.6	0.8	784.6
Cabezon (OR)	46º16' to 42º N. lat.	47			-		47.0
Cabezon (CA)	S of 42º N. lat.	150			-	0.3	149.7
California scorpionfish	S of 34°27' N. lat.	150			0.2	2.0	147.8
Canary rockfish	Coastwide	566	35.0		7.2	1.2	522.6
Chilipepper	S of 40º10' N. lat.	2,607			10.9	5.0	2,591.1
COWCOD	S of 40º10' N. lat.	10			2.0	0.0	8.0
DARKBLOTCHED	Coastwide	641	0.2		2.5	24.5	613.9
Dover sole	Coastwide	50,000	1,497.0		41.9	54.8	48,406.3
English sole	Coastwide	9,964	200.0		5.8	7.0	9,751.2
Lingcod	N of 40'10º N. lat.	3,333	250.0		11.7	16.0	3,055.3
Lingcod	S of 40'10º N. lat.	1,251			1.1	6.9	1,243.0
Longnose skate	Coastwide	2,000	130.0		13.2	3.8	1,853.0
Longspine thornyhead	N of 34º27' N. lat.	2,894	30.0		13.5	3.3	2,847.2
Longspine thornyhead	S of 34º27' N. lat.	914			1.4	1.8	910.8
Nearshore rockfish north	N of 40º10' N. lat.	105	1.5		-	0.3	103.2
Nearshore rockfish south	S of 40º10' N. lat.	1,163			2.7	1.4	1,158.9
Shelf rockfish north	N of 40º10' N. lat.	2,049	30.0		24.8	26.0	1,968.2
Shelf rockfish south	S of 40º10' N. lat.	1,623			8.6	8.6	1,605.8
Slope rockfish north	N of 40º10' N. lat.	1,755	36.0		9.5	18.6	1,690.9
Slope rockfish south	S of 40º10' N. lat.	707			2.0	17.2	687.8
Other fish	Coastwide	474					474.0
Other flatfish	Coastwide	8,510	60.0		19.0	125.0	8,306.0
Pacific cod	Coastwide	1,600	500.0		7.0	2.0	1,091.0
Pacific whiting	Coastwide	325,072	56,888.0			1,500.0	266,684.0
Petrale sole	Coastwide	3,136	220.0		17.7	3.2	2,895.1
POP	N of 40º10' N. lat.	171	9.2		5.2	10.0	146.6
Sablefish	N of 36º N. lat.	6,041	Table 4-5				
Sablefish	S of 36º N. lat.	1,075			3.0	2.0	1,070.0
Shortbelly rockfish	Coastwide	500			2.0	8.9	489.1
Shortspine thornyhead	N of 34º27' N. lat.	1,713	50.0		7.2	1.8	1,654.0
Shortspine thornyhead	S of 34º27' N. lat.	906			1.0	41.3	863.7
Spiny dogfish	Coastwide	2,094	275.0		12.5	49.5	1,757.0
Splitnose rockfish	S of 40º10' N. lat.	1,760			9.0	0.2	1,750.8
Starry flounder	Coastwide	1,282	2.0			8.3	1,271.7
Widow rockfish	Coastwide	13,508	200.0		8.2	0.5	13,299.3
YELLOWEYE	Coastwide	20	2.3		3.3	0.4	14.0
Yellowtail rockfish	N of 40º10' N. lat.	6,196	1,000.0		16.6	3.4	5,176.1

Table 4-82. Alternative 2. Stock specific fishery harvest guidelines (HG) or annual catch targets (ACT) and allocations for 2017 (in mt).

Species	Area	Fishery HG or ACT		Trawl		Non-trawl	
			Allocation Type	%	Mt	%	Mt
Arrowtooth flounder	Coastwide	11,705.9	Amendment 21	95%	11,120.6	5%	585.3
Big skate	Coastwide	436.6	Biennial	95%	414.8	5%	21.8
Black (WA)	N of 46º16'	287.0	None				
Black (OR)	46º16' to 42º N. lat.	526.4	None				
Black (CA)	S of 42º N. lat.	319.0	None				
BOCACCIO	S of 40º10' N. lat.	784.6	Biennial	N/A	188.6	N/A	596.3
Cabezon (OR)	46º16' to 42º N. lat.	47.0	None				
Cabezon (CA)	S of 42º N. lat.	149.7	None				
California scorpionfish a/	S of 34°27' N. lat.	111.0	None				
Canary rockfish	Coastwide	522.6	Biennial	N/A	278.4	N/A	244.2
Chilipepper	S of 40º10' N. lat.	2,591.1	Amendment 21	75%	1,943.3	25%	647.8
COWCOD b/	S of 40º10' N. lat.	4.0	Biennial	N/A	1.4	N/A	2.6
DARKBLOTCHED	Coastwide	613.9	Amendment 21	95%	583.2	5%	30.7
Dover sole	Coastwide	48,406.3	Amendment 21	95%	45,986.0	5%	2,420.3
English sole	Coastwide	9,751.2	Amendment 21	95%	9,263.6	5%	487.6
Lingcod	N of 40'10º N. lat.	3,055.3	Amendment 21	45%	1,374.9	55%	1,680.4
Lingcod	S of 40'10º N. lat.	1,243.0	Amendment 21	45%	559.4	55%	683.7
Longnose skate	Coastwide	1,853.0	Biennial	90%	1,667.7	10%	185.3
Longspine thornyhead	N of 34º27' N. lat.	2,847.2	Amendment 21	95%	2,704.8	5%	142.4
Longspine thornyhead	S of 34º27' N. lat.	910.8	None				
Nearshore rockfish north	N of 40º10' N. lat.	103.2	None				
Nearshore rockfish south	S of 40º10' N. lat.	1,158.9	None				
Shelf rockfish north	N of 40º10' N. lat.	1,968.2	Biennial	60.2%	1,184.9	39.8%	783.3
Shelf rockfish south	S of 40º10' N. lat.	1,605.8	Biennial	12.2%	195.9	87.8%	1,409.9
Slope rockfish north	N of 40º10' N. lat.	1,690.9	Amendment 21	81%	1,369.6	19%	321.3
Slope rockfish south	S of 40º10' N. lat.	687.8	Amendment 21	63%	433.3	37%	254.5
Other fish	Coastwide	474.0	None				
Other flatfish	Coastwide	8,306.0	Amendment 21	90%	7,475.4	10%	830.6
Pacific cod	Coastwide	1,091.0	Amendment 21	95%	1,036.4	5%	54.5
Pacific whiting c/	Coastwide	266,684.0	Amendment 21	100%	266,684.0	0%	0.0
Petrale sole	Coastwide	2,895.1	Amendment 21	95%	2,750.3	5%	144.8
POP	N of 40º10' N. lat.	146.6	Amendment 21	95%	139.3	5%	7.3
Sablefish	N of 36º N. lat.		Table 4-5				
Sablefish	S of 36º N. lat.	1,070.0	Amendment 21	42%	449.4	58%	620.6
Shortbelly rockfish	Coastwide	489.1	None				0.0
Shortspine thornyhead	N of 34º27' N. lat.	1,654.0	Amendment 21	95%	1,571.3	5%	82.7
Shortspine thornyhead	S of 34º27' N. lat.	863.7	Amendment 21	NA	50.0	NA	813.7
Spiny dogfish	Coastwide	1,757.0	None				
Splitnose rockfish	S of 40º10' N. lat.	1,750.8	Amendment 21	95%	1,663.3	5%	87.5
Starry flounder	Coastwide	1,271.7	Amendment 21	50%	635.9	50%	635.9
Widow rockfish	Coastwide	13,299.3	Amendment 21	91%	12,102.4	9%	1,196.9
YELLOWEYE	Coastwide	14.0	Biennial	N/A	1.1	N/A	12.9
Yellowtail rockfish	N of 40º10' N. lat.	5,176.1	Amendment 21	88%	4,554.9	12%	621.1

a/ The California scorpionfish fishery harvest guideline (147.8 mt) is further reduced to an ACT of 111 mt

b/ The cowcod fishery harvest guideline (8 mt) is further reduced to an ACT of 4 mt

c/ Pacific whiting TAC forecasts for 2017-2018 were unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-83. Alternative 2. 2018 ACLs and estimates of tribal, EFP, research, and incidental open access (OA) mortality (in mt), used to calculate the fishery harvest guideline (HG).

Species	Area	ACL	Tribal	EFP	Research	OA	Fishery HG
Arrowtooth flounder	Coastwide	13,743	2,041.0		16.4	40.8	11,644.9
Big skate	Coastwide	494	15.0		4.0	38.4	436.6
Black (WA)	Washington	301	18.0		-	-	283.0
Black (OR)	Oregon	520			-	0.6	519.4
Black (CA)	California	319					319.0
Blackgill	S of 40º10' N. lat.	123			0.5	0.1	122.4
BOCACCIO	S of 40º10' N. lat.	741			4.6	0.8	735.6
Cabezon (OR)	46º16' to 42º N. lat.	47			-		47.0
Cabezon (CA)	S of 42º N. lat.	149			-	0.3	148.7
California scorpionfish	S of 34°27' N. lat.	150			0.2	2.0	147.8
Canary rockfish	Coastwide	504	35.0		7.2	1.2	460.6
Chilipepper	S of 40º10' N. lat.	2,507			10.9	5.0	2,491.1
COWCOD	S of 40º10' N. lat.	10			2.0	0.0	8.0
DARKBLOTCHED	Coastwide	653	0.2		2.5	24.5	625.9
Dover sole	Coastwide	50,000	1,497.0		41.9	54.8	48,406.3
English sole	Coastwide	7,537	200.0		5.8	7.0	7,324.2
Lingcod	N of 40'10º N. lat.	3,110	250.0		11.7	16.0	2,832.3
Lingcod	S of 40'10º N. lat.	1,144			1.1	6.9	1,136.0
Longnose skate	Coastwide	2,000	130.0		13.2	3.8	1,853.0
Longspine thornyhead	N of 34º27' N. lat.	2,747	30.0		13.5	3.3	2,700.2
Longspine thornyhead	S of 34º27' N. lat.	867			1.4	1.8	863.8
Nearshore rockfish north	N of 40º10' N. lat.	105	1.5		-	0.3	103.2
Nearshore rockfish south	S of 40º10' N. lat.	1,179			2.7	1.4	1,174.9
Shelf rockfish north	N of 40º10' N. lat.	2,047	30.0		24.8	26.0	1,966.2
Shelf rockfish south	S of 40º10' N. lat.	1,624			8.6	8.6	1,606.8
Slope rockfish north	N of 40º10' N. lat.	1,754	36.0		9.5	18.6	1,689.9
Slope rockfish south	S of 40º10' N. lat.	586			2.0	17.2	566.8
Other Fish	Coastwide	441					441.0
Other flatfish	Coastwide	7,281	60.0		19.0	125.0	7,077.0
Pacific cod	Coastwide	1,600	500.0		7.0	2.0	1,091.0
Pacific whiting	Coastwide	325,072	56,888.0			1,500.0	266,684.0
Petrale sole	Coastwide	3,013	220.0		17.7	3.2	2,772.1
POP	N of 40º10' N. lat.	176	9.2		5.2	10.0	151.6
Sablefish	N of 36º N. lat.	6,299	Table 4-5				
Sablefish	S of 36º N. lat.	1,120			3.0	2.0	1,115.0
Shortbelly rockfish	Coastwide	500			2.0	8.9	489.1
Shortspine thornyhead	N of 34º27' N. lat.	1,698	50.0		7.2	1.8	1,639.0
Shortspine thornyhead	S of 34º27' N. lat.	898			1.0	41.3	855.7
Spiny Dogfish	Coastwide	2,083	275.0		12.5	49.5	1,746.0
Splitnose rockfish	S of 40º10' N. lat.	1,761			9.0	0.2	1,751.8
Starry flounder	Coastwide	1,282	2.0			8.3	1,271.7
Widow rockfish	Coastwide	12,655	200.0		8.2	0.5	12,446.3
YELLOWEYE	Coastwide	20	2.3		3.3	0.4	14.0
Yellowtail rockfish	N of 40º10' N. lat.	6,002	1,000.0		16.6	3.4	4,982.1

[a/] Pacific whiting TAC forecasts for 2017-2018 were unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-84. Alternative 2. Stock specific fishery harvest guidelines (HG) or annual catch targets (ACT) and allocations for 2018 (in mt).

Species	Area	Fishery HG or ACT		Trawl		Non-trawl	
			Allocation Type	%	Mt	%	Mt
Arrowtooth flounder	Coastwide	11,644.9	Amendment 21	95%	11,062.6	5%	582.2
Big skate	Coastwide	436.6	Biennial	95%	414.8	5%	21.8
Black (WA)	N of 46º16'	283.0	None				
Black (OR)	46º16' to 42º N. lat.	519.4	None				
Black (CA)	S of 42º N. lat.	319.0	None				
Blackgill	S of 40º10' N. lat.	122.4	Amendment 26	41%	50.2	59%	72.2
BOCACCIO	S of 40º10' N. lat.	735.6	Biennial	N/A	176.8	N/A	558.8
Cabezon (OR)	46º16' to 42º N. lat.	47.0	None				
Cabezon (CA)	S of 42º N. lat.	148.7	None				
California scorpionfish a/	S of 34°27' N. lat.	111.0	None				
Canary rockfish	Coastwide	460.6	Biennial	N/A	245.4	N/A	215.2
Chilipepper	S of 40º10' N. lat.	2,491.1	Amendment 21	75%	1,868.3	25%	622.8
COWCOD b/	S of 40º10' N. lat.	4.0	Biennial	N/A	1.4	N/A	2.6
DARKBLOTCHED	Coastwide	625.9	Amendment 21	95%	594.6	5%	31.3
Dover sole	Coastwide	48,406.3	Amendment 21	95%	45,986.0	5%	2,420.3
English sole	Coastwide	7,324.2	Amendment 21	95%	6,958.0	5%	366.2
Lingcod	N of 40'10º N. lat.	2,832.3	Amendment 21	45%	1,274.5	55%	1,557.8
Lingcod	S of 40'10º N. lat.	1,136.0	Amendment 21	45%	511.2	55%	624.8
Longnose skate	Coastwide	1,853.0	Biennial	90%	1,667.7	10%	185.3
Longspine thornyhead	N of 34º27' N. lat.	2,700.2	Amendment 21	95%	2,565.2	5%	135.0
Longspine thornyhead	S of 34º27' N. lat.	863.8	None				
Nearshore rockfish north	N of 40º10' N. lat.	103.2	None				
Nearshore rockfish south	S of 40º10' N. lat.	1,174.9	None				
Shelf rockfish north	N of 40º10' N. lat.	1,966.2	Biennial	60.2%	1,183.7	39.8%	782.5
Shelf rockfish south	S of 40º10' N. lat.	1,606.8	Biennial	12.2%	196.0	87.8%	1,410.8
Slope rockfish north	N of 40º10' N. lat.	1,689.9	Amendment 21	81%	1,368.8	19%	321.1
Slope rockfish south	S of 40º10' N. lat.	566.8		91%	515.8	9%	51.0
Other fish	Coastwide	441.0	None				
Other flatfish	Coastwide	7,077.0	Amendment 21	90%	6,369.3	10%	707.7
Pacific cod	Coastwide	1,091.0	Amendment 21	95%	1,036.4	5%	54.5
Pacific whiting c/	Coastwide	266,684.0	Amendment 21	100%	266,684.0	0%	0.0
Petrale sole	Coastwide	2,772.1	Amendment 21	95%	2,663.5	5%	138.6
POP	N of 40º10' N. lat.	151.6	Amendment 21	95%	144.0	5%	7.6
Sablefish	N of 36º N. lat.	0.0	Table 4-5				
Sablefish	S of 36º N. lat.	1,115.0	Amendment 21	42%	468.3	58%	646.7
Shortbelly rockfish	Coastwide	489.1	None				0.0
Shortspine thornyhead	N of 34º27' N. lat.	1,639.0	Amendment 21	95%	1,557.0	5%	81.9
Shortspine thornyhead	S of 34º27' N. lat.	855.7	Amendment 21	NA	50.0	NA	805.7
Spiny dogfish	Coastwide	1,746.0	None				
Splitnose rockfish	S of 40º10' N. lat.	1,751.8	Amendment 21	95%	1,664.2	5%	87.6
Starry flounder	Coastwide	1,271.7	Amendment 21	50%	635.9	50%	635.9
Widow rockfish	Coastwide	12,446.3	Amendment 21	91%	11,326.1	9%	1,120.2
YELLOWEYE	Coastwide	14.0	Biennial	N/A	1.1	N/A	12.9
Yellowtail rockfish	N of 40º10' N. lat.	4,982.1	Amendment 21	88%	4,384.2	12%	597.8

a/ The California scorpionfish fishery harvest guideline (147.8 mt) is further reduced to an ACT of 111 mt

b/ The cowcod fishery harvest guideline (8 mt) is further reduced to an ACT of 4 mt

c/ Pacific whiting TAC forecasts for 2017-2018 were unavailable during the preparation of the analysis; therefore the 2015 values were used.

Table 4-85. Alternative 2. Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018.

2017										
Fishery	**Bocaccio b/**		**Cowcod b/**		**Dkbl**		**POP**		**Yelloweye**	
	Allocation a/	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**
Off the Top Deductions	5.4	5.4	2.0	2.0	27.2	27.2	24.4	24.4	6.0	6.0
EFPc/										
Research d/	4.6	4.6	2.0	2.0	2.5	2.5	5.2	5.2	3.3	3.3
Incidental OA e/	0.8	0.8	0.0	0.0	24.5	24.5	10.0	10.0	0.4	0.4
Tribal f/					0.2	0.2	9.2	9.2	2.3	2.3
Trawl Allocations	188.6	57.3	1.4	0.2	583.2	108.1	139.3	45.0	1.1	0.1
--SB Trawl	188.6	57.3	1.4	0.2	552.7	98.7	122.0	39.1	1.1	0.1
--At-sea whiting MS					12.6	4.5	7.2	2.5		
--At-sea whiting CP					17.8	4.9	10.2	3.4		
Non-Trawl Allocation	596.0	169.8	2.6	2.2	30.7	7.2	7.3	0.5	12.9	12.1
Non-Nearshore	182.1	0.0		0.0		7.0		0.5	0.7	0.8
LE FG										
OA FG										
Directed OA: Nearshore	2.3	0.5		0.0		0.2		0.0	2.0	2.0
Recreational Groundfish										
WA						--		--	3.3	2.7
OR						--		--	3	2.9
CA	411.6	169.3		2.2		--		--	3.9	3.7
TOTAL	790.0	232.5	6.0	4.4	641.1	142.5	171.0	69.9	20.0	18.2
2017 Harvest Specification	**790**	**790**	**10.0**	**10.0**	**641**	641	**171**	171	**20**	20
Difference	0.0	557.5	4.0	5.6	0	498.5	0.0	101.1	0.0	1.8
Percent of ACL	100.0%	29.4%	60.0%	43.7%	100.0%	22.2%	100.0%	40.9%	100.0%	91.1%
Key			= not applicable							
	--		= trace, less than 0.1 mt							
			= Fixed Values							
			= Projection from GMT Model							
			= off the top deductions							

a/ Formal allocations are represented in the black shaded cells and are specified in regulation in Tables 1b and 1e. The other values in the allocation columns are 1) off the top deductions, 2) set asides from trawl allocation, 3) ad-hoc allocations recommended in the biennial process, 4) HG for the recreational fisheries for bocaccio, canary, and YE.

b/ South of 40°10' N. lat. The cowcod fishery HG (8 mt) is further reduced to an ACT of 4 mt.

c/ EFPs are amounts set aside to accommodate anticipated operations

d/ Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.

e/ The GMT's best estimate of impacts based on historical mortality.

f/ Tribal values represent the the values requested by the tribes.

g/ Values based on the 50 percentile (average) projection from the bootstrap model.

2018										
Fishery	**Bocaccio b/**		**Cowcod b/**		**Dkbl**		**POP**		**Yelloweye**	
	Allocation a/	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**
Off the Top Deductions	5.4	5.4	2.0	2.0	27.2	27.2	24.4	24.4	6.0	6.0
EFPc/										
Research d/	4.6	4.6	2.0	2.0	2.5	2.5	5.2	5.2	3.3	3.3
Incidental OA e/	0.8	0.8	0.0	0.0	24.5	24.5	10.0	10.0	0.4	0.4
Tribal f/					0.2	0.2	9.2	9.2	2.3	2.3
Trawl Allocations	176.8	53.7	1.4	0.2	594.6	108.1	144.0	45.2	1.1	0.0
--SB Trawl	176.8	53.7	1.4	0.2	563.5	98.7	127.0	39.3	1.1	0.0
--At-sea whiting MS					12.8	4.5	7.2	2.5		
--At-sea whiting CP					18.2	4.9	10.2	3.4		
Non-Trawl Allocation	558.8	169.8	2.6	2.2	31.3	7.5	7.6	0.5	12.9	12.1
Non-Nearshore	170.7	0.0		0.0		7.3		0.5	0.7	0.8
LE FG										
OA FG										
Directed OA: Nearshore	2.2	0.5		0.0		0.2		0.0	2.0	2.0
Recreational Groundfish										
WA						--		--	3.3	2.7
OR						--		--	3	2.9
CA	385.9	169.3		2.2		--		--	3.9	3.7
TOTAL	741.0	228.9	6.0	4.4	653.1	142.8	176.0	70.1	20.0	18.1
2018 Harvest Specification	**741**	**741**	**10.0**	**10.0**	**653**	653	**176**	176	**20**	20
Difference	0.0	512.1	4.0	5.6	0	510.2	0.0	105.9	0.0	1.9
Percent of ACL	100.0%	30.9%	60.0%	43.7%	100.0%	21.9%	100.0%	39.8%	100.0%	90.7%

Key		
		= not applicable
	--	= trace, less than 0.1 mt
		= Fixed Values
		= Projection from GMT Model
		= off the top deductions

a/ Formal allocations are represented in the black shaded cells and are specified in regulation in Tables 1b and 1e. The other values in the allocation columns are 1) off the top deductions, 2) set asides from trawl allocation, 3) ad-hoc allocations recommended in the biennial process, 4) HG for the recreational fisheries for bocaccio, canary, and YE.

b/ South of 40°10' N. lat. The cowcod fishery HG (8 mt) is further reduced to an ACT of 4 mt.

c/ EFPs are amounts set aside to accommodate anticipated operations

d/ Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.

e/ The GMT's best estimate of impacts based on historical mortality.

f/ Tribal values represent the the values requested by the tribes.

g/ Values based on the 50 percentile (average) projection from the bootstrap model.

4.1.3.1 Harvest Guidelines and Other Allocations

The canary rockfish recreational HGs as well as the nearshore and non-nearshore shares are lower under Alternative 1 (Table 4-86), compared to No Action (Table 4-7), coincident with the decrease in the ACLs. The HGs described under No Action (Section 4.1.1.3) for blackgill rockfish in 2017, blue rockfish south of 42° N. latitude, California scorpionfish south of 34°27' N. latitude, and Nearshore Rockfish north of 40°10' N. latitude would also apply under Alternative 2.

Table 4-86. Alternative 1 Allocations, HGs, and shares of Canary Rockfish.

Sector	2017	2018
Fishery Harvest Guideline	522.6	460.6
Trawl Allocation	278.4	245.4
Shorebased IFQ	*211.5*	*186.4*
Catcher Processor	*39.1*	*34.4*
Mothership	*27.8*	*24.5*
Non-Trawl Allocations	244.2	215.2
Non-Nearshore	*18.6*	*16.4*
Nearshore Fixed Gear	*32.8*	*28.9*
Washington Recreational a/	*16.6*	*14.7*
Oregon Recreational a/	*57.3*	*50.5*
California Recreational a/	*118.9*	*104.8*
a/ Values represent HGs which may be adjusted within the non-trawl allocation.		

4.1.3.2 Overview of Management Measures

The following bullet points summarize management measure changes by sector under Alternative 2. A more detailed discussion of management measures by sector follows. New measures, discussed in Chapter 3 and analyzed in Appendix B, could also be implemented.

- Trawl Sectors: Notable changes include higher trawl allocations for darkblotched and widow rockfishes and lower allocations for canary rockfish compared to No Action. Accordingly, the shorebased IFQ and allocations to the at-sea whiting co-ops would be higher for darkblotched and widow rockfishes and lower for canary rockfish, compared to No Action.
- Non-Trawl Sector: Notable changes include higher non-trawl allocations for darkblotched and widow rockfishes and lower allocations for canary rockfish, compared to No Action.
    - The non-nearshore and nearshore shares of canary rockfish would decrease, compared to No Action; however, the RCA and trip limit options described under No Action would still apply under Alternative 2.
    - Tribal fisheries would operate under the same management measures as No Action.
    - Washington, Oregon, and California recreational fisheries would have lower canary rockfish HGs under Alternative 2; however the fishery would still operate under the same management measures described under the No Action Alternative.

4.1.3.3 Shorebased IFQ – Alternative 2

The trawl RCA structure under Alternative 2 is the same as No Action (Tables 4-9 and 4-10). Allocations and projections differ between Alternative 2 and No Action only for three species; canary, darkblotched, and widow rockfishes. The canary rockfish allocation under Alternative 1 is one third of the No Action alternative, and so is the projection, since canary rockfish catch has co-varied responsively with changes in the allocation, both under IFQ and trip limit management. The darkblotched rockfish allocation under Alternative 1 is more than 60 percent higher than under No Action. The projected catch is only slightly higher under Alternative 1, since catch of darkblotched rockfish has not shown appreciable responsiveness to changes in the allocation, under IFQ. Both the allocation and the projected catch are more than eight times higher for widow rockfish under Alternative 1 than under No Action, since catch of widow rockfish has been highly responsive to changes in the allocation. Big skate impacts, trip limits, and management measures would be the same as Alternative 1.

Table 4-9. Alternative 2 – Shorebased IFQ. Projected mortality for IFQ species under Alternative 2 for 2017 compared to the allocations or set-asides. No action estimates of mortality are provided (right panel).

IFQ Species	Area	Alternative 2 2017		No Action 2017	
		Projected Mortality (mt)	SB IFQ Allocation (mt)	Projected Mortality (mt)	SB IFQ Allocation (mt)
Arrowtooth flounder	Coastwide	2,302.2	11,050.6	2,302.2	11,050.6
BOCACCIO	South of 40°10' N. lat.	57.3	188.6	57.3	188.6
Canary Rockfish	Coastwide	168.5	211.5	538.6	676.1
Chilipepper	South of 40°10' N. lat.	353.8	1,943.3	353.8	1,943.3
COWCOD	South of 40°10' N. lat.	0.17	1.44	0.17	1.4
DARKBLOTCHED	Coastwide	98.7	552.7	97.6	341.1
Dover sole	Coastwide	7,062.1	45,981.0	7,062.1	45,981.0
English sole	Coastwide	240.7	9,258.6	240.7	9,258.6
Lingcod	North of 40°10' N. lat.	315.4	1,359.9	315.4	1,359.9
Lingcod	South of 40°10' N. lat.		559.4		559.4
Longspine thornyheads	North of 34°27' N. lat.	942.7	2,699.8	942.7	2,699.8
Shelf Rockfish	North of 40°10' N. lat.	66.5	1,149.9	66.5	1,149.9
Shelf Rockfish	South of 40°10' N. lat.	15.5	195.9	15.5	195.9
Slope Rockfish	North of 40°10' N. lat.	260.6	1,269.6	260.6	1,269.6
Slope Rockfish	South of 40°10' N. lat.	119.5	433.3	119.5	433.3
Other Flatfish	Coastwide	1,549.2	7,455.4	1,549.2	7,455.4
Pacific cod	Coastwide	156.5	1,031.4	156.5	1,031.4
Pacific halibut a/	North of 40°10 N. lat.	26.1	84.5	26.1	84.5
PACIFIC OCEAN PERCH	North of 40°10' N. lat.	39.1	121.9	39.1	121.9
Pacific whiting b/	Coastwide	83,693.1	112,007.3	83,693.1	112,007.3
Petrale sole	Coastwide	2,620.2	2,745.3	2,620.2	2,745.3
Sablefish	North of 36° N. lat.	2,660.0	2,790.1	2,660.0	2,790.1
Sablefish	South of 36° N. lat.	143.9	449.4	143.9	449.4
Shortspine thornyheads	North of 34°27' N.	695.0	1,551.3	695.0	1,551.3
Shortspine thornyheads	South of 34°27' N	2.5	50.0	2.5	50.0
Splitnose rockfish	South of 40°10' N. lat.	64.1	1,663.3	64.1	1,663.3
Starry flounder	Coastwide	10.0	630.9	10.0	630.9
Widow rockfish	Coastwide	9,178.0	11,400.4	1,078.8	1,340.1
YELLOWEYE ROCKFISH	Coastwide	0.08	1.15	0.08	1.1
Yellowtail rockfish	North of 40°10' N. lat.	1,401.5	4,254.9	1,401.5	4,254.9

a/ Pacific halibut is managed using IBQ, see regulations at §660.140. Starting in 2015, the maximum IBQ allocation is 45 mt, see (§660.55 (m)). There is no projection model for Pacific halibut bycatch. As stated in regulations (§660.55 (m)), a Pacific halibut set-aside of 10 mt, to accommodate bycatch in the at-sea Pacific whiting fisheries and in the shorebased trawl sector south of 40°10' N. latitude (estimated to 5 mt each). There is no projection model for Pacific halibut bycatch.

b/ The Pacific whiting TAC was unavailable during the preparation of the EIS, therefore the 2015 values were used.

Table 4-10. Alternative 2 – Shorebased IFQ. Projected mortality for IFQ species under Alternative 2 for 2018 compared to the allocations or set-asides. No action estimates of mortality are provided (right panel).

IFQ Species	Area	Alternative 2 2018		No Action 2018	
		Projected Mortality (mt)	SB IFQ Allocation (mt)	Projected Mortality (mt)	SB IFQ Allocation (mt)
Arrowtooth flounder	Coastwide	2,299.8	10,992.6	2,299.8	10,992.6
BOCACCIO	South of 40°10' N. lat.	53.7	176.8	53.7	176.8
Canary Rockfish	Coastwide	148.5	186.4	498.0	625.1
Chilipepper	South of 40°10' N. lat.	353.8	1,868.3	353.8	1,868.3
COWCOD	South of 40°10' N. lat.	0.17	1.44	0.17	1.4
DARKBLOTCHED	Coastwide	97.9	563.5	97.9	352.8
Dover sole	Coastwide	7,062.1	45,981.0	7,062.1	45,981.0
English sole	Coastwide	220.2	6,953.0	220.2	6,953.0
Lingcod	North of 40°10' N. lat.	291.0	1,259.5	291.0	1,259.5
Lingcod	South of 40°10' N. lat.		511.2		511.2
Longspine thornyheads	North of 34°27' N. lat.	939.5	2,560.2	939.5	2,560.2
Shelf Rockfish	North of 40°10' N. lat.	66.4	1,148.7	66.4	1,148.7
Shelf Rockfish	South of 40°10' N. lat.	15.5	196.0	15.5	196.0
Slope Rockfish	North of 40°10' N. lat.	260.5	1,268.8	260.5	1,268.8
Slope Rockfish	South of 40°10' N. lat.	101.5	357.1	101.5	357.1
Other Flatfish	Coastwide	1,319.3	6,349.3	1,319.3	6,349.3
Pacific cod	Coastwide	156.5	1,031.4	156.5	1,031.4
Pacific halibut a/	North of 40°10 N. lat.	26.1	84.5	26.1	84.5
PACIFIC OCEAN PERCH	North of 40°10' N. lat.	39.3	126.6	39.3	126.6
Pacific whiting b/	Coastwide	83,693.1	112,007.3	83,693.1	112,007.3
Petrale sole	Coastwide	2,508.7	2,628.5	2,508.7	2,628.5
Sablefish	North of 36° N. lat.	2,776.3	2,912.1	2,776.3	2,912.1
Sablefish	South of 36° N. lat.	149.9	468.3	149.9	468.3
Shortspine thornyheads	North of 34°27' N.	694.5	1,537.0	694.5	1,537.0
Shortspine thornyheads	South of 34°27' N	2.5	50.0	2.5	50.0
Splitnose rockfish	South of 40°10' N. lat.	64.1	1,664.2	64.1	1,664.2
Starry flounder	Coastwide	10.0	630.9	10.0	630.9
Widow rockfish	Coastwide	8,589.3	10,669.2	1,078.8	1,340.1
YELLOWEYE ROCKFISH	Coastwide	0.08	1.15	0.08	1.1
Yellowtail rockfish	North of 40°10' N. lat.	1,347.9	4,084.2	1,347.9	4,084.2

a/ Pacific halibut is managed using IBQ, see regulations at §660.140. Starting in 2015, the maximum IBQ allocation is 45 mt, see (§660.55 (m)). There is no projection model for Pacific halibut bycatch. As stated in regulations (§660.55 (m)), a Pacific halibut set-aside of 10 mt, to accommodate bycatch in the at-sea Pacific whiting fisheries and in the shorebased trawl sector south of 40°10' N. latitude (estimated to 5 mt each). There is no projection model for Pacific halibut bycatch.

b/ The Pacific whiting TAC was unavailable during the preparation of the analysis, therefore the 2015 values were used.

4.1.3.4 At-Sea Whiting Co-ops – Alternative 2

The at-sea whiting co-ops would operate under the same management measures described under No Action with a few modifications. The 2017-2018 allocations for the catcher-processor and mothership sectors under Alternative 2 are provided in Table 4-87 and compared to No Action. Notable differences from No Action include lower canary rockfish allocations and higher darkblotched and widow rockfish allocations. Projected catches under the bootstrap simulation would be the same as Alternative 1, as the only allocation that changes is for canary rockfish, which was unrestricted in the simulation (Table 4-77 and Table 4-78). All other allocations were the same. The projections under the bycatch rate approach are the same as under No Action since the whiting TAC remains the same. At-sea whiting set-asides would be the same under Alternative 2 as under No Action (Table 4-20).

Table 4-87. Alternative 2 – At-Sea. Allocations for the catcher-processor (CP) and mothership sectors (MS) under Alternative 2. The No Action allocations are provided (right panel) for reference.

