Agenda Item E.6
Attachment 1 (**Electronic Only**)
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DRAFT

Phase 2 Stock Definitions: Analysis of the Preliminary Preferred Alternative for 47 Groundfish Species Adopted under Alternative 1 in March 2025.

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The following is a standard document produced by the Pacific Fishery Management Council (Council) and the National Marine Fisheries Service (NMFS) West Coast Region to provide the analytical background for decision-making.

Abstract:

Under its on-going Stock Definitions agenda item, the Pacific Fishery Management Council (Council) is evaluating those stocks currently managed in the Pacific Coast Groundfish Fishery Management Plan (FMP) to identify and define stocks in need of conservation and management in the Exclusive Economic Zone (EEZ). As part of this larger action, the Council is considering three action alternatives. Alternative 1 would identify species as in need of conservation and management in the EEZ. Alternative 2 would identify species as not in need of conservation and management in the EEZ and remove the species from the FMP. Alternative 3 would identify species as not in need of conservation and management in the EEZ and classify the species as an ecosystem component species in the FMP. The Council adopted Alternative 1 at their March meeting as the preliminary preferred alternative (PPA) for 47 of the 86 groundfish species currently managed in the FMP. Of the 47 species, 12 stocks for 11 species were defined under Amendment 31 (canary, squarespot, sunset, and vermilion rockfishes, Dover, petrale, and rex soles, lingcod, Pacific spiny dogfish, sablefish, and shortspine thornyhead; November 2023) and 8 species are proposed to be defined under Amendment 35 (English sole and blackspotted, chilipepper, redbanded, rougheye, widow, yelloweye, and yellowtail rockfishes) (NOA published, March 2025) to the Groundfish FMP. The Council is not reconsidering the stock definitions for these 19 species. Rather, in this action, which is a subpart of the Council's larger Stock Definitions process, the Council is evaluating the need for conservation and management in the EEZ for all 47 species and contemplating defining stock units, including geographic delineations, within the jurisdiction of the FMP, for the 28 species not defined under Amendments 31 and 35. The 28 species comprise 18 rockfish species (aurora, bank, blackgill, bocaccio, cowcod, darkblotched, greenspotted, greenstriped, harlequin, Pacific ocean perch, redstripe, rosethorn, sharpchin, shortraker, silvergray, splitnose, starry, stripetail, yellowmouth rockfishes), three flatfish species (arrowtooth flounder, Pacific sanddab, and flathead sole), two skates (big and longnose skates), and California scorpionfish, longspine thornyhead, Pacific cod, and Pacific hake. The FMP, at present, does not include stock delineations for these species. This analysis includes an examination of population structure of these species as a means to understand if their stocks should be defined at a coastwide scale or at smaller geographies. The Council is considering three Options to identify a stock's geographic delineation. Option 1 would define a species as single stock, either as a coastwide or state specific stock (Option 1). Option 2 would define a species as two stocks delineated at specific geographical scales (e.g., North and South of 40° 10′ N. lat., etc.). Option 3 would define a species as three stocks delineated at specific geographical scales (e.g., a Washington stock, an Oregon stock, and a California stock, etc.). In March 2025, Alternative 1, Option 1, was adopted as PPA for all these 28 species. In this analysis, Bocaccio, cowcod, and greenspotted rockfish will also be analyzed under Option 2 and darkblotched rockfish will be analyzed under Option 3, as the Council's Range of Alternatives (ROA) specified those Options for these species.

Acronyms and Abbreviations

ABC	Acceptable biological catch
ACL	Annual catch limit
CA/OR/WA	California, Oregon, and Washington
CDFW	California Department of Fish and Wildlife
EC	Ecosystem component
EEZ	Exclusive Economic Zone
FMP	Fishery Management Plan
GAP	Groundfish Advisory Subpanel
GMT	Groundfish Management Team
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSST	Minimum Stock Size Threshold
mt	Metric ton
NMFS	National Marine Fisheries Service
ODFW	Oregon Department of Fish and Wildlife
OFL	Overfishing limits
PacFIN	Pacific Fisheries Information Network
PMFC	Pacific Fishery Management Council (used in references)
RecFIN	Recreational Fisheries Information Network
RCA	Rockfish Conservation Area
SSC	Scientific and Statistical Committee
WCGOP	West Coast Groundfish Observer Program
WDFW	Washington Department of Fish and Wildlife

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Executive Summary

Introduction

As part of the Phase 2 stock definition process, the Pacific Fishery Management Council (Council) is undertaking this process to 1) identify species and their stocks.[1] in need of conservation and management in the EEZ and 2) define stocks of those species in the Pacific Coast Groundfish Fishery Management Plan (FMP). This document analyzes the preliminary preferred alternative (PPA) that was adopted for 47 of the 86 groundfish species listed in the FMP at the March 2025 Council meeting. This specific action is a subpart of the Council's larger Phase 2 stock definitions process.

Purpose and Need

The Council adopted the following purpose and need statement for the larger Phase 2 stock definitions action, of which this particular action is a subpart, at their September 2024 meeting.

> "The function of Amendment **[TBD]** to the Pacific Fishery Management Council's (Council) Pacific Coast Groundfish Fishery Management Plan (FMP) is to identify and define **[TBD]** stocks of **[TBD]** managed groundfish species in need of conservation and management at a geographic scale sufficient for assessing overfished status and determining if overfishing is occurring based on key biological, ecological, social, and economic information currently available. Amendment **[TBD]** is necessary to align the FMP with the requirements of the Magnuson Stevens Fishery Conservation and Management Act and its National Standards to enhance the Council's ability to attain sustainability objectives, especially those outlined in National Standard 1."