Stock	Area	Alternative 2				No Action			
		2017		2018		2017		2018	
		CP All. (mt)	MS All. (mt)	CP All. (mt)	MS All. (mt)	CP All. (mt)	MS All. (mt)	CP All. (mt)	MS All. (mt)
Canary rockfish	Coastwide	39.1	27.8	34.4	24.5	124.9	89.0	115.5	82.3
DARKBLOTCHED	Coastwide	17.8	12.6	18.2	12.8	11	7.8	11.4	8.0
POP	N of 40°10' N. lat.	10.2	7.2	10.2	7.2	10.2	10.2	7.2	7.2
Pacific whiting a/	Coastwide	90,673	64,004	90,673	64,004	90,673	64,004	90,673	64,004
Widow rockfish	Coastwide	411.5	290.5	385.1	271.8	170	170	120	120

a/ The 2017 and 2018 Pacific whiting TACs were unavailable during the preparation of the analysis, therefore the 2015 values were used.

4.1.3.5 Limited Entry and Open Access Fixed Gear– Alternative 2

Non-Nearshore – Alternative 2

Alternative 2 is similar to the No Action Alternative, except that the non-trawl allocations for darkblotched and widow rockfishes are higher while canary rockfish is lower (Table 4-82 and Table 4-84). Under Alternative 2, the nearshore and non-nearshore trip limits and RCA structure described under No Action would apply. While the nearshore and non-nearshore fishery shares of canary rockfish decrease compared to No Action, the canary rockfish trip limits do not change because they were developed only to allow for retention of previously discarded landings, not to encourage targeting.

Nearshore – Alternative 2

There are three changes for the nearshore fishery under Alternative 2, compared to No Action. The canary rockfish ACL, non-trawl allocation, and nearshore share is lower under Alternative 2 (Table 4-82 and Table 4-84), compared to No Action (Table 4-2 and Table 4-4). Additionally, the California black rockfish and California scorpionfish south of 34°27' N. latitude ACLs and non-trawl allocations are lower under Alternative 2 (Table 4-82 and Table 4-84), compared to No Action (Table 4-2 and Table 4-4). However, the same management measures and trip limit options described under No Action would apply under Alternative 2 since projected mortality is well below the nearshore share and therefore reduced trip limits

are not needed to keep catch below the reduced ACLs and non-trawl allocations (canary, Table 4-47; black rockfish CA, Table 4-50; and California scorpionfish south of 34°27' N. latitude Table 4-52).

It is noteworthy that Alternative 2 has the greatest potential that total mortality of canary rockfish could exceed the nearshore share. For instance, total mortality for a 300 lb trip limit for the open access fishery and 14 percent targeting is projected to be 18.9 mt, which is within 10 mt of the 2018 allocation (Table 4-47). If targeting is greater than projected, there is greater potential for the fishery to exceed their allocation.

4.1.3.6 Tribal Fisheries – Alternative 2

Tribal fisheries would operate under the HGs and allocations displayed in Table 4-81 and Table 4-83. Tribal fisheries would be managed using the same measures described under No Action.

4.1.3.7 Washington Recreational – Alternative 2

Alternative 2 is similar to the No Action Alternative, except that the Washington recreational HG for canary rockfish decreases to 16.6 mt in 2017 and 22.9 mt in 2018 (Table 4-79) compared to No Action (Table 4-54). Under Alternative 1, the Washington recreational season structure (Status Quo Table 4-55 and Option 1 Table 4-56) and sub-bag limit options are the same as No Action. Projected mortality is the same as No Action (Table 4-57).

Table 4-88. Alternative 2: Washington recreational HGs for2017 and 2018.

Stock	2017	2018
Canary Rockfish	16.6	14.7
YELLOWEYE ROCKFISH	3.3	3.3
Black Rockfish	287	283
Nearshore Rockfish	13.1	13.1

4.1.3.8 Oregon Recreational – Alternative 2

Alternative 2 is similar to the No Action Alternative, except that the Oregon recreational HG for canary rockfish decreases to 57.3 mt in 2017 and 50.5 mt in 2018 (Table 4-89 and Table 4-79) compared to No Action (Table 4-58). Under Alternative 2, the Oregon recreational season (Figure 4-5) and sub-bag limit options are the same as No Action. Projected mortality is the same as No Action (Table 4-60).

Table 4-89. Oregon recreational Federal HGs (in mt) and state quotas under the Alternative 2 for 2017-2018.

Stock	HGs and State Quotas a/	
	2017	2018
Canary Rockfish	57.3	50.5
YELLOWEYE ROCKFISH	3.0	3.0
Black Rockfish OR b/	400.1	394.7
Greenlings c/	41.1	34.9
Nearshore Rockfish N. of 40°10' N. lat. d/	44.5	44.5

a/ Federal HG are established for canary and yelloweye rockfish only. The state process in Oregon establishes quotas for black rockfish, blue rockfish, other Nearshore Rockfish, and greenlings (all species). The state quotas, which are yet to be determined are not intended to be implemented in Federal regulation, they are only provided as information.
b/ The values shown are the presumptive share, based on the 2015 recreational and commercial sharing percentages in Oregon State Regulations
c/ Includes kelp and other greenlings. The values shown are the presumptive share based on the 2015 recreational and commercial sharing percentages in Oregon State Regulations.
d/ Includes blue rockfish. The state of Oregon has a Federal HG for Nearshore Rockfish North of 40°10' N. Lat. of 60.5 mt, which is shared between the Oregon commercial nearshore and recreational fisheries. The values shown are the presumptive share, based on 2015 recreational and commercial sharing percentages in Oregon State Regulations.

4.1.3.9 California Recreational – Alternative 2

Alternative 2 is similar to the No Action Alternative except the California recreational HG for canary rockfish decreases to 118.9 mt in 2017 and 104.8 mt in 2018 and the allowable limit for black rockfish is reduced to 319 mt when compared to No Action. The California scorpionfish HG remains 111 mt, and as such the decrease in the ACL under Alternative 2, compared to No Action, does not result in changes to management measures.

Under Alternative 2, the California recreational season structure options are the same as No Action (Option 1 Figure 4-8; Option 2 Figure 4-9; Option 3 Figure 4-10; Option 4 Figure 4-11). Projected mortality for most species is similar to No Action, except for black rockfish (Option 1 Table 4-63; Option 2 Table 4-64; Option 3 Table 4-65; Option 4 Table 4-66).

Given the reduced allowable limit for black rockfish the sub-bag limit would need to be further reduced statewide to two fish to accommodate season structure Option 1 (Figure 4-8; 123.2 mt) and season structure Option 2 (Figure 4-9; 125.1 mt). A three fish sub-bag limit could be accommodated statewide under season structure Option 3 (Figure 4-10; 202.2 mt). A five fish sub-bag limit could be accommodated statewide under season structure Option 4 (Figure 4-11; 135.9 mt).

4.1.4 Alternative 3 – Preferred ACLs, Preferred Management Measures

Alternative 3 combines the preferred harvest specifications as described in Section 2.1.4 with preferred adjustments to routine management measures and the implementation of new management measures. Notable changes to harvest specifications from No Action include higher ACLs for darkblotched, POP, and widow rockfish along with lower ACLs for California scorpionfish. Big skate will also be actively managed with stock-specific harvest specifications. Additionally, under Alternative 3 all management measures for blue rockfish would be classified as blue/deacon rockfish to match the harvest specifications for these species (Section 2.2.6). Table 3-1 contains a complete list of new management measures included under Alternative 3. Detailed analysis of new management measures and enhanced analysis for selected existing

measures is provided in Appendix B. Summary impacts of implementing the all management measures are described by sector below.

The impact analysis displayed below by sector was conducted on the ACLs based on Council action from April 206 (see Tables 4-90 to 4-94 in Agenda Item G.4, Attachment 2, June 2016). Differences between those value and those under Alternative 3 (see Table 4-90 through Table 4-94 below in this document) are as follows: canary rockfish ACLs were increased from 1,526 mt in 2017 and 2018 to 1,714 mt and 1,526 mt, respectively; darkblotched ACLs were increased from 490 mt in 2017 and 2018 to 641 mt and 653 mt, respectively; and POP ACLs were increased from 171 mt in 2017 and 176 mt in 2018 to 281 mt in both years. However, in combination with the ACL increases, the Council also established buffers from the ACL (described below) which reduced amount of fish available to the sectors. Additionally, as described below (Section 4.1.4.1) the off the top deductions from the ACLs were changed for chilipepper and bocaccio, compared to those present in Agenda Item G.4, Attachment 2, June 2016.

The fishery allocations described below have been revised to represent the final values under Alternative 3, Preferred Alternative; however revised projection modeling was not conducted since the expected changes were thought to be minimal. Qualitative descriptions of anticipated changes as a result of the different ACLs are included, where appropriate.

4.1.4.1 Deductions from the ACL

A detailed description of the calculations for the off-the-top deductions for tribal, research, incidental open access, and EFPs can be found under the No Action Alternative in Section 4.1.1.1. The Alternative 3 deductions from the ACL are the same as under No Action except for the following:

Tribal
The tribal set-aside for canary rockfish was increased from 35 mt under No Action to 50 mt under Alternative 3 (see Agenda Item G.4.a, Supplemental Tribal Report, June 2016).

EFP and Research
The Council recommended a commercial jig fishing EFP, as described in Agenda Item G.3, Attachment 2, June 2016, with the following modifications: (1) a requirement for observer coverage on 30 percent of the trips combined with fishermen collecting and arranging for analysis of data on the other 70 percent of the trips; (2) extend the southern boundary for the EFP to Point Conception; and (3) add up to three additional vessels to the EFP for a total of seven vessels. Deductions from the ACL to accommodate the EFP would be those requested by the applicants (see Table 4-90 and Table 4-92), including 30 mt for chilipepper and 10 mt for bocaccio. The ODFW research deduction for yelloweye was reduced by 0.03 mt to accommodate this EFP.

The Council also adopted the Nature Conservancy EFP that uses selective pot gear to harvest lingcod (Agenda Item I.2, Supplemental Attachment 6, November 2015), with the condition that activity be limited to those waters seaward of a line approximating the 75 fathom depth contour. No off-the-top deductions are required for this EFP, since those catches will be covered using QP allocated in the shorebased IFQ fishery or trip limits for non-IFQ species.

Research
The 2017 Oregon research deduction for yelloweye rockfish was reduced from 1.0 mt under No Action to 0.57 mt under Alternative 3. The reduction was to provide 0.03 mt to the commercial jig EFP and a 0.4 mt buffer. There will be no buffer in 2018 and the Oregon research value would be 0.97 mt.

Buffer Approach

Under Alternative 3, the Council also established buffers from the canary, darkblotched, and POP ACLs to account for unforeseen catch events in any sector. When unforeseen catch events occur that compromise a sector's ability to access target species (e.g., catch is projected to attain a quota prior to target species attainment or catch event results attainment of a quota causing fishery closure), the Council could make a recommendation to NMFS to release the buffer thereby increasing the sector allocation and providing greater access to target species. When determining whether to release the buffer, the Council would consider the allocation framework criteria outlined in the FMP and the objectives to maintain or extend fishing and marketing opportunities, while taking into account the best available fishery information on sector needs. The Council could recommend full reapportionment, partial reappointment, or no reapportionment, based on the allocation framework criteria and objectives outlined in the FMP and managing the risk of exceeding an ACL. In the event the buffer is not reallocated inseason it would increase the likelihood that catch will be within the ACL. The buffer approach is similar to the existing process that is used when research, EFP, or incidental open access mortality is lower than the pre-season projections and a sector has realized a need to access the residual yield (see Section 4.1.1.1).

The buffer approach is not expected to result in changes in fishing behavior, compared to No Action, because the sectors will continue to be managed within the existing management system which is designed to increase access to target species while minimizing bycatch interactions (e.g., individual accountability and co-op management in the trawl sectors). Furthermore, there is no guarantee that the buffer would be released and there is limited access to it since the recommendation to release a buffers could only occur Council meeting through routine inseason action with implementation occurring several weeks later. That is, it would be impractical and inefficient to design fishing operations based on potential access to the buffer.

Under the buffer approach, all sectors would receive lower allocations than if the entire ACL were allocated (Table XXX 1). In other words, there is potential foregone yield by all sectors (either through targeting or increased access to bycatch) by establishing the buffer under Alternative 3. The forgone yield by implementing the buffer could be considered the price for addressing uncertainty in the assessment and projected catches as well as future management of the fishery (i.e. unsure of what level of targeting might occur), while achieving conservation goals and objectives and providing stability in management of the fishery, as envisioned in the FMP and under MSA. Overall, however, the forgone yield is expected to be minimal since historical ACL attainment for these species has been low. From 2011-2014, on average 42 percent of the canary ACLs were attained, 41 percent of the darkblotched ACLs, and 35 percent of the POP ACLs (see WCGOP Groundfish Mortality Reports).

Table XXX 1. Canary, POP, and Darkblotched rockfish allocations with and without the buffers.

	Canary		POP		Darkblotched	
Allocation type	Buffer	No Buffer	Buffer	No Buffer	Buffer	No Buffer
ACL	1,714.0	1,714.0	281.0	281.0	641.0	641.0
"Off-top" set-asides	59.4	59.4	24.4	24.4	27.3	27.3
Buffer	188.0	0.0	25.0	0.0	50.0	0.0
Fishery HG	1,466.6	1,654.6	231.6	256.6	563.7	613.7
Non-trawl	406.5	406.5	11.6	12.8	28.2	30.7
Trawl	1,060.1	1,248.1	220.0	243.8	535.5	583.0
--SB Trawl	1,014.1	1,202.1	198.3	219.7	507.6	552.6
--At-sea whiting MS	30.0	30.0	9.0	9.9	11.6	12.6
--At-sea whiting CP	16.0	16.0	12.7	14.1	16.4	17.8
Non-trawl	406.5	406.5	11.6	12.8	28.2	30.7
--Non-Nearshore HG	46.5	46.5	-----	-----	-----	-----
--Nearshore HG	100	100	-----	-----	-----	-----
--WA Rec HG	50	50	-----	-----	-----	-----
--OR Rec HG	75	75	-----	-----	-----	-----
--CA Rec HG	135	135	-----	-----	-----	-----

4.1.4.2 Allocating the Fishery HG

The Council recommended that the fishery HGs for cowcod and California scorpionfish be reduced to ACTs of 4 mt and 111 mt, respectively, in 2017 and 2018. The trawl and non-trawl allocations for these species are then established based on the ACT values. The fishery HGs for most of the remaining species are further allocated between the trawl and non-trawl fisheries based on the percentages adopted under Amendment 21 to the groundfish FMP or decided during the 2017-2018 biennium (i.e., two-year allocations). Sablefish north of 36° N. latitude is allocated under the Amendment 6 framework, which allocates the commercial HG between the limited entry (trawl and fixed gear) and open access sectors. Further, the FMP outlines criteria for allocating Pacific whiting, darkblotched, POP, and widow between the shorebased IFQ, catcher-processor, and mothership sectors.

For some species, no allocations are necessary since ACL attainment has historically been low due to the lack of market demand, limited access as a result of the RCA configurations, or the need to limit overfished species interactions. Additionally, some species are managed and allocated by the west coast states (e.g., nearshore species). For any stock that has been declared overfished, the formal trawl/non-trawl and open access/limited entry allocation established under provisions of the FMP and regulations (50 CFR 660.50) may be temporarily revised for the duration of the rebuilding period.

Two-year trawl and non-trawl allocations are decided during the biennial process for those species without long-term allocations or species where the long-term allocation is suspended. The ACLs and allocations for species subject to short-term allocations are indicated in Table 4-91 and Table 4-93. A summary of the basis for the two-year allocations under Alternative 3 are as follows

- Bocaccio: trawl (39 percent) and non-trawl (61 percent) allocation, which is an increase to the trawl sector compared to No Action. The increase to the trawl sector is expected to allow greater harvest of co-occurring shelf species. The increased bocaccio ACL for 2017-2018, compared to

2016, is expected to provide increased opportunities to the non-trawl sector (e.g., increased trip limit and bag limits) and thus would mitigate the decrease in the allocation.

- Cowcod: trawl (36 percent) and non-trawl (64 percent) allocation, which is the same as under No Action.
- Yelloweye rockfish: trawl (8 percent) and non-trawl (92 percent) allocation, which is the same as under No Action.
- Canary rockfish: trawl sector (72 percent) and non-trawl (28 percent), which is an increase to the trawl sector, compared to No Action. The general approach was to first accommodate the needs of the non-trawl and at-sea sectors and then allocate the remainder to the IFQ sector. The increase to the IFQ sector is expected to allow greater harvest of co-occurring shelf species. The increased canary ACL for 2017-2018, compared to 2016, is expected to provide increased opportunities to the non-trawl sector (e.g., increased trip limit and bag limits) and thus would mitigate the decrease in the allocation. Furthermore, the non-trawl sector management measures remain limited due to low yelloweye rockfish allocations.
- Big skate would be allocated 95 percent to the trawl fishery and 5 percent to the non-trawl fishery, based historical catch from 2010-2015 (Agenda Item I.9.a, Supplemental GMT Report 3, November 2015).
- Longnose skate would be allocated 90 percent to the trawl fishery and 10 percent to the non-trawl fishery, based historical catch (see 2013-2014 EIS Appendix C, Table C-54).
- Shelf rockfish north would be allocated 60.2 percent to the trawl fishery and 39.8 percent to the non-trawl fishery, based historical catch from 2005-2008 (see 2011-2012 EIS, Appendix B)
- Shelf rockfish south would be allocated 12.2 percent to the trawl fishery and 87.8 percent to the non-trawl fishery, based historical catch from 2005-2008 (see 2011-2012 EIS, Appendix B)

Table 4-90 through Table 4-94 contains the ACLs, off-the-top deductions, buffers, and allocations analyzed under Alternative 3. Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018 can be found in Table 4-95.

Table 4-90. Alternative 3. 2017 ACLs and estimates of tribal, EFP, research, incidental open access (OA) mortality (mt) as well as a buffer, used to calculate the fishery harvest guideline (HG).

Species	Area	ACL	Tribal	EFP	Research	OA	Buffer	HG
Arrowtooth flounder	Coastwide	13,804	2,041.0		16.4	40.8		11,705.9
Big skate	Coastwide	494	15.0		4.0	38.4		436.6
Black (WA)	Washington	305	18.0		-	-		287.0
Black (OR)	Oregon	527			-	0.6		526.4
Black (CA)	California	334		1.0				333.0
BOCACCIO	S of 40º10' N. lat.	790		10.0	4.6	0.8		774.6
Cabezon (OR)	46º16' to 42º N. lat.	47			-			47.0
Cabezon (CA)	S of 42º N. lat.	150			-	0.3		149.7
California scorpionfish	S of 34°27' N. lat.	150			0.2	2.0		147.8
Canary rockfish	Coastwide	1,714	50.0	1.0	7.2	1.2	188.0	1,466.6
Chilipepper	S of 40º10' N. lat.	2,607		30.0	10.9	5.0		2,561.1
COWCOD	S of 40º10' N. lat.	10		0.015	2.0	0.0		8.0
DARKBLOTCHED	Coastwide	641	0.2	0.1	2.5	24.5	50.0	563.8
Dover sole	Coastwide	50,000	1,497.0		41.9	54.8		48,406.3
English sole	Coastwide	9,964	200.0		5.8	7.0		9,751.2
Lingcod	N of 40'10º N. lat.	3,333	250.0	0.5	11.7	16.0		3,054.8
Lingcod	S of 40'10º N. lat.	1,251		1.0	1.1	6.9		1,242.0
Longnose skate	Coastwide	2,000	130.0		13.2	3.8		1,853.0
Longspine thornyhead	N of 34º27' N. lat.	2,894	30.0		13.5	3.3		2,847.2
Longspine thornyhead	S of 34º27' N. lat.	914			1.4	1.8		910.8
Nearshore rockfish N.	N of 40º10' N. lat.	105	1.5		-	0.3		103.2
Nearshore rockfish S.	S of 40º10' N. lat.	1,163			2.7	1.4		1,158.9
Shelf rockfish north	N of 40º10' N. lat.	2,049	30.0	3.0	24.8	26.0		1,965.2
Shelf rockfish south	S of 40º10' N. lat.	1,623		30.0	8.6	8.6		1,575.8
Slope rockfish north	N of 40º10' N. lat.	1,755	36.0	1.0	9.5	18.6		1,689.9
Slope rockfish south	S of 40º10' N. lat.	707		1.0	2.0	17.2		686.8
Other fish	Coastwide	474						474.0
Other flatfish	Coastwide	8,510	60.0		19.0	125.0		8,306.0
Pacific cod	Coastwide	1,600	500.0		7.0	2.0		1,091.0
Pacific whiting	Coastwide	325,072	56,888.0	1.0		1,500.0		266,683.0
Petrale sole	Coastwide	3,136	220.0		17.7	3.2		2,895.1
POP	N of 40º10' N. lat.	281	9.2		5.2	10.0	25.0	231.6
Sablefish	S of 36º N. lat.	1,075			3.0	2.0		1,070.0
Shortbelly	Coastwide	500			2.0	8.9		489.1
Shortspine thornyhead	N of 34º27' N. lat.	1,713	50.0		7.2	1.8		1,654.0
Shortspine thornyhead	S of 34º27' N. lat.	906			1.0	41.3		863.7
Spiny dogfish	Coastwide	2,094	275.0	1.0	12.5	49.5		1,756.0
Splitnose	S of 40º10' N. lat.	1,760		1.5	9.0	0.2		1,749.3
Starry flounder	Coastwide	1,282	2.0			8.3		1,271.7
Widow rockfish	Coastwide	13,508	200.0	9.0	8.2	0.5		13,290.3
YELLOWEYE	Coastwide	20	2.3	0.03	2.7	0.4		14.6
Yellowtail rockfish	N of 40º10' N. lat.	6,196	1,000.0	10.0	16.6	3.4		5,166.1

a/ The Pacific whiting total allowable catch was unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-91. Alternative 3. Stock specific fishery harvest guidelines (HG) or annual catch targets (ACT) and allocations for 2017 (in mt).

Species	Area	Fishery HG or ACT		Trawl		Non-trawl	
			Allocation Type	%	Mt	%	Mt
Arrowtooth flounder	Coastwide	11,705.9	Amendment 21	95%	11,120.6	5%	585.3
Big skate	Coastwide	436.6	Biennial	95%	414.8	5%	21.8
Black (WA)	N of 46º16'	287.0	None				
Black (OR)	46º16' to 42º N. lat.	526.4	None				
Black (CA)	S of 42º N. lat.	333.0	None				
BOCACCIO	S of 40º10' N. lat.	774.6	Biennial	39.04%	302.4	60.96%	472.2
Cabezon (OR)	46º16' to 42º N. lat.	47.0	None				
Cabezon (CA)	S of 42º N. lat.	149.7	None				
California scorpionfish a/	S of 34°27' N. lat.	111.0	None				
Canary rockfish	Coastwide	1,466.6	Biennial	72.281%	1,060.1	27.716%	406.5
Chilipepper	S of 40º10' N. lat.	2,561.1	Amendment 21	75%	1,920.8	25%	640.3
COWCOD b/	S of 40º10' N. lat.	4.0	Biennial	36%	1.4	64%	2.6
DARKBLOTCHED	Coastwide	563.8	Amendment 21	95%	535.6	5%	28.2
Dover sole	Coastwide	48,406.3	Amendment 21	95%	45,986.0	5%	2,420.3
English sole	Coastwide	9,751.2	Amendment 21	95%	9,263.6	5%	487.6
Lingcod	N of 40'10º N. lat.	3,054.8	Amendment 21	45%	1,374.7	55%	1,680.2
Lingcod	S of 40'10º N. lat.	1,242.0	Amendment 21	45%	558.9	55%	683.1
Longnose skate	Coastwide	1,853.0	Biennial	90%	1,667.7	10%	185.3
Longspine thornyhead	N of 34º27' N. lat.	2,847.2	Amendment 21	95%	2,704.8	5%	142.4
Longspine thornyhead	S of 34º27' N. lat.	910.8	None				
Nearshore rockfish north	N of 40º10' N. lat.	103.2	None				
Nearshore rockfish south	S of 40º10' N. lat.	1,158.9	None				
Shelf rockfish north	N of 40º10' N. lat.	1,965.2	Biennial	60.2%	1,183.1	39.8%	782.1
Shelf rockfish south	S of 40º10' N. lat.	1,575.8	Biennial	12.2%	192.2	87.8%	1,383.6
Slope rockfish north	N of 40º10' N. lat.	1,689.9	Amendment 21	81%	1,368.8	19%	321.1
Slope rockfish south	S of 40º10' N. lat.	686.8	Amendment 21	63%	432.7	37%	254.1
Other fish	Coastwide	474.0	None				
Other flatfish	Coastwide	8,306.0	Amendment 21	90%	7,475.4	10%	830.6
Pacific cod	Coastwide	1,091.0	Amendment 21	95%	1,036.4	5%	54.5
Pacific whiting c/	Coastwide	266,683.0	Amendment 21	100%	266,683.0	0%	0.0
Petrale sole	Coastwide	2,895.1	Amendment 21	95%	2,750.3	5%	144.8
POP	N of 40º10' N. lat.	231.6	Amendment 21	95%	220.0	5%	11.6
Sablefish	S of 36º N. lat.	1,070.0	Amendment 21	42%	449.4	58%	620.6
Shortbelly	Coastwide	489.1	None				0.0
Shortspine thornyhead	N of 34º27' N. lat.	1,654.0	Amendment 21	95%	1,571.3	5%	82.7
Shortspine thornyhead	S of 34º27' N. lat.	863.7	Amendment 21	NA	50.0	NA	813.7
Spiny dogfish	Coastwide	1,756.0	None				
Splitnose	S of 40º10' N. lat.	1,749.3	Amendment 21	95%	1,661.8	5%	87.5
Starry flounder	Coastwide	1,271.7	Amendment 21	50%	635.9	50%	635.9
Widow rockfish	Coastwide	13,290.3	Amendment 21	91%	12,094.2	9%	1,196.1
YELLOWEYE	Coastwide	14.6	Biennial	N/A	1.1	N/A	13.1
Yellowtail rockfish	N of 40º10' N. lat.	5,166.1	Amendment 21	88%	4,546.1	12%	619.9

a/ The California scorpionfish fishery harvest guideline (147.8 mt) is further reduced to an ACT of 111 mt.
b/ The cowcod fishery harvest guideline (8 mt) is further reduced to an ACT of 4 mt.
c/ Pacific whiting TAC forecasts for 2017-2018 were unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-92. Alternative 3. 2018 ACLs and estimates of tribal, EFP, research, and incidental open access (OA) mortality (in mt) as well as a buffer, used to calculate the fishery harvest guideline (HG).

Species	Area	ACL	Tribal	EFP	Research	OA	Buffer	HG
Arrowtooth flounder	Coastwide	13,743	2,041.0		16.4	40.8		11,644.9
Big skate	Coastwide	494	15.0		4.0	38.4		436.6
Black (WA)	Washington	301	18.0		-	-		283.0
Black (OR)	Oregon	520			-	0.6		519.4
Black (CA)	California	332		1.0				331.0
Blackgill	S of 40º10' N. lat.	123			0.5	0.1		122.4
BOCACCIO	S of 40º10' N. lat.	741		10.0	4.6	0.8		725.6
Cabezon (OR)	46º16' to 42º N. lat.	47			-			47.0
Cabezon (CA)	S of 42º N. lat.	149			-	0.3		148.7
California scorpionfish	S of 34°27' N. lat.	150			0.2	2.0		147.8
Canary rockfish	Coastwide	1,526	50.0	1.0	7.2	1.2		1,466.6
Chilipepper	S of 40º10' N. lat.	2,507		30.0	10.9	5.0		2,461.1
COWCOD	S of 40º10' N. lat.	10		0.015	2.0	0.0		8.0
DARKBLOTCHED	Coastwide	653	0.2	0.1	2.5	24.5	50.0	575.8
Dover sole	Coastwide	50,000	1,497.0		41.9	54.8		48,406.3
English sole	Coastwide	7,537	200.0		5.8	7.0		7,324.2
Lingcod	N of 40'10º N. lat.	3,110	250.0	0.5	11.7	16.0		2,831.8
Lingcod	S of 40'10º N. lat.	1,144		1.0	1.1	6.9		1,135.0
Longnose skate	Coastwide	2,000	130.0		13.2	3.8		1,853.0
Longspine thornyhead	N of 34º27' N. lat.	2,747	30.0		13.5	3.3		2,700.2
Longspine thornyhead	S of 34º27' N. lat.	867			1.4	1.8		863.8
Nearshore rockfish N.	N of 40º10' N. lat.	105	1.5		-	0.3		103.2
Nearshore rockfish S.	S of 40º10' N. lat.	1,179			2.7	1.4		1,174.9
Shelf rockfish north	N of 40º10' N. lat.	2,047	30.0	3.0	24.8	26.0		1,963.2
Shelf rockfish south	S of 40º10' N. lat.	1,624		30.0	8.6	8.6		1,576.8
Slope rockfish north	N of 40º10' N. lat.	1,754	36.0	1.0	9.5	18.6		1,688.9
Slope rockfish south	S of 40º10' N. lat.	586		1.0	1.5	17.1		566.4
Other fish	Coastwide	441						441.0
Other flatfish	Coastwide	7,281	60.0		19.0	125.0		7,077.0
Pacific cod	Coastwide	1,600	500.0		7.0	2.0		1,091.0
Pacific whiting a/	Coastwide	325,072	56,888.0	1.0		1,500.0		266,683.0
Petrale sole	Coastwide	3,013	220.0		17.7	3.2		2,772.1
POP	N of 40º10' N. lat.	281	9.2		5.2	10.0	25.0	231.6
Sablefish	S of 36º N. lat.	1,120			3.0	2.0		1,115.0
Shortbelly	Coastwide	500			2.0	8.9		489.1
Shortspine thornyhead	N of 34º27' N. lat.	1,698	50.0		7.2	1.8		1,639.0
Shortspine thornyhead	S of 34º27' N. lat.	898			1.0	41.3		855.7
Spiny dogfish	Coastwide	2,083	275.0	1.0	12.5	49.5		1,745.0
Splitnose	S of 40º10' N. lat.	1,761		1.5	9.0	0.2		1,750.3
Starry flounder	Coastwide	1,282	2.0			8.3		1,271.7
Widow rockfish	Coastwide	12,655	200.0	9.0	8.2	0.5		12,437.3
YELLOWEYE	Coastwide	20	2.3	0.03	3.27	0.4		14.0
Yellowtail rockfish	N of 40º10' N. lat.	6,002	1,000.0	10.0	16.6	3.4		4,972.1

[a/] Pacific whiting TAC forecasts for 2017-2018 were unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-93. Alternative 3. Stock specific fishery harvest guidelines (HG) or annual catch targets (ACT) and allocations for 2018 (in mt).

Species	Area	Fishery HG or ACT		Trawl		Non-trawl	
			Allocation Type	%	Mt	%	Mt
Arrowtooth flounder	Coastwide	11,644.9	Amendment 21	95%	11,062.6	5%	582.2
Big skate	Coastwide	436.6	Biennial	95%	414.8	5%	21.8
Black (WA)	N of 46º16'	283.0	None				
Black (OR)	46º16' to 42º N. lat.	519.4	None				
Black (CA)	S of 42º N. lat.	331.0	None				
Blackgill	S of 40º10' N. lat.	122.4	Amendment 26	41%	50.2	59%	72.2
BOCACCIO	S of 40º10' N. lat.	725.6	Biennial	39.04%	283.3	60.96%	442.3
Cabezon (OR)	46º16' to 42º N. lat.	47.0	None				
Cabezon (CA)	S of 42º N. lat.	148.7	None				
California scorpionfish a/	S of 34°27' N. lat.	111.0	None				
Canary rockfish	Coastwide	1,466.6	Biennial	72.281%	1,060.1	27.716%	406.5
Chilipepper	S of 40º10' N. lat.	2,461.1	Amendment 21	75%	1,845.8	25%	615.3
COWCOD b/	S of 40º10' N. lat.	4.0	Biennial	36%	1.4	64%	2.6
DARKBLOTCHED	Coastwide	575.8	Amendment 21	95%	547.0	5%	28.8
Dover sole	Coastwide	48,406.3	Amendment 21	95%	45,986.0	5%	2,420.3
English sole	Coastwide	7,324.2	Amendment 21	95%	6,958.0	5%	366.2
Lingcod	N of 40'10º N. lat.	2,831.8	Amendment 21	45%	1,274.3	55%	1,557.5
Lingcod	S of 40'10º N. lat.	1,135.0	Amendment 21	45%	510.8	55%	624.3
Longnose skate	Coastwide	1,853.0	Biennial	90%	1,667.7	10%	185.3
Longspine thornyhead	N of 34º27' N. lat.	2,700.2	Amendment 21	95%	2,565.2	5%	135.0
Longspine thornyhead	S of 34º27' N. lat.	863.8	None				
Nearshore rockfish north	N of 40º10' N. lat.	103.2	None				
Nearshore rockfish south	S of 40º10' N. lat.	1,174.9	None				
Shelf rockfish north	N of 40º10' N. lat.	1,963.2	Biennial	60.2%	1,181.8	39.8%	781.4
Shelf rockfish south	S of 40º10' N. lat.	1,576.8	Biennial	12.2%	192.4	87.8%	1,384.4
Slope rockfish north	N of 40º10' N. lat.	1,688.9	Amendment 21	81%	1,368.0	19%	320.9
Slope rockfish south	S of 40º10' N. lat.	566.4	Amendment 26	91%	515.4	9%	51.0
Other fish	Coastwide	441.0	None				
Other flatfish	Coastwide	7,077.0	Amendment 21	90%	6,369.3	10%	707.7
Pacific cod	Coastwide	1,091.0	Amendment 21	95%	1,036.4	5%	54.5
Pacific whiting c/	Coastwide	266,683.0	Amendment 21	100%	266,683.0	0%	0.0
Petrale sole	Coastwide	2,772.1	Amendment 21	95%	2,633.5	5%	138.6
POP	N of 40º10' N. lat.	231.6	Amendment 21	95%	220.0	5%	11.6
Sablefish	S of 36º N. lat.	1,115.0	Amendment 21	42%	468.3	58%	646.7
Shortbelly	Coastwide	489.1	None				0.0
Shortspine thornyhead	N of 34º27' N. lat.	1,639.0	Amendment 21	95%	1,557.0	5%	81.9
Shortspine thornyhead	S of 34º27' N. lat.	855.7	Amendment 21	NA	50.0	NA	805.7
Spiny dogfish	Coastwide	1,745.0	None				
Splitnose	S of 40º10' N. lat.	1,750.3	Amendment 21	95%	1,662.8	5%	87.5
Starry flounder	Coastwide	1,271.7	Amendment 21	50%	635.9	50%	635.9
Widow rockfish	Coastwide	12,437.3	Amendment 21	91%	11,317.9	9%	1,119.4
YELLOWEYE	Coastwide	14.0	Biennial	N/A	1.1	N/A	12.9
Yellowtail rockfish	N of 40º10' N. lat.	4,972.1	Amendment 21	88%	4,375.4	12%	596.6

a/ The California scorpionfish fishery harvest guideline (147.8 mt) is further reduced to an ACT of 111 mt

b/ The cowcod fishery harvest guideline (8 mt) is further reduced to an ACT of 4 mt

c/ Pacific whiting TAC forecasts for 2017-2018 were unavailable during the preparation of the analysis; therefore the 2015 values were used.

Table 4-94. Alternative 3. Estimates of tribal, research, recreational (Rec), and EFP mortality (in mt), used to calculate the fishery sablefish commercial harvest guideline north of 36° N. latitude for 2017 and 2018.

Stock	Year	ACL (mt)	Tribal Share (mt) [a/]	Research (mt)	Rec. (mt)	EFP (mt)	Commercial HG (mt)
Sablefish N. of 36° N. lat.	2017	6,041	604	26	6.1	1	5,404
	2018	6,299	630	26	6.1	1	5,636

[a/] The sablefish allocation to Pacific coast treaty Indian Tribes would be 10 percent of the sablefish ACL for the area north of 36° N. lat. This allocation represents the total amount available to the treaty Indian fisheries before deductions for discard mortality.

Table 4-95. Alternative 3. Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018.

2017										
Fishery	**Bocaccio b/**		**Cowcod b/**		**Dkbl**		**POP**		**Yelloweye**	
	Allocation a/	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**	**Allocation a/**	**Projected Impacts**
Off the Top Deductions	15.4	15.4	2.0	2.0	77.3	27.3	49.4	24.4	5.4	5.4
EFPc/	10.0	10.0	0.015	0.015	0.1	0.1			0.03	0.03
Research d/	4.6	4.6	2.0	2.0	2.5	2.5	5.2	5.2	2.70	2.70
Incidental OA e/	0.8	0.8	0.03	0.03	24.5	24.5	10.0	10.0	0.4	0.4
Tribal f/					0.2	0.2	9.2	9.2	2.3	2.3
Buffer					50.0		25.0		0.4	
Trawl Allocations	302.4	92.7	1.4	0.2	535.6	146.4	220.0	49.5	1.1	0.1
--SB Trawl	302.4	92.7	1.4	0.2	507.6	136.9	198.3	43.0	1.1	0.1
--At-sea whiting MS g/					11.6	4.5	9.0	1.8		
--At-sea whiting CP g/					16.4	5.0	12.7	4.7		
Non-Trawl Allocation	472.2	202.1	2.6	2.2	28.2	7.2	11.6	0.5	13.1	12.0
Non-Nearshore	144.3	16.6		0.0		7.0		0.5	0.8	0.8
LE FG										
OA FG										
Directed OA: Nearshore	1.8	0.6		0.0		0.2		0.0	2.1	2.1
Recreational Groundfish										
WA						--		--	3.3	3.1
OR						--		--	3	2.8
CA	326.1	184.9		2.2		--		--	3.9	3.2
TOTAL	790.0	310.2	4.0	2.4	641.1	180.9	281.0	74.4	19.6	17.5
2017 Harvest Specification	**790**	**790**	**10.0**	**10.0**	**641**	641	**281**	281	**20**	20
Difference	0.0	479.8	6.0	7.6	0	460.1	0.0	206.6	0.4	2.5
Percent of ACL	100.0%	39.3%	40.0%	23.7%	100.0%	28.2%	100.0%	26.5%	98.2%	87.6%

Key	
	= not applicable
--	= trace, less than 0.1 mt
	= Fixed Values
	= Projection from GMT Model
	= off the top deductions

a/ Formal allocations are represented in the black shaded cells and are specified in regulation in Tables 1b and 1e. The other values in the allocation columns are 1) off the top deductions, 2) set asides from trawl allocation (at-sea petrale only) 3) ad-hoc allocations recommended in the biennial process, 4) HG for the recreational fisheries for canary and YE.

b/ South of 40°10' N. lat. The cowcod fishery HG (8 mt) is further reduced to an ACT of 4 mt.

c/ EFPs are amounts set aside to accommodate anticipated operations

d/ Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.

e/ The GMT's best estimate of impacts based on historical mortality.

f/ Tribal values represent the the values requested by the tribes.

g/ Values based on the 50 percentile (average) projection from the bootstrap model described in Section 4.1.4.5.

2018

Fishery	Bocaccio b/		Cowcod b/		Dkbl		POP		Yelloweye	
	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts
Off the Top Deductions	15.4	15.4	2.0	2.0	77.3	27.3	49.4	24.4	6.0	6.0
EFPc/	10.0	10.0	0.015	0.015	0.1	0.1			0.03	0.03
Research d/	4.6	4.6	2.0	2.0	2.5	2.5	5.2	5.2	3.27	3.27
Incidental OA e/	0.8	0.8	0.03	0.03	24.5	24.5	10.0	10.0	0.4	0.4
Tribal f/					0.2	0.2	9.2	9.2	2.3	2.3
Buffer					50.0		25.0			
Trawl Allocations	283.3	86.9	1.4	0.2	547.0	146.4	220.0	50.0	1.1	0.1
--SB Trawl	283.3	86.9	1.4	0.2	518.4	136.9	198.3	44.1	1.1	0.1
--At-sea whiting MS g/					11.8	4.5	9.0	2.5		
--At-sea whiting CP g/					16.7	5.0	12.7	3.4		
Non-Trawl Allocation	442.3	202.1	2.6	2.2	28.8	7.5	11.6	0.5	12.9	12.0
Non-Nearshore	135.1	16.6		0.0		7.3		0.5	0.7	0.8
LE FG										
OA FG										
Directed OA: Nearshore	1.7	0.6		0.0		0.2		0.0	2.0	2.1
Recreational Groundfish										
WA						--		--	3.3	3.1
OR						--		--	3	2.8
CA	305.5	184.9		2.2		--		--	3.9	3.2
TOTAL	741.0	304.4	4.0	2.4	653.1	181.2	281.0	74.9	20.0	18.1
2017 Harvest Specification	**741**	**741**	**10.0**	**10.0**	**653**	653	**281**	281	**20**	20
Difference	0.0	436.6	6.0	7.6	0	471.8	0.0	206.1	0.0	1.9
Percent of ACL	100.0%	41.1%	40.0%	24.0%	100.0%	27.7%	100.0%	26.7%	100.0%	90.5%

Key		
		= not applicable
	--	= trace, less than 0.1 mt
		= Fixed Values
		= Projection from GMT Model
		= off the top deductions

a/ Formal allocations are represented in the black shaded cells and are specified in regulation in Tables 1b and 1e. The other values in the allocation columns are 1) off the top deductions, 2) set asides from th allocation (at-sea petrale only) 3) ad-hoc allocations recommended in the biennial process, 4) HG for the recreational fisheries for canary and YE.

b/ South of 40°10' N. lat. The cowcod fishery HG (8 mt) is further reduced to an ACT of 4 mt.

c/ EFPs are amounts set aside to accommodate anticipated operations

d/ Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.

e/ The GMT's best estimate of impacts based on historical mortality.

f/ Tribal values represent the the values requested by the tribes.

g/ Values based on the 50 percentile (average) projection from the bootstrap model described in Section 4.1.4.5.

4.1.4.3 Harvest Guidelines

Accountability measures that increase the likelihood that total catch stays within the ACL include HGs, which are a specified numerical harvest objective that is not a quota. Attainment of an HG does not require closure of a fishery. The following is a summary of the HGs recommended under Alternative 3; detailed rationale can be found in Section 4.1.1.3.

Blackgill Rockfish South of 40°10' N. Latitude

In 2017, the Council recommended a blackgill rockfish HG within the Slope Rockfish complex south of 40°10´ N. latitude. The blackgill rockfish HG (120.2 mt) would be further allocated 63 percent to trawl and 37 percent to non-trawl (44.5 mt), per the Amendment 21 allocations for the Slope Rockfish complex south of 40°10´ N. latitude. The blackgill rockfish non-trawl HG would be further divided 60 percent to limited entry (26.7 mt) and 40 percent to open access (17.8 mt).

If Amendment 26, which proposes to manage blackgill south of 40°10´ N. latitude with stock-specific harvest specifications, is implemented in 2018, then the blackgill south of 40°10' N. latitude non-trawl allocation (72.2 mt) would be further divided 60 percent to limited entry (43.3 mt) and 40 percent to open access (28.9 mt). In the event Amendment 26 is delayed, the Council recommended implementing a 122.4 mt blackgill rockfish HG within the Slope Rockfish complex south of 40°10´ N. latitude in 2018. The blackgill rockfish HG would be further allocated 63 percent to trawl and 37 percent to non-trawl (45.3 mt), per the Amendment 21 allocations for the Slope Rockfish complex south of 40°10´ N. latitude. The blackgill rockfish non-trawl HG would be divided 60 percent to limited entry (27.2 mt) and 40 percent to open access (18.1 mt).

Bocaccio Rockfish South of 40°10´ N. Latitude

The Council recommended a bocaccio HG for the California recreational fisheries in 2017 and 2018 of 326.1 mt and 305.5 mt, respectively. Implementing the HG is expected to help ensure catch within the non-trawl sector, which is primarily from the California recreational fisheries, stays within the non-trawl allocations.

Blue Rockfish South of 42° N. Latitude

The Council recommended HGs for blue rockfish south of 42° N. latitude within the Nearshore Rockfish complexes north and south of 40°10´ N. latitude of 304.6 mt in 2017 and 311.2 mt for 2018. Detailed discussion of this HG can be found in 4.1.1.3.

Canary Rockfish

As described in Section 2.2.4, the latest canary rockfish assessment indicates that the stock is rebuilt. In addition to the two-year trawl and non-trawl allocations, state-specific HGs are established for the Washington, Oregon, and California recreational fisheries. Additionally, shares have been identified for the nearshore and non-nearshore fisheries. Table 4-96 summarizes the canary rockfish allocations under Alternative 3.

Table 4-96. Alternative 3 ACLs, Fishery HG, Allocations, HGs, and shares of canary rockfish (in mt).

	2017	2018
ACL	1,714	1,526
Fishery Harvest Guideline	1,466.6	1,466.6
Trawl Allocation a/	**1,060.1**	**1,060.1**
Shorebased IFQ Allocation a/	*1,014.1*	*1,014.1*
Catcher Processor Allocation b/	*16*	*16*
Mothership Allocation b/	*30*	*30*
Non-Trawl Allocation a/	**406.5**	**406.5**
Non-Nearshore Share a/	*46.5*	*46.5*
Nearshore Fixed Gear Share a/ c/	*100*	*100*
Washington Recreational HG a/	*50*	*50*
Oregon Recreational HG a/	*75*	*75*
California Recreational HG a/	*135*	*135*

a/ Attainment of these values do not require fishery closure.
b/ Attainment of these values would require fishery closure.
c/ Additionally, there is an informal share of 73.3 percent to California and 26.8 percent to Oregon.

Nearshore Rockfish North of 40°10' N. Latitude

The West Coast states propose to monitor and manage catches of Nearshore Rockfish north of 40° 10' N. latitude using state-specific HGs. If harvest levels in a particular state approach 75 percent of the state-specific HGs, the states will consult via a conference call and determine whether inseason action would be needed. The HGs for Washington and Oregon would be state HGs and not established in Federal regulations. In California, the HG would be specified in Federal regulation and would apply only in the area between 42° N. latitude to 40°10' N. latitude. If inseason action were needed, the states of Washington and Oregon would take action through state regulation. California would propose changes through Federal regulations. Inseason updates would be provided to the Council at the September and November meetings.

The Council requested analysis of a range of state-specific Nearshore Rockfish HGs north of 40° 10' N. latitude (Table 4-8) to keep catch within the ACL. The Council selected Option 2 as their preferred alternative (Table 4-97), which uses status quo proportions to allocate stocks without state-specific assessment boundaries. For stocks that have state-specific stock assessment boundaries, the states would receive 100 percent of the ACL contribution.

Table 4-97. Nearshore Rockfish north of 40° 10' N. latitude HGs.

Stock	State	Option 2
Nearshore Rockfish North of 40°10´ N. Lat.	WA	16.9
	OR	46.1
	CA	40.2

State Quotas

In addition to Federal HGs, there are state quotas for nearshore species that further limit harvest in the commercial nearshore and recreational fisheries. In Oregon, the decision to allocate nearshore species between the commercial and recreational fisheries is made by the Oregon Fish and Wildlife Commission (Commission). The nearshore species that are allocated between the commercial and recreational fisheries by the Commission include kelp greenling, cabezon, black rockfish, and the rockfish species within the

Federal Nearshore Rockfish complex. Decisions made by the Commission occur after final Council action to adopt the Federal harvest specifications and are implemented through state regulation only. To facilitate the analysis of the Federal action to establish harvest specifications (i.e., to ensure that the combined removals from the sport and commercial fisheries did not exceed Federal allocations to Oregon as a whole), assumptions were made about the possible state allocations of these nearshore species to the commercial and recreational fisheries (i.e., status quo percentages). These values are placeholders and do not presuppose future action by the Commission.

In California, allocations between the commercial and recreational fisheries are made by the Fish and Game Commission, with the authority to allocate nearshore rockfish, cabezon, and kelp greenling. These allocations were used to support analyses in development of management measures for Federal action.

HG Summary

Yield set-asides and HGs, including quotas established by state entities, are accountability measures that increase the probability that catches will remain at or below the ACLs. Table 4-98 summarizes the Federal HGs proposed for use in management in 2017-2018.

Table 4-98. Alternative 3: Summary of the Harvest Guidelines proposed for 2017-2018.

Species	Description	2017 (mt)	2018 (mt)
Bocaccio Rockfish	California Recreational	326.1	305.5
Blackgill S. of 40° 10' N. lat. a/	HG within the Slope Rockfish complex South of 40° 10´ N. lat.	120.2	122.4
	HG within the Non-Trawl Allocation	44.5	45.3
Blue Rockfish S. of 42° N. lat.	HG within the Nearshore Rockfish complex North and South of 40° 10´ N. lat.	304.6	311.2
Canary Rockfish	Washington Recreational	50	50
	Oregon Recreational	75	75
	California Recreational	135	135
Nearshore Rockfish 40° 10' N. lat. to 42° N.	HG within the Nearshore Rockfish complex North and South of 40° 10´ N. lat.	40.2	40.2
Yelloweye Rockfish	Washington Recreational	3.3	3.3
	Oregon Recreational	3.0	3.0
	California Recreational	3.9	3.9

a/ The 2018 values are only implemented if Amendment 26, which proposes to manage blackgill south of 40°10´ N. latitude with stock-specific harvest specifications, is delayed.

4.1.4.4 Shorebased Individual Fishing Quota (IFQ) – Alternative 3

Allocations differ between Alternative 3 and No Action for bocaccio, canary, darkblotched, POP, and widow rockfish. For bocaccio rockfish, deductions for the EFP were increased (see Section 4.1.4.1) and

the trawl allocation percentage increased from 24 percent under No Action to 39 percent under Alternative 3 (see Section 4.1.4.2). The increased bocaccio allocation is expected to provide greater access to the shelf. During the initial analysis of canary rockfish allocations under No Action (as well as Alternatives 1 and 2), the September 2015 scorecard percentage (i.e., trawl allocation of 53 percent with 77 percent of that allocated to the IFQ sector, or 40 percent of the HG) was used. However, the Council selected an approach for Alternative 3 that first accommodated the needs of the non-trawl and at-sea sectors, then allocated the remainder to the IFQ sector (1014.1 mt, or 69 percent of the HG). The shorebased IFQ allocation is 50 percent more than the No Action allocations (676.1 mt in 2017 and 625.1 mt in 2018).

For darkblotched, POP, and widow rockfish, there were ACL increases which resulted in increased allocations to the IFQ sector based on Amendment 21 allocation percentages specified in the FMP. The most notable increase from No Action to Alternative 3 was the roughly eight times greater allocation for widow rockfish.

Under Alternative 3, the trawl RCA would have the same configuration as in 2016, except that north of 48°10' N. latitude the shoreward boundary would be 100 fm and the seaward boundary would be 150 fm. Detailed analysis of trawl RCA adjustment can be found in Appendix B, Section B.1.3. The daily vessel limit, designed for overfished species, for canary rockfish would be removed, given that the stock is rebuilt. Trip limits for non-IFQ species would be the same as in 2016, except for big skate (Table 4-99).

Table 4-99. Big skate trip limits coast wide for shorebased IFQ fishery for 2017-2018.

JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
5,000 lbs./2 months	25,000 lbs./2 months	30,000 lbs./2 months	35,000 lbs./2 months	10,000 lbs./2 months	5,000 lbs./2 months

Impact (Groundfish Mortality) - IFQ

Alternative 3 initially proposed lower ACLs and allocations for darkblotched and POP (see Agenda Item G.4, Attachment 3, June 2016 and Agenda Item G.4, Attachment 2, June 2016; Tables 4-100 and 4-101). The final preferred structure under Alternative 3 resulted in annual allocations that are on average 96.5 mt higher for darkblotched and an average of 74.1 mt higher for POP. Additionally, amounts deducted from the ACL to accommodate for EFPs were increased for bocaccio and chilipepper rockfish (see Section 4.1.4.1) which reduced the shorebased IFQ allocations by 2.7 mt and 15 mt, respectively. The shorebased IFQ modeling presented below was done on the initial ACLs allocations. The increase in allocations is expected to increase attainment of co-occurring slope species as well as Pacific whiting. Further, increases to the POP allocation could help the IFQ better attain their allocations of widow and yellowtail rockfishes in the mid-water non-whiting trawl fishery; a GMT bycatch model showed than POP have greater potential than canary rockfish to constrain access to these healthy, underutilized stocks (Agenda Item G.2.a, Supplemental GMT Report, June 2016). The decrease in bocaccio and chilipepper rockfish allocations would not likely have a noticeable effect since attainment for these species is low.

This section examines potential impacts of Alternative 3 using two approaches, which both operate under the assumption that canary rockfish is a bycatch stock that limits access to other target species on the shelf: (1) model-based projections informed by data when harvest specifications were at similar levels, and more recent IFQ data; (2) a bycatch rate analysis examining potential harvest amounts for canary-limited targets, given different amounts of available canary rockfish.

Shorebased IFQ Model Projections

Catch projections for the IFQ sector under Alternative 3 were made using a revised approach, compared to those presented under No Action and Alternatives 1 and 2 to inform projections for target species that co-occur with canary rockfish on the shelf, and account for the Alternative 3 canary allocation. This revised approach is considered "best available science" given feedback at the March and April Council meetings about how industry intends to leverage the increased availability of canary rockfish. Under Alternative 3, projections for many shelf target stocks were made with the explicit assumptions that (1) increased canary rockfish allocations under the alternative would have a substantial impact on catch of co-occurring shelf target stocks and (2) landings and harvest specifications data from the late 1990s, immediately previous to canary rockfish being managed as an overfished stock, were the most usable and appropriate data available to inform projections about this situation.

Thus, a portion of the differences between projections under No Action and Alternative 3 in Table 4-2 and Table 4-3 can be attributed to the revised (and improved) Alternative 3 methodology, particularly for target species that co-occur with canary rockfish. That is, those differences are larger than they would be if analyzed using the same approach; especially for shelf targets.

Model settings for some other species were also revised (compared to those used under No Action and Alternatives 1 and 2), including darkblotched rockfish and some co-occurring slope species. Settings for chilipepper rockfish were revised to account for the increase in allocation and projected catch of bocaccio rockfish, because they co-occur. The projected groundfish mortality for IFQ species under Alternative 3 and No Action appear in Table 4-100 and Table 4-101, and historical mortality estimates are provided in Table 4-10 and Table 4-11 for comparison. Description of the projection model used for this sector can be found in Appendix A. Groundfish mortality of non-IFQ species is not projected using a model; however historical data from 2013 and 2014 are provided for comparison (Table 4-12).

Projected mortality under Alternative 3 is higher than the average for 2013 and 2014 for most species. A noteworthy increase is seen with canary rockfish, whose allocation has risen under Alternative 3, compared with previous years under IFQ. Concomitantly, its projected catch has also risen by more than 75 times, compared with catch levels in 2013 and 2014. Total catch of widow rockfish is projected to increase approximately 18 times (compared with 2013 and 2014) under Alternative 3, while bocaccio catch is projected to increase roughly eight times; this equates to a near tripling of attainment in 2013-14. The stock is projected to be rebuilt in 2016. Widow rockfish was declared rebuilt in 2013-14 and the ACL increased from 600 mt to 1,500 mt. In 2015, the widow ACL increased again, but one as large as proposed under Alternative 3 has not been seen in some time; over the time series of 1995 to 2015, the widow rockfish HG was as high as 6,500 mt in 1995-1997. Given that the allocation amounts under Alternative 3 were so much higher than recent historical data (through the 1990s), upper bounds of the highest historical catch were not imposed on this projection, as they were for some other shelf species. Thus, projections of widow and yellowtail may be somewhat optimistic, given uncertainty in potentially high bycatch rates of canary rockfish for these target species (see *Bycatch Approach* below).

The responsiveness of canary rockfish catch to changes in relevant management measures is clear from examining landing levels of this stock in the late 1990s before it was declared rebuilt, as well as during IFQ years, even though attainment has been relatively low in most IFQ years. After taking data from 1995-1999 into account in the model for canary rockfish as well as shelf targets, we expect higher catch of species such as Dover sole, lingcod, yellowtail rockfish, arrowtooth flounder, English sole, Other Flatfish (includes rex sole and Pacific sanddabs), and Shelf Rockfish north. Attainment of yellowtail rockfish is also expected to rise along with dramatic increases to the widow and canary rockfish allocations, and are expected to be caught in the burgeoning non-whiting midwater trawl fishery. For several species, including Dover sole,

lingcod, and arrowtooth flounder, currently projected catch levels under the alternatives are similar to levels seen in the late 1990s.

Projections for canary rockfish and many co-occurring shelf species, in addition to bocaccio, darkblotched and widow rockfish, and species that co-occur with each of them, were partially informed by data outside of the model reference inputs of 2011-2014. Those data were from landings in the late 1990s, when canary, bocaccio, darkblotched, and widow rockfish were not overfished, and their catch was not restricted so as to markedly constrain catch of other co-occurring species. Where possible, proxy trawl allocations were developed to inform historical attainment, which were in turn used to inform catch projections through model tuning parameters. Attainment threshold parameter values were adjusted so as to free up stocks who historically responded to changes in their own harvest specifications during the 1990s, to do so in the analysis. This was necessary because several species have been relatively unresponsive to variation in allocation levels under IFQ, likely due to constraints of bycatch species with very low allocations (i.e. those under rebuilding plans). Information was borrowed from related species when not available for a species itself; e.g. there were no OYs or HGs for several IFQ species in the 1990s to use for direct derivation of proxy trawl allocations and attainment. Correlated responsiveness to change in specifications of constraining co-occurring species was also taken into account.

This approach informed revised model runs of the alternatives. In modeling Alternative 3, a revised No Action Alternative was chosen as the base model, and catch ratios among canary rockfish and associated shelf targets were then applied to model-based projections using Alternative 3 allocations for 2017 and 2018. This yielded projections for target stocks taking into account the increased projected catch of canary rockfish, which directly resulted from its substantially higher allocation under Alternative 3 (compared with No Action).

The results indicate marked increases in projected catch levels over previous estimates, for Dover sole, lingcod, yellowtail rockfish, arrowtooth flounder, English sole, Other Flatfish (including rex sole and Pacific sanddabs), Shelf Rockfish north of 40°10’ N. latitude, and somewhat for starry flounder. Chilipepper rockfish projections also rose using the revised approach, coinciding with projected catch of bocaccio rockfish. Some slope species, including thornyheads, Pacific ocean perch, and slope rockfish north of 40°10´ N. latitude rose somewhat, coinciding with increases in darkblotched rockfish allocations and projections. An assumption made when incorporating historical data was that the relevant market conditions and other constraints (e.g. bycatch) will either be similar enough, or surmountable enough during the current management regime of IFQ, to enable similar proportions of the allocations to be harvested as informed by the historical data. All data were year-weighted, and model sensitivity to alternative weighting schemes was evaluated.

Dover sole and lingcod projections do not differ between 2017 and 2018 because they hit the upper bounds on the projections of peak catch over the historical reference period (late 1990s). Projections for other shelf targets generally do co-vary with both the target allocations and the canary allocation.

Even with applying upper bounds, there is great uncertainty in how quickly and whether the market and buyers can enable such high catches of many species as in the late 1990s; particularly for flatfish, which have followed a relatively flat catch trajectory in recent years, even under dramatically changing allocations for some species (e.g. Dover sole, arrowtooth flounder, English sole, and starry flounder). Relieving some limitations of bycatch certainly goes a long way toward increasing catch of these targets, but is not the sole factor involved.

Lingcod was modeled as a coastwide stock, because of the lack of data as area-specific IFQ categories; it has been managed north and south of 40° 10’ N. latitude for just two of the four years in the model reference data. However, applying the weighted average proportions of the catch in the northern and southern areas

over the data yields the following northern and southern estimates from the coastwide projections. For lingcod north of 40°10´ N. latitude, the estimate under Alternative 3 in 2017 would be 1304.7 mt; in the South it would be 58.6 mt, based simply on the weighted annual average of 95.7 percent of IFQ lingcod which is harvested in the northern area. Changes in fixed gear effort that may occur as a result of the sharp increase in canary rockfish availability are not taken into account in this apportionment of the model estimate among areas. The estimates are the same for 2018, since the coastwide projection hit the upper bounds in both years (described earlier).

Longer term, in the next version of the model, there are plans to adapt and integrate a bycatch routine from the 2013-2014 IFQ model into the current version, which will provide additional functional interactions among species, and result in more model-based variation in catch projections among alternatives, with less need for post-hoc integration of historical data and tuning.

Table 4-100. Alternative 3 – Shorebased IFQ. Projected mortality for IFQ species under Alternative 3 for 2017 compared to the allocations or set-asides. No action estimates of mortality are provided (right panel).

IFQ Species	Area	Alt. 3 2017		No Action 2017	
		Projected Mortality (mt)	SB IFQ Allocation (mt)	Projected Mortality (mt)	SB IFQ Allocation (mt)
Arrowtooth flounder	Coastwide	4,516.9	11,050.6	2,302.2	11,050.6
BOCACCIO	South of 40°10' N. lat.	92.7	302.4	57.3	188.6
Canary rockfish	Coastwide	792.3	1,014.1	538.6	676.1
Chilipepper	South of 40°10' N. lat.	611.0	1,920.8	353.8	1,943.3
COWCOD	South of 40°10' N. lat.	0.17	1.40	0.17	1.4
DARKBLOTCHED	Coastwide	136.9	507.6	97.6	341.1
Dover sole	Coastwide	12,058.4	45,981.0	7,062.1	45,981.0
English sole	Coastwide	704.2	9,258.6	240.7	9,258.6
Lingcod	North of 40°10' N. lat.	1,304.7	1,359.7	315.4	1,359.9
Lingcod	South of 40°10' N. lat.	58.6	558.9		559.4
Longspine thornyheads	North of 34°27' N. lat.	1,352.7	2,699.8	942.7	2,699.8
Shelf Rockfish	North of 40°10' N. lat.	144.4	1,148.1	66.5	1,149.9
Shelf Rockfish	South of 40°10' N. lat.	28.2	192.2	15.5	195.9
Slope Rockfish	North of 40°10' N. lat.	260.5	1,268.8	260.6	1,269.6
Slope Rockfish	South of 40°10' N. lat.	119.3	432.7	119.5	433.3
Other Flatfish	Coastwide	3,369.1	7,455.4	1,549.2	7,455.4
Pacific cod	Coastwide	156.5	1,031.4	156.5	1,031.4
Pacific halibut a/	North of 40°10 N. lat.	26.1	84.5	26.1	84.5
PACIFIC OCEAN PERCH	North of 40°10' N. lat.	43.0	198.3	39.1	121.9
Pacific whiting b/	Coastwide	83,693.1	112,007.3	83,693.1	112,007.3
Petrale	Coastwide	2,620.2	2,745.3	2,620.2	2,745.3
Sablefish	North of 36° N. lat.	2,660.0	2,789.6	2,660.0	2,790.1
Sablefish	South of 36° N. lat.	143.9	449.4	143.9	449.4
Shortspine thornyheads	North of 34°27' N.	808.7	1551.3	695.0	1,551.3
Shortspine thornyheads	South of 34°27' N	2.5	50.0	2.5	50.0
Splitnose rockfish	South of 40°10' N. lat.	64.0	1661.8	64.1	1,663.3
Starry flounder	Coastwide	21.7	630.9	10.0	630.9
Widow rockfish	Coastwide	9,171.7	11,392.7	1,078.8	1,340.1
YELLOWEYE ROCKFISH	Coastwide	0.08	1.10	0.08	1.1
Yellowtail rockfish	North of 40°10' N. lat.	4,145.8	4,246.1	1,401.5	4,254.9

a/ Pacific halibut is managed using IBQ, see regulations at §660.140. Starting in 2015, the maximum IBQ allocation is 45 mt, see (§660.55 (m)). There is no projection model for Pacific halibut bycatch. As stated in regulations (§660.55 (m)), a Pacific halibut set-aside of 10 mt, to accommodate bycatch in the at-sea Pacific whiting fisheries and in the shorebased trawl sector south of 40°10' N. latitude (estimated to 5 mt each). There is no projection model for Pacific halibut bycatch.
b/ The Pacific whiting TAC was unavailable during the preparation of the analysis, therefore the 2015 values were used.

Table 4-101. Alternative 3 – Shorebased IFQ. Projected mortality for IFQ species under Alternative 3 for 2018 compared to the allocations or set-asides. No action estimates of mortality are provided (right panel).

IFQ Species	Area	Alternative 3 2018		No Action 2018	
		Projected Mortality (mt)	SB IFQ Allocation (mt)	Projected Mortality (mt)	SB IFQ Allocation (mt)
Arrowtooth flounder	Coastwide	4,872.3	10,992.6	2,299.8	10,992.6
Blackgill	South of 40°10' N. lat.	50.2	50.2	N/A	N/A
BOCACCIO	South of 40°10' N. lat.	86.9	283.3	53.7	176.8
Canary Rockfish	Coastwide	792.3	1,014.1	498.0	625.1
Chilipepper	South of 40°10' N. lat.	587.8	1,845.8	353.8	1,868.3
COWCOD	South of 40°10' N. lat.	0.17	1.40	0.17	1.4
DARKBLOTCHED	Coastwide	136.9	518.4	97.9	352.8
Dover sole	Coastwide	12,058.4	45,981.0	7,062.1	45,981.0
English sole	Coastwide	571.9	6,953.0	220.2	6,953.0
Lingcod	North of 40°10' N. lat.	1,208.4	1,259.32	291.0	1,259.5
Lingcod	South of 40°10' N. lat.	58.6	510.75		511.2
Longspine thornyheads	North of 34°27' N. lat.	1,291.9	2,560.2	939.5	2,560.2
Shelf Rockfish	North of 40°10' N. lat.	156.0	1,146.8	66.4	1,148.7
Shelf Rockfish	South of 40°10' N. lat.	28.3	192.4	15.5	196.0
Slope Rockfish	North of 40°10' N. lat.	260.3	1,268.0	260.5	1,268.8
Slope Rockfish	South of 40°10' N. lat.	113.2	515.4	101.5	357.1
Other Flatfish	Coastwide	3,103.3	6,349.3	1,319.3	6,349.3
Pacific cod	Coastwide	156.5	1,031.4	156.5	1,031.4
Pacific halibut a/	North of 40°10 N. lat.	26.1	84.5	26.1	84.5
PACIFIC OCEAN PERCH	North of 40°10' N. lat.	44.1	198.3	39.3	126.6
Pacific whiting b/	Coastwide	8,3693.1	112,007.3	83,693.1	112,007.3
Petrale sole	Coastwide	2,508.7	2,628.5	2,508.7	2,628.5
Sablefish	North of 36° N. lat.	2,776.3	2,911.6	2,776.3	2,912.1
Sablefish	South of 36° N. lat.	149.9	468.3	149.9	468.3
Shortspine thornyheads	North of 34°27' N.	802.5	1,537.0	694.5	1,537.0
Shortspine thornyheads	South of 34°27' N	2.5	50.0	2.5	50.0
Splitnose rockfish	South of 40°10' N. lat.	64.1	1,662.8	64.1	1,664.2
Starry flounder	Coastwide	23.5	630.9	10.0	630.9
Widow rockfish	Coastwide	8,583.1	10,661.5	1,078.8	1,340.1
YELLOWEYE ROCKFISH	Coastwide	0.08	1.15	0.08	1.1
Yellowtail rockfish	North of 40°10' N. lat.	3,979.1	4,075.4	1,347.9	4,084.2

a/ Pacific halibut is managed using IBQ, see regulations at §660.140. Starting in 2015, the maximum IBQ allocation is 45 mt, see (§660.55 (m)). There is no projection model for Pacific halibut bycatch. As stated in regulations (§660.55 (m)), a Pacific halibut set-aside of 10 mt, to accommodate bycatch in the at-sea Pacific whiting fisheries and in the shorebased trawl sector south of 40°10' N. latitude (estimated to 5 mt each). There is no projection model for Pacific halibut bycatch.

b/ The Pacific whiting TAC was unavailable during the preparation of the analysis, therefore the 2015 values were used.