Proposed Action

This action is consistent with the authority provided in the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the principal legal basis for fishery management within the Exclusive Economic Zone (EEZ). §302(h)(1) requires a Council to prepare an FMP for each fishery under its authority that requires (or in other words, is in need of) conservation and management, the National Standard Guidelines (§600.305), and Chapter 3 of the FMP. The proposed action would amend the FMP to 1) identify 47 species and their stocks as in need of conservation and management in the EEZ (Table ES 1) and 2) define stocks for 28 of these groundfish species. The action will 1) require an FMP amendment; 2) makes no changes to the species composition of current groundfish stock complexes; and 3) is not intended to revise the harvest specifications framework in the FMP or have allocative effects.

[1] The term "stock of fish" means a species, subspecies, geographical grouping, or other category of fish capable of management as a unit (16 USC. 1802 MSA § 3(42)).

Table ES 1. Species analyzed in this document.

Species			
• Arrowtooth flounder	• Dover sole	• Pacific sanddab	• Silvergray rockfish
• Aurora rockfish	• English sole	• Pacific spiny dogfish	• Splitnose rockfish
• Bank rockfish	• Flathead sole	• Petrale sole	• Squarespot rockfish
• Big skate	• Greenspotted rockfish	• Redbanded rockfish	• Starry rockfish
• Blackgill rockfish	• Greenstriped rockfish	• Redstripe rockfish	• Stripetail rockfish
• Blackspotted rockfish	• Harlequin rockfish	• Rex sole	• Sunset rockfish
• Bocaccio rockfish	• Lingcod	• Rosethorn rockfish	• Vermilion rockfish
• California scorpionfish	• Longnose skate	• Rougheye rockfish	• Widow rockfish
• Canary rockfish	• Longspine thornyhead	• Sablefish	• Yelloweye rockfish
• Chilipepper rockfish	• Pacific cod	• Sharpchin rockfish	• Yellowmouth rockfish
• Cowcod	• Pacific hake	• Shortraker rockfish	• Yellowtail rockfish
• Darkblotched rockfish	• Pacific Ocean perch	• Shortspine thornyhead	

Range of Alternatives

The Council adopted the Range of Alternatives (ROA) for the larger Phase 2 stock definitions action at their March 2025 meeting. The ROA included a No Action alternative and three action alternatives. Alternative 1 included three stock delineation Options. Only one sub-option will be adopted for species that are identified as in need of conservation and management in the EEZ, and for which stocks are not yet defined. The proposed ROA, as presented to the Council in March 2025, is summarized below.

No Action: The Council would not identify species and their stocks as in need of conservation and management in the EEZ. All species, and stocks (where applicable) considered under this action would remain in FMP. The Council would not define or redefine any of the stocks of the species considered in this action in the FMP.

Alternative 1: Species identified as in need of conservation and management. Stocks of the species will be defined as one or more stocks, consistent with the options below, and will remain in the FMP.

- **Option 1** would amend the FMP to define the species as a single (coastwide, state-specific, etc.) stock within the Fishery Management Unit (FMU)
- **Option 2** would amend the FMP to define the species as two stocks within the FMU (e.g., a stock north of 42° N .lat. and a stock south of 42° N. lat.)
- **Option 3** would amend the FMP to define the species as three stocks within the FMU (e.g., California stock, an Oregon stock, and a Washington stock)

Alternative 2: Species identified as not in need of conservation and management. Stocks of the species will not be defined and the species will be removed from the FMP.

Alternative 3: Species identified as not in need of conservation and management. Species identified as an EC species in FMP Chapter 3. Stocks of the species will not be defined.

Preliminary Preferred Alternative

The Council adopted Alternative 1 for 47 species as their PPA for this action in March 2025. These species would be identified as in need of conservation and management in the EEZ. A total of 19 of these species (Table ES 2) are not considered under the Alternative 1 stock definitions Options, as their stocks were defined under Amendment 31 (A31) or were proposed to be defined under Amendment 35 (A35)[2]. The Council is not reconsidering the stock definitions for these 19 species. Rather, in this action, which is a subpart of the Council's larger Stock Definitions process, the Council will consider stock definitions for 28 species. Stocks for those species are already defined are described in the FMP, Chapter 3, Table 3-2, which is incorporated by reference.

Table ES 2. The species and their stocks defined under Amendment 31 or 35 adopted under Alternative 1 as the PPA. Species/stocks not considered under the Options.

Species			
• Blackspotted rockfish	• Lingcod	• Rougheye rockfish	• Vermilion rockfish
• Canary rockfish	• Pacific spiny dogfish	• Sablefish	• Widow rockfish
• Chilipepper rockfish	• Petrale sole	• Shortspine thornyhead	• Yelloweye rockfish
• Dover sole	• Redbanded rockfish	• Squarespot rockfish	• Yellowtail rockfish
• English sole	• Rex sole	• Sunset rockfish	

The Council adopted Option 1, a single stock, for the remaining 28 species evaluated in this action as their PPA. Under this Option, consistent with the Council's PPA, all species except for California scorpionfish, cowcod, harlequin, and starry rockfishes would be defined as coastwide stocks. Harlequin rockfish would be defined as a combined Oregon/Washington stock; whereas, California scorpionfish and cowcod and starry rockfish defined as California-only stocks. Option 2, two stocks, was also considered for boccacio, cowcod darkblotched, harlequin and greenspotted rockfishes. Option 3, three stocks, was also considered for darkblotched rockfish. The Council added Option 2 for bocaccio rockfish for consideration, which would define it as a stock north and a stock south of 40°10′ N. lat. at their March 2025 meeting, following the Science and Statistical Committee's (SSC) recommendation. The SSC, in Agenda Item H.6.a, Supplemental SSC Report 1, March 2025 recommended that the Council add Option 2 (a stock north of 34°27′ N. lat and a stock south of 34°27′ N. lat) for greenspotted rockfish to account for differences in growth rates and exploitation histories. The SSC also recommended adding Option 2 (a stock north of 42° N. lat. and a stock south of 42° N. lat.) and Option 3 (a California stock, an Oregon stock, and a Washington stock) for darkblotched rockfish to account for genetic differences between Washington and northern California. The Council adopted Option 1 as their PPA for all 28 species (Table ES 3). Table ES 4 presents a comparison of the combined information for each species in this action.