Blackgill rockfish

The 2018 blackgill rockfish south of 40°10′ N. latitude shorebased IFQ allocation of 50.1 mt, which is 41 percent of the fishery HG of 122.4 mt, is expected to be established when NMFS implements Amendment 26. It will be an allocation percentage that is established in the FMP and thus would require an FMP amendment to change; i.e., the Council does not have the option to modify it through the biennial cycle.

Model-based projections with post hoc proportional accommodations for pulling the stock out of the Slope Rockfish south of 40°10′ N. latitude complex yield projections between 88 and 103 percent attainment of the 2018 allocation, depending on whether an approach of weighted averaging or trending species composition is taken. Looking at the same data through the lens of either simple catch trends or averages would yield projections of between 78 and 94 percent attainment, respectively.

Catch of blackgill rockfish south of 40°10′ N. latitude under Alternative 3 was projected based on applying the proportions of the Slope Rockfish south of 40°10′ N. latitude complex that blackgill rockfish has comprised during the IFQ program, onto the Slope Rockfish south of 40°10′ N. latitude model projection itself. Model tuning for the Slope Rockfish south of 40°10′ N. latitude complex was not altered in response to the darkblotched rockfish allocation increase (a key coast wide slope rockfish species), since darkblotched rockfish is more densely distributed to the north, and slope rockfish catch and effort are also much higher in the north. Tuning parameter values used were those derived during model development, with 2011-2014 IFQ data.

The majority of blackgill rockfish south of 40°10′ N. latitude catch in the southern area has been with trawl gear overall during IFQ management, although a sizable proportion was caught with fixed gear in 2013, and the catch distribution among gears within IFQ has been highly variable. During 2012, the year of highest catch under IFQ, 75 mt was caught with bottom trawl gear alone (Table 4-102), which represented 92.3 percent of the IFQ catch of the species that year.

The proportion of blackgill rockfish south of 40°10′ N. latitude within the complex was also especially high in 2012, and was most variable in the first two year of the program (was 0.31, 0.65, 0.47, and 0.39 respectively, from 2011 to 2014). Making a projection based on weighted average catch composition (45.6 percent) under IFQ results in 51.6 mt, 103 percent attainment of the 50.1 mt allocation. However, if future catch composition is following the recent trend of decreasing variability within the IFQ Slope Rockfish south of 40°10′ N. latitude complex, and the future blackgill rockfish south of 40°10′ N. latitude contribution resembles the most recent data year, 2014, rather than the average, that would suggest a proportion of 0.39, which would mean a projection of 44.1 mt or 88 percent attainment. There is substantial uncertainty regarding what will happen if the species is avoided when managed outside the complex. This is an entirely new circumstance.

Table 4-102: Distribution of blackgill rockfish south of 40°10′ N. latitude total catch in IFQ by gear type, from 2011-2014, total annual IFQ catch, and proportion by gear type. Source = WCGOP.

IFQ Subsector	2011	2012	2013	2014
IFQ - Bottom Trawl Gear	14.27	73.56	39.77	34.93
IFQ - Fixed Gear	1.72	6.11	15.16	3.44
Total	**15.99**	**79.66**	**54.93**	**38.37**
Proportion Bottom Trawl	0.89	0.92	0.72	0.91
Proportion Fixed	0.11	0.08	0.28	0.09

Slope Rockfish S. of 40°10′ N. latitude catch has shown low responsiveness to changes in the allocation during IFQ years (although the allocation has varied little, by 13 percent), so annual catch itself is also worth considering as an indication of the future. Annual catch was most variable in the first two years of the IFQ program, but has shown a stabilizing trend since then. Average annual catch was 47.2 mt; using this as a projection would yield 94 percent attainment. Given the trend of stabilizing annual catch, if future catch resembles that of 2014 (most recent total catch estimate available), rather than an average, then that

would suggest an attainment of 78percent. It should be noted however that the model itself does take into account the degree to which catch responds to allocation, and that species-specific parameter value was optimized using reference data over 2011-2014.

Recent data show that reducing targeting by fixed gear alone may or may not have a meaningful effect on catch of this stock, given the large variability in catch distribution among gear types.

Bycatch Rate Approach

In this analysis, we assessed the harvest potential of target shelf stocks coastwide assuming canary rockfish continue to be treated as a limiting bycatch stock. Attainment rates of target shelf rockfish stocks were similar for each of the three alternative canary rockfish ACLs and corresponding IFQ allocations. However, the Groundfish Advisory Subpanel (GAP) indicated that higher allocations of canary rockfish would increase their ability to access bottom shelf stocks (e.g., dover sole, English sole, lingcod) and mid-water shelf rockfish (e.g., yellowtail, widow, and chilipepper rockfishes), which was not reflected by the original IFQ model (i.e., no relationship between targets and canary rockfish). While the revised IFQ projection model described above does take into consideration the relationship between canary rockfish allocations and other shelf species landings, it also assumes the landings patterns seen in the 1990s, when canary rockfish was targeted. The approach described below is intended to provide projections based on if canary rockfish was truly a bycatch only species (as informed by the GAP).

Given that each extra pound of canary rockfish could provide the IFQ fishery many more pounds of target species (if they continue to treat canary rockfish as a bycatch species, as they indicated), the GAP and GMT felt it was important to analyze what the difference in landings potential could be for the alternative two year canary rockfish IFQ allocations (i.e., Alternative 3=1,014 mt; No Action=625 mt) using a bycatch rate approach. The bycatch rate approach provides the harvest potential (upper limit) for bottom and mid-water target shelf stocks assuming they continue to treat canary rockfish as a bycatch limiting species and utilize "every last pound" of their IFQ sector canary rockfish allocation.

In order to provide additional information outside of the IFQ model projections (with modifications described above), further analysis was done by examining the WCGOP database and the potential access that increased allocations of canary rockfish under Alternative 3 may provide.

In order to assess the amount of other target stocks that may be caught with increases in canary rockfish allocation, WCGOP data from 2011-2013 was used to calculate bycatch rates of canary rockfish to other target shelf stocks by gear type (Table 4-103). The following criteria were used when filtering the WCGOP data set (based on GAP input):

1. Gear
    a. Midwater trawl was defined as gear code 3 (midwater trawl) and where the trip had less than 50 percent whiting (as defined in regulation)
    b. Bottom trawl was defined as anything landed in the "Catch Shares" sector (used by WCGOP) and had gear codes 1,2,4,5, and 17 (all of the possible bottom trawl gears).
    c. Fixed gear was not included in this analysis, as it is assumed the majority of canary interaction will occur with trawl gear.
2. Depth: Average depth was less than or equal to 100 fm (to capture only shelf trips)
3. Denominator stocks (i.e. target stocks for each gear type)
    a. Bottom trawl: arrowtooth flounder, Dover sole, English sole, lingcod, rex sole, Pacific sanddab, and longnose skate
    b. Midwater trawl: widow, yellowtail, bocaccio, and chilipepper rockfish

Table 4-103. WCGOP Bycatch Rates from 2011-2013 of Canary Rockfish to Target Shelf Species by Gear Type

Gear Type	Min	25th	50th	75th	Max	Mean
Bottom Trawl	0	0	0.00046	0.003187	1.327398	0.006809
Midwater Trawl	0	0	0	0.003984	8.89275	0.077982

As seen in Table 4-103, bottom trawl gears typically have less canary bycatch compared to midwater trawl as the average bycatch rate is more than 11 times lower. Bottom trawl gears presumably have less bycatch due to the net configurations (e.g., selective flatfish net[5] and excluders) specifically designed to reduce canary rockfish encounters. In contrast, canary rockfish bycatch rates are presumably greater in midwater trawls because these nets are designed for targeting midwater rockfish (e.g. widow, yellowtail, and chilipepper rockfish). Although they have tried to avoid canary rockfish while targeting other midwater rockfish stocks since canary was declared overfished in 2000, incidentals catches are not uncommon since these stocks may co-occur or schools may be difficult to differentiate on sonar, which is why there is potential for disaster tows to occur if they accidentally deploy on a pure canary rockfish school.

If the IFQ sector continues to try to avoid canary rockfish (i.e., maintains their mean bycatch rates from 2011-2014) and resumes their historical fishing strategy (i.e., percentage of mid-water vs. bottom trawl activity during the 1990's before canary rockfish were declared overfished), they could potentially catch 95,011 mt of bottom target shelf stocks and 4,576 mt of mid-water target shelf stocks under the Alternative 3 allocation of 1,014.1 mt of canary rockfish for the IFQ sector (Table 4-104). While this theoretically could mean they could catch their entire allocations of target bottom stocks (from the denominator list above), they would not be expected to catch their full allocations of mid-water stocks (i.e., projection is 4,576 mt combined, whereas the combined IFQ allocation is 17,880 mt).

As the GAP indicated, landings potential for the Alternative 3 canary rockfish allocation could be greater (nearly double from this bycatch rate approach) for both bottom and mid-water stocks compared to the No Action canary rockfish allocation (i.e., 625.1 mt). However, to achieve this full harvest potential, industry would have to continue to not target canary rockfish (which they indicated they will not) and use "every last pound" of canary allocation (which would be difficult unless better quota pound trading occurs) to access the other species in their portfolios.

[5] In March 2016, the Council took action to remove the selective flatfish trawl (SFFT) requirement north of 40° 10′ N. lat. with an expected implementation date of 2017.

Table 4-104: Harvest potential of shelf bottom and mid-water target stocks (defined above in denominator stock list) assuming trawlers continue to utilize their full canary rockfish allocations as bycatch to better attain target stocks ("bycatch model").

	Two year canary allocation	
	Alternative 3	**No action**
Preferred Canary ACL	1,526	1,526
IFQ allocation of canary rockfish	**1,014**	**625**
Canary already taken by IFQ fisheries	10	10
Residual "leftover" canary	1,004	615
Mid-water trawl canary bycatch rate (mean)	0.077982	0.077982
Bottom trawl canary bycatch rate (mean)	0.006809	0.006809
% of historical of shelf fishing w/ mid-water trawl	35.5%	35.5%
% of historical shelf fishing w/ bottom trawl	64.5%	64.5%
Mid-water target stock potential harvest	4,576	2,802
Bottom target stock potential harvest	95,011	58,190

4.1.4.5 At-Sea Whiting Co-ops – Alternative 3

The at-sea whiting co-ops would operate under the same management measures described under No Action with a few modifications. The 2017-2018 allocations for the catcher-processor and mothership sectors under Alternative 3 are provided in Table 4-105 and compared to No Action. For canary rockfish, the ACLs are similar between No Action and Alternative 3; however the two-year allocations under Alternative 3 would be lower. The allocations for darkblotched, POP, and widow rockfish are higher under Alternative 3, compared to No Action, as a result of the higher ACLs under Alternative 3.

Alternative 3 initially proposed lower ACLs and allocations for darkblotched and POP (see Agenda Item G.4, Attachment 3, June 2016 and Agenda Item G.4, Attachment 2, June 2016; Tables 4-105). For the catcher-processor sector, the final preferred structure under Alternative 3 resulted in annual allocations that are 2.5 mt higher for POP and an average of 3.1 mt higher for darkblotched rockfish. For the mothership sector, the final preferred structure under Alternative 3 resulted in annual allocations that are 1.8 mt higher for POP and an average of 2.2 mt higher for darkblotched rockfish. The bootstrap modeling for the at-sea sectors was done on the initial ACLs allocations proposed for darkblotched and POP under Alternative 3. The slight increase in allocations is expected to slightly increase the probability that the sectors will attain their whiting allocations without exceeding the bycatch species allocations.

Projected catches under the bootstrap simulation would be different than No Action (or Alternatives 1 or 2), as canary rockfish catches were unrestricted in those simulations (Table 4-18, Table 4-19, Table 4-77, and Table 4-78). Increased allocations for darkblotched and widow rockfish compared to No Action could allow for more hauls to be drawn within the simulation before attaining the respective species allocations; however, since canary catches were restricted in Alternative 3, a simulated season closure could occur due to reaching the canary allocation. Under No Action and Alternatives 1 and 2, the proposed canary allocations were much higher than any historical mortality seen by the at-sea fleets. While the allocations could have been used as a specific parameter in the bootstrap analysis, only Alternative 2 would have seen a possible closure in the mothership fleet (less than a one percent chance; Table 4-78). Due to this low probability and the wide range of potential canary allocations and ACLs in the initial scoping, the intent of leaving the canary catch unrestricted was to also provide estimates of what amount of canary the sectors may need in order to prosecute their whiting allocation under the more limited ranges of other constraining species allocations. The bootstrap simulation results presented in Table 4-106 and Table 4-107 were updated to use the Alternative 3 allocations described in Table 4-105. The projections under the bycatch rate approach are the same as under No Action since the whiting TAC remains the same. At-sea whiting set-asides would be the same under Alternative 3 as under No Action (Table 4-20).

Table 4-105: Alternative 3 – At-Sea. Allocations for the catcher-processor (CP) and mothership sectors (MS) under Alternative 3. The No Action allocations are provided (right panel) for reference.

Stock	Area	Alternative 3				No Action			
		2017		2018		2017		2018	
		CP All. (mt)	MS All. (mt)	CP All. (mt)	MS All. (mt)	CP All. (mt)	MS All. (mt)	CP All. (mt)	MS All. (mt)
Canary rockfish	Coastwide	16	30	16	30	124.9	89.0	115.5	82.3
DARKBLOTCHED	Coastwide	16.4	11.6	16.7	11.8	11	7.8	11.4	8.0
POP	N of 40º10' N. lat.	12.7	9.0	12.7	9.0	10.2	10.2	7.2	7.2
Pacific whiting a/	Coastwide	90,673	64,004	90,673	64,004	90,673	64,004	90,673	64,004
Widow rockfish	Coastwide	411.2	290.3	384.8	271.6	170	170	120	120

a/ The 2017 and 2018 Pacific whiting TACs were unavailable during the preparation of the analysis, therefore the 2015 values were used.

Table 4-106: Alternative 3- At-Sea- Catcher-Processor. Landing projections for the CP sector under Alternative 3 for 2017-2018 using the bootstrap methodology. The initial Alternative 3 allocations, which were used in the analysis, are provided on the right for reference. The final allocations can be found in Table 4-105. Bolded text indicates values that are higher than the initial allocations.

Stock	CP All. (mt)	Percentage of Simulated Seasons									
		1%	5%	10%	25%	50%	75%	90%	95%	99%	99.99%
Whiting	90,673	22,428	37,974	59,022	90,673	90,673	90,673	90,673	90,673	90,673	90,673
DARKBLOTCHED	13.5	0.3	1.4	1.7	2.7	5	7.1	9.4	11.7	**14.1**	15.8
POP	10.2	0.1	0.2	0.3	1	4.7	8.6	**10.4**	10.9	12.5	14.4
Widow rockfish	411.2	3.6	5.9	8.5	14.4	31.6	67	97.2	118	322.8	**485.9**
Canary rockfish	16	0	0.1	0.1	0.2	0.4	0.6	1.2	2.3	4.4	6.8

Table 4-107: Alternative 3- At-Sea- Mothership. Projections for the MS sector under Alternative 3 for 2017-2018 using the bootstrap method sampling hauls from 2000-2015. The initial Alternative 3 allocations, which were used in the analysis, are provided on the right for reference. The final allocations can be found in Table 4-105. Bolded text indicates values that are higher than the initial allocations.

Stock	MS All. (mt)	Percentage of Simulated Seasons									
		1%	5%	10%	25%	50%	75%	90%	95%	99%	99.99%
Whiting	64,004	14,669	26,731	58,852	64,004	64,004	64,004	64,004	64,004	64,004	64,004
DARKBLOTCHED	9.5	0.2	0.5	1	2.3	4.5	6.3	8.9	**9.5**	10.2	12.3
POP	7.2	0.1	0.1	0.3	0.9	1.8	3.6	5.6	**7.2**	8.2	9.7
Widow rockfish	290.3	1.6	11.5	15.5	23.5	46.3	70.5	101.7	160.6	208.5	270.1
Canary rockfish	30	0.1	0.1	0.1	0.3	0.7	1.1	2.1	2.4	16.1	**31.9**

Compared to No Action, Alternative 3 predicts higher amounts of the bycatch species being caught. By having higher bycatch allocations, it allows for more hauls to be drawn or hauls with greater whiting (and

potentially bycatch) catches to be drawn without simulating a closure. The magnitude at which the allocation changes from No Action to Alternative 3 affects the amount of possible catch that can occur in a simulated season. As widow increases the most from No Action to Alternative 3 for both sectors, the possible landings of widow increase the most as well; on the other hand, darkblotched rockfish allocations only slightly increase, and therefore, there is only a slight increase in the simulated landings. However, the resulting probabilities of exceeding the widow allocation are reduced from a 1 in 20 chance under No Action (i.e. 90 percent of 10,000 simulations resulted in landings higher than the allocation; Table 4-18) to a 1 in 100 chance (Table 4-106) under Alternative 3 for the CP sector and 1 in 20 to no observed risk (i.e. the maximum amount in the simulation was lower than the allocation) for the MS sector, respectively.

However, the increase in allocations for darkblotched and widow rockfish allocations from No Action to Alternative 3 also increases the probability of attaining the sector's whiting allocation. In other words, as seen in Table 4-18 under No Action, at least 50 percent of the simulations for the CP sector achieve the whiting allocation. With the Alternative 3 allocations, there is at least 75 percent probability (i.e. less than 25 percent of simulations resulted in whiting landings lower than the allocation). The same pattern is seen for the MS sector.

With Alternatives 1 (and 2), there were higher allocations of darkblotched and widow rockfish compared to Alternative 3. While the probability of achieving the whiting allocation is the same under Alternative 3 and Alternatives 1 and 2 (at least 50 percent) for the CP sector, , the probability of being closed due to exceeding an allocation increased from Alternatives 1 and 2 to Alternative 3 due to the lower allocations of darkblotched and widow rockfish. Table 4-77 shows that there is a 1 in 10,000 risk of the CP being closed due to darkblotched or widow rockfish. However, under Alternative 3 (Table 4-106), that risk increases to 1 in 100 for darkblotched rockfish (widow is the same under all three alternatives). However, for the MS sector, at least 90 percent of the simulations resulted in achieving the whiting allocation under Alternative 1 and 2 (Table 4-78) compared to at least 75 percent under Alternative 3 (Table 4-107).

4.1.4.6 Limited Entry and Open Access Fixed Gear Management – Alternative 3

Alternative 3 is similar to the No Action Alternative, except that the non-trawl allocations for darkblotched, POP, and widow rockfishes are higher while bocaccio and canary rockfish are lower (Table 4-91 and Table 4-93, compared to Table 4-2 and Table 4-4). Under Alternative 3, the nearshore and non-nearshore trip limits and non-trawl RCA structure described under No Action would apply except for the adjustments to trip limits and the seaward non-trawl RCA between 40°10´ and 34°27´ N. latitude presented below. While the nearshore and non-nearshore fishery shares of canary rockfish decrease compared to No Action (except for nearshore in 2018), the canary rockfish trip limits do not change because they were developed only to allow for retention of previously discarded landings, not to encourage targeting.

Under Alternative 3, the non-trawl RCA seaward boundary south of 40°10' N. latitude to 34°27' N. latitude would be moved from 150 fm to 125 fm. Based on historical WCGOP data, there would be minimal expected efforts shifts for the gear switching IFQ vessels or non-IFQ fixed gear vessels. However, there could be some utilization of those vessels mainly fishing shoreward of the non-trawl RCA (30 fm) in order to target chilipepper and possibly yellowtail rockfish; the scale of this movement of effort is unclear though. Detailed analysis of this adjustment can be found in Appendix B, Section B.1.4.

Trip Limit Analysis

Sablefish

Table 4-108 contains the allocations and shares of sablefish north and south of 36° N. latitude under Alternative 3. The north of 36° N. latitude values are slightly different than those under No Action (Table 4-23 and Table 4-24) and Alternatives 1 and 2 because 1 mt was deducted from the ACL to provide for the commercial jig EFP. Under Alternative 3, the short-term sablefish allocation south of 36° N. latitude between the limited entry and open access fixed gear sectors of 70 percent and 30 percent, respectively, would be established (Table 4-108, third table) compared to 55 percent to limited entry and 45 percent to

open access under No Action (Table 4-25). Trip limits intended to attain the allocations under Alternative 3 can be found in Table 4-109 for north of 36° N. latitude and Table 4-110 for south of 36° N. latitude. Note that the original Alternative 3 trip limits selected by the Council in April 2016 were based on a previous model structure and incomplete data. Projected attainment of the open access share north of 36° N would have exceeded 100 percent; therefore, the trip limits in Table 4-109 and Table 4-110 were the final recommended limits to keep the sectors within their landing targets.

Table 4-108: Alternative 3: FMP allocations of sablefish north of allocations south of 36° N. latitude for the fixed gear fisheries (top two tables). Two-year sablefish allocations south of 36° N. latitude for the non-trawl sector, with 70 percent to limited entry and 30 percent to open access (bottom table).

Year	Area	Com. HG	LE Share	LEFG Share (mt)				Estimated Tier Limits (lbs)		
				LE FG Total Catch Share	Landed Catch Share a/	Primary Season Landed Share	LEFG DTL Landed Share	Tier 1	Tier 2	Tier 3
2017	North 36°	5,404	4,896	2,056	1,982	1,685	297	51,947	23,612	13,493
2018	North 36°	5,636	5,106	2,145	2,067	1,757	310	54,179	24,627	14,072

Year	Area	OA Total Catch Share (mt)	Directed OA Landed Catch Share (mt) a/
2017	North 36°	508	490
2018	North 36°	530	511

Year	Area	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/
2017	South 36°	1,070	621	434	186	419	179
2018	South 36°	1,143	647	453	194	436	187

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 2013. In 2017-2018, 18 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

Table 4-109: Alternative 3. Sablefish trip limits (lbs.) north of 36° N. latitude for limited entry and open access fixed gears with estimated mortality (mt) and percent attainment of the landed catch share. LE estimated mortality is based on a range of price assumptions.

Fishery	Jan-Feb	Mar-Apr	May-Jun	July-Aug	Sept-Oct	Nov-Dec	Est. Mort. (mt)	Percent Attainment
Limited Entry	1,125 lbs./week, not to exceed 3,375 lbs. bimonthly						217-254	73.1-85.7
Open Access a/	300 lbs./day, or one landing per week up to 1,200 lbs., not to exceed 2,400 lbs. bimonthly						426	86.9

a/ Council selected 300 lbs./day, or one landing per week up to 1,400 lbs., not to exceed 2,800 lbs. bimonthly as their initial Alternative 3; however, updated model suggests that those limits would result in 586 mt or 119 percent of the landing share.

Table 4-110. Alternative 3. Sablefish trip limits (lbs.) south of 36° N. latitude for limited entry and open access fixed gears with estimated mortality (mt) and percent attainment of the landed catch share. Limited entry estimated mortality is based on a range of price assumptions.

Fishery	Jan-Feb	Mar-Apr	May-Jun	July-Aug	Sept-Oct	Nov-Dec	Est. Mort. (mt)	Percent Attainment
Limited Entry	1,700/week						273-386	65.2-92.2
Open Access	300 lbs./day, or one landing per week up to 1,600 lbs., not to exceed 3,200 lbs. bimonthly						34.9	18.7

Blackgill Rockfish South of 40°10´ N. latitude

In 2017, the Council recommended a blackgill rockfish HG within the Slope Rockfish complex south of 40°10´ N. latitude. The blackgill rockfish HG (120.2 mt) would be further allocated 63 percent to trawl and 37 percent to non-trawl (44.5 mt), per the Amendment 21 allocations for the Slope Rockfish complex south of 40°10´ N. latitude. The blackgill rockfish non-trawl HG would be further divided 60 percent to limited entry (26.7 mt) and 40 percent to open access (17.8 mt). Table 4-111 contains the blackgill rockfish south of 40°10´ N. latitude trip limits for 2017.

If Amendment 26, which proposes to manage blackgill south of 40°10´ N. latitude with stock-specific harvest specifications, is implemented in 2018, then the non-trawl allocation for blackgill south of 40°10' N. latitude would be 72.2 mt, which would be further divided 60 percent to limited entry (43.3 mt) and 40 percent to open access (28.9 mt). Table 4-112 contains the blackgill rockfish south of 40°10´ N. latitude trip limits for 2018.

In the event Amendment 26 is delayed, the Council recommended implementing a 122.4 mt blackgill rockfish HG within the Slope Rockfish complex south of 40°10´ N. latitude in 2018. The blackgill rockfish HG would be further allocated 63 percent to trawl and 37 percent to non-trawl (45.3 mt), per the Amendment 21 allocations for the Slope Rockfish complex south of 40°10´ N. latitude. The blackgill rockfish non-trawl HG would be divided 60 percent to limited entry (27.2 mt) and 40 percent to open access (18.1 mt). In this situation, the trip limits in 2017, which are contained in Table 4-111, would remain in 2018.

Table 4-111. Alternative 3: Blackgill rockfish trip limits, south of 40° 10' N. latitude for 2017 for non-trawl fixed gear sectors, with estimated mortality (mt) and percent attainment of the limited entry/open access apportionments.

Fishery	Jan-Feb	Mar-Apr	May-Jun	July-Aug	Sept-Oct	Nov-Dec	Est. Mort. (mt)	Share (mt)	Percent Attainment
Limited Entry	1,375 lbs. bimonthly			1,600 lbs. bimonthly			23.1	26.7	86.5
Open Access	475 lbs. bimonthly			550 lbs. bimonthly			4.6	17.8	25.8

Table 4-112. Alternative 3: Amendment 26[a/]blackgill rockfish trip limits, south of 40° 10' N. latitude for 2018 for non-trawl fixed gear sectors under the Alternative 3 sharing allocation of 60 percent to limited entry, 40 percent to open access, with estimated mortality (mt) and percent attainment of the limited entry/open access apportionments.

Fishery	Jan-Feb	Mar-Apr	May-Jun	July-Aug	Sept-Oct	Nov-Dec	Est. Mort. (mt)	Share (mt)	Percent Attainment
Limited Entry	2,000 lbs. bimonthly						29.6	43.3	68.4
Open Access	800 lbs. bimonthly						7.1	28.9	24.6

a/ In the event Amendment 26 is delayed, the 2017 trip limits (Table 4-111) would remain in regulation and are expected to keep catch within the limited entry and open access shares.

Yellowtail Rockfish North of 40°10' N. latitude

Table 4-113 depicts the Alternative 3 trip limits and projected impacts for yellowtail rockfish for both limited entry and open access sectors north of 40°10' N. latitude. Because the non-trawl allocation for yellowtail rockfish complex applies to the entire area north of 40°10' N. latitude (619.9 mt in 2017, 596.6 mt in 2018), modifications to trip limits north of 40°10' N. latitude were investigated that would apply to the three states. All assumptions for recreational data and commercial landings are same as No Action. Although there could be a minor increase in the bycatch of overfished species as a result of increasing trip limits, the amount cannot be quantified, similar to No Action.

Table 4-113: Alternative 3.- Limited Entry and Open Access monthly trip limits (in lbs.) and projected impacts (mt) and percent attainment for non-trawl yellowtail rockfish north of 40°10' N. latitude.

Sector	Trip Limits (pounds per month)	Projected mortality (mt)	Recreational Projected Mortality a/	Total Projected Mortality (mt)	Percent of 2018 non-trawl allocation
Limited Entry	1,000	1.9	94.2	99.4	16.6 %
Open Access	500	3.3			

a/ Projected mortalities are based on average landings from RecFIN (A+B1) from 2011-2014 for Washington and California. The Oregon recreational projected mortality estimate methodology can be found http://www.pcouncil.org/wp-content/uploads/2016/04/F6a_Sup_ODFW_Rpt_APR2016BB.pdf and includes the Council recommended midwater sport fishery.

Shelf Rockfish between 40°10' N. latitude and 34°27' N. latitude

Although shelf rockfish are managed as a complex for the entire area south of 40°10' N. latitude, trip limits only apply to the management area between 40°10' N. latitude and 34°27' N. latitude for the open access non-trawl fixed-gear sector. Shelf rockfish are not formally allocated within non-trawl sectors, that is, the non-trawl commercial limited entry and open access sectors, as well as the recreational sector, share the non-trawl allocation. Table 4-114 shows the Alternative 3 bi-monthly trip limits for the open access sector

between 40°10' and 34°27' N. latitude and corresponding projected impacts. Modeling assumptions are the same as under No Action.

Table 4-114. Alternative 3: Bimonthly open access trip limits (in lbs.) and projected impacts (mt) for Shelf Rockfish complex between 40°10' and 34° 27´ N. latitude for open access fixed gear sector.

Jan-Feb	Mar-Apr	May-Jun	July-Aug	Sept-Oct	Nov-Dec	Projected Mortality (mt)
400 lbs.	CLOSED	400 lbs. bimonthly				27.3

Under these trip limits and the projected mortalities for limited entry and recreational under No Action, the total non-trawl mortality (commercial and recreational) for the Shelf Rockfish complex south of 40°10' N. latitude is 540.1 mt or 39.0 percent of the trawl allocation.

Although no effort shift occurred during previous inseason actions, participation in the open access sector has traditionally been more unpredictable than limited entry, making it difficult to predict catch and fleet behavior; therefore, it is possible that projected landings could be higher than expected if the trip limit is increased sufficiently enough to encourage entry into the fishery by new participants.

Because the open access shelf rockfish trip limit also includes vermilion, and widow rockfishes and chilipepper, consideration was given to the projected impacts to those species, which are well below allowable limits. Vermilion rockfish mortality under No Action is estimated to be 11.5 mt, with that estimate to increase to 18.1 mt under the proposed 400 pound trip limit. For widow rockfish, the No Action estimate is 0.2 mt, with an estimated increase to 0.4 mt at the proposed 400 pound trip limit amount. For chilipepper, the No Action estimate is 0.6 mt, with an estimated increase to 0.9 mt at the proposed 400 pound trip limit. It is likely that the trip limit increase will have an effect on canary rockfish or overfished species, similar to No Action.

Bocaccio South of 40°10' N. latitude

Bocaccio is managed as a single stock for the entire area south of 40°10' N. latitude under two-year trawl and non-trawl allocations. The non-trawl allocation is further sub-divided between the fixed gear sectors and the recreational sector, which is managed under a harvest guideline. Trip limits for limited entry and open access sectors have historically been divided north and south of 34°27' N. latitude - presumably due to differences in encounter rates. The non-trawl allocation for bocaccio (both commercial and California recreational) under Alternative 3 is 472.2 mt and 442.3 mt for 2017 and 2018, respectively.

Table 4-115 describes Alternative 3 trip limits for both limited entry and open access fixed gears south of 40°10´ N. latitude. Under Alternative 3, bocaccio would be removed from the Shelf Rockfish aggregate trip limit between 40°10´ and 34°27´ N. latitude to reduce discarding as the stock continues to rebuild and encounters increase. Table 4-116 shows the projected mortality (mt) for the commercial non-trawl limited entry and open access sectors for Alternative 3 and the percent of the 2018 commercial allocation. In 2017, the total non-trawl allocation is 472.2 mt, with 326.1 mt allocated to the California recreational sector and 144.3 mt to the commercial sector. In 2018, the total non-trawl allocation is 442.3 mt, allocated to the recreational and commercial sectors at 305.5 mt and 135.1 mt, respectively. Because the 2018 commercial allocation (135.1 mt) is the lesser of the two years, it is used in this analysis.

Table 4-115: Alternative 3. Bocaccio trip limits (lbs.) for limited entry and open access fixed gears south of 40° 10´ N. latitude.

Sector	Area	Jan-Feb	Mar-Apr	May-Jun	July-Aug	Sept-Oct	Nov-Dec
Limited Entry	40°10´-34°27´ N. lat.	1,000 lbs. bimonthly					
	South of 34°27´ N. lat.	1,500 lb.	CLOSED	1,500 lbs. bimonthly			
Open Access	South of 40°10´ N. lat.	500 lb.	CLOSED	500 lbs. bimonthly			

Table 4-116: Summary mortality estimates (mt) for bocaccio rockfish by sector and area compared to the 2018 non-trawl commercial limited entry and open access allocation. The 2018 allocation amount was used because it is the lesser of the two years.

Area	Commercial Projected Mortality (mt)			Recreational Projected Mortality (mt) a/	Total Mortality (mt)	2018 Non-Trawl Allocation	Percent of 2018 non-trawl allocation
	LE	OA	Total				
40°10´-34°27´ N. lat.	0.3	4.9	5.2	184.9	201.5	442.3	45.5%
South of 34°27´ N. lat.	5.9	5.5	11.4				

a/ The recreational estimate reflects the Alternative 3 recreational sub-bag limit of 10 fish.

Although very little effort shift occurred during previous inseason actions, participation in the open access sector has traditionally been more unpredictable than limited entry, making it difficult to predict catch and fleet behavior; therefore, it is possible that projected landings could be higher than expected if the trip limit is increased sufficiently enough to encourage entry into the fishery by new participants.

Similar to No Action, it is likely that trip limit increases can have an effect on canary rockfish and cowcod, although the exact amount cannot be quantified; however, as noted in prior trip limit analyses, accurately predicting the effects (e.g., effort, fishing behavior, latent capacity) of increased trip limits is difficult in the open access sector because the fishery is unrestricted.

Impact (Groundfish Mortality) – Non-Nearshore North of 36° N. latitude

Projected mortality under Alternative 3 was evaluated using 2002-2013 WCGOP data in the non-nearshore model with the proposed sablefish allocations north of 36° N. latitude (Table 4-108) taking into account the trip limit adjustments for canary, blackgill south of 40°10´ N. latitude, yellowtail, shelf rockfish complex between 40°10´ and 34°27´ N. latitude including widow and chilipepper, and bocaccio south of 40°10´ N. latitude.

The non-nearshore fishery shares and non-trawl allocations for overfished species under Alternative 3 are in Table 4-117. The Alternative 3 non-trawl overfished species allocations increased for darkblotched, POP, and yelloweye rockfish (only in 2017), compared to No Action (Table 4-38). The Alternative 3 bocaccio allocations were lower than under No Action.

Projected mortality for yelloweye rockfish is 0.8 mt for 2017 and 2018 compared to the 0.7 mt and 0.8 mt shares, respectively (Table 4-117). As discussed under No Action, the non-nearshore model typically overestimates yelloweye rockfish impacts, as the fishery has historically not attained or come close to attaining its share. Therefore, if historical trends continue, the fishery may only take approximately 0.5 mt

of the 0.7/0.8 mt shares of yelloweye rockfish. The bocaccio projected impacts in Table 4-117 are different than No Action since they take into account the trip limit adjustments proposed in Table 4-116. Projected mortality for all other overfished species is the same as under No Action.