[2] Not yet approved, Notice of Availability, 3/5/2025

Table ES 3. Alternative 1 stock definition Options to be analyzed for the 28 groundfish species which have not had their stocks defined. The numbering of the Options reflects the number of area delineations considered for the species. Single stock means one stock within the fishery management unit, which could or could not be delineated as coastwide. PPA=preliminary preferred alternative.

Stock	Option(s)	Stock (s)	Proposed Stock Definition
Arrowtooth flounder	**Option 1 (PPA)**	Single Stock	Coastwide
Aurora rockfish	**Option 1 (PPA)**	Single Stock	Coastwide
Bank rockfish	**Option 1 (PPA)**	Single Stock	Coastwide
Big skate	**Option 1 (PPA)**	Single Stock	Coastwide
Blackgill rockfish	**Option 1 (PPA)**	Single Stock	Coastwide
Bocaccio rockfish	**Option 1 (PPA)**	Single Stock	Coastwide
	Option 2	Two Stocks	A stock north of 40°10′ N. lat. A stock south of 40°10′ N. lat.
California scorpionfish	**Option 1 (PPA)**	Single Stock	California-only
Cowcod	**Option 1 (PPA)**	Single Stock	California-only
	Option 2	Two Stocks	California Stock Oregon stock
Darkblotched rockfish	**Option 1 (PPA)**	Single Stock	Coastwide
	Option 2	Two Stocks	A stock north of 42° A stock south of 42°
	Option 3	Three Stocks	A California stock, an Oregon stock, & a Washington stock
Flathead sole	**Option 1 (PPA)**	Single Stock	Coastwide
Greenspotted rockfish	**Option 1 (PPA)**	Single Stock	Coastwide
	Option 2	Two Stocks	A stock north of 34°27′ N. lat. A stock south of 34°27′ N. lat.
Greenstriped rockfish	**Option 1 (PPA)**	Single Stock	Coastwide
Harlequin rockfish	**Option 1 (PPA)**	Single Stock	Oregon/Washington
	Option 2	Two Stocks	An Oregon stock A Washington stock
Longnose skate	**Option 1 (PPA)**	Single Stock	Coastwide
Longspine thornyhead	**Option 1 (PPA)**	Single Stock	Coastwide
Pacific cod	**Option 1 (PPA)**	Single Stock	Coastwide
Pacific hake	**Option 1 (PPA)**	Single Stock	Coastwide
Pacific ocean perch	**Option 1 (PPA)**	Single Stock	Coastwide
Pacific sanddab	**Option 1 (PPA)**	Single Stock	Coastwide
Redstripe rockfish	**Option 1 (PPA)**	Single Stock	Coastwide
Rosethorn rockfish	**Option 1 (PPA)**	Single Stock	Coastwide
Sharpchin rockfish	**Option 1 (PPA)**	Single Stock	Coastwide
Shortraker rockfish	**Option 1 (PPA)**	Single Stock	Coastwide
Silvergray rockfish	**Option 1 (PPA)**	Single Stock	Coastwide
Splitnose rockfish	**Option 1 (PPA)**	Single Stock	Coastwide

Stock	Option(s)	Stock (s)	Proposed Stock Definition
Starry rockfish	**Option 1 (PPA)**	Single Stock	California-only
Stripetail rockfish	**Option 1 (PPA)**	Single Stock	Coastwide
Yellowmouth rockfish	**Option 1 (PPA)**	Single Stock	Coastwide

Comparison of Alternatives

The 47 species evaluated in this action include the 45 species for which principal mortality was found to occur in Federal waters when applying the 25 percent threshold adopted[3] by the Council in March 2025, and vermillion rockfish off Oregon and lingcod. The Groundfish Advisory Subpanel (GAP), Groundfish Management Team (GMT), and SSC recommended the inclusion of vermilion rockfish and lingcod in Alternative 1. Following the Council's adoption of Alternative 1 as PPA for these 47 species, and consistent with the discussion and analysis in this document, these species are not considered further under either Alternative 2 or Alternative 3.

The Council's ROA was developed for its larger Phase 2 stock definitions process, which is proceeding consistent with the guidance in the National Standards at 50 C.F.R. §600.305(c), which establishes a non-exhaustive 10-factor test to evaluate whether species are in need of conservation and management in the EEZ, and accordingly whether those stocks should be added to an FMP, continue to be managed in an FMP, removed from an FMP, or designated as ecosystem component (EC) species. Because the species evaluated in this action have (with the exception of vermillion rockfish off Oregon and lingcod) met the 25 percent threshold, the Council considered that principal mortality for these species occurs within the EEZ. This finding indicates that these species meet the criteria of Factors (ii) and (iii) at §600.305(c), which weighs in favor of continued management under the FMP.