Routine adjustments of the non-trawl RCA would occur in the event the projected overfished species mortality is expected to exceed the non-nearshore shares or non-trawl allocations (Table 4-117). RCA changes can also be accommodated to provide greater access to target species when overfished species mortality is projected to be within the non-nearshore shares or non-trawl allocations (e.g., changing from 125 to 100 fm).

Table 4-117: Alternative 3 – Non-Nearshore fishery: Overfished species shares for the non-nearshore fixed gear fishery under Alternative 3.

Stock	Area	Total Projected OFS Mortality 2017/2018 (mt)	Shares 2017/2018 (mt)	Non-Trawl Allocation 2017/2018 (mt)
BOCACCIO	S. 40°10' N. lat.	16.6	144.3/135.1	472.2/442.3
COWCOD	S. 40°10' N. lat.	0.0		2.6/2.6
DARKBLOTCHED	Coastwide	7.0/7.3		28.2/28.8
POP	N. 40°10' N. lat.	0.5/0.5		11.6/11.6
YELLOWEYE	Coastwide	0.8/0.8	0.8/0.7	13.1/12.9

Table 4-118 and Table 4-119 contain the projected groundfish mortality for the non-nearshore fishery north of 36° N. latitude for 2017 and 2018, respectively.

Table 4-118: Alternative 3. Projected groundfish mortality for the limited entry (LE) and open access (OA) fixed gear fisheries north of 36° N. latitude (in mt) for 2017 compared to the non-trawl allocation.

Stock	Management Area	LE	OA	Total	Non-Trawl Allocation a/
Arrowtooth flounder	Coastwide	60.3	10.9	71.2	585.3
Big Skate		7.8	1.4	9.3	21.8
Black rockfish	South of 46°16` N. lat.	0.0	0.0	0.0	
Cabezon	California	0.0	0.0	0.0	
Cabezon	Oregon	0.0	0.0	0.0	
California scorpionfish	South of 34°27` N. lat.	0.0	0.0	0.0	
Canary rockfish b/	Coastwide	0.8	0.2	1.0	406.5
Chilipepper rockfish	South of 40°10` N. lat.	0.0	0.9	0.9	640.3
Dover sole	Coastwide	8.3	1.5	9.8	2,420.3
Ecosystem Component Species		82.7	20.8	103.5	
English sole	Coastwide	0.0	0.0	0.0	487.6
Lingcod	North of 40°10` N. lat.	18.6	2.9	21.5	1,680.2
Lingcod	South of 40°10` N. lat.	1.5	2.1	3.6	683.1
Longnose skate	Coastwide	81.5	16.4	98.0	185.3
Longspine Thornyhead	North of 34°27` N. lat.	2.9	0.7	3.6	142.4
Nearshore rockfish	North of 40°10` N. lat.	0.1	0.0	0.2	
Nearshore rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shelf rockfish	North of 40°10` N. lat.	5.6	1.0	6.7	782.1
Shelf rockfish	South of 40°10` N. lat.	2.2	27.3	29.5	1,383.6
Slope rockfish	North of 40°10` N. lat.	73.0	13.1	86.1	321.1
Slope rockfish c/	South of 40°10` N. lat.	17.9	7.5	25.4	254.1
Mixed thornyheads		1.4	0.4	1.8	
Other flatfish	Coastwide	0.5	0.1	0.6	830.6
Other groundfish		0.0	0.0	0.0	
Pacific cod	Coastwide	2.3	0.4	2.7	54.5
Pacific hake	Coastwide	0.6	0.1	0.7	0
Rockfish Unid	North of 40°10` N. lat.	1.3	0.2	1.5	
Rockfish Unid.	South of 40°10` N. lat.	1.3	0.4	1.8	
Rougheye Rockfish	North of 40°10` N. lat.	35.6	6.4	42.0	
Rougheye Rockfish	South of 40°10` N. lat.	1.2	0.4	1.6	
Shortbelly rockfish		0.0	0.0	0.0	0
Shortraker Rockfish	North of 40°10` N. lat.	7.5	1.4	8.9	
Shortraker Rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shortraker/Rougheye Rockfish	North of 40°10` N. lat.	10.5	1.9	12.4	
Shortraker/Rougheye Rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shortspine Thornyhead	North of 34°27` N. lat.	23.4	5.5	28.9	82.7
Spiny dogfish	Coastwide	204.9	38.2	243.1	
Splitnose rockfish	South of 40°10` N. lat.	0.1	0.0	0.1	87.5
Starry flounder	Coastwide	0.0	0.0	0.0	635.9
Widow rockfish	Coastwide	0.0	0.4	0.4	1,196.1
Yellowtail rockfish	North of 40°10` N. lat.	1.9	3.3	5.2	619.9

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.
b/ The non-nearshore share for canary rockfish under Alternative 3 is 46.5 mt in 2017.
c/ Includes blackgill rockfish; from non-nearshore model.

Table 4-119: Alternative 3. Projected groundfish mortality for the limited entry (LE) and open access (OA) fixed gear fisheries north of 36° N. latitude (in mt) for 2018 compared to the non-trawl allocation.

Stock	Management Area	LE	OA	Total	Non-Trawl Allocation a/
Arrowtooth flounder	Coastwide	62.9	11.3	74.3	582.2
Big Skate		8.2	1.5	9.7	21.8
Black rockfish	South of 46°16` N. lat.	0.0	0.0	0.0	
Blackgill rockfish	South of 40°10` N. lat.	29.6	7.1	36.7	72.2
Cabezon	California	0.0	0.0	0.0	
Cabezon	Oregon	0.0	0.0	0.0	
California scorpionfish	South of 34°27` N. lat.	0.0	0.0	0.0	
Canary rockfish b/	Coastwide	0.8	0.2	1.0	406.5
Chilipepper	South of 40°10` N. lat.	0.0	0.9	0.9	615.3
Dover sole	Coastwide	8.6	1.6	10.2	2,420.3
Ecosystem Component Species		86.3	21.7	108.0	
English sole	Coastwide	0.0	0.0	0.0	366.2
Lingcod	North of 40°10` N. lat.	19.4	3.1	22.5	1,557.5
Lingcod	South of 40°10` N. lat.	1.5	2.2	3.7	624.3
Longnose skate	Coastwide	85.0	17.1	102.2	185.3
Longspine Thornyhead	North of 34°27` N. lat.	3.0	0.7	3.7	135
Nearshore rockfish	North of 40°10` N. lat.	0.1	0.0	0.2	
Nearshore rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shelf rockfish	North of 40°10` N. lat.	5.9	1.1	7.0	781.4
Shelf rockfish	South of 40°10` N. lat.	2.2	27.3	29.5	1,384.4
Slope rockfish	North of 40°10` N. lat.	76.2	13.6	89.8	320.9
Slope rockfish c/	South of 40°10` N. lat.	18.7	7.8	26.5	51.0
Mixed thornyheads		1.4	0.4	1.8	
Other flatfish	Coastwide	0.5	0.1	0.6	707.7
Other groundfish		0.0	0.0	0.0	
Pacific cod	Coastwide	2.4	0.4	2.8	54.5
Pacific hake	Coastwide	0.6	0.1	0.7	0
Rockfish Unid	North of 40°10` N. lat.	1.3	0.2	1.5	
Rockfish Unid.	South of 40°10` N. lat.	1.4	0.4	1.8	
Rougheye Rockfish	North of 40°10` N. lat.	37.1	6.7	43.8	
Rougheye Rockfish	South of 40°10` N. lat.	1.2	0.4	1.7	
Shortbelly rockfish		0.0	0.0	0.0	0
Shortraker Rockfish	North of 40°10` N. lat.	7.9	1.4	9.3	
Shortraker Rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shortraker/Rougheye Rockfish	North of 40°10` N. lat.	10.9	2.0	12.9	
Shortraker/Rougheye Rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shortspine Thornyhead	North of 34°27` N. lat.	24.4	5.7	30.1	81.9
Spiny dogfish	Coastwide	213.7	39.9	253.6	
Splitnose rockfish	South of 40°10` N. lat.	0.1	0.0	0.1	87.5
Starry flounder	Coastwide	0.0	0.0	0.0	635.9
Widow rockfish	Coastwide	0.0	0.4	0.4	1,119.4
Yellowtail rockfish	North of 40°10` N. lat.	1.9	3.3	5.2	596.6

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.
b/ The non-nearshore share for canary rockfish under No Action is 46.5 mt for 2018.
c/ Includes blackgill rockfish in projected impacts (from non-nearshore model), but non-trawl allocation reflects complex without blackgill rockfish.

Impact (Groundfish Mortality) – Non-Nearshore South of 36° N. latitude

Projected groundfish mortality for the area south of 36° N. latitude under Alternative 3 was estimated by using the three-year (2012-2014) average of estimated mortality from the WCGOP groundfish reports (Table 4-120) except for where trip limit projection models were available (i.e., blackgill, widow, and chilipepper rockfish and shelf rockfish complex south of 36° N. latitude). Due to the lack of a model to predict the mortality in this area and assumptions made within the trip limit projections, it is assumed that 2017 and 2018 mortalities are the same.

Table 4-120: Alternative 3. Projected groundfish mortality for the limited entry and open access fixed gear fisheries south of 36° N. latitude (in mt) for 2017/2018 compared to the 2017 non-trawl allocation.

Stock	Management Area	Limited Entry (mt)	Open Access (mt)	Total (mt)	2018 Non-Trawl Allocation a/ (mt)
Arrowtooth flounder	Coastwide		1.9	1.9	582.2
Big Skate		3.0	0.2	3.3	21.8
Blackgill rockfish	South of 40°10` N. lat.	29.6	7.1	36.7	72.2
Canary rockfish b/	Coastwide	0.8	0.2	1.0	406.5
Chilipepper rockfish	South of 40°10` N. lat.	0.1	0.9	1.0	615.3
Dover sole	Coastwide	1.7	0.1	1.9	
Ecosystem Component Species		92.3	2.9	95.2	
Lingcod	South of 40°10` N. lat.	0.2	4.9	5.1	624.3
Longnose skate	Coastwide	4.5	2.5	7.0	185.3
Longspine Thornyhead	North of 34°27` N. lat.	5.3	0.0	5.3	135.0
Longspine Thornyhead	South of 34°27` N. lat.	15.9	0.8	16.6	
Nearshore rockfish	South of 40°10` N. lat.		0.1	0.1	
Shelf rockfish	South of 40°10` N. lat.	3.3	10.7	14.1	1,384.4
Slope rockfish c/	South of 40°10` N. lat.	16.5	21.3	37.8	51.0
Mixed thornyheads		0.2	0.0	0.2	
Other flatfish	Coastwide	1.8	1.6	3.4	707.7
Other groundfish		1.1	0.3	1.4	
Pacific cod	Coastwide	0.1	0.1	0.1	54.5
Pacific hake	Coastwide	1.0	0.0	1.0	0
Rockfish Unid.	South of 40°10` N. lat.	0.4	1.0	1.4	
Shortspine Thornyhead	North of 34°27` N. lat.	24.0	1.0	25.1	81.9
Shortspine Thornyhead	South of 34°27` N. lat.	104.5	4.1	108.6	805.7
Spiny dogfish	Coastwide	0.6	3.4	4.0	
Splitnose rockfish	South of 40°10` N. lat.	0.1	0.2	0.2	87.5
Widow rockfish	Coastwide	0.1	0.4	0.5	1,119.4

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.
b/ The non-nearshore share for canary rockfish under No Action is 46.5 mt for 2017 and 2018.
c/ Includes blackgill rockfish in projections (from non-nearshore model); in 2018, blackgill rockfish will be pulled from the complex. The 2018 non-trawl allocation for slope rockfish is 50.9 mt.

Nearshore – Alternative 3

Changes for Alternative 3, compared to No Action, that affect the nearshore fishery are as follows: (1) the Alternative 3 canary rockfish share of 100 mt is slightly lower than the share (105 mt, 97 mt) associated with the No Action ACL (104.8 mt for 2016, 96.9 mt for 2017); (2) the yelloweye rockfish share increased from 2.0 mt under No Action to 2.1 mt (with the 0.1 mt gain attributed to the California informal share) in 2017; (3) the Alternative 3 sharing option for the Nearshore Rockfish complex north of 40°10' N. latitude differs from No Action (more to CA and WA, less to OR); (4) the Alternative 3 shoreward non-trawl RCA south of 34°27' N. latitude is liberalized from 60 fm to 75 fm; and (5) Alternative 3 trip limits differ from

the No Action trip limits for black rockfish in California north of 40°10' N. latitude (lower), California scorpionfish (higher), canary rockfish (higher), and shallow and deeper Nearshore Rockfish south of 40°10' N. latitude (higher).

While there are many changes between Alternative 3 and No Action as listed above, landings are projected to be similar for both alternatives, and this stability in landing projections also causes overfished species impacts (e.g., yelloweye rockfish) to be the same (fully taken). This is because overfished species projections are directed related to the quantity of landings.

Non-trawl RCA South of 34°27' N. Latitude

Projections under No Action and Alternatives 1 and 2 did not account for the change in the non-trawl RCA south of 34°27' N. latitude from 60 fm to 75 fm. A detailed analysis of the proposal is contained within can be found in Appendix B, Section B.1.4. In summary, projected impacts are not expected to increase because the areas opened under the RCA adjustment are much deeper than is typically fished by the nearshore fishery, which tends to restrict the majority of its fishing efforts in as shallow of depths as possible to sustain its live fish fishery.

Canary rockfish HG (two year allocation)

As mentioned above, the Alternative 3 canary rockfish share of 100 mt is slightly lower than the original share associated with the No Action ACL (104.8 mt for 2017, 96.9 mt for 2018). The projected total mortality of canary rockfish is 6.1 mt with no retention, 12.5 mt under the No Action trip limits analyzed (300 lbs. LEFG and 100 lbs. OA, both bi-monthly), and 15 mt for the Alternative 3 trip limits (300 lbs. LEFG and 150 lbs. OA, both bi-monthly). In all cases, projected impacts are expected to be well below the Alternative 3 and No Action shares. Given the uncertainty in projections (depends on how much targeting will occur), the buffer between the Alternative 3 trip limit projections and allocations may be utilized more than expected.

Nearshore Rockfish North of 40°10' N. latitude

The Council requested analysis of a range of state-specific Nearshore Rockfish HGs north of 40°10' N. latitude (Table 4-8) to keep catch within the ACL (see Section 4.1.4.3). The Council selected Option 2 as their preferred alternative (Table 4-121), which uses status quo proportions to allocate stocks without state-specific assessment boundaries. For stocks that have state-specific stock assessment boundaries, the states would receive 100 percent of the ACL contribution. The No Action sharing option is that the states use those status quo shares for all stocks. As shown in Table 4-121, all states are projected to be within their respective state shares for both the No Action and Alternative 3, Option 2 sharing options. Projections are for the combined totals of the commercial and recreational fisheries specific to California and Oregon, and the recreational fishery for Washington (which does not have commercial nearshore fishery). Since the states are projected to be within their respective HG shares, total mortality is projected to be within the ACL.

Table 4-121. Harvest guidelines and projected mortality by state of the Nearshore Rockfish complex north of 40°10' N. latitude for the No Action and Alternative 3 state sharing options.

State sharing option	HG			Projected total mortality					
				WA		OR		CA	
	WA	OR	CA	MT	% of HG	MT	% of HG	MT	% of HG
No Action	13.2	60.5	29.6	5.0	38%	46.1	76%	10.8	36%
Alt. 3	16.9	46.1	40.2	5.0	30%	46.1	100%	12.9	32%

Nearshore rockfish north complex (N. of 40°10' N. latitude) - Oregon

The Oregon Nearshore Rockfish complex north of 40°10' N. latitude HG is further divided between commercial nearshore and recreational fisheries via state rule. The projected impacts for these Oregon fisheries, however, had to be summed to ensure the total was within the Oregon federal share for the No Action and Alternative 3 state sharing options (Table 4-122). For both sharing options, Oregon is expected to remain within their Federal share for both their commercial and recreational fisheries combined.

Projected impacts for the Oregon fisheries are revised under Alternative 3 based on returning to 2014 state regulations for the nearshore (trip limits) and recreational fisheries (bag limits). In 2014, commercial nearshore landings were 10.8 mt (Table 4-44) and for Alternative 3 landings are estimated to be 13.0 mt. The No Action and Alternatives 1 and 2 projected landings were 17.5 mt. The No Action and Alternatives 1 and 2 projected impacts for recreational were 35.6 mt but have been revised to 33.4 mt under Alternative 3 to account for revised effort projections.

In 2015, Oregon had to reduce their trip limits and bags limit in order to stay within their federal share, which had decreased from 48.4 mt (original HG) to 36 mt (75 percent of HG) (Agenda Item F.7.b; Supplemental WDFW/ODFW Report; June 2014). Since the Oregon HG will increase from 36 mt in 2015 to 46.1 mt under Alternative 3, the reduced trip limits and bag limits implemented in 2015 are no longer expected to be necessary.

Table 4-122. Projected mortality for the Oregon commercial nearshore and recreational fisheries relative to the Oregon HG of the Nearshore Rockfish complex north of 40°10' N. latitude for the No Action and Alternative 3 state sharing options. Projections are based on state trip limits and bag limits returning to levels prior to the 2015 reductions.

	Projected mortality			Attainment of HG	
State sharing option	OR Nearshore	OR Recreational	OR Total	OR HG	% of HG
No Action	13	33.1	46.1	60.5	76%
Alternative 3	13	33.1	46.1	46.1	100%

Nearshore Rockfish North of 40°10' N. latitude - California

For California, the projected impacts are based on the 2010-2014 average for the commercial fishery. The projected mortality (mt) for both 2017 and 2018 is 5.2 mt for both the No Action alternative and Alternative 3 sharing. Even though the non-trawl RCA shoreward boundary was changed from 20 fm to 30 fm in 2015 and 2016 for California north of 40°10' N. latitude, no substantial mortality increase is expected as a result of this boundary change. This is due, in part, to the fact that the boundary modification was designed to allow additional access to black rockfish, which is the dominant target nearshore rockfish in northern California. For the recreational sector, the projected impact under No Action is estimated to be 5.6 mt, while for Alternative 3 it is estimated to be 7.7 (Table 4-123). This difference in the recreational sector is due to an increase in the fishing season of 2.5 months for the northern management area.

Table 4-123. Projected total mortality (mt) of the California commercial nearshore and recreational fisheries relative to the California HG of the Nearshore Rockfish north of 40°10' N. latitude for the No Action and Alternative 3 state sharing options.

Alternative	Projected mortality (mt)		Total	CA Percent of HG (40.2 mt)
	Commercial	Recreational		
No Action	5.2	5.6	10.8	26.5 %
Alternative 3	5.2	7.7	12.9	31.7 %

Trip Limit Analysis

Black rockfish

Under Alternative 3, black rockfish trip limits for limited entry and open access for California north of 40°10' N. latitude would be reduced (Table 4-124) to account for the lower 2017-2018 California black rockfish ACL. Prior to the 2017-2018 cycle, black rockfish was managed under a constant catch harvest control rule with a 1,000 mt ACL, which was shared 58 percent to Oregon and 42 percent to California (i.e., 420 mt). In California, the back rockfish ACL is shared by the commercial and recreational sectors with a 2017 ACL of 334 mt and a 2018 ACL of 332 mt.

Table 4-124. Alternative 3: Summary of black rockfish bi-monthly trip limits (in lbs.) for the limited entry and open access fixed-gear sectors north of 40°10' N. latitude in California and corresponding projected mortality impacts (mt) for the commercial and recreational sectors, compared to the 2018 ACL. The percent attainment ACL for 2018 is used because it is the lesser of the two years.

	Trip Limits (pounds)						Projected commercial mortality (mt)	Projected recreational statewide mortality (mt)	Total mortality (mt)	Percent of 2018 ACL
	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6				
No Action	8,500 lb./2 mo.				6,000 lb./2 mo.		108.5	217.4	325.9	98.2
Alt. 3	7,000 lb./2 mo.						94.1		311.5	93.8

California scorpionfish

Under Alternative 3, the commercial trip limits for California scorpionfish south of 34°27' N. latitude would increase from the 2016 regulation amount of 1,200 pounds per bimonthly period (period 2 is closed) to 1,500 pounds per bimonthly period (period 2 is closed). California scorpionfish are not formally allocated between the trawl or non-trawl sectors, nor are they formally allocated within the non-trawl sector (i.e., the non-trawl sector is shared among LE, OA fixed gear sectors, and recreational). The ACL for 2017 and 2018, south of 34°27' N. latitude is to increase to 150 mt per year with an ACT of 111 mt. Table 4-125 contains a summary of the projected impacts under the preferred trip limits for California south of 34°27' N. latitude.

Table 4-125. Alternative 3: Summary of limited entry and open access bi-monthly trip limits (in lbs.) and projected impacts (mt) for California scorpionfish south of 34°27' N. latitude.

	Commercial				
	Trip limit (pounds)	Projected mortality (mt)	Recreational projected mortality (mt)	Total	Percent of ACT
No Action	1,200	4.7	96.7	101.4	91.4%
Alternative 3	1,500	5.5		102.2	92.1%

Canary rockfish

A range of limited entry and open access fixed gear canary rockfish trip limits were analyzed (see Appendix B, Section B.1.2). Under the Council's preferred canary rockfish ACL and sharing alternatives (Table 4-96), there are also informal shares of 73.3 percent to California and 26.8 percent to Oregon. For each pairing of alternative trip limits and two year allocations, projected mortality is expected to be within the total nearshore HG and the states are also expected to stay within their informal shares (Table 4-126). The

Council's preferred trip limits for canary rockfish are 300 lbs./2 months for limited entry and 150 lbs./2 months for open access.

Table 4-126. Projected nearshore mortality of canary rockfish (total and by state informal shares) for each alternative trip limits (bi-monthly) and two year allocations.

			Nearshore total (CA + OR)			California portion			Oregon portion		
	Trip limits		Projected mortality	Two year HG		Projected mortality	Share (73.3%)		Projected mortality	Share (26.7%)	
	LEFG	OA		No Action	Alt 3		No Action	Alt 3		No Action	Alt 3
No Action	0	0	6.1	118.6	100.0	5.2	86.9	73.3	0.9	31.7	26.7
Alt. 3	300	150	15.0	118.6	100.0	12.7	86.9	73.3	2.3	31.7	26.7

Note: No action HG = [Preferred ACL of 1526 – 43.4 set-asides] x .08 (8% nearshore using 2015 scorecard)

Shallow and Deeper Nearshore Rockfish South of 40°10' N lat.

Modifications to the existing limited entry and open access trip limits for shallow and deeper Nearshore Rockfish south of 40°10' N. latitude are proposed under Alternative 3 (Table XXX 2). For deeper nearshore rockfish, one trip limit is proposed for the entire area south of 40°10' N latitude in 2017-18, unlike the No Action structure where limits differ north and south of 34°27' N latitude. Landings of shallow and deeper nearshore rockfish have been limited over the last decade due to the need to minimize bycatch of the overfished species, primarily canary and yelloweye rockfishes. As a result, commercial landings for both the shallow and deeper nearshore rockfishes have averaged 10 percent or less of the Nearshore Rockfish complex ACL. The proposed trip limits are intended to increase attainment of the ACL while keeping overfished species mortality within the nearshore fishery share (Table XXX 3).

Table XXX 2. Limited entry and open access trip limits (in pounds) for shallow and deeper nearshore rockfish south of 40°10' N lat. in 2016.

Alt.	Sector	Period and Trip Limit (pounds)						Mortality (mt)
		1	2	3	4	5	6	
No Action	Shallow NS RF South of 40°10'	600	Closed	800	900	800	1,000	55.6
	Deeper NS RF 40°10' – 34°27'	700	Closed	700	900	900	1,000	42.6
	Deeper NS RF South of 34°27'	500	Closed	600	900	900	1,000	4.6
Alt. 3	Shallow NS RF South of 40°10'	1,200	Closed	1,200 / 2 mo				81.8
	Deeper NS RF South of 40°10'	1,000	Closed	1,000 / 2 mo				56.5

Table XXX 3. Landings summary (mt) of shallow and deeper nearshore rockfishes from 2011 to 2015 compared to recreational landings and the Nearshore Rockfish complex south of 40°10' N. latitude ACL.

Year	Comm. South of 40°10'	Rec. South of 40°10'	Total	ACL
2011	97.5	456.1	553.6	1,001
2012	87.0	476.8	563.8	990
2013	96.5	660.4	756.9	990
2014	97.9	663.7	761.6	1,161
2015	109.2	614.1	723.3	1,159

Commercial landings data source: PacFIN

The nearshore model is a landings-based model which projects overfished species impacts based on expected landings of target species. A combined shallow and deeper nearshore rockfish catch of up to 160 mt can be accommodated without exceeding the 2017 yelloweye rockfish allocation. The Alternative 3 trip limits are expected to result in landings of 138.3 mt, within the 160 mt limit. A slight increase to bocaccio rockfish mortality (0.1 mt) is also projected by the model, however, the nearshore fishery mortality (Table 4-128) is well within the nearshore share for bocaccio (Table 4-95, 1.8 mt and 1.7 mt).

Impact (Groundfish Mortality) - Nearshore

Projected landings for target stocks are found in Table 4-127. Changes in expected landings under Alternative 3 compared to 2016 is as follows: California black rockfish (-14.4 mt); California scorpionfish (+0.8 mt); Shallow and Deeper Nearshore Rockfish complex south of 40°10´ N. latitude (+ 35.5 mt), and canary rockfish (+8.9 mt). Compared to No Action (Table 4-43), landings are higher for canary rockfish (2 mt) and Shallow and Deeper Nearshore Rockfish complex south of 40°10´ N. latitude (+ 35.5 mt), but lower for the Nearshore Rockfish complex north of 40°10´ N. latitude (4.5 mt).

Projected overfished species mortality can be found in Table 4-128. Differences from No Action include a 0.1 mt higher yelloweye rockfish share to California in 2017 and a concurrent increase in yelloweye rockfish impacts south of 40°10´ N. latitude. There is also a 0.1 mt increase to bocaccio impacts as a result of the Shallow and Deeper Nearshore Rockfish south of 40°10´ N. latitude complex trip limit adjustments.

In all cases, total mortality is expected to within all allocation variations such as: (1) the nearshore fishery for California and Oregon combined (e.g., canary rockfish HG); (2) state-specific allocations for nearshore and recreational fisheries (e.g., OR HG for the nearshore north complex); and ACLs.

Table 4-127. Alternative 3. Expected landings under Alternative 3. Target species landings by area are also shown in the far right panel. The 2017 quotas (or HGs) for Oregon are provided in parenthesis. Quotas for Oregon are the state partition of Federal allocations to the Oregon "commercial nearshore fishery," with the remainder to the Oregon sport fisheries.

Stock	Area	Total (mt) 2017-2018	By Area for 2017-2018			
			OR Total (mt)	CA Total (mt)	40°10'-42° N lat. (mt)	S. of 40°10' N. lat. (mt)
Black rockfish	OR	126	126 (126) a/			
Black rockfish	CA	100		100	95	5
Cabezon	OR	23.6	23.6			
Cabezon	CA	65.5	N/A	65.5	2.5	63
Canary Rockfish b/	OR&CA	14.5	2.2	12.3	2.3	10.0
Kelp greenling	OR	30	30 c/			
Kelp greenling	CA	3.8	N/A	3.8	0.4	3.4
Lingcod	N. 40°10' N. lat.	68.6	65 d/	3.6	3.6	
Lingcod	S. 40°10' N. lat.	21.2	N/A	21.2		21.2
Nearshore Rockfish N. e/	N. 40°10' N. lat.	18.2	13.0 a/	5.2	5.2	
--*Blue rockfish*		6.6	3.0	3.6	3.6	
--*Other Nearshore Rockfish*		11.6	10.0	1.6	1.6	
Nearshore Rockfish S.	S. 40°10' N. lat.	138.3	N/A	138.3	N/A	138.3
--*Blue rockfish*			N/A			
--*Shallow Nearshore Rockfish f/*		81.8	N/A	81.8	N/A	81.8
--*Deeper Nearshore Rockfish g/*		56.5	N/A	56.5	N/A	56.5

a/ The nearshore commercial fishery Oregon is projected to catch their entire allocations of black rockfish and nearshore rockfish, which are not federal allocations rather presumptive state allocation (to the Oregon nearshore fishery) from within the federal Oregon allocations ACL (for black rockfish) or HG for nearshore rockfish

b/ Canary rockfish landings are projections based on Alternative 3 trip limits of 150 lbs. for OA and 300 lbs. for LE.

c/ Oregon landings of kelp greenling are expected to rise beyond average since the 2015 assessment found that stock to be more robust than previously thought, and that historical harvests have been below target. In response, Oregon is expected to increase state trip limits of kelp greenling to better utilize the stock.

d/ Lingcod landings in Oregon have shown a constant yearly increase and are expected to increase in the future at the same rate.

e/ Nearshore Rockfish totals consists of black-and-yellow, blue, China, gopher, grass, kelp, brown, olive, copper, treefish, calico, and quillback rockfish. These species are part of the Nearshore Rockfish complex north and south of 40°10' N. latitude.

f/ Shallow Nearshore Rockfish consists of black-and-yellow rockfish, China rockfish, gopher rockfish, grass rockfish, and kelp rockfish south of 40°10' N. latitude. These species are part of the Nearshore Rockfish complex south of 40°10' N. latitude.

g/ Deeper Nearshore Rockfish consists of black rockfish, 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. latitude.

Table 4-128. Projected overfished species (OFS) and petrale sole mortality (mt) for Alternative 3 (parentheses are informal state shares within the overall nearshore HG). Differences from No Action include a 0.1 mt higher yelloweye rockfish share to California in 2017 and a 0.1 mt increase on bocaccio impacts as a result of the Shallow and Deeper Nearshore Rockfish south of 40°10´ N. latitude complex trip limit adjustments.

Stock	Area	Total Projected OFS Mortality 2017-2018	Projected OFS Mortality and shares by Area for 2017-2018			
			Oregon Total (Share)	CA Total (Share)	40°10' – 42° N. lat.	S. of 40°10' N. lat.
BOCACCIO	S. 40°10' N. lat.	0.6	N/A	0.6	N/A	0.6
COWCOD	S. 40°10' N. lat.	0	N/A	0	N/A	0
DARKBLOTCHED	Coastwide	0.2	0.1	0.1	0	0.1
POP	N. 40°10' N. lat.	0	0	0	0	0
Petrale sole	Coastwide	0	0	0	0	0
YELLOWEYE	Coastwide	2.1/2.1 (2.1/2.0)	1.4 (1.4)	0.7 (0.7/0.6)	0.5	0.2

4.1.4.7 Tribal Fisheries – Alternative 3

The Council adopted preferred tribal measures that are as described under No Action, except that the tribal set-aside for canary was increased from 35 mt to 50 mt under Alternative 3. The projected landings under Alternative 3 are the same as under No Action, Alternative 1, and Alternative 2.

4.1.4.8 Washington Recreational – Alternative 3

The primary catch controls for the Washington recreational fishery are season dates, depth closures, bag limits, and GCAs, including YRCAs. Alternative 3 is similar to the No Action Alternative, except that the Washington HG for canary rockfish would be 50 mt in 2017 and 2018 and the Washington HG for the Nearshore Rockfish complex north of 40°10' N. latitude would be 16.9 mt in 2017 and 2018 (Table 4-129).

Table 4-129. Alternative 3: Washington Recreational. Harvest guidelines for the Washington recreational fisheries.

Species	HG (mt)	
	2017	2018
Canary Rockfish	50.0	50.0
YELLOWEYE ROCKFISH	3.3	3.3
Black Rockfish	287	283
Nearshore Rockfish N. 40°10´ Lat.	16.9	16.9

Groundfish Seasons and Area Restrictions

Season Structure

Under Alternative 3, the Washington recreational groundfish season in all Marine Areas would be open from the second Saturday in March (3/11/17 and 3/10/18) through the third Saturday in October (10/21/17 and 10/20/18) (Table 4-130). Alternative 3 is only slightly different than Option 1 considered under the No Action Alternative, which would have opened the recreational groundfish season from March 15 through October 15. The minor change to the season structure under Alternative 3, compared to Option 1 under No Action, was to provide better alignment with the lingcod season. Under Alternative 3, the recreational groundfish season would be shorter by approximately five months compared to the 2016 groundfish season in regulation, which is open year round. The Alternative 3 groundfish season is not expected to result in significant changes to groundfish mortality because very little fishing effort currently occurs from October through February. Similar to Option 1 under No Action, the Alternative 3 groundfish season is intended to cap groundfish fishing effort at current levels and minimize additional effort that could potentially develop in the future.

Lingcod seasons under Alternative 3 are also slightly revised compared to the lingcod season in regulation for 2016. The change was done to simplify regulations since the lingcod season would be open the same dates as the recreational groundfish season in Marine Areas 1-3 (i.e., 3/11/17-10/21/17 and 3/10/18-10/20/18). The 2016 lingcod seasons in Marine Areas 1-3 are open from the Saturday closest to March 15 through the Saturday closest to October 15.

Under Alternative 3, the recreational lingcod season in Marine Area 4 (Cape Alava to the U.S. Canadian border) would be open from April 16 through October 15. This is slightly different than the 2016 lingcod season in regulation which is open from April 16 through October 15, or the Saturday closest to October 15; whichever is earlier. Similar to changes to the groundfish seasons, the Alternative 3 lingcod season is not expected to result in significant changes to groundfish mortality.

Area Restrictions

Under Alternative 3, fishing for, retention, or possession of lingcod during the Washington recreational fisheries would be prohibited seaward of a line connecting the following coordinates from the Queets River 47°31.70′ N. latitude, 124°45.00′ W. longitude to 47°38.17′ N. latitude, 124°30.00′ W. longitude, to 47°38.17′ N. latitude, 124°21.00′ W. longitude to 46°33.00′ N. latitude, 124°21.00′ W. longitude, year round except as allowed in Washington Marine Area 2 on days open to the primary Pacific halibut fishery. This change is different from the 2016 coordinates in regulation in that the southern boundary, which is located in the Columbia River area (Marine Area 1), is moved five miles north. Stakeholder input was used to establish a new southern boundary that reduced the size of the current lingcod closure area to allow additional access to deepwater lingcod areas without expected increases in yelloweye rockfish catches.

Table 4-130. Alternative 3: Washington Recreational Season 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 May 9 - Labor Day a/				BF Open		BF Closed	
2 (S. Coast)	BF Closed		BF Open <30 fm Mar 15 - June 15 b/ c/ d/ e/			BF Open b/					BF Closed	
1 (Col. River)	BF Closed		BF Open		BF Open f/g						BF Closed	

a/ Retention of lingcod, Pacific cod and sablefish allowed >20 fm on days when Pacific halibut is open.
b/ Retention of lingcod 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.) year round except on days open to the primary halibut fishery.
c/ Retention of sablefish and Pacific cod allowed > 30 fm from May 1- June 15.
d/ Retention of rockfish allowed > 30 fathoms.
e/ Retention of lingcod allowed > 30 fathoms on days that the primary halibut season is open.
f/ Retention of groundfish, except sablefish, Pacific cod and, flat fish (other than halibut) prohibited during the all-depth Pacific halibut fishery.
g/ Retention of lingcod prohibited seaward of 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. during the open lingcod season.

Groundfish Bag Limits

Under Alternative 3, the recreational rockfish sub-bag limit would be the same as the Status Quo Option analyzed under the No Action Alternative except, retention of up to one canary rockfish would be allowed under the 12 groundfish aggregate daily bag limit in Marine Areas 1 and 2. Based on input from Washington recreational stakeholders and the need to minimize encounters with yelloweye rockfish, which continue to drive management measures for Washington recreational fisheries, canary rockfish retention would not be permitted in Marine Areas 3 and 4. Retention of yelloweye rockfish would continue to be prohibited in all areas (Marine Areas 1-4). The recreational aggregate bag limit would continue to include a sub-limit of two cabezon in Marine Areas 1-3 and one in Marine Area 4.

A two canary rockfish allowance was also analyzed for all Marine Areas under Alternative 3. This will allow for a flexible management approach that provides the opportunity to reassess canary retention at the end of 2017 to determine whether the retention should continue and if an increase in the sub-limit should be implemented in 2018. In addition, the analysis of Alternative 3 includes an estimate of mortality assuming some potential targeting of canary rockfish which was not analyzed under the No Action Alternative. The modeling approach used to estimate canary impacts when anglers target canary rockfish is essentially the same as was used to estimate projected impacts for all groundfish under the Alternatives. The analysis looked at the most recent year's catch and effort data relative to the number of anglers that had encountered canary rockfish in the most recent season and the potential number of anglers that could encounter a canary rockfish if they chose to fish until they had caught their one fish canary sub limit. The approach is described further under the Impact section.

Lingcod Seasons and Size Limits

Under Alternative 3, the recreational lingcod season in Marine Areas 1 through 3 (Washington-Oregon border at 46°16' N. latitude to Cape Alava at 48°10' N. latitude) would be revised so they are the same as the Alternative 3 recreational groundfish season; open from the second Saturday in March through the third Saturday in October. This is slightly different than the Status Quo season (lingcod season in regulation for 2016) that is described as open from the Saturday closest to March 15 through the Saturday closest to October 15.

Under Alternative 3, the recreational lingcod season in Marine Area 4 (Cape Alava to the U.S. Canadian border) would be open from April 16 through October 15. This is slightly different than the Status quo lingcod season dates which are open from April 16 through October 15, or the Saturday closest to October 15; whichever is earlier.

Under Alternative 3, the lingcod seasons and size limits by area would be as follows:

- Marine Areas 1-3: March 11 through October 21 in 2017 and March 10 through October 20 in 2018. Minimum size, 22 inches.
- Marine Area 4: April 16 through October 15 in 2017 and 2018. Minimum size, 22 inches.

Additional Management Measures Analyzed

Under Alternative 3, a sub limit of up to one canary rockfish would be allowed in Marine Areas 1 and 2 within the groundfish daily bag limit. The Alternative 3 analysis also explored projected impacts if anglers are permitted to retain up to one or two canary rockfish in all marine areas (Marine Areas 1-4) rather than just Marine Areas 1 and 2. For example, if anglers are allowed to retain up to one canary rockfish in all areas, projected mortality would be 66.1 mt. If two canary rockfish are allowed in all management areas, projected mortality would be 132.1 mt. Management measures that allow canary retention are being considered for Washington recreational fisheries in a conservative manner that takes into consideration the uncertainties with angler behavior and potential misidentification with yelloweye rockfish. Because canary rockfish has been a prohibited species for many years, it is particularly difficult to predict how anglers will respond; that is, will anglers simply retain canary rockfish encountered while targeting other species (e.g., black rockfish) or will there be focused targeting of canary rockfish? The additional analysis for up to two canary rockfish in all management areas provides the framework analysis to facilitate a flexible approach and, with updated data from 2017, would provide valuable insight when considering if canary retention should continue and if an increase in the sub limit should be implemented in 2018 and beyond.

Impact (Groundfish Mortality)

Projected mortality for overfished and non-overfished species under Alternative 3 are summarized in Table 4-131. Management measures under Alternative 3 include: a sub-bag limit for canary rockfish, a shorter recreational groundfish season that aligns with the lingcod season, and a revision to move the southern boundary of the deepwater lingcod closure five miles north in Marine Area 1. Under Alternative 3, projected mortality for canary rockfish is updated from the No Action alternative to include some degree of targeting.

Two scenarios were explored to estimate projected mortality under Alternative 3 for 2017 and 2018. Recreational angler trip data from 2015 was used to estimate canary rockfish projected mortality for 2017 and 2018. Overall, projected mortality of canary rockfish increases under Alternative 3 compared to No Action when assuming that anglers will target canary rockfish after many years as a prohibited species. The low target scenario considered only angler trips where canary rockfish were encountered in 2015 in Marine Areas 1 and 2 and assumed that each angler on that trip stayed to fish in that area until all anglers

caught one canary rockfish; Marine Areas 3 and 4 were assumed to have the same impacts as under No Action. In this situation however, anglers would have been fishing under non-retention regulations and would have likely selected their fishing location to avoid areas where canary rockfish might be encountered. The degree of targeting under this scenario is based on the boat not moving to another location when one angler encountered a canary rockfish but instead stayed to allow the other anglers the opportunity to target canary rockfish. An alternate scenario ("high target") was used to estimate projected impacts and assumed that all anglers that targeted bottomfish in 2015 in Marine Areas 1 and 2 would actively seek out canary rockfish to allow everyone on the vessel to retain up to one canary as part of their daily groundfish bag limit; Marine Areas 3 and 4 were assumed to have same impacts as under No Action since retention would remain prohibited. This would assume that vessels would explore new fishing locations where canary rockfish might be abundant that had previously been avoided. It is likely that projected mortality falls somewhere between the low and high target scenarios as angler behavior is uncertain. However, projected mortality under Alternative 3 is based on the high target scenario to ensure that management measures are not set too liberally.

As described under the No Action Alternative, reducing the recreational groundfish season likely will not have a significant impact on projected groundfish mortality as there is little fishing effort from March through October. While there is some groundfish effort, primarily in March and October, we assumed that anglers that historically fished during that time period would continue to fish and would simply shift their effort to later March and before the last week in October.

No increase in yelloweye rockfish is anticipated as a result of modifying the size of the deepwater lingcod closure.

Table 4-131: Alternative 3- Projected mortality for the Washington recreational fisheries.

Stock	2017/2018	
	Status Quo (2016)	Preferred
Canary Rockfish	1.6	37.2
YELLOWEYE ROCKFISH	2.8	3.1
Black Rockfish	280.9	280.9
Lingcod	112.0	112.0
Nearshore Rockfish N. of 40°10´ N. lat.	5.0	5.0
Blue Rockfish	*1.2*	*1.2*
Quillback Rockfish	*1.1*	*1.1*
Copper Rockfish	*0.9*	*0.9*
China Rockfish	*1.5*	*1.5*
Brown Rockfish	-	-
Grass Rockfish	-	-
Yellowtail Rockfish	37.4	37.4
Vermilion Rockfish	1.0	1.0
Cabezon	5.0	5.0
Kelp Greenling	1.2	1.2

4.1.4.9 Oregon Recreational – Alternative 3

Primary catch controls for the Oregon recreational fishery are season dates, depth closures, bag limits, and GCAs, including YRCAs. Alternative 3 analyzes the Oregon recreational fishery under the Alternative 3 ACLs (Table 4-90 and Table 4-92) and Oregon recreational HGs or presumed state quotas shown in Table 4-132.

The west coast states will be responsible for tracking and managing catches of Nearshore Rockfish complex north of 40°10' N. latitude. If harvest levels in Oregon approach 75 percent of the state-specific HG (Table 4-132), the state of Oregon will consult with the other west coast states via a conference call and determine whether inseason action is needed. The HG for Oregon would be a state HG and not established in Federal regulations. Within state regulations, determined by the Oregon Fish and Wildlife Commission at a later date, the Oregon HG would be further divided for the commercial and recreational fisheries. The values shown in the Alternative 3 analysis are the presumptive shares based on 2015 recreational and commercial sharing percentages in Oregon State Regulations but are subject to change pending actions by the Commission. In the event inseason action is needed, the state of Oregon would take action through state regulation. Inseason updates would be provided to the Council at the September and November meetings.

Table 4-132. Alternative 3. Oregon recreational Federal harvest guidelines (HG) or state quotas under Alternative 3 (mt).

Stock	2017 HG or State Quota	2018 HG or State Quota
Black Rockfish OR a/	400.1	394.7
Canary Rockfish b/	75	75
Greenlings c/	41.1	34.9
Nearshore Rockfish North of 40°10' N. Lat. d/	33.1	33.4
YELLOWEYE ROCKFISH b/	3.0	3.0

a/ The state process in Oregon establishes the commercial and recreational quotas for black rockfish. The values are the presumptive recreational share based on the 2015 recreational and commercial sharing percentages in Oregon state regulations. Final sharing will be determined by the Oregon Fish and Wildlife Commission.
b/ Federal HG are established for canary rockfish and yelloweye rockfish and should be included in Federal regulation.
c/ Includes kelp and other greenlings. The state process in Oregon establishes the commercial and recreational quotas for greenling. The values are the presumptive recreational share based on the 2015 recreational and commercial sharing percentages in Oregon state regulations. Final sharing will be determined by the Oregon Fish and Wildlife Commission.
d/ Includes blue rockfish. The state of Oregon has a HG for Nearshore Rockfish north of 40°10' N. latitude of 46.1 mt in 2017 and 36.5 mt in 2018, which is shared between the Oregon commercial nearshore and recreational fisheries. The values shown are the presumptive shares based on 2015 recreational and commercial sharing percentages in Oregon state regulations. Final sharing will be determined by the Oregon Fish and Wildlife Commission.

Groundfish Seasons and Area Restrictions

Season structure

Under Alternative 3, the Oregon recreational groundfish fishery would operate the same as under No Action (Figure 4-5). This is the season structure in place in 2016. Canary rockfish and Nearshore Rockfish complex north of 40°10′ N. latitude species would be part of the ten fish marine bag (no sub-bag limits). Projected mortality of yelloweye and canary rockfish are within the Federal HGs, therefore the shore-based fishery would be open year-round. Oregon recreational sector Federal HGs are not in place for any other species.

Area Closures

The current Stonewall Bank YRCA configuration, which has been in place since 2006 and utilized under No Action, would also remain under Alternative 3 (Figure 4-6).

Two Options for extending the status quo Stonewall Bank YRCA for 2017-2018 recreational fisheries, should they become necessary, are also shown in Figure 4-6, would be defined in regulation by the coordinates in Table 4-59.

Groundfish Bag Limits and Size Limits

Under Alternative 3, the same daily bag limits and length limits as under No Action would be in place, except the minimum size limit for kelp greenling would be removed and there would be no sub-limit on canary.

Beginning in 2015, to stay within the recreational portion of the Oregon HG for the Nearshore Rockfish complex north of 40°10' N. latitude complex, the State of Oregon, through state processes reduced the daily bag limit of blue (and deacon) rockfish to three and prohibited the retention of China, copper, and quillback rockfish. With the 2017 and 2018 ACLs for Nearshore Rockfish complex north of 40°10' N. latitude being slightly higher than 2014 and prior, the state-specified sub-bag limit for blue rockfish and prohibition of retention of China, copper, and quillback rockfish were no longer necessary and thus were removed for modeling and projections.

The following minimum size limits applied to the 2016 Oregon recreational fisheries and would be in place under Alternative 3:

- Lingcod – 22 in.
- Cabezon – 16 in.
- Kelp greenling – none

New Management Measures

One additional management measure was analyzed for the Oregon recreational fisheries: allowing fishing for flatfish (other than Pacific halibut) outside of the 40-fathom seasonal depth restriction (Appendix B, Section B.2.3).

Additionally, a variety of season structure (depths and months) were modeled to determine potential mortality to overfished species.

Inseason Management Tools

The same monitoring program and inseason management tools used under No Action would also be used under Alternative 3.

Impacts (Projected Mortality)

The annual projected mortality presented in Table 4-133 is anticipated, given the season structure and bag limits detailed above. Yelloweye rockfish impacts continue to be the most constraining in terms of setting the season structure under Alternative 3. The projected impacts for canary rockfish are somewhat uncertain. To account for targeting of canary rockfish, the model was calibrated with the canary rockfish catch rate distributions (i.e., percent of anglers that caught 0-10 canary rockfish) from the current era (with avoidance) adjusted to mirror the distributions from the 1990's when targeting was permitted. This calibration

accounted for the shelf, the primary canary rockfish habitat, now being closed (i.e., shelf trips were excluded from the historic dataset). ODFW presented this model calibration technique in a report at the April 2016 Council meeting (Agenda Item F.6.a. Supplemental ODFW Report) and received feedback from industry that this modeling technique represents the best available science.

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 fm 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 while avoiding or minimizing interactions with overfished rockfish species.

To account for impacts for the new longleader opportunity it was assumed there would be 5,000 substitution long-leader trips (i.e., traditional recreational groundfish to long-leader) and 2,000 new long-leader trips (i.e., in addition to current traditional groundfish trips). Since actual longleader participation is uncertain, liberal trip projections were assumed. Per this analysis, no changes are needed to management measures for the alternative harvest specifications, as Oregon recreational fisheries would continue to remain within the respective sector allocation.

The projected mortality for the Nearshore Rockfish complex north of 40°10’ N. latitude is based on modeling without the state-specified sub-bag limit for blue (and deacon) rockfish and prohibition of China, copper, and quillback rockfish that was required in 2015 and 2016. For 2017-2018 all species of this complex would be part of the regular marine bag limit. The combined projected mortality for the complex from commercial and recreational fisheries in Oregon are shown in Table 4-133.

Table 4-133. Alternative 3 – Oregon Recreational. Revised projected mortality (mt) of species with Oregon recreational specific allocations under Alternative 3, including estimates for the new longleader opportunity and allowing retention of flatfish species outside of the seasonal 40 fathom depth restriction.

				Source of Difference		
Stock	**Original Projected Mortality (mt)**	**Revised Projected Mortality (mt)**	**Difference (mt)**	**New longleader opportunity**	**Adjustment for canary rockfish targeting**	**Flatfish retention outside of 40 fm during Apr-Sept**
Canary Rockfish	17.1	47.1	30	13.4	16.6	0.0
YELLOWEYE	2.9	2.8	-0.1	-0.1	0	0.0
Black Rockfish OR	353.2	336.7	-16.5	-16.1	-0.4	0.0
Greenlings a/	6.4	6.1	-0.3	-0.3	0	0.0
Nearshore Rockfish North of 40°10' N. Lat. b/	35.6	33.1	2.5	0	0	0.0
Widow Rockfish c/	0.54	12.8	12.3	12.0	0.3	0.0
Yellowtail Rockfish c/	11.2	63.1	51.9	48.7	3.2	0.0
a/ Includes kelp and other greenlings						

b/ Includes blue rockfish. The State of Oregon has a Federal HG of Nearshore Rockfish North of $40^{0}10'$ N. Lat. Of 46.11 mt, which is shared between the Oregon commercial nearshore and recreational fisheries. Revised projections occur as a result of updated effort projections.
c/ Original projection was not shown in table, but both original and revised projections shown here as these are the most influenced stocks by the new longleader opportunity

4.1.4.10 California Recreational – Alternative 3

Harvest specifications under Alternative 3 are similar to the No Action Alternative, except for the changes noted below. The California recreational HG for canary rockfish decreases from an average of 366 mt in 2017-2018 to 135.0 mt and the California scorpionfish ACL decreases from 265 mt (2017) and 261 mt (2018) to 150 mt in both years. For bocaccio, the recreational HG decreases from 411.6 mt and 385.9 mt to 326.1 mt and 305.5 mt, in 2017 and 2018 respectively. The Nearshore Rockfish complex HG north of 40° 10' N latitude increases from 29.6 mt under No Action to 40.7 mt under Alternative 3 (see Section 4.1.4.3). The Nearshore Rockfish complex HG north of 40°10´ N latitude is shared between the recreational and commercial sectors; there is no formal allocation between the recreational and commercial sectors.

Figure 4-12 shows the California recreational season structure under Alternative 3. The starting date for retaining California scorpionfish aligns with the start date for the RCG seasons (which differ by area); however retention is prohibited in all areas after August 31. Compared to the 2016 season structure, the Northern and Mendocino Management Areas would be extended by two and a half months, through December 31. Allowable fishing depths would be increased in the Northern Management Area from 20 fm to 30 fm during May 1 through October 31. Due to high yelloweye rockfish encounters in the Mendocino Management Area, the depth restriction will remain at 20 fathoms from May 1 through October 31. However, from November through December the depth restriction would be eliminated in both the Northern and Mendocino Management Areas; fishing would be permissible at all depths. Allowable fishing depths would also be increased in the San Francisco and Central Management Areas by 10 fathoms to 40 and 50 fathoms, respectively. Due to projected cowcod impacts, the season structure in the Southern Management Area would remain the same as in 2016; similarly the California scorpionfish season will remain the same as in 2016 (i.e. closed September through December).

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 15 – Dec 31 <40fm							
Central	Closed				April 1 – Dec 31 <50fm							
Southern	Closed				Mar 1 – Dec 31 <60 fm							

Figure 4-12. Proposed California recreational groundfish season structure for 2017-2018.

Bag Limits and Size Limits

Under Alternative 3, the size, bag and sub-bag limits would remain similar to 2016 except for those described below.

Black rockfish- To keep within allowable limits, the sub-bag limit for black rockfish would be reduced from five to three fish within the 10 fish aggregate RCG complex bag limit.

Bocaccio- The sub-bag limit of three fish within the 10 fish aggregate RCG complex bag limit would be eliminated to reduce discarding; anglers would be able to retain up to 10 bocaccio.

Canary rockfish- Canary rockfish was recently declared rebuilt, as a result, retention of canary rockfish would be permitted with a sub-bag limit of one fish within the 10 fish aggregate RCG complex bag limit.

Lingcod- The lingcod bag limit of three fish would be reduced to two fish based upon a request from industry; further, recreational catch has been increasing in recent years and attainment of the non-trawl allocation has been high.

New Management Measures

Three new management measures were contemplated for 2017-2018; however only two were selected for implementation in 2017-2018 under Alternative 3(see Section 3.1). The two measures proposed for implementation are briefly described below, for more detailed description please see Appendix B, Sections B.2.4 and B.2.5.

New Inseason Process

This management measure would allow for inseason action to be taken outside of a Council meeting based upon attainment or projected attainment of federal harvest specifications for black rockfish (commercial and recreational), canary rockfish (recreational), and yelloweye rockfish (recreational). Upon consultation with CDFW and Council staff, NMFS would be able to take actions defined as routine, to keep mortality within allowable limits. This would be similar to the current inseason process, except that it will allow for action to be taken during the summer months when the majority of catch accrues and there are typically many months between Council meetings.

Exempt Petrale Sole and Starry Flounder from Season and Depth Restrictions

This management measure would remove petrale sole and starry flounder from the recreational season and depth restrictions; anglers could retain petrale sole and starry flounder year round, without depth constraint. These petrale sole and starry flounder are commonly encountered while anglers are pursuing other species which have different seasons and/or allowable depth (e.g., Pacific halibut) or open year round without depth constraint (e.g., Pacific sanddab). As a result, this management measure would reduce regulatory discarding.

Impact (Groundfish Mortality)

At the April 2016 Council meeting, CDFW received input that assumptions about targeting behavior used to model projected canary impacts in the fishery may have been misinformed; constituents indicated that canary targeting was likely to occur, even under a one fish sub-bag limit. As a result, the projection model was updated to reflect this new information. The updated assumptions in the model and resulting projected mortality reflect the best available science and information. Modelling assumptions for all other species remain the same as under the other alternatives.

Table 4-134 below, provides projected mortality resulting from Alternative 3.

Table 4-134. Projected mortality in the California recreational fishery under Alternative 3. Values in parenthesis indicate bag or sub-bag limits and resulting mortality which differ from 2016. Note "YR" indicates retention allowed year round, without depth constraint, under the proposed new management measure.

Stock	Projected Recreational Mortality	California Recreational HG 2017/18	Non-Trawl Allocation 2017/18 a/
BOCACCIO (10)	127.0 (184.9)	326.1/305.5	472.2/442.3
Canary Rockfish (1)b/	41.6 (135.0)	135.0	406.5
COWCOD	2.2		2.6
YELLOWEYE	3.2	3.9	13.1/12.9
Black Rockfish (3)	284.4 (217.4)		
Blue Rockfish	149.3	305/311	
Cabezon	33.0		
California Scorpionfish	96.7		
Greenlings	10.2		
Lingcod N. of 40°10' N. lat. (2)c/	86.8 (68.2)		1,680.2/1,557.5
Lingcod S. of 40°10' N. lat. (2)	494.4 (410.5)		683.1/624.3
Widow Rockfish	30.3		1,196.1/1,119.4
Nearshore Rockfish N. of 40°10' N. lat.	7.7		
Nearshore Rockfish S. of 40°10' N. lat.	343.7		
Petrale sole (YR)d/	0.8 (6.6)		144.8/138.6
Starry flounder (YR)d/	1.2 (7.5)		635.9

a/ Includes non-nearshore, nearshore, and recreational.
b/ Projected mortality differs from the amount reported in Agenda Item F.6.a, Supplemental CDFW Report because of updated assumptions based upon input received at the April Council meeting.
c/ Only includes the area between 42° N lat. and 40° 10' N lat, while the non-trawl allocation is applicable for the entire area North of 40°10' N lat.
d/ Retention of these species would be allowed year round without depth constraint. In 2016, these species could be retained only during months and depths which were open to groundfish fishing.

4.1.5 Summary of Groundfish Mortality under the Alternatives

Detailed descriptions of the fishery management measures and the modeled estimates of groundfish mortality are reported by alternative and sector in Sections 4.1.1, 4.1.2, 4.1.3, and 4.1.4. Impacts to groundfish stocks are assessed in relation to limit reference points (OFL, MSST). In this context although management measures are designed to achieve but not exceed ACL, impacts to stock status are evaluated under the assumption that all of the ACL is harvested. Historically, however, given a variety of factors like overfished species interactions, market conditions, weather, etc., there are very few stocks and complexes where the ACL is achieved. Each biennium, GMT catch projection models are used to adjust management measures to better attain ACLs while limiting the risk that ACLs are exceeded (and since the ACL is a precautionary reduction from the limit reference point, even exceeding it does not represent a serious adverse impact). Despite the best efforts to improve ACL attainment, there is little interannual variation on ACL attainment for most species.

4.2 Short-Term Socioeconomic Impacts of the Integrated Alternatives

This section evaluates the effects of the alternatives on fishery participants and fishing communities. Section 3.2 in the EIS for the 2015-2016 harvest specifications and management measures and Amendment 24 (PFMC and NMFS 2015) describes the economic status of these affected groups during the baseline period used for that analysis (2003 to 2012) based on historical commercial landings data, estimates of recreational fishing activity, and census data. Updated baseline information may be found in the 2016

Groundfish SAFE (PFMC 2016). Here, various methods are used to estimate how conditions may change from the baseline, either by applying harvest specifications based on default HCRs and compliant management measures (No Action Alternative) or under Alternatives 1 and 2, which contain different ACLs for key stocks and default ACLs for the remaining stocks.

The 2015 EIS (PFMC and NMFS 2015) describes the models and data used to project socioeconomic impacts. Updated documentation of the models may be found in Appendix A. Projection models include:

- GMT catch projection models for different commercial sectors of the groundfish fishery
- GMT fishing effort (angler trips) projection models for the recreational groundfish fishery
- The landings distribution model (LDM), which is used to estimate where landings are likely to occur and the resulting port-level ex-vessel revenue
- The IOPAC model used to evaluate the effect of the alternatives on coastal communities (ports where commercial groundfish landings and recreational groundfish effort occur) by estimating personal income generated ("income impacts") and associated employment
- Net revenue in commercial fishery operations based on projected landings and vessel cost earnings surveys.

The following sections assess socioeconomic impacts in terms of:

- Changes in commercial ex-vessel revenue by fishery sector
- Change in recreational angler trips by community
- Change in net revenue by fishery
- Change in income and employment impacts by community resulting from changes in commercial landings revenue and recreational effort.

4.2.1 Change in Ex-Vessel Revenue and Angler Trips

4.2.1.1 Commercial Fisheries

Revenue estimates are based on projected landings estimates from the GMT models referenced above.

Table 4-137 and Table 4-138 compare ex-vessel revenue estimates under the action alternatives to the No Action Alternative. Projections assume average ex-vessel prices observed in 2015. Effects are presented according to groundfish fishery "sectors" (see the 2015 EIS PFMC and NMFS 2015, Section 3.2.2).

Table 4-139, and Table 4-140 compare projected shoreside commercial ex-vessel revenue under the alternatives to the annual average for the 2011-2015 baseline period.[6] Note that revenue projections are more aggregated in these tables and they don't include estimates for some of the sectors, such as at-sea whiting and tribal groundfish fisheries, included in through

The TAC for Pacific whiting is set annually outside of this harvest specifications process. The 2015 Pacific whiting TAC and allocations are used to derive an estimate of catch and resulting revenue for the whiting sectors. For the at-sea sectors revenue are assumed to be the same across all alternatives.

Compared to No Action:

[6] Ex-vessel revenue for 2015 should be considered provisional since not all fish tickets had been entered into PacFIN by the query date of February 3, 2016.

- Alternative 1 shows an overall increase in shoreside ex-vessel revenue of $6.6 million to a total of $95.3 million and Alternative 2 shows an increase of $6.5 million to $95.2 million. These revenue changes occur exclusively in the shoreside non-whiting IFQ sector (trawl and fixed gear).
- Alternative 3 shows an overall increase in shoreside ex-vessel revenue of $19.8 million to a total of $108.8 million. Almost all of this change occurs in the shoreside IFQ sector. Alternative 3 combines the preferred ACLs with preferred management measures.

Table 4-135. Estimated ex-vessel revenues by groundfish harvest sector under the alternatives (2015 $million).

	No Action		Alternative 3*		Alternative 1		Alternative 2	
	2017	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**
Shoreside Sectors:								
Whiting	13.3	13.3	**13.3**	**13.3**	13.3	13.3	13.3	13.3
Non-whiting Trawl+Non-trawl IFQ	40.1	40.0	**60.3**	**59.3**	46.9	46.4	46.8	46.3
Limited Entry Fixed Gear	16.0	16.7	**16.5**	**17.1**	16.0	16.7	16.0	16.7
Nearshore Open Access	4.7	4.7	**4.7**	**4.7**	4.7	4.7	4.7	4.7
Non-nearshore Open Access	4.4	4.5	**4.0**	**4.1**	4.4	4.5	4.4	4.5
Incidental Open Access	0.2	0.2	**0.2**	**0.2**	0.2	0.2	0.2	0.2
Tribal (incl. whiting)	9.8	9.9	**9.8**	**10.0**	9.8	9.9	9.8	9.9
Shoreside sectors' Totals	**88.5**	**89.3**	**108.8**	**108.7**	**95.3**	**95.7**	**95.2**	**95.6**
At-sea Sectors:								
Non Tribal Whiting	25.9	25.9	**25.9**	**25.9**	25.9	25.9	25.9	25.9
Tribal Whiting	5.1	5.1	**5.1**	**5.1**	5.1	5.1	5.1	5.1
At-sea sectors' Totals	**31.0**	**31.0**	**31.0**	**31.0**	**31.0**	**31.0**	**31.0**	**31.0**
TOTAL Groundfish Revenue	**119.5**	**120.4**	**139.8**	**139.7**	**126.4**	**126.7**	**126.3**	**126.6**

*Alternative 3 combines preferred ACLs with preferred management measures.

Table 4-136. Change in groundfish ex-vessel revenues from the No Action Alternative by groundfish harvest sector under the action alternatives, 2017-2018 average (2015 $million).

	No Action	Alternative 3*	Alternative 1	Alternative 2
	2017-18	2017-18	2017-18	2017-18
Shoreside Sectors:				
Whiting	*13.3*	**-0.000**	+0.000	+0.000
Non-whiting Trawl+Non-trawl IFQ	*40.0*	**+19.753**	+6.605	+6.504
Limited Entry Fixed Gear	*16.3*	**+0.476**	+0.000	+0.000
Nearshore Open Access	*4.7*	**-0.042**	+0.000	+0.000
Non-nearshore Open Access	*4.5*	**-0.395**	+0.000	+0.000
Incidental Open Access	*0.2*	**+0.000**	+0.000	+0.000
Tribal (incl. whiting)	*9.9*	**+0.015**	+0.000	+0.000
Shoreside sectors' Totals	***88.9***	**+19.806**	**+6.605**	**+6.504**
At-sea Sectors:				
Non Tribal Whiting	*25.9*	**+0.0**	+0.0	+0.0
Tribal Whiting	*5.1*	**+0.0**	+0.0	+0.0
At-sea sectors' Totals	***31.0***	**+0.0**	**+0.0**	**+0.0**
TOTAL Groundfish Revenue	***119.9***	**+19.8**	**+6.6**	**+6.5**

*Alternative 3 combines preferred ACLs with preferred management measures.

Table 4-137. Change in groundfish ex-vessel revenues from the No Action Alternative by shoreside harvest sector under the action alternatives (percent).

	No Action	Alternative 3*	Alternative 1	Alternative 2
	2017-18	2017-18	2017-18	2017-18
Shoreside Sectors:				
Whiting	*13.3*	**-0.0%**	+0.0%	+0.0%
Non-whiting Trawl+Non-trawl IFQ	*40.0*	**+49.3%**	+16.5%	+16.2%
Limited Entry Fixed Gear	*16.3*	**+2.9%**	+0.0%	+0.0%
Nearshore Open Access	*4.7*	**-0.9%**	+0.0%	+0.0%
Non-nearshore Open Access	*4.5*	**-8.9%**	+0.0%	+0.0%
Incidental Open Access	*0.2*	**+0.0%**	+0.0%	+0.0%
Tribal (incl. whiting)	*9.9*	**+0.1%**	+0.0%	+0.0%
Shoreside sectors' Totals	***88.9***	**+22.3%**	**+7.4%**	**+7.3%**
At-sea Sectors:				
Non Tribal Whiting	*25.9*	**+0.0%**	+0.0%	+0.0%
Tribal Whiting	*5.1*	**+0.0%**	+0.0%	+0.0%
At-sea sectors' Totals	***31.0***	**+0.0%**	**+0.0%**	**+0.0%**
TOTAL Groundfish Revenue	***119.9***	**+16.5%**	**+5.5%**	**+5.4%**

*Alternative 3 combines preferred ACLs with preferred management measures.

Compared to the 2011-2015 baseline period (Table 4-138-Table 4-140)

- Alternative 3 shows the largest increase in ex-vessel revenue $26.3 million. This is about twice the increase in ex-vessel revenue estimated for Alternatives 1 and 2. Alternative 3 combines the preferred ACLs with preferred management measures.
- Alternatives 1 and 2 show an increase in ex-vessel revenue of about $13 million across all shoreside sectors.
- The shoreside whiting sector shows a decline of $8.3 million from the baseline but it must be remembered that this ex-vessel revenue estimates assumes the Pacific whiting TAC in 2017-2018 will be the same as the 2015 TAC. In reality, the TAC could be higher or lower. For example, the 2016 TAC, which is known at this time, is 42,481 metric tons higher than the 2015 TAC.
- Alternative 2 only differs in projected ex-vessel revenue from Alternative 1 by $100,000 less revenue in the shoreside non-whiting IFQ sector.
- No Action shows the smallest increase from the baseline, an increase of $6.4 million to a total of $78.7 million or an increase of almost 9 percent.
- In relative terms the smallest projected revenue increase is 21.4 percent in the non-nearshore fixed gear sector under Alternatives 1 and 2; Alternative 3 is only slightly higher for this sector. The largest relative increase occurs in the non-whiting IFQ fishery under Alternative 3, at 99.5 percent or about a doubling in revenue from the baseline.

Table 4-138. Groundfish ex-vessel revenues under the Baseline (5-year 2011 to 2015 inflation-adjusted average annual ex-vessel revenue) and 2017-18 Alternatives by aggregated non-tribal shoreside commercial harvest sector under the commercial fishery alternatives (2015 $million).

$ million	***Baseline***	**No Action**	**Alternative 3***	**Alternative 1**	**Alternative 2**
		2017-18	**2017-18**	**2017-18**	**2017-18**
Whiting	*21.6*	*13.3*	***13.3***	*13.3*	*13.3*
Non-whiting Trawl+Non-trawl IFQ	*30.0*	*40.0*	***59.8***	*46.7*	*46.5*
Nearshore Fixed Gear	*3.6*	*4.7*	***4.7***	*4.7*	*4.7*
Non-nearshore Fixed Gear	*17.1*	*20.8*	***20.9***	*20.8*	*20.8*
Totals	***72.3***	***78.8***	***98.6***	***85.5***	***85.3***

*Alternative 3 combines preferred ACLs with preferred management measures.