When providing guidance on the continued management of a species or stock in an FMP, the regulations at §600.305(c)(4) specifically provide that Factors (i) through (ii) §600.305(c) "*should be considered first, as they address maintaining a fishery resource and the marine environment… These factors weigh in favor of continuing to include a stock in an FMP*." Further, §600.305(c)(3) states "*if the amount... of catch that occurs in Federal waters is a significant contributing factor to the stock's status, such information should weigh heavily in favor of continuing to include a stock in the FMP*." The analysis in this document finds that the 47 species evaluated are important components of the marine environment (Factor i). These species were identified as having principal mortality(>25 percent) in Federal waters and thus, for the purposes of this action, are considered primarily caught by commercial and recreational fisheries operating in the EEZ (Factor ii). Additionally, as these species have principal mortality in Federal waters, the FMP can improve or maintain their condition as the jurisdiction of the FMP is limited to Federal waters (Factor iii). Based on these findings, removing these species from the FMP (Alternative 2) or designating them as EC Species (Alternative 3) would does not comport with the analytical findings or the National Standards.

Comparison of Alternative 1 Options

Of the species adopted under Alternative 1 as PPA , stock delineation Options are considered for 28 species that have not already been defined under A31 and the proposed A35. As noted above,

[3] See Agenda Item H.6, Supplemental Revised Attachment 1 for detail on the 25 percent threshold.

five species (bocaccio, cowcod, and darkblotched, greenspotted, and harlequin rockfishes) are considered under multiple Options, whereas, all the other species were considered under Option 1, only. The Council adopted Option 1, single stock, as PPA stock definition for these 28 species.

The majority of the comparative analysis for the stock delineations is species specific and focuses on two metrics: the biological risks to the species and the management burden for the Council and NMFS. These metrics are described qualitatively as the actual impacts from applying a modified harvest control rule framework to the newly defined stocks will occur in subsequent harvest specifications and management measure processes. At this time, those impacts are not known.

Biological Considerations for Stock Definitions

The focus of the biological analysis is based on the presence or absence of stock structure. The biological risks in not adopting a representative stock definition may be in the form of localized depletion, or the fishery not achieving optimum yield (OY). Localized depletion could result in stocks status impacts, range contractions, and population fragmentation.[4] The literature review conducted for the Phase 2 stock definitions process (Agenda Item H.6, Attachment 3, March 2025) indicated the 28 species which need their stocks defined, except cowcod, greenspotted, and darkblotched rockfishes, do have little to no evidence of stock structure. Generally, for species with no discernable stock structure an Option 1 stock definition (single stock) is unlikely to increase the risk of localized depletion or not achieving OY compared to status quo. California scorpionfish and starry rockfish are range limited to California and would be defined thusly.

Bocaccio has little evidence to support population structure, but it has two sub-area assessments. As noted by He and Field (2017), which assessed the area south of 43 N. lat, the range of bocaccio extends considerably further north and there is some evidence that there are two demographic clusters centered around southern/central California and the West Coast of British Columbia. This finding is supported by apparent differences in growth, maturity, and longevity, although genetic evidence seems to indicate a single West Coast population. Therefore two stock definition Options were offered for bocaccio to comport to the assessment stratification. This analysis concludes Option 1 definition (coastwide) for bocaccio could increase the risk of localized and not achieving OY, as compared to status quo.

Harlequin rockfish is considered under Option 1 and Option 2 based on its geographic range (Love et al, 2002). It has never been assessed and is currently managed in the Shelf Rockfish Complex, to which it provides no harvest specifications. Neither Option is expected to increase the risk of localized depletion or not achieving OY, as compared to status quo.

Cowcod, has population structure, with a strong population break at 34°27′ N. lat. Results of a genetic study (Hess et al, 2014) there appear to be two primary lineages in the Southern California Bight (SCB). Both lineages co-occur in the SCB and there does not seem to be a clear pattern of depth stratification or spatial structure in that area. Cowcod found north of Point Conception consist primarily of a single genetic lineage; however, there is evidence for considerable gene flow across the Point Conception boundary (Dick and He, 2019; Hess et al, 2014). Therefore, two stock definition Options were offered for cowcod to comport with the assessment stratification and the geographic range of this species. This analysis concludes that Option 1 definition (California-only)

[4] See §3.5.3 of NOAA Technical Memorandum NMFS F/SPO 31, July 1998.

for cowcod could increase the risk of localized depletion and not achieving OY, as compared to status quo.

The SSC, in their statement (Agenda Item H.6.a, supplemental SSC Report 1, March 2025), indicated greenspotted rockfish and darkblotched rockfish also have population structure. In their report the SSC stated that for greenspotted rockfish, growth rates and exploitation histories north and south of Point Conception, California should be taken into account and these differences were represented by two area models in the 2011 stock assessment (). The SSC recommended Option 2 (stock a north and a stock south of 34°27′ N. lat.) be added for consideration by the Council. The SSC noted there are indications of genetic differences between Washington and California for darkblotched rockfish and recommended the Council add a two stock (Option 2) and a three stock (Option 3) for consideration. They did not recommend stock areas; thus staff identified a stock north and a stock south of 42° N. lat. as Option 2 and state-specific stocks for Option 3. The literature review indicates there is limited data to support population structure. Defining more than one stock for these rockfishes may decrease the risk of localized depletion and maintain or increase the Council's ability to achieve OY for these stocks.

Management Burden Considerations

Increased management burden may come in the form of allocative management recommendations the Council may need to make after stock definitions for these species are adopted. The premise is that some stock definitions, or may require allocative decisions by the Council to maintain status quo management measures or require new assessments to provide harvest specifications by stock. That process could increase the risk of inequitable or unfair state-specific allocations or increase the amount of time and effort (potentially both analytical and/or procedural[5]) needed to develop fair and equitable allocations. Generally, Option 1 is least likely to disrupt current allocation considerations and to require management measure modifications with a few exceptions. As shown in Table ES 4, species with annual catch limit scale of less than coastwide generally have had coastwide assessments. For those species in complexes, the coastwide harvest specifications are proportion north and south of 40°10′ N. lat. The exceptions are bocaccio and starry rockfish. Bocaccio is currently managed as a single species south of 40°10′ N. lat. and as a component species of the shelf rockfish complex north of 40°10′ N. lat. A coastwide stock definition could compel the Council to reconsider its current management of the species. Starry rockfish is currently managed as a component species of the shelf rockfish complexes north and south of 40°10′ N. lat. A California-only stock could reduce the allocation amount of the shelf rockfish complex are north 42° N. lat. by a negligible amount.[6] Option 2 and 3 for are dissimilar to the current management

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Considerations regarding the proposed action's consistency with the National Standards are offered in Chapter 5

[5] Analytical may be development of allocations that are "fair and equitable" under the NS4. Procedural may be describing formal or informal allocations in the FMP.
[6] Contributes an OFL of 0.004mt to the shelf rockfish complex north of 40°10′ N. lat.

Table ES 4. The combined option, delineation, population structure (Pop Struct), annual catch limit (ACL scale), assessment year (Assess Yr.),, assessment category and area stratification for the species without defined stocks considered under this Action. The Preliminary Preferred Alternative (PPA) is identified. The left side shows the species, the alternative(s) it is considered under, and the resulting geographic delineation of the alternative. North = N, South = S, Washington = WA, Oregon = OR, California = CA, and CW = coastwide

Species	Option	Potential Stock Delineations	Pop. Struct	Current ACL Scale	NMFS Status Area	Assess Yr	Category & Stratification	Notes
Arrowtooth flounder	1 (PPA)	**Coastwide (PPA)**	U	Coastwide	Pacific Coast	2017	2 CW	
Aurora rockfish	1 (PPA)	**Coastwide (PPA)**	U	Slope Rockfish Complex N/S of 40° 10′ N. lat..	Pacific Coast	2013	1 CW	
Bank rockfish	1 (PPA)	**Coastwide (PPA)**	U	Slope Rockfish Complex N/S of 40° 10′ N. lat..	Slope N/S 40 10 Complex	2011	3 CW	
Big skate	1 (PPA)	**Coastwide (PPA)**	N	Coastwide	Pacific Coast	2019	2 CW	
Blackgill rockfish	1 (PPA)	**Coastwide (PPA)**	U	Slope Rockfish Complex N/S of 40° 10′ N. lat..	Southern California	2011 (N 4010), 2017 (S 4010)	3 (N4010), 1 (S 4010)	
Bocaccio rockfish	1 (PPA)	**Coastwide (PPA)**	U	South of 40°10′ N.at Shelf Rockfish Complex N of 40° 10′ N. lat..	Southern California / N of 40° 10′ N. lat.	2011 (N 4010) 2019 (S 4010)	3 (N4010), 1 (S 4010)	
California scorpionfish	1 (PPA)	**CA-Only (PPA)**	U	Coastwide	Southern California	2017	1 (S 3427	range = CA
Cowcod	1 (PPA)	**CA-Only (PPA)**	Y	South of 40°10 N lat.	Southern California	2019	2 (S 3427)	range = CA & OR
	2	CA/OR					3 (N 3427)	
Darkblotched rockfish	1 (PPA)	Coastwide	U	Coastwide	Pacific Coast	2017	1 CW	
Flathead sole	1 (PPA)	Coastwide (PPA)	U	Coastwide	Other Flatfish complex	-	3 CW	
Greenspotted rockfish	1 (PPA)	Coastwide (PPA)	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Pacific Coast	2011	3 (OR/WA) 2 CA	
Greenstriped rockfish	1 (PPA)	**Coastwide (PPA)**	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Pacific Coast	2009	3 CW	

Species	Option	Potential Stock Delineations	Pop. Struct	Current ACL Scale	NMFS Status Area	Assess Yr	Category & Stratification	Notes
Harlequin rockfish	1 (PPA)	**OR/WA (PPA).**	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat.. a/	Shelf N/S 40 10 Complex	N/A	3 NA	range = OR & WA
	2	OR and WA						
Longnose skate	1 (PPA)	**Coastwide (PPA)**	U	Coastwide	Pacific Coast	2019	2 CW	
Longspine thornyhead	1 (PPA)	**Coastwide (PPA)**	U	N/S of 34° 27′ N. lat.	Pacific Coast	2013	2 CW	
Pacific cod	1 (PPA)	**Coastwide (PPA)**	U	Coastwide	Pacific Coast	-	3 CW	
Pacific hake	1 (PPA)	**Coastwide (PPA)**	U	Coastwide	Pacific Coast	2023	-	
Pacific Ocean perch	1 (PPA)	**Coastwide (PPA)**	U	North of 40° 10′ N. lat. Shelf Rockfish Complex S of 40° 10′ N. lat a/	Pacific Coast	2017	2 CW	
Pacific sanddab	1 (PPA)	**Coastwide (PPA)**	N	Coastwide	Pacific Coast	2011	3 CW	
Redstripe rockfish	1 (PPA)	**Coastwide (PPA)**	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Shelf N/S 40 10 Complex	2011	3 CW	
Rosethorn rockfish	1 (PPA)	**Coastwide (PPA)**	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Shelf N/S 40 10 Complex	2011	3 CW	
Sharpchin rockfish	1 (PPA)	**Coastwide (PPA)**	U	Slope Rockfish Complex N/S of 40° 10′ N. lat..	Slope N/S 40 10 Complex	2013	2 CW	
Shortraker rockfish	1 (PPA)	**Coastwide (PPA)**	U	Slope Rockfish Complex N/S of 40° 10′ N. lat..	Slope N/S 40 10 Complex	2011	3 CW	
Silvergray rockfish	1 (PPA)	**Coastwide (PPA)**	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Shelf N/S 40 10 Complex	2011	3 CW	
Speckled rockfish	1 (PPA)	**Coastwide (PPA)**	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Shelf N/S 40 10 Complex	2011	3 CW	
Splitnose rockfish	1 (PPA)	**Coastwide (PPA)**	N	Slope Rockfish Complex N/S of 40° 10′ N. lat..	Slope N/S 40 10 Complex	2011	3 CW	
Starry rockfish	1 (PPA)	Coastwide	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Shelf N/S 40 10 Complex	2011	3 CW	range = CA
		CA-Only (PPA)						
Stripetail rockfish	1 (PPA)	**Coastwide (PPA)**	N	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Pacific Coast	2011	3 CW	
Yellowmouth rockfish	1 (PPA)	**Coastwide (PPA)**	U	Slope Rockfish Complex N/S of 40° 10′ N. lat..	Slope N/S 40 10 Complex	2011	3 CW	