Table 4-139. Change in groundfish ex-vessel revenues from the Baseline (5-year 2011 to 2015 inflation-adjusted average annual ex-vessel revenue) by aggregated non-tribal shoreside commercial harvest sector under the commercial fishery alternatives (2015 $million).

$ million	***Baseline***	**No Action**	**Alternative 3***	**Alternative 1**	**Alternative 2**
		2017-18	**2017-18**	**2017-18**	**2017-18**
Whiting	*21.6*	-8.284	**-8.284**	-8.284	-8.284
Non-whiting Trawl+Non-trawl IFQ	*30.0*	+10.072	**+29.824**	+16.677	+16.576
Nearshore Fixed Gear	*3.6*	+1.095	**+1.052**	+1.095	+1.095
Non-nearshore Fixed Gear	*17.1*	+3.672	**+3.753**	+3.672	+3.672
Totals	***72.3***	**+6.555**	**+26.346**	**+13.160**	**+13.059**

*Alternative 3 combines preferred ACLs with preferred management measures.

Table 4-140. Change in groundfish ex-vessel revenues from the Baseline (5 year 2011–2015 inflation-adjusted average annual ex-vessel revenue) by aggregated non-tribal shoreside commercial harvest sector under the commercial fishery alternatives (percent).

$ million	*Baseline*	No Action	Alternative 3*	Alternative 1	Alternative 2
		2017-18	2017-18	2017-18	2017-18
Whiting	*21.6*	-38.4%	**-38.4%**	-38.4%	-38.4%
Non-whiting Trawl+Non-trawl IFQ	*30.0*	+33.6%	**+99.5%**	+55.6%	+55.3%
Nearshore Fixed Gear	*3.6*	+30.0%	**+28.9%**	+30.0%	+30.0%
Non-nearshore Fixed Gear	*17.1*	+21.4%	**+21.9%**	+21.4%	+21.4%
Totals	***72.3***	**+9.1%**	**+36.4%**	**+18.2%**	**+18.1%**

*Alternative 3 combines preferred ACLs with preferred management measures.

In the 2015 EIS, the discussion of modeling commercial fishery impacts presents a number of caveats

- Effort displaced by management measures is assumed not to switch readily into another fishery sector or geographic region
- 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 the realm of what has occurred in the recent past.
- Catch projections in the IFQ fishery may not reflect the leveraging effect of increases in ACLs for "choke" species (those with low ACLs/allocations. A higher allocation of, for example, canary rockfish to the shorebased IFQ fishery may generate more actual revenue than is forecast using the current catch projection models.
- Stock recruitment variability and catch monitoring uncertainty mean that actual catches may differ from the projections. Although actual ACL attainment my differ from projections, inseason management measures are 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; 73.88 percent of the TAC is allocated to U.S. fisheries. Since the TAC and resulting allocation is not determined during the harvest specifications process, a historical TAC is used to estimate socioeconomic impacts. The actual TACs for 2017 and 2018 could be higher or lower than the assumed value.

For more discussion of these caveats see pages 370-371 in the 2015 EIS.

4.2.1.2 Recreational Fisheries

For recreational fisheries, projected marine area angler boat trips taken in groundfish plus Pacific halibut recreational fisheries are compared to historical recreational fishing effort under the proposed management alternatives. Table 4-141, Table 4-142, and Table 4-143 compare average annual recreational angler trips during the 2010-2014 baseline period to projected angler effort under the alternatives. Results are shown by coastal regions that are aggregated from statistical reporting regions.[7]

[7] The Puget Sound region is not shown in these tables because Council managed recreational fisheries do not occur in this region.

The Council wished to explore a number of recreational management options under each of the alternative ACLs and allocations. Most of these management variations have a modest effect on project angler fishing effort. To produce a tractable number of projections that cover the range of potential effort levels (and below, personal income and employment), the alternatives and these management options are presented in five scenarios in addition to No Action. For more information about the proposed management options see Section 4.

The change in recreational fishing effort from the baseline period:

- Under Alternatives 1 and 2:
  - With California Options 1 and 3 the increase from the baseline is 204,800 angler trips or 25 percent.
  - With California Option 4 there is a substantial decrease in angler trips of 260,100 (-31 percent).
- Under Alternative 1, with California Options 1 and 3 and the Washington State Option, a very similar increase—204,400 angler trips (25 percent) is estimated.
- No Action shows the same increase as Alternatives 1 and 2 combined with California Options 1 and 3.[8]
- Alternative 1 with California Option 2 shows the largest increase, 212,800 angler trips or 26 percent.
- Alternative 3 is estimated to result in an increase of 209,000 angler trips from the baseline, which is the largest increase across the alternatives.

There are regional differences in the projected changes in angler trips:

- Since Southern California accounts for the largest share of coastwide recreational angler trips (61% during the baseline period), the Santa Barbara to San Diego region also shows the largest nominal changes in effort ranging from an increase of 102,000 trips (20%) across all the scenarios except for California Option 4 where angler trips would decline by 238,800 (-47%).
- The largest relative increases across all the alternatives are projected for the Fort Bragg to Bodega Bay region. These increases are 85%-98% except for under California Option 4 where the increase is 50%.
- The San Francisco region shows the next largest relative increase for all scenarios except California Option 4 at almost 80 percent. This is an increase of 44,000 angler trips to a total of 100,000.
- The rest of Northern California (Crescent City to Bodega Bay) also shows higher relative increases than Southern California or Washington/Oregon. The highest relative increase in Northern California (98%) is projected for the Fort Bragg-Bodega Bay region under Alternative 3, which represents preferred ACLs combined with preferred management measures. This would be an increase of 11,200 angler trips to a total of 22,600. Angler trips in the Crescent City-Eureka region would increase by 10,200 or almost 44%.
- Washington and Oregon account for 15 percent of total angler trips during the baseline period, and the projected changes in angler trips are more modest than in the California regions. The Washington Coast shows relative increases across the alternatives, ranging from 16.3 percent to 16.8 percent. (The Washington groundfish season alternative under Alternative 1 shows the smaller increase.) This translates into 5,200-5,400 more angler trips to increase the totals to above 37,000.
- In Oregon relative changes range from declines of less than 1 percent in the Coos Bay-Brookings region to an increase of 7.4 percent for the Astoria-Tillamook region. These changes do not vary across the alternatives.

[8] Due to rounding there are slight differences in the fractional percentages for equivalent angler effort estimates.

In modeling recreational fishery impacts, it is assumed that anglers who are displaced or discouraged by management measures under a particular alternative cannot switch readily into a different fishery in the same region or another region elsewhere along the coast. Thus the numbers reported below probably represent something of an upper bound on regional economic impacts on recreational fisheries, or the maximum amount of displacement likely to occur under the alternatives. This also means that the models may not necessarily be able to distinguish subtle differences resulting from relatively fine distinctions between the alternatives if those differences lie within the models' margins of error.

Table 4-141. Estimated Recreational Effort (halibut+bottomfish) under the Baseline and 2017-18 Alternatives (thousands of angler trips).

Community Groups	*Baseline (average 2010-2014)*	*No Action*	Alternative 3*	Alternative 1 (CA Ops 1 and 3)	Alternative 2 (CA Ops 1 and 3)	Alternatives 1 and 2 (CA Op 2)	Alternatives 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 and 3) + WA Groundfish Season Alt
Puget Sound		-	**-**	-	-	-	-	-
Washington Coast	32.1	37.4	**37.4**	37.4	37.4	37.4	37.4	37.3
Astoria-Tillamook	15.0	16.1	**16.1**	16.1	16.1	16.1	16.1	16.1
Newport	45.4	48.0	**48.0**	48.0	48.0	48.0	48.0	48.0
Coos Bay-Brookings	34.8	34.7	**34.7**	34.7	34.7	34.7	34.7	34.7
Crescent City-Eureka	23.2	30.6	**33.4**	30.6	30.6	38.1	23.1	30.6
Fort Bragg - Bodega Bay	11.4	21.1	**22.6**	21.1	21.1	21.6	17.2	21.1
San Francisco Area	56.0	100.4	**100.4**	100.4	100.4	100.4	51.3	100.4
SC – Mo – MB*	105.6	137.9	**137.9**	137.9	137.9	137.9	74.5	137.9
SB – LA – SD*	509.0	611.0	**611.0**	611.0	611.0	611.0	270.1	611.0
Coastwide Total	**832.4**	1,037.2	**1,041.5**	1,037.2	1,037.2	1,045.2	572.3	1,037.0

*Alternative 3 combines preferred ACLs with preferred management measures.

Table 4-142. Estimated change from Baseline Recreational Effort (halibut+bottomfish) under the 2017-18 Alternatives (thousands of angler trips).

Community Groups	*Baseline (average 2010-2014)*	*No Action*	Alternative 3*	Alternative 1 (CA Ops 1 and 3)	Alternative 2 (CA Ops 1 and 3)	Alternatives 1 and 2 (CA Op 2)	Alternatives 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 and 3) + WA Groundfish Season Alt
Puget Sound		-	**-**	-	-	-	-	-
Washington Coast	*32.1*	+5.4	**+5.4**	+5.4	+5.4	+5.4	+5.4	+5.2
Astoria-Tillamook	*15.0*	+1.1	**+1.1**	+1.1	+1.1	+1.1	+1.1	+1.1
Newport	*45.4*	+2.5	**+2.5**	+2.5	+2.5	+2.5	+2.5	+2.5
Coos Bay-Brookings	*34.8*	-0.1	**-0.1**	-0.1	-0.1	-0.1	-0.1	-0.1
Crescent City-Eureka	*23.2*	+7.4	**+10.2**	+7.4	+7.4	+14.9	-0.2	+7.4
Fort Bragg - Bodega Bay	*11.4*	+9.7	**+11.2**	+9.7	+9.7	+10.2	+5.8	+9.7
San Francisco Area	*56.0*	+44.4	**+44.4**	+44.4	+44.4	+44.4	-4.7	+44.4
SC – Mo – MB*	*105.6*	+32.3	**+32.3**	+32.3	+32.3	+32.3	-31.1	+32.3
SB – LA – SD*	*509.0*	+102.0	**+102.0**	+102.0	+102.0	+102.0	-238.8	+102.0
Coastwide Total	***832.4***	+204.8	**+209.0**	+204.8	+204.8	+212.8	-260.1	+204.6

*Alternative 3 combines preferred ACLs with preferred management measures.

Table 4-143. Estimated change from Baseline Recreational Effort (halibut+bottomfish) under the 2017-18 Alternatives (percent).

Community Groups	*Baseline (average 2010-2014)*	*No Action*	Alternative 3*	Alternative 1 (CA Ops 1 and 3)	Alternative 2 (CA Ops 1 and 3)	Alternatives 1 and 2 (CA Op 2)	Alternatives 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 and 3) + WA Groundfish Season Alt
Puget Sound		-	-	-	-	-	-	-
Washington Coast	32.1	+16.8%	**+16.8%**	+16.8%	+16.8%	+16.8%	+16.8%	+16.3%
Astoria-Tillamook	15.0	+7.4%	**+7.4%**	+7.4%	+7.4%	+7.4%	+7.4%	+7.4%
Newport	45.4	+5.6%	**+5.6%**	+5.6%	+5.6%	+5.6%	+5.6%	+5.6%
Coos Bay-Brookings	34.8	-0.3%	**-0.3%**	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%
Crescent City-Eureka	23.2	+31.8%	**+43.8%**	+31.8%	+31.8%	+64.2%	-0.7%	+31.8%
Fort Bragg - Bodega Bay	11.4	+85.1%	**+98.1%**	+85.1%	+85.1%	+89.2%	+50.4%	+85.1%
San Francisco Area	56.0	+79.3%	**+79.3%**	+79.3%	+79.3%	+79.3%	-8.3%	+79.3%
SC – Mo – MB*	105.6	+30.6%	**+30.6%**	+30.6%	+30.6%	+30.6%	-29.5%	+30.6%
SB – LA – SD*	509.0	+20.0%	**+20.0%**	+20.0%	+20.0%	+20.0%	-46.9%	+20.0%
Coastwide Total	**832.4**	+24.6%	**+25.1%**	+24.6%	+24.6%	+25.6%	-31.2%	+24.6%

*Alternative 3 combines preferred ACLs with preferred management measures.

4.2.2 Cost and Net Revenue Estimates

Table 4-144 and Table 4-145 contain updated net revenue estimates for the non-whiting trawl IFQ fishery, non-whiting non-trawl IFQ fishery, limited entry fixed gear fishery, open access nearshore fishery, and open access non-nearshore fishery. Results were calculated using the estimated ex-vessel revenue data sent on June 5 and include results for Alternative 3. [9] For each alternative, the tables provide revenue, variable costs, fixed costs, variable cost net revenue (revenue minus variable cost) and total cost net revenue (revenue minus total costs) by fishery. Results are presented for each alternative. This analysis was performed by Drs. Carl Lian and Erin Steiner at the NWFSC.

Estimates of costs for each scenario were developed using the landings figures provided by consulting economist Ed Waters as well as information collected through the Northwest Fisheries Science Center's economic data collection program. For the trawl fishery, data as recent as 2014 was available for analysis. For the limited entry fixed gear and open access groundfish fishery, data from 2011-2012 was used for analysis. While our cost surveys attempt to capture a complete picture of the costs of operating a commercial fishing vessel, there are a small share of costs that are not captured by these surveys. As a result, net revenue provides an upward biased measure of profitability.

Accounting net revenues are calculated as the difference between the ex-vessel value of landings and the estimated costs incurred in achieving those landings.[10] Net revenue results are not provided for the shoreside whiting fishery for two reasons. First, whiting prices in the various scenarios for 2017 and 2018 are $.08 a pound, and during the period for which we have economic data (2011 to 2014) to estimate variable costs in the IFQ fishery, whiting prices were $.10 to $.14 per pound. Since crew members are typically paid a share of revenue with some deductions, this drop in whiting prices will likely have a substantial impact on crew costs, the largest variable cost category. However, this effect is not quantifiable at this time. Second, the NWFSC does not have sufficient economic data reflecting costs in the newly emerging non-whiting mid-water trawl fishery. Some scenarios for 2017 and 2018 assume the non-whiting mid-water trawl fishery is harvesting over 10 million pounds per year, whereas in 2014 (the most recent year of economic data) less than 2 million pounds of non-whiting were landed with mid-water gear. Given the emerging nature of this fishery, it is likely that the NWFC's data will be substantially improved when 2015 data from trawl fishery participants is collected (which is due September 1, 2016).

These two problems do not affect the other five fisheries, for which net revenue results are provided (see Table 4-144). The variable cost net revenue estimates (revenue minus variable costs) measure short-run profitability of operating a catcher vessel. Total cost net revenue (revenue minus total cost) measures the long-run profitability of operating a catcher vessel.

[9] The ex-vessel revenue estimates are derived from the Landings Distribution Model.

[10] These estimates are based on a comparison of landings revenues projected under the alternatives with landings and average costs reported in economic data reports (for IFQ sectors) and on cost-earnings surveys of samples of vessels in the remaining groundfish sectors. Values reported are "total cost net revenues," which include pro-rations of certain estimated fixed cost components in addition to the variable costs directly associated with each groundfish fishery sector.

Table 4-144. Estimates of ex-vessel revenue (output from Landings Distribution Model), variable cost net revenue (ex-vessel revenue net variable costs), and total cost net revenue (ex-vessel revenue net variable costs and fixed costs) by fishery for the alternatives. Values in dollars and for total cost net revenue as a percentage of gross revenue.

	No Action		Alt 1		Alt 2		Alt 3	
Fishery	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**
	Revenue (All Groundfish Species) by Fishery							
	Total ex-vessel revenue (output from LDM)							
Shoreside Whiting	$14,140,994	$14,126,202	$17,383,856	$17,131,628	$17,367,163	$17,116,771	$17,894,363	$17,718,185
Non-whiting Trawl	$33,249,293	$33,050,902	$36,871,144	$36,400,332	$36,784,470	$36,323,190	$49,569,755	$48,856,814
Non-whiting Fixed Gear	$5,962,295	$6,098,059	$5,957,451	$6,093,261	$5,954,506	$6,090,639	$6,112,824	$5,981,205
LE Fixed Gear	$16,019,776	$16,658,193	$16,019,776	$16,658,193	$16,019,776	$15,385,633	$16,488,277	$17,142,311
Open Access Nearshore	$4,572,078	$4,572,078	$4,572,078	$4,572,078	$4,572,078	$4,572,078	$4,696,750	$4,696,750
Open Access Non-nearshore	$4,371,036	$4,535,211	$4,371,036	$4,535,211	$4,371,036	$4,039,786	$3,984,693	$4,131,697
	Variable Cost Net Revenue							
	Ex-vessel revenue net variable costs							
Shoreside Whiting								
Non-whiting Trawl	$15,673,042	$15,495,055	$16,637,012	$16,384,893	$16,598,447	$16,350,569	$21,826,873	$21,314,787
Non-whiting Fixed Gear	$2,205,064	$2,208,058	$2,178,611	$2,181,453	$2,158,658	$2,163,694	$2,386,124	$2,393,525
LE Fixed Gear	$5,339,390	$5,554,519	$5,339,390	$5,554,519	$5,339,390	$5,178,476	$5,426,933	$5,644,981
Open Access Nearshore	$2,292,746	$2,292,746	$2,292,746	$2,292,746	$2,292,746	$2,292,746	$2,299,553	$2,299,553
Open Access Non-nearshore	$2,010,988	$2,090,042	$2,010,988	$2,090,042	$2,010,988	$1,942,539	$1,856,791	$1,928,992
	Total Cost Net Revenue By Fishery							
	Ex-vessel revenue net variable costs and fixed costs							
Shoreside Whiting								
Non-whiting Trawl	$11,090,304	$10,912,317	$12,054,273	$11,802,154	$12,015,708	$11,767,830	$17,244,135	$16,732,048
Non-whiting Fixed Gear	$1,058,410	$1,061,404	$1,031,957	$1,034,799	$1,012,004	$1,017,040	$1,239,470	$1,246,872
LE Fixed Gear	$2,875,424	$3,090,553	$2,875,424	$3,090,553	$2,875,424	$2,714,510	$2,962,967	$3,181,015
Open Access Nearshore	$389,301	$389,301	$389,301	$389,301	$389,301	$389,301	$396,108	$396,108
Open Access Non-nearshore	$314,563	$393,618	$314,563	$393,618	$314,563	$246,114	$160,366	$232,567
	Total Cost Net Revenue By Fishery as a Percentage of Gross Revenue							
Shoreside Whiting								
Non-whiting Trawl	33%	33%	33%	32%	33%	32%	35%	34%
Non-whiting Fixed Gear	18%	17%	17%	17%	17%	17%	20%	21%
LE Fixed Gear	18%	19%	18%	19%	18%	18%	18%	19%
Open Access Nearshore	9%	9%	9%	9%	9%	9%	8%	8%
Open Access Non-nearshore	7%	9%	7%	9%	7%	6%	4%	6%

Table 4-145. Estimates of costs by fishery for the alternatives.

	No Action		Alt 1		Alt 2		Alt 3	
Fishery	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**
	Variable Cost By Fishery							
	Variable costs including crew and captain compensation, fuel, ice, and bait							
Shoreside Whiting								
Non-whiting Trawl	$17,576,250	$17,555,846	$20,234,132	$20,015,439	$20,186,023	$19,972,621	$27,742,881	$27,542,027
Non-whiting Fixed Gear	$3,757,231	$3,890,001	$3,778,841	$3,911,808	$3,795,848	$3,926,945	$3,726,701	$3,587,680
LE Fixed Gear	$10,680,386	$11,103,673	$10,680,386	$11,103,673	$10,680,386	$10,207,156	$11,103,275	$11,497,329
Open Access Nearshore	$2,279,332	$2,279,332	$2,279,332	$2,279,332	$2,279,332	$2,279,332	$2,407,008	$2,397,197
Open Access Non-nearshore	$2,360,048	$2,445,168	$2,360,048	$2,445,168	$2,360,048	$2,097,247	$2,445,418	$2,202,704
	Fixed Cost By Fishery							
	Fixed costs including fishing gear, vessel and on-board equipment, repair and maintenance and moorage							
Shoreside Whiting								
Non-whiting Trawl	$4,582,739	$4,582,739	$4,582,739	$4,582,739	$4,582,739	$4,582,739	$4,582,739	$4,582,739
Non-whiting Fixed Gear	$1,146,654	$1,146,654	$1,146,654	$1,146,654	$1,146,654	$1,146,654	$1,146,654	$1,146,654
LE Fixed Gear	$2,463,966	$2,463,966	$2,463,966	$2,463,966	$2,463,966	$2,463,966	$2,463,966	$2,463,966
Open Access Nearshore	$1,903,445	$1,903,445	$1,903,445	$1,903,445	$1,903,445	$1,903,445	$1,903,445	$1,903,445
Open Access Non-nearshore	$1,696,425	$1,696,425	$1,696,425	$1,696,425	$1,696,425	$1,696,425	$1,696,425	$1,696,425
	Total Cost Net Revenue By Fishery							
	Ex-vessel revenue net variable costs and fixed costs							
Shoreside Whiting								
Non-whiting Trawl	$11,090,304	$10,912,317	$12,054,273	$11,802,154	$12,015,708	$11,767,830	$17,244,135	$16,732,048
Non-whiting Fixed Gear	$1,058,410	$1,061,404	$1,031,957	$1,034,799	$1,012,004	$1,017,040	$1,239,470	$1,246,872
LE Fixed Gear	$2,875,424	$3,090,553	$2,875,424	$3,090,553	$2,875,424	$2,714,510	$2,962,967	$3,181,015
Open Access Nearshore	$389,301	$389,301	$389,301	$389,301	$389,301	$389,301	$396,108	$396,108
Open Access Non-nearshore	$314,563	$393,618	$314,563	$393,618	$314,563	$246,114	$160,366	$232,567

4.2.3 Communities: Change in Income and Employment Impacts by Community

Socioeconomic impacts to fishing communities engaged in the groundfish fishery are evaluated based on the change in personal income (income impacts) and employment-related measures under the alternatives. These effects are a function of the projected changes in commercial and recreational fishing activity described above. Comparisons are with respect to the No Action Alternative. Impacts were estimated using NWFSC IOPAC input-output model, and they convey combined direct, indirect, and induced economic effects resulting from projected changes in recreational angling, commercial fishing, fish processing, and related input supply and support activities.

For simplification and ease of combining and comparing impacts from commercial and recreational fishing activities, coastal ports are grouped regionally. For a description of the counties included in these regions see page 378 in the 2015 EIS.

Commercial fishery and recreational fishery impacts are calculated and 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, processors, and recreational anglers under the alternatives.

Income and employment impacts from Pacific whiting caught in the at-sea catcher-processor and mothership sectors are not included in these totals. Most of the associated income and employment impacts would likely accrue in the Seattle region.

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 realm of what may have occurred over the past five to ten years. Analysis of scenarios that represent particularly large departures from baseline conditions may, therefore, result in biased impact estimates.

4.2.3.1 Income Impacts

Table 4-146 presents estimates of personal income by region due to projected commercial groundfish fishing activity under the Alternatives. Table 4-147 and Table 4-148 compare this information relative to No Action. Table 4-149 presents the estimated income impacts resulting from recreational groundfish fisheries with Table 4-150 and Table 4-151 presenting the estimates relative to No Action. As with the angler trip estimates presented above, recreational income impacts are presented in terms of the five management option scenarios that reflect different approaches to recreational fishery management in Washington and California. (See Sections 4.1.1 through 4.1.3 for a description of these management options.)

Commercial fishery income impacts:

- Coastwide estimated personal income from commercial groundfish fishing ranges from $124 million under No Action to $160 million under Alternative 3.
- Oregon accounts for about two-thirds of coastwide personal income generated by the shoreside commercial groundfish fishery and also accounts for $30 million of the estimated $35 million increase in income compared to No Action. This is because the bulk of commercial revenue comes from the IFQ fishery, which is concentrated in Oregon (and southern Washington coast) ports. Under Alternative 3 Oregon communities show a 39 percent increase from No Action under Alternative 3, or $29.7 million.

- California accounts for a 22 percent of coastwide income, most of this occurring in the two Northern California regions. There is no measurable change in personal income impacts in California under Alternatives 1 and 2. (Income impacts are reported to the nearest $100,000; the +/- signs before zero values in Table 4-147 and Table 4-148 indicate changes less than this reporting threshold.) Under Alternative 3, personal income in California communities would increase by $4.2 million. More than half of the increase in personal income in California, $2.3 million, occurs in the Crescent City-Eureka region.
- Washington Coast communities would realize $2 million more income under Alternative 3 compared to No Action, and a $1 million increase under Alternatives 1 and 2. Under Alternatives 1 and Puget Sound shows no change in personal income compared to No Action.

Table 4-146. Commercial fishery income impacts under the alternatives by community group ($mil) in 2017-2018.

Community Groups	No Action		Alternative 3*		Alternative 1		Alternative 2	
	2017	2018	2017	2018	2017	2018	2017	2018
Puget Sound	4.3	4.5	**4.6**	**4.8**	4.3	4.5	4.3	4.5
Washington Coast	13.3	13.4	**15.1**	**15.2**	14.4	14.5	14.3	14.4
Astoria-Tillamook	44.2	43.9	**69.3**	**68.8**	53.3	52.3	53.2	52.2
Newport	15.7	16.0	**18.5**	**18.5**	18.1	18.1	18.1	18.1
Coos Bay-Brookings	15.8	16.0	**17.9**	**17.8**	15.7	15.9	15.7	15.9
Crescent City-Eureka	9.3	9.3	**11.7**	**11.5**	9.2	9.3	9.2	9.3
Fort Bragg – Bodega Bay	8.7	8.8	**9.9**	**9.8**	8.7	8.8	8.7	8.8
San Francisco Area	2.3	2.3	**2.5**	**2.5**	2.3	2.3	2.3	2.3
SC – Mo – MB	6.2	6.3	**6.7**	**6.7**	6.2	6.3	6.2	6.3
SB – LA – SD	3.9	4.0	**4.1**	**4.2**	3.9	4.0	3.9	4.0
Coastwide Total	123.7	124.5	**160.3**	**159.8**	136.2	136.0	136.0	135.8

*Alternative 3 combines preferred ACLs with preferred management measures.
Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-147. Change in commercial fishery income impacts (from No Action Alternative) under the action alternatives by community group ($mil) in 2017-2018. Estimates are presented as the average annual value for the two-year management period.

Community Groups	No Action	Alternative 3*	Alternative 1	Alternative 2
	2017-18	2017-18	2017-18	2017-18
Puget Sound	*4.4*	**+0.3**	-0.0	-0.0
Washington Coast	*13.4*	**+1.8**	+1.1	+1.0
Astoria-Tillamook	*44.0*	**+25.1**	+8.8	+8.6
Newport	*15.9*	**+2.7**	+2.2	+2.2
Coos Bay-Brookings	*15.9*	**+2.0**	-0.1	-0.1
Crescent City-Eureka	*9.3*	**+2.3**	-0.0	-0.0
Fort Bragg – Bodega Bay	*8.8*	**+1.1**	+0.0	+0.0
San Francisco Area	*2.3*	**+0.1**	-0.0	-0.0
SC – Mo – MB	*6.3*	**+0.5**	+0.0	+0.0
SB – LA – SD	*4.0*	**+0.2**	+0.0	+0.0
Coastwide Total	*124.1*	**+35.9**	+12.0	+11.8

*Alternative 3 combines preferred ACLs with preferred management measures.
Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-148. Change in commercial fishery income impacts (from No Action Alternative) under the action alternatives by community group (percent).

Community Groups	No Action	Alternative 3*	Alternative 1	Alternative 2
	2017-18	2017-18	2017-18	2017-18
Puget Sound	*4.4*	**+6.6%**	-0.0%	-0.0%
Washington Coast	*13.4*	**+13.1%**	+7.9%	+7.8%
Astoria-Tillamook	*44.0*	**+56.9%**	+19.9%	+19.6%
Newport	*15.9*	**+16.8%**	+14.1%	+14.0%
Coos Bay-Brookings	*15.9*	**+12.7%**	-0.4%	-0.6%
Crescent City-Eureka	*9.3*	**+24.9%**	-0.3%	-0.3%
Fort Bragg – Bodega Bay	*8.8*	**+12.0%**	+0.2%	+0.0%
San Francisco Area	*2.3*	**+6.4%**	-0.2%	-0.3%
SC – Mo – MB	*6.3*	**+7.2%**	+0.2%	+0.2%
SB – LA – SD	*4.0*	**+5.2%**	+0.0%	+0.0%
Coastwide Total	*124.1*	**+29.0%**	+9.7%	+9.5%

*Alternative 3 combines preferred ACLs with preferred management measures.
Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Recreational fishery income impacts:

- Coastwide, income impacts vary slightly across the alternatives/options scenarios with the exception of California Option 4. Except for the California Option 4 scenario, coastwide income under the management scenarios is estimated at approximately $236 million. Under Option 4 coastwide income would be considerably less at $119 million. All of the differences occur in California regions.

- In relative terms, Northern California shows a 15 percent increase under California Option 2 under the action alternatives, or $929,000.
- All California regions show declines from No Action under California Option 4 ranging from about $96 million in the Santa Barbara to San Diego region to $542,000 in the Fort Bragg-Bodega Bay region.
- No change from No Action is estimated for California Options 1 and 3.
- The Washington Season Option would result in a small, $12,000 reduction in income compared to No Action.

Table 4-149. Recreational fishery income impacts of the alternatives and recreational management options by community group ($1,000s).

	No Action ($,000)	Alternative 3*	Alternative 1 (CA Ops 1 and 3)	Alternative 2 (CA Ops 1 and 3)	Alternatives 1 and 2 (CA Op 2)	Alternatives 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 and 3) + WA Groundfish Season Alt
Puget Sound	-	**-**	-	-	-	-	-
Washington Coast	5,826	**5,826**	5,826	5,826	5,826	5,826	5,814
Astoria-Tillamook	1,512	**1,512**	1,512	1,512	1,512	1,512	1,512
Newport	6,820	**6,820**	6,820	6,820	6,820	6,820	6,820
Coos Bay-Brookings	2,809	**2,809**	2,809	2,809	2,809	2,809	2,809
Crescent City-Eureka	3,506	**3,506**	3,506	3,506	4,370	2,642	3,506
Fort Bragg - Bodega Bay	2,894	**2,894**	2,894	2,894	2,958	2,352	2,894
San Francisco Area	20,891	**20,891**	20,891	20,891	20,891	10,679	20,891
SC – Mo – MB	20,046	**20,046**	20,046	20,046	20,046	10,827	20,046
SB – LA – SD	171,552	**171,552**	171,552	171,552	171,552	75,845	171,552
Coastwide Total	235,856	**235,856**	235,856	235,856	236,784	119,312	235,844

*Alternative 3 combines preferred ACLs with preferred management measures.
Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-150. Change in recreational fishery income impacts from No Action under the action alternatives by community group ($1,000s).

Community Groups	*No Action ($ mil)*	*Alternative 3**	Alternative 1 (CA Ops 1 and 3)	Alternative 2 (CA Ops 1 and 3)	Alternatives 1 and 2 (CA Op 2)	Alternatives 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 and 3) + WA Groundfish Season Alt
Puget Sound	-	-	-	-	-	-	-
Washington Coast	*5.8*	-	-	-	-	-	-0.0
Astoria-Tillamook	*1.5*	-	-	-	-	-	-
Newport	*6.8*	-	-	-	-	-	-
Coos Bay-Brookings	*2.8*	-	-	-	-	-	-
Crescent City-Eureka	*3.5*	**+0.3**	-	-	+0.9	-0.9	-
Fort Bragg - Bodega Bay	*2.9*	**+0.2**	-	-	+0.1	-0.5	-
San Francisco Area	*20.9*	-	-	-	-	-10.2	-
SC – Mo – MB*	*20.0*	-	-	-	-	-9.2	-
SB – LA – SD*	*171.6*	-	-	-	-	-95.7	-
Coastwide Total	*235.9*	**+0.5**	-	-	+0.9	-116.5	-0.0

*Alternative 3 combines preferred ACLs with preferred management measures.
Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-151. Change in recreational fishery income impacts from No Action under the action alternatives by community group (percent).

Community Groups	*No Action ($ mil)*	*Alternative 3**	Alternative 1 (CA Ops 1 and 3)	Alternative 2 (CA Ops 1 and 3)	Alternatives 1 and 2 (CA Op 2)	Alternatives 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 and 3) + WA Groundfish Season Alt
Puget Sound	-	-	-	-	-	-	-
Washington Coast	*5.8*	-	-	-	-	-	-0.2%
Astoria-Tillamook	*1.5*	-	-	-	-	-	-
Newport	*6.8*	-	-	-	-	-	-
Coos Bay-Brookings	*2.8*	-	-	-	-	-	-
Crescent City-Eureka	*3.5*	**+9.2%**	-	-	+24.7%	-24.6%	-
Fort Bragg - Bodega Bay	*2.9*	**+7.0%**	-	-	+2.2%	-18.7%	-
San Francisco Area	*20.9*	-	-	-	-	-48.9%	-
SC – Mo – MB*	*20.0*	-	-	-	-	-46.0%	-
SB – LA – SD*	*171.6*	-	-	-	-	-55.8%	-
Coastwide Total	*235.9*	**+0.2%**	-	-	+0.4%	-49.4%	-0.0%

*Alternative 3 combines preferred ACLs with preferred management measures.
Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

4.2.3.2 Employment Impacts

Table 4-152 shows projected employment impacts due to the commercial groundfish fishery under the alternatives; Table 4-153 and Table 4-154 show the impacts relative to No Action. Table 4-155 shows projected employment impacts due to the recreational groundfish under the alternatives; Table 4-156 and Table 4-157 show the impacts relative to No Action.