a/ contributes no harvest specifications.

1. Introduction

The Council is required to identify stocks in need of conservation and management in the Exclusive Economic Zone (EEZ) per the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and its National Standards. The process to determine if a stock is in need of conservation and management in the EEZ is provided in the National Standards guidance at §600.305(c). The Pacific Coast Groundfish Fishery Management Plan (FMP) currently lists the species managed under the FMP (see FMP Chapter 3, Table 3-1) and the groundfish stocks thus far defined (see FMP Chapter 3, Table 3-2 under Amendment 31 (A31) or pending definition under Amendment 35 (A35). As will be described in the History of this Action section, the current FMP list of species provides insufficient detail necessary to identify the managed species as a stock, e.g., geographic boundaries, etc. In 2022, the Council began work to define stocks of managed groundfish. This action is a continuation of that process.

The goals of this specific action, which is a subpart of the larger stock definitions process, are to determine if a set of 47 managed groundfish are: 1) in need of conservation and management in the EEZ and 2) define the stocks of the 28 species from this grouping that have not yet been defined. Current scientific literature and the advice of the Scientific and Statistical Committee (SSC) suggests population structure is a foundation to defining a species as a stock and can help to delineate the stock on a geographic scale (see Agenda Item E.8.a Supplemental SSC Report 1 November 2023, Agenda Item H.5.a, Supplemental SSC Report 1, November 2022; Agenda Item E.3.a, Supplemental SSC Report 1, November 2021). Genetics, larval dispersal, adult movement, and variation in life history characteristics are used to understand population structure. Accordingly, based on the MSA, the National Standards, best scientific information available (BSIA), and how the Council has considered species in the past, this analysis frames the question of how to define a groundfish stock by first reviewing the BSIA as detailed in the Literature Review for a species (Agenda Item H.6, Attachment 3, March 2025; hereinafter literature review) and contrasting/comparing that information against the stock definition Options (described below).

1.1 Proposed Action

This action is consistent with the authority provided in the MSA. Section 302(h)(1) requires a Council to prepare an FMP for each fishery under its authority that requires (or in other words, is in need of) conservation and management, the National Standard Guidelines (§600.305), and Chapter 3 of the FMP. The proposed action would amend the FMP to 1) identify 47 species and their stocks as in need of conservation and management in the EEZ and 2) define stocks for 28 of these groundfish species (Table 1). The action would require an FMP amendment. This action makes no proposed changes to the species composition of 2025-26 groundfish stock complexes. Nor is this action intended to revise the harvest specifications framework in the FMP or have allocative effects. Groundfish harvest specifications for species and stock complexes in varying geographic scales are developed through the framework described in the FMP and codified into federal regulations. This action is not intended to have allocative effects. Harvest specifications and management measures for any newly defined stocks would be developed and implemented as part of a subsequent groundfish specifications and management measures process, consistent with §5.1 of the Groundfish FMP, which the Council is beginning to work on in June 2025.

Table 1. Species considered under this action.

Species Defined under Amendments 31 and 35			
Blackspotted rockfish	Squarespot rockfish	Yellowtail rockfish	lingcod
Canary rockfish	Sunset rockfish	Dover sole	Pacific spiny dogfish
Chilipepper rockfish	Vermilion rockfish	English sole	Sablefish
Redbanded rockfish	Widow rockfish	Petrale sole	Shortspine thornyhead
Rougheye rockfish	Yelloweye rockfish	Rex sole	
Species to Undergo Definition Process			
Arrowtooth flounder	Cowcod	Longspine thornyhead	Sharpchin rockfish
Aurora rockfish	Darkblotched rockfish	Pacific cod	Shortraker rockfish
Bank rockfish	Flathead sole	Pacific hake	Silvergray rockfish
Big skate	Greenspotted rockfish	Pacific Ocean perch	Splitnose rockfish
Blackgill rockfish	Greenstriped rockfish	Pacific sanddab	Starry rockfish
Bocaccio	Harlequin rockfish	Redstripe rockfish	Stripetail rockfish
California scorpionfish	Longnose skate	Rosethorn rockfish	Yellowmouth rockfish.

The proposed action would define the stocks for 28 species currently managed in the FMP and thus allow for NMFS to make stock status determinations (i.e., overfished/not-overfished), evaluate depletion relative to the management target (BMSY) and the minimum stock size threshold (MMST), as described in Sections 4.3 through 4.5 of the FMP, for stocks of these species. FMPs must describe status determination criteria, or the measurable and objective factors (e.g., OFL, MSST, etc.), for each managed stock to determine if a stock is overfished or whether overfishing is occurring (§600.310(e)(2)(i)(A). The FMP describes the harvest specification process used to set the overfishing fishing limit (OFL), acceptable biological catch (ABC), and annual catch limits (ACL). The Stock Assessment and Fishery Evaluation (SAFE) document details the harvest specification factors such as harvest control rules (HCR), OFLs, ABCs, etc. based on the BSIA for each groundfish species in the fishery on a biennial basis. This action makes no changes to the species composition of stock complexes or harvest specifications as implemented in the 2025-26 groundfish harvest specifications. It is assumed the Council will continue to manage species that are currently in a complex within their current complex. Changes to complexes will be considered in a later phase of the Council's larger stock definitions process..

1.2 Description of Management Area

The management area is the West Coast EEZ —defined generally as the area from 3 nautical miles to 200 nautical miles seaward of Washington, Oregon, and California state waters and the communities that engage in fishing in waters off these states. This geographic area within the jurisdiction of the FMP may be referred to as the fishery management unit (FMU) and is depicted in Figure 3-1 of the FMP (PFMC, 2022a)

1.3 Purpose and Need

The Council adopted the following purpose and need statement for the larger stock definitions action, of which this particular action is a subpart, at their September 2024 meeting..

"The function of Amendment **[TBD]** to the Pacific Fishery Management Council's (Council) Pacific Coast Groundfish Fishery Management Plan (FMP) is to identify and define **[TBD]** stocks of **[TBD]** managed groundfish species in need of conservation and management at a geographic scale sufficient for assessing overfished status and determining if overfishing is occurring based on key biological, ecological, social, and economic information currently available. Amendment **[TBD]** is necessary to align the FMP with the requirements of the Magnuson Stevens Fishery Conservation and Management Act and its National Standards to enhance the Council's ability to attain sustainability objectives, especially those outlined in National Standard 1."

1.4 History of Action

The history of the larger stock definitions action is well documented in Agenda Item H.6, Supplemental Revised Attachment 1, March 2025, which is incorporated by reference. In brief, the Groundfish FMP was found to not have defined stocks of managed species. In 2022, NMFS advised the Council at multiple meetings (e.g. Agenda Item E.3.a, NMFS Report 1, March 2022, verbally Agenda Item H.5, November 2022, etc.) that steps must be taken to draw the FMP into compliance with the MSA and the National Standards by defining the groundfish species in need of conservation and management as stocks. The Council initiated a process, called Phase 1, to correct this issue. Phase 1 developed a process to define stocks of managed species and, over the course of A31 and the proposed A35, defined 28 stocks of 21 species managed in the FMP. Phase 1 was used to define stocks of species that were undergoing assessments whilst a second Phase, or Phase 2, was planned to complete the process of identifying and defining those stocks of species currently managed in the FMP that are in need of conservation and management in the EEZ.

The Council initiated Phase 2 in November 2023 with a discussion process (Agenda Item E.8, Attachment 1, November 2023). Staff returned at the September 2024 Council meeting, with the proposed analytical framework of Phase 2 (Agenda Item I.8, Attachment 1, September 2024) to initiate scoping of the action. The framework was largely built on National Standard guidance, notably at §600.305(c), which can be used to determine whether a stock requires conservation and management. The Council adopted the framework, a purpose and need statement, and the revised process planning schedule (Agenda Item E.8, Attachment 2, November 2024). Council staff was directed to develop a range of alternatives (ROA) for all remaining undefined groundfish species managed in the FMP for consideration at the March 2025 meeting.

The Council's initial analysis of those species (Agenda Item H.6, Supplemental Revised Attachment 1, March 2025) focused on Factors 2 and 3 from §600.305(c) to make preliminary determinations as to which species would benefit from a complete 10-factor analysis under the regulations. This approach is supported by the direction provided at 50 CFR 600.305(c)(4), which sets forth that if the amount and/or type of catch that occurs in Federal waters is a significant contributing factor to a stock's status, such information would weigh heavily in favor of continuing to include that stock in an FMP. Accordingly, the guidance in §600.305(c) recommends that Councils consider giving weight to Factors 1-3 first in the process of applying the factors found at §600.305(c).

The analysis presented at the March 2025 Council meeting (Agenda Item H.6, Supplemental Revised Attachment 1, March 2025; hereinafter ROA Analysis) proposed a 25 percent threshold

as a framework for categorizing catch of species as occurring principally in the EEZ, and thus for identifying species to be likely candidates for continued Federal management in the FMP. In brief, if 25 percent or more of a species' principal mortality is in the EEZ, it would be identified as likely appropriate for remaining in the FMP based on the guidance found at §600.305(c). If mortality was less than 25 percent in the EEZ, the species would be identified for a thorough 10-factor evaluation under §600.305(c) in order to ascertain if the species should be retained for management in the FMP, removed from the FMP, or designated as an ecosystem component (EC) species. That full 10-factor analysis of the remaining groundfish species will occur on a separate track and will be completed as a separate action within the Council's larger stock definitions process.

In March 2025, the Council adopted the 25 percent threshold, as detailed in the ROA Analysis, as a tool to use in its stock definitions process. Applying this framework, the Council identified two groups of species. A set of 60 species which had principal mortality in the EEZ (Group 1) and a set of 26 species which had either mixed/ambiguous results, had mortality less than 25 percent in the EEZ, or had no mortality on the U.S. West Coast (Group 2). Also in March 2025, the Council adopted the ROA for Phase 2 of its groundfish stock definitions process. Specifically, the Council is considering three action alternatives under this larger action. Alternative 1 would identify the groundfish species currently managed in the FMP that are in need of conservation and management in the EEZ and define the stocks of those species for continued Federal management. Alternative 2 would identify the species that are not in need of conservation and management in the EEZ and proposes to evaluate those species for removal from the FMP. Alternative 3 would identify those species not in need of conservation and management in the EEZ and proposes to evaluate those species for classification as an ecosystem component (EC) species in the FMP. For those species identified as in need of conservation and management in the EEZ, the Council also adopted three Options under Alternative 1. Option 1 would define a species as single stock, either as a coastwide or state specific stock. Option 2 would define a species as two stocks delineated at specific geographical scales (e.g., North and South of 40° 10′ N. lat., etc.). Option 3 would define a species as three stocks delineated at specific geographical scales (e.g., a Washington stock, an Oregon stock, and a California stock, etc.).

Based on advice from the GMT (Agenda Item H.6.a, Supplemental GMT Report 1, March 2025) and the GAP (Agenda Item H.6.a, Supplemental GMT Report 1, March 2025), in March 2025, the Council identified 39 species that it recommended for the thorough 10-factor analysis under §600.305(c).These 39 species include 13 species from Group 1 that had principal mortality in the EEZ and all of the Group 2 species. As noted, that 10-factor analysis will be completed in a separate action, and thus document, and the Council is expected to consider PPA for those species in June of 2025.

In March 2025, the Council adopted Alternative 1 as PPA for the remaining 47 species of Group 1. Alternative 1, Option 1 was adopted for a total of 28 species, which comprises 18 rockfish species (bocaccio, cowcod, Pacific Ocean perch (POP), and aurora, bank, blackgill, darkblotched, greenspotted, greenstriped, harlequin, redstripe, rosethorn, sharpchin, shortraker, silvergray, splitnose, starry, stripetail, yellowmouth rockfishes), three flatfish species (arrowtooth flounder, Pacific sanddab, and flathead sole), two skates (big and longnose skates), and California scorpionfish, longspine thornyhead, Pacific cod, and Pacific hake. The Council's ROA further specified that Bocaccio, cowcod, darkblotched, harlequin, and greenspotted rockfish should be analyzed under Alternative 1, Option 2 and that darkblotched rockfish be analyzed under

Alternative 1, Option 3. In total, the 47 species considered in this analysis under the Council's March 2025 PPA for Alternative 1 include 45 species from Group 1 (i.e., with greater than 25 percent mortality in the EEZ) and two species with mixed or uncertain mortality results (vermilion rockfish off Oregon and lingcod).

1.5 Analytical Process

The following analysis is undertaken to 1) evaluate whether a subset of managed groundfish species are in need of conservation and management in the EEZ and 2) determine appropriate geographic boundaries for stocks of those species identified as such. Spatial fishery mortality data are used to inform the §600.305(c) analysis and to identify those groundfish species in need of conservation and management in the EEZ. BSIA population structure data (genetics, larval dispersal, adult movement, and variation in life history characteristics) is used to determine appropriate stock delineations.

1.5.1 Conservation and Management

As described in Section 1.4, the analytical approach the Council is following for determining whether a species from the group of 47 species, which were identified using the 25 percent threshold is in need of conservation and management in the EEZ is focused on Factors 1-3 from §600.305(c). Factors 1-3 are as follows: 1) the stock is an important component of the marine environment, 2) the stock is caught by the fishery, and 3) whether an FMP can improve or maintain the condition of the stock. With the exception of vermillion rockfish off Oregon and lingcod, the group of 47 species was developed using a framework based on the threshold percentage for attributing principal mortality in Federal waters. If mortality was greater than 25 percent in the EEZ, species catch was principally attributed to Federal waters for the purposes of evaluating whether that groundfish species is in need of conservation and management under the regulations. For the purpose of this action, species with principal mortality in the EEZ are categorized "as in the fishery" (i.e., as meeting the Factor (ii) test), which weighs in favor of identifying that species as in need of conservation and management in the EEZ and continued Federal management under the FMP.

The 25 percent threshold was applied to total mortality for each of the 86 groundfish species currently managed in the FMP, by state and fishery sector (commercial and recreational). That analysis identified 60 species with principal mortality in the EEZ; 24 with principal mortality in state waters; and 2 species that have no reported or observed groundfish fishery mortality in at least the last 21 years. Mortality (catch) in state or Federal waters is used to evaluate §600.305(c) Factors 2 and 3, as those factors evaluate whether a species is caught by the (federal) fishery and whether Federal fishery management has influence on the species condition. Species distribution and habitat availability are also evaluated as other ways in which these factors could be analyzed.

Habitat suitability models are limited and the analysis of the spatial occurrence of fishing mortality was the primary information used for the initial determination of which species out of the 86 total managed groundfish species should be evaluated using the 3-factor analysis, as opposed to a more thorough analysis under all 10 §600.305(c) factors. For those currently managed groundfish species for which the 10-factor analysis is necessary to evaluate their need for conservation and management in the EEZ, this analysis will occur on a separate track, and in a separate document, from the analysis of the 47 species determined to be principally caught in Federal waters when

applying the 25 percent threshold. Additionally, it is worth noting that while the 25 percent threshold may identify and attribute principal mortality of a species to the EEZ for the purposes of this analysis, and while the history of Federal management may suggest that a species is a strong candidate for continued Federal management, there may be other considerations that could lead the Council to not retain species that meet the 25 percent threshold and are currently managed in the FMP, if the Council determines that those species are not in need of conservation and management in the EEZ.

1.5.2 Stock Definitions

The analytical