Commercial fishery employment impacts:

- Averaging employment estimates for 2017 and 2018, No Action is expected to result in 2,015 jobs; the action alternatives would result in higher employment, with Alternative 1 resulting in 2,155 jobs, 2,153 jobs for Alternative 2, and. 2,439 jobs for Alternative 3. Alternative 3 combines the preferred ACLs with preferred management measures.
- Similar to income, the largest job increases under the action alternatives are expected on the Washington Coast and Oregon communities. Southern Oregon and California communities for the most part show fewer resulting jobs impacts compared to No Action. Alternative 2 would result in 2 fewer jobs in this region compared to No Action; Alternative 1 would result in one less job. In contrast, Alternative 3 would result in an increase of 75 jobs in Southern Oregon and California
- Under No Action 55 percent of jobs are associated with Oregon ports, 33 percent in California, and 12 percent in Washington.
- Compared to No Action, under Alternative 1 jobs in Oregon would increase by 127 and in Washington increase by 14 jobs. California shows no appreciable change in the number of jobs (less than one job).
- Compared to No Action, under Alternative 2 jobs in Oregon would increase by 125 and in Washington increase by 13 jobs. California shows no appreciable change in the number of jobs (less than one job).
- Compared to No Action, under Alternative 3 jobs in Oregon would increase by 345, in Washington increase by 25 jobs, and in California increase by 54 jobs.

Recreational fishery employment impacts:

- Averaging 2017 and 2018, Under No Action 3,372 jobs would result. The differences among the alternatives are relatively small (with the exception of under California Option 4).
- California Option 4 is estimated to result in 1,743 fewer jobs—about half the number under No Action. Most of this difference from No Action would occur in Southern California.

Table 4-152. Commercial fishery employment impacts under the alternatives by community group (number of jobs).

Community Groups	No Action		Alternative3*		Alternative 1		Alternative 2	
	2017	2018	2017	2018	2017	2018	2017	2018
Puget Sound	48	50	**51**	**53**	48	50	48	50
Washington Coast	180	183	**203**	**205**	194	196	194	196
Astoria-Tillamook	556	553	**852**	**847**	664	652	662	651
Newport	219	222	**249**	**250**	245	246	244	246
Coos Bay-Brookings	341	344	**363**	**363**	340	343	340	342
Crescent City-Eureka	152	152	**183**	**181**	151	152	151	152
Fort Bragg – Bodega Bay	162	165	**180**	**179**	162	165	162	165
San Francisco Area	46	47	**48**	**48**	46	47	46	47
SC – Mo – MB	203	204	**207**	**208**	203	204	203	204
SB – LA – SD	100	102	**104**	**105**	100	102	100	102
Coastwide Total	2,008	2,022	**2,441**	**2,438**	2,154	2,157	2,151	2,155

*Alternative 3 combines preferred ACLs with preferred management measures.
Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-153. Change in commercial fishery employment impacts (from No Action Alternative) under the action alternatives by community group (number of jobs).

Community Groups	No Action	Alternative 3*	Alternative 1	Alternative 2
	2017-18	2017-18	2017-18	2017-18
Puget Sound	*49*	**+2.8**	-0.0	-0.0
Washington Coast	*181*	**+22.5**	+13.5	+13.4
Astoria-Tillamook	*554*	**+295.2**	+103.4	+101.9
Newport	*220*	**+29.4**	+25.0	+24.9
Coos Bay-Brookings	*342*	**+20.6**	-1.1	-1.5
Crescent City-Eureka	*152*	**+29.7**	-0.3	-0.4
Fort Bragg – Bodega Bay	*164*	**+15.5**	+0.0	-0.2
San Francisco Area	*47*	**+1.6**	-0.1	-0.1
SC – Mo – MB	*203*	**+4.1**	+0.3	+0.3
SB – LA – SD	*101*	**+3.6**	+0.0	+0.0
Coastwide Total	*2,015*	**+424.8**	+140.8	+138.3

*Alternative 3 combines preferred ACLs with preferred management measures.
Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-154. Change in commercial fishery employment impacts (from No Action Alternative) under the action alternatives by community group (percent).

Community Groups	No Action	Alternative 3*	Alternative 1	Alternative 2
	2017-18	2017-18	2017-18	2017-18
Puget Sound	*49*	**+5.6%**	-0.0%	-0.0%
Washington Coast	*181*	**+12.4%**	+7.5%	+7.4%
Astoria-Tillamook	*554*	**+53.2%**	+18.6%	+18.4%
Newport	*220*	**+13.3%**	+11.4%	+11.3%
Coos Bay-Brookings	*342*	**+6.0%**	-0.3%	-0.4%
Crescent City-Eureka	*152*	**+19.5%**	-0.2%	-0.3%
Fort Bragg – Bodega Bay	*164*	**+9.4%**	+0.0%	-0.2%
San Francisco Area	*47*	**+3.3%**	-0.1%	-0.2%
SC – Mo – MB	*203*	**+2.0%**	+0.2%	+0.2%
SB – LA – SD	*101*	**+3.5%**	+0.0%	+0.0%
Coastwide Total	*2,015*	**+21.1%**	+7.0%	+6.9%

*Alternative 3 combines preferred ACLs with preferred management measures.
Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-155. Recreational fishery employment impacts under the alternatives and recreational management options by community group (number of jobs).

Community Groups	*No Action*	Alternative 3*	Alternative 1 (CA Ops 1 and 3)	Alternative 2 (CA Ops 1 and 3)	Alternatives 1 and 2 (CA Op 2)	Alternatives 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 and 3) + WA Groundfish Season Alt
Puget Sound	-	**-**	-	-	-	-	-
Washington Coast	161	**161**	161	161	161	161	161
Astoria-Tillamook	42	**42**	42	42	42	42	42
Newport	174	**174**	174	174	174	174	174
Coos Bay-Brookings	74	**74**	74	74	74	74	74
Crescent City-Eureka	57	**63**	57	57	71	43	57
Fort Bragg - Bodega Bay	47	**50**	47	47	48	38	47
San Francisco Area	283	**283**	283	283	283	145	283
SC – Mo – MB*	336	**336**	336	336	336	181	336
SB – LA – SD*	2,558	**2,558**	2,558	2,558	2,558	1,131	2,558
Coastwide Total	3,732	**3,741**	3,732	3,732	3,748	1,989	3,732

*Alternative 3 combines preferred ACLs with preferred management measures.
Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-156. Change in recreational fishery employment impacts from No Action under the action alternatives by community group (number of jobs).

Community Groups	*No Action*	Alternative 3*	Alternative 1 (CA Ops 1 and 3)	Alternative 2 (CA Ops 1 and 3)	Alternatives 1 and 2 (CA Op 2)	Alternatives 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 and 3) + WA Groundfish Season Alt
Puget Sound	-	-	-	-	-	-	-
Washington Coast	*161*	-	-	-	-	-	-0
Astoria-Tillamook	*42*	-	-	-	-	-	-
Newport	*174*	-	-	-	-	-	-
Coos Bay-Brookings	*74*	-	-	-	-	-	-
Crescent City-Eureka	*57*	+5	-	-	+14	-14	-
Fort Bragg - Bodega Bay	*47*	+3	-	-	+1	-9	-
San Francisco Area	*283*	-	-	-	-	-139	-
SC – Mo – MB*	*336*	-	-	-	-	-154	-
SB – LA – SD*	*2,558*	-	-	-	-	-1,427	-
Coastwide Total	*3,732*	+9	-	-	+15	-1,743	-0

*Alternative 3 combines preferred ACLs with preferred management measures.
Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-157. Change in recreational fishery employment impacts from No Action under the action alternatives by community group (percent).

Community Groups	*No Action*	*Alternative 3**	Alternative 1 (CA Ops 1 and 3)	Alternative 2 (CA Ops 1 and 3)	Alternatives 1 and 2 (CA Op 2)	Alternatives 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 and 3) + WA Groundfish Season Alt
Puget Sound	-	-	-	-	-	-	-
Washington Coast	*161*	-	-	-	-	-	-0.1%
Astoria-Tillamook	*42*	-	-	-	-	-	-
Newport	*174*	-	-	-	-	-	-
Coos Bay-Brookings	*74*	-	-	-	-	-	-
Crescent City-Eureka	*57*	**+9.2%**	-	-	+24.7%	-24.6%	-
Fort Bragg - Bodega Bay	*47*	**+7.0%**	-	-	+2.2%	-18.7%	-
San Francisco Area	*283*	-	-	-	-	-48.9%	-
SC – Mo – MB*	*336*	-	-	-	-	-46.0%	-
SB – LA – SD*	*2,558*	-	-	-	-	-55.8%	-
Coastwide Total	*3,732*	**+0.2%**	-	-	+0.4%	-46.7%	-0.0%

*Alternative 3 combines preferred ACLs with preferred management measures.
Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

4.2.3.3 Other Impacts

The 2015 EIS (PFMC and NMFS 2015) discusses other socioeconomic impacts. Impacts to processors can be inferred from commercial ex-vessel revenue estimates, which represent processor purchases. Quantitatively, the dollar values in Table 4-135 represent these purchases and the relative impacts are the same as described above in Section 4.2.1.1.

The 2015 EIS also briefly discusses effects related to non-market and non-use (NMNU) values. These are non-consumptive uses that range from recreational enjoyment of the environment (e.g., wildlife viewing) to option or existence value (benefit derived from the knowledge that these resources will be available in the future or simply that environmental quality is maintained). However, it is not possible to quantify how the proposed action would affect these values. Generally speaking, the proposed action must comply with MSA National Standards and the goals and objectives enumerated in the FMP. All of the alternatives are consistent with the resulting harvest management framework, which has as its goal maintaining stocks at their target biomasses. This goal may support realization of NMNU values.

Fishery management regulations can indirectly affect vessel safety, either because of disinvestment by vessel operators due to low revenue or incentives that causes them to go out in hazardous weather. No regulatory changes under the proposed action have been identified that would have a substantial impact on these factors. Furthermore, much of the groundfish fishery has transitioned to catch shares management either through the IFQ program, co-ops for the at-sea Pacific whiting fishery, or individual vessel allocations in the limited entry fixed gear sablefish fishery. A study reported to the Council in the 2015 State of the California Current Report (Agenda Item E.1.b, NMFS Report 2, March 2015) found that the transition to catch shares reduced the probability of a fisherman taking a fishing trip on a high wind day.

Management of the fishery may also affect human wellbeing but it is very difficult to directly measure these effects. NOAA's California Current Integrated Ecosystem Assessment program has been developing indicators of human wellbeing, which are reported to the Council annually in the aforementioned report. Past EISs, including the 2015 EIS, have also presented demographic data and assessment of community vulnerability to represent wellbeing. While this information can help distinguish among communities in terms of their status, the effect of the alternatives wellbeing can only be inferred from projected changes in personal income in communities.

4.2.3.4 Impact Summary

It is important to note that the commercial and recreational impact estimates are not necessarily comparable. The underlying assumption in both the commercial and recreational impact estimates is that there is no substitution for either activity. On the commercial side, if a management alternative reduces groundfish landings, vessels have no ability to substitute towards some other fishing opportunity, nor do they have an ability to substitute towards some other non-fishing occupation such as agriculture, construction, education, hospitality, etc. Likewise, on the commercial side, processors have no ability to substitute towards some other source of fish in the production process such as foreign or Alaska imports, nor do processors have ability to substitute towards non-fishing opportunities. On the recreational side, the underlying assumption is that anglers participating in recreational fishing have no other recreational substitution possibilities within the region. If a management alternative reduces the number of angler trips for groundfish, there is no ability for anglers to substitute towards some other fishing activity such as targeting tuna or salmon, nor is there an ability to substitute towards some other non-fishing related activity such as scuba diving, camping, etc. The underlying assumption is that if recreational groundfish trips are reduced, then all spending by anglers for food, fuel, tackle, etc. related to these trips would essentially leave the region. Currently, there is a dearth of information about the likelihood with which commercial anglers would substitute towards some other business opportunity, and the same is true for the likelihood of substitution by recreational anglers.

Nevertheless, it is not unreasonable to expect that recreational anglers may more easily substitute towards some other recreational opportunity than commercial anglers can find new business opportunities. Consequently, caution should be used in direct comparison between commercial and recreational impacts.

Recognizing the caveats discussed above, Table 4-158 displays recreational and commercial income impacts for the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3 side by side. These tables also show the relative share of commercial versus recreational income impacts by community.

- The **No Action Alternative** is estimated to result in $124 million in commercial impacts and $236 million in recreational income impacts.
- **Alternative 1** is estimated to result in $136 million in commercial impacts and with California recreational Options 1 or 3, $236 million in recreational income impacts—the same as No Action.
- **Alternative 2** is estimated to result in $136 million in commercial impacts and with California recreational Options 1 or 3, $236 million in recreational income impacts—the same as No Action.
- **Alternative 3** is estimated to result in $160 in commercial impacts and $236 million in recreational income impacts. Alternative 3 combines preferred ACLs with preferred management measures.

The difference between the alternatives as measured by commercial fishery ex-vessel revenue occur mainly in the shoreside IFQ fishery.

The recreational fishery is a major contributor to coastwide personal income. Taking the no action alternative as an example, $172 million in recreational income impacts is occurs in the Santa Barbara to San Diego region. More generally, the recreational fishery accounts for the vast majority of income impacts in communities from San Francisco to San Diego. This is a function of both the large income impacts from recreational fishing and the relatively small income impacts derived from commercial fishing. The reverse is true for more northerly communities.

California recreational management Option 4 shows the biggest difference with respect recreational fishery income impacts. Based on Table 4-149, California Option 4 would result in $118 million less personal income compared to California Option 2 under either action alternative, representing a large proportion of the coastwide combined personal income impacts under any of the alternatives.

As described in Section 4.1.4, Council adopted higher ACLs for canary, darkblotched, and POP than what had been previously analyzed under Alternative 3. Additionally, slight increases to the off-the-top deductions to the ACL were made for chilipepper and bocaccio, which resulted in slightly different trawl and non-trawl allocations for these species. The changes are not expected to substantially affect the estimates of ex-vessel revenue, net revenue, personal income, and employment summarized in this section. Therefore, the analysis of Alternative 3, the preferred alternative, was not re-run. A qualitative description of the expected socio-economic benefits of the final ACLs, compared to the previous ACLs under Alternative 3, is provided below.

Increasing the darkblotched and POP ACLs is expected to primarily benefit the trawl fisheries since catch in the non-trawl sectors has been well below the allocation (see WCGOP Groundfish Mortality Reports). For the at-sea sectors, the increased allocations will increase the likelihood that the sectors will attain their respective whiting allocations. For the shorebased IFQ program, the increased POP allocation is expected to facilitate the mid-water rockfish trawl strategy for yellowtail and widow rockfish. The increases for both POP and darkblotched are expected to provide increased access to whiting and other slope species. The buffer concept under the preferred alternative could help further reduce bycatch constraints in at-sea whiting sectors since the sector could receive more than their original Amendment 21 allocations if an unforeseen catch event occurs and fish are reallocated inseason. The buffer could also provide relief to IFQ vessel owners that exceed their annual vessel limits since releasing the buffer would increase the annual vessel

limits. The higher canary rockfish ACLs in combination with the buffer is expected to benefit all sectors if an unforeseen catch event occurs.

Table 4-158. Comparison of projected personal income from recreational and commercial groundfish fisheries by community group under the No Action Alternative.

Community Groups	No Action		Alternative 1*		Alternative 2*		Alternative 3‡	
	Commercial	Recreational	Commercial	Recreational	Commercial	Recreational	Commercial	Recreational
	$ millions							
Puget Sound	4.4	-	4.4	-	4.4	-	4.7	-
Washington Coast	13.4	5.8	14.4	5.8	14.4	5.8	15.1	5.8
Astoria-Tillamook	44.0	1.5	52.8	1.5	52.7	1.5	69.1	1.5
Newport	15.9	6.8	18.1	6.8	18.1	6.8	18.5	6.8
Coos Bay-Brookings	15.9	2.8	15.8	2.8	15.8	2.8	17.9	2.8
Crescent City-Eureka	9.3	3.5	9.3	3.5	9.3	3.5	11.6	3.8
Fort Bragg – Bodega Bay	8.8	2.9	8.8	2.9	8.8	2.9	9.8	3.1
San Francisco Area	2.3	20.9	2.3	20.9	2.3	20.9	2.5	20.9
SC – Mo – MB	6.3	20.0	6.3	20.0	6.3	20.0	6.7	20.0
SB – LA – SD	4.0	171.6	4.0	171.6	4.0	171.6	4.2	171.6
Coastwide Total	124.1	235.9	136.1	235.9	135.9	235.9	160.1	236.4
	Percent of coastwide impacts							
Puget Sound	4%	-	3%	-	3%	-	3%	-
Washington Coast	11%	2%	11%	2%	11%	2%	9%	2%
Astoria-Tillamook	35%	1%	39%	1%	39%	1%	43%	1%
Newport	13%	3%	13%	3%	13%	3%	12%	3%
Coos Bay-Brookings	13%	1%	12%	1%	12%	1%	11%	1%
Crescent City-Eureka	7%	1%	7%	1%	7%	1%	7%	2%
Fort Bragg – Bodega Bay	7%	1%	6%	1%	6%	1%	6%	1%
San Francisco Area	2%	9%	2%	9%	2%	9%	2%	9%
SC – Mo – MB	5%	8%	5%	8%	5%	8%	4%	8%
SB – LA – SD	3%	73%	3%	73%	3%	73%	3%	73%
Coastwide Total	100%	100%	100%	100%	100%	100%	100%	100%

*California recreational options 1 and 3.

‡Alternative 3 combines preferred ACLs with preferred management measures.

Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

5. Cumulative Effects

The purpose of a cumulative effects analysis is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective, but rather, the intent is to focus on those effects that are truly meaningful.

The EIS for 2015-2016 harvest specifications and management measures and Amendment 24 (PFMC and NMFS 2015) includes an analysis of the cumulative effects of biennial management under the PCGFMP framework.[11] That EIS addresses the significance of the expected cumulative impacts as they relate to the federally-managed groundfish fishery. This analysis is incorporated by reference and summarized here. New information indicating potential changes in cumulative effects is also presented.

5.1 Scope of Cumulative Effects

Affected resources are described in Chapter 3 of the 2015 EIS. Updated information may be found in the 2016 Groundfish SAFE document. The geographic scope of these affected resources is the EEZ off Washington, Oregon, and California and fishing communities participating the groundfish fishery. The temporal scope of the cumulative effects analysis in the 2015 EIS includes past and actions having continuing effects on the resources within the scope of the proposed actions and reasonably foreseeable future actions affecting resources within the scope of the proposed actions. Since the proposed actions evaluated in the 2015 EIS includes the management framework described in the PCGFMP as amended by Amendment 24, the same geographic and temporal scope applies to the current proposed actions.

5.2 Effects of Past, Present, and Reasonably Foreseeable Future Actions Other than the Proposed Actions

5.2.1 Fishery-Related

The EIS identifies and describes fishery management actions contributing to cumulative effects: 1) past groundfish harvest specifications and management measures, 2) review of groundfish essential fish habitat designation and mitigation measures, 3) the Council's Fishery Ecosystem Plan, 4) regulatory adjustments to the trawl rationalization program, 5) seabird avoidance measures, and 6) regulation of fisheries for species other than groundfish. These actions have progressed since the 2015 EIS was prepared. Information on regulatory implementation of actions in these categories and initiation of new actions can be found on the NMFS WCR website and the Council's website. Another source of information for ongoing actions is Agenda Item I.1.a, NMFS Report 1 (November 2015, which presents NMFS's rulemaking plan for 2015-2016 for groundfish and halibut fisheries. These actions are briefly summarized below.

Regulations for the 2015-2016 harvest specifications and management measures were implemented in early 2015. NMFS also established a process to allow the fishery to proceed before the regulations came into force. Various other regulatory actions established Pacific whiting and Pacific halibut allocations and inseason management to achieve ACLs. Other measures of a primarily technical nature, such as specifications for VMS and regulations for midwater trawl fisheries, were implemented. The Council is considering authorizing a new midwater recreational fishery off Oregon, which would be managed under the biennial process. In addition, Amendment 24 to the PCGFMP was approved.

[11] This EIS is available at http://www.westcoast.fisheries.noaa.gov/publications/nepa/groundfish/1516spexfeis.pdf.

The trawl rationalization program (shoreside IFQ and at-sea co-ops) is subject to ongoing regulatory actions that are technical fixes, intended to make the program function more efficiently, or address allocations affecting IFQ. These measures include fishery monitoring measures, and divestiture of excess IFQ.

The National Marine Fisheries Service (NMFS) has developed a preliminary draft environmental impact statement (EIS), evaluating proposed changes to gear requirements in the trawl catch share program. The EIS covers a suite of eight gear issues, as follows: (1) minimum mesh sizes, (2) measuring mesh size, (3) codend regulations, (4) selective flatfish trawl, (5) chafing gear, (6) multiple gears on board, (7) fishing in multiple management areas, and (8) fishing before previous catch is stowed. The purpose of this action is to provide more flexibility in the configuration and use of gear for participants in the trawl rationalization program, while at the same time ensuring that conservation objectives are met. Such flexibility is expected to foster innovation and allow for more optimal harvest operations. Benefits may include increased efficiency through reduced costs and increased revenues. The Council chose a final preferred alternative for this action at its March 2016 meeting.

Various proposals related to fishery monitoring are in the implementation phase or under Council consideration. These include a rulemaking to implement an electronic monitoring (EM) program for the limited entry (LE) midwater trawl vessel in the Pacific whiting fishery that fish in the mothership and Shorebased IFQ Program, and an EM program for LE trawl vessels that use fixed gear to harvest fish under the Shorebased IFQ program. In addition, the Council is considering new requirements to monitor vessel movements, and continuing to develop an electronic monitoring program for the non-whiting midwater trawl and bottom trawl fisheries under the Shorebased IFQ Program.

The Seabird Avoidance Program for the Pacific coast groundfish fishery became effective December 18, 2015 (80 FR 71975). This imposes a streamer line requirement for fixed gear fisheries.

Comprehensive Ecosystem Based Amendment 1 was approved on March 10, 2016, and pursuant regulations became effective on May 4, 2016. These measures prevent the development of fisheries targeting certain forage species without first undergoing a careful review in the Council process. Incidental landings of these species in currently authorized fisheries is also limited.

NMFS is also evaluating the effect of the groundfish fishery on ESA-listed salmonids. In April, June, and September 2015 and March 2016 NMFS briefed the Council on elements to be considered in the consultation including mitigation measures. The consultation may be completed before or during the 2017-2018 management period. New mitigation measures could be implemented. The USFWS intends to reinitiate section 7 consultation on the effects of the groundfish fishery on the endangered short-tail albatross, and following recommendation from the Council's ESA Workgroup, NMFS will be reinitiating consultation on eulachon for the groundfish fishery.

NMFS expects to implement regulations in 2016 to define which Pacific whiting landings count towards IFQ holdings and divestiture. Also in 2016, regulations related to the sablefish fixed gear fishery are planned for implemented. This includes allowing joint registration of a vessel to both a limited entry trawl and fixed gear permit endorsements, allowing IFQ and fixed gear vessel allocations to be fished simultaneously.

5.2.2 Not Fishery-Related

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 may cause the biggest climate change-related impact on fisheries in the foreseeable future. No other non-

fishing actions discernably affecting the resources within the scope of the proposed action have been subsequently identified.

5.2.3 Summary of Effects of Past, Present, and Reasonably Foreseeable Future Actions not Identified in the 2015 EIS

The 2015 EIS evaluated direct, indirect, and cumulative effects to the following environmental components:

- Groundfish Stocks
- Socioeconomic Environment
- Essential Fish Habitat
- California Current Ecosystem
- Protected Species
- Non-groundfish Species

Table 5-1 and Table 5-2 are excerpted from see Section 4.15.6 in the 2015 EIS. Table 5-1 summarizes the effects of past, present and reasonably foreseeable future actions and Table 5-2 summarizes the cumulative, or combined effects, of the action and the other external actions. The effects summarized in these tables are relevant to the current proposed action.

Table 5-1. Summary effects of past, present, and reasonably foreseeable future actions on the environmental components evaluated in the 2015-2016 Groundfish Harvest Specifications EIS (Table 4-234).

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; however, some stocks remain 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; climate change may reduce local abundance
Socioeconomic (Human Communities)	**Mixed (Low Positive and Low Negative)** Fishery resources have supported profitable industries but management measures associated with stock rebuilding have curtailed fishing opportunities; trawl rationalization increased operational flexibility	**Mixed (Low Positive and Low Negative)** Stock status and yield have allowed fishery revenues to increase; falling participation and agglomeration may concentrate revenues in fewer communities	**Low Positive** No actions are identified that would accelerate falling participation and agglomeration	**Low to Moderate Positive** Stock status and yield have allowed fishery revenues to increase; falling participation and agglomeration may concentrate revenues in fewer communities
Essential Fish Habitat	**Low to Moderate Positive** Evidence suggests that trawl fishing effort is falling; past actions have mitigated adverse effects of fishing on EFH	**Mixed (Low Positive and Low Negative)** Trawl fishing effort stable; ongoing actions continue to mitigate adverse effects of fishing on EFH; Trawl RCA boundary change proposed	**Low Positive** Trawl fishing effort not likely to increase; future actions likely to enhance the mitigation of adverse effects of fishing on EFH	**Low to Moderate Positive** Trawl fishing effort not likely to increase; future actions likely to enhance the mitigation of adverse effects of fishing on EFH
California Current Ecosystem	**Mixed (Low Positive and Low Negative)** Based on simulations, the development of fisheries has had both positive and negative indirect effects on ecosystem attributes	**Neutral** Ongoing prosecution of fisheries at current levels not expected to change ecosystem attributes from the baseline; other actions likely have negligible impacts	**Mixed (Low Positive and Low Negative)** Ongoing prosecution of fisheries at current levels not expected to change ecosystem attributes from the baseline; climate change likely to have moderate to substantial impacts	**Neutral** Ongoing prosecution of fisheries at current levels not expected to change ecosystem attributes from the baseline; climate change likely to have moderate to substantial impacts

Table 5-1 (continued). Summary effects of past, present, and reasonably foreseeable future actions on the environmental components evaluated in the 2015-2016 Groundfish Harvest Specifications EIS.

Environmental Component	Past Actions	Present Actions	Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, Future Actions
Protected Species	**Mixed (Low Positive and Low Negative)** Protected species take modest in groundfish fisheries and documented through observer program; requirements of ESA, and MMPA implemented	**Low Positive** Most populations increasing; ESA and MMPA mitigation addressed and ongoing	**Low Positive** Most populations increasing; future adverse effects likely to be addressed through ESA and MMPA	**Low Positive** Most populations increasing; adverse effects likely to be addressed through ESA and MMPA
Non-groundfish Species	**Neutral** Bycatch in groundfish fisheries is negligible	**Neutral** Bycatch in groundfish fisheries is negligible	**Neutral** Bycatch in groundfish fisheries is negligible	**Neutral** Bycatch in groundfish fisheries is negligible

Table 5-2. Summary of the cumulative effects of the proposed actions in the 2015-2016 Groundfish Harvest Specifications EIS (Table 4 235).

Affected Resources	Baseline*	Past, Present, and Reasonably Foreseeable Future Actions	2015-2016 Harvest Specifications and Management Measures	Amendment 24 Proposed Action	Cumulative Effects
Groundfish Stocks	Low to Moderate Positive (Section 3.1)	Low Positive	Low Positive	Neutral	Low Positive
Human Communities	Mixed (Low Positive and Low Negative) Section 3.2)	Mixed (Low to Moderate Positive)	Low Positive	Mixed (Low Positive and Low Negative)	Low Positive
Essential Fish Habitat	Low to Moderate Positive (Section 3.3)	Low Moderate Positive	Mixed (Low Positive and Low Negative)	Neutral	Low to Moderate Positive
California Current Ecosystem	Neutral (Section 3.4)	Neutral	Neutral	Neutral	Neutral
Protected Species	Low Positive (Section 3.5)	Low Positive	Neutral	Neutral	Low Positive
Non-Groundfish Stocks	Neutral (Section 3.6)	Neutral	Neutral	Neutral	Neutral

* Although the temporal scope of past and present actions for the affected resources encompasses actions that occurred after FMP implementation (1982), the baseline period is 2003 to 2012, which is the temporal context within which affected resources are described in Chapter 3.

The 2015 EIS concluded that cumulative effects to these environmental components ranged from neutral to moderately positive. The direct and indirect effects of the current proposed actions are disclosed and discussed in Sections 2 through 3 of this document. Those effects are within the scope of those identified for setting harvest specifications and implementing related management measures consistent with the PCGFMP framework as analyzed in the 2015 EIS. The description of actions other than the proposed actions as updated above indicates that the context and intensity of resulting impacts are not substantially different than what was disclosed in the 2015 EIS.

6. Consistency of the Proposed Actions with the Magnuson-Stevens Act 10 National Standards for Fishery Conservation and Management

An FMP or plan amendment and any pursuant regulations must be consistent with ten national standards contained in the MSA (§301). These are described below.

National Standard 1 states that conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the OY 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 (FMP 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 Groundfish FMP 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.

Because of past overfishing, seven groundfish stocks are currently declared overfished. Widow rockfish was determined to be rebuilt in 2011 and was no longer managed under a rebuilding plan beginning in 2013. Petrale sole was declared overfished in 2010, based on a revision to the OY harvest management framework that incorporates estimates of B_{MSY} of $B_{25\%}$ and MSST of $B_{12.5\%}$ for flatfish. Petrale sole was rebuilt in 2015, but was managed under its rebuilding plan for the 2015-2016 biennial cycle. For the 2017-2018 period it is proposed to be managed under the default HCR and resulting specifications for healthy stocks. Canary rockfish was declared rebuilt in 2015 and will be managed according to [insert preferred HCR here] for the 2017-2018 period. The 2015 darkblotched rockfish assessment projects the stock will be rebuilt by the start of 2016 before new harvest specifications are

implemented in 2017. The Council considered continuing the rebuilding plan HCR into the next biennial period or implementing the default HCR for healthy stocks based on its rebuilt status [Insert preferred HCR here]

Bocaccio rockfish south of 40°10' N. lat., cowcod, Pacific ocean perch, and yelloweye rockfish are the remaining overfished species currently managed under the PCGMFP (assuming darkblotched is declared rebuilt in 2016). These stocks will be managed under the default HCRs specified in their rebuilding plans.

Section 304(e) introduces a tradeoff formulated as specifying a time to rebuild "as short as possible, taking into account the status and biology of any overfished stocks, the needs of fishing communities, … and the interaction of the overfished stock of fish within the marine ecosystem…" The Council took into account this tradeoff for overfished stocks and, based on the best available science (the most recent stock assessment results), did not consider alternative HCRs for the four overfished stocks enumerated above.

National Standard 2 states that conservation and management measures shall be based on 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. The supporting science is discussed below.

The harvest specifications (specifically, ACLs) considered under the proposed action (the action alternatives, including the Preferred Alternative), are based on the most recent stock assessments, 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). 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.

Finally, 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. The 2016 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 NWFSC has developed a model application, called IOPAC, for estimating personal income impacts of commercial fishing on the West Coast. This model is documented in Appendix A.

National Standard 3 states that, 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.

Groundfish ACLs are set for management units, which include stocks, stock complexes, or geographic subdivisions thereof. Stock complexes group co-occurring species, many of which have not been formally assessed. The 2016 Groundfish SAFE document describes how ACLs for stock complexes are

developed, based on ABC 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.

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.

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.

National Standard 4 states that 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 fishers, such allocation shall be (A) fair and equitable to all such fishers; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

The proposed measures will not discriminate between residents of different states. Allocation decisions are also made as part of the biennial harvest specifications process for those stocks for which formal allocations have not been established under the FMP. Chapter 3 describes these allocation decisions. Emphasis is placed on equitable division, while achieving conservation goals. Decision-making on these 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.

National Standard 5 states that 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.

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 states that conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

Management measures reflect differences in catch, and, in particular, bycatch, of overfished species, among different fisheries. For example, different RCA configurations are established for different gear types (trawl versus fixed gear), and the catch control tools also differ. For example, 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 open

access sector, cumulative trip limits are used for particular management units and/or during certain times of the year. Recreational fisheries are managed with area closures and bag limits that are proposed by the states and are appropriate to the catches and characteristics of each state's recreational fishery.

National Standard 7 states that conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

Generally, by coordinating management, monitoring, and enforcement activities between the three West Coast states, duplication and, thus, cost are minimized. Chapter 3 evaluates proposed management measures in detail, including consideration of associated costs and duplication.

National Standard 8 states that 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 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 2015-2016 harvest specifications and management measures and Amendment 24 to the PCGFMP (PFMC and NMFS 2015) evaluates the long-term effects of alternative harvest management policies on 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 Section 4.2). These effects were taken into account in choosing the Preferred Integrated Alternative (incorporating harvest specifications and related management measures). Target species catch for each alternative is projected based on these management measures; this allows an estimate of resulting ex-vessel revenue and personal income impacts at the community level (with the port group area the unit of analysis for community impacts).

National Standard 9 states that 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. As noted above, 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 open access 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.

National Standard 10 states that conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

RCAs may affect safety if more vessels elect to fish seaward of the closed areas and are more exposed to bad weather conditions. Individual accountability under catch share management has resulted in vessels more often fishing seaward of the RCA to avoid catch of species such as canary and yelloweye rockfish, for which the allocations and resulting available QP are limited. As harvesters gain experience with the management program, they may be able to develop opportunities to fish shoreward of RCAs, while avoiding catch of these species, resulting in more inshore fishing. A study reported to the Council in the 2015 Annual State of the California Current Ecosystem Report (California Current Integrated Ecosystem Assessment Team 2015) found that since catch share (IFQ) management was implemented in the groundfish fishery "the overall average annual rate of fishing on high wind days to decrease by 85%, even accounting for the influence of safety trainings and other types of Coast Guard regulations that have varied over time" (p. 19).

The expiration of the moratorium on quota share trading may lead to further capacity reduction and increased profits in the trawl sector. This may result in more investment in vessels and equipment that would enhance safety. Less efficient vessels are expected to leave the trawl fishery as part of this consolidation, which may eliminate older, less safe vessels.

For vessels electing to increase the amount of time fishing seaward of RCAs, implementing a VMS capable of sending distress calls could provide some mitigation. Although units with this capability have been approved for use, vessel owners are not required to purchase a unit with this capability. Also, by providing near real-time vessel position data, VMS could aid in search and rescue operations.

7. Consistency of the Proposed Actions with Other Applicable MSA Provisions

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 groundfish FMP 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. This process is ongoing; the Council is scheduled to choose a preferred alternative in early 2017. 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).

NMFS will compile any additional necessary information required to be contained in a fishery impact statement, Section 303a(9), for Amendment 27.

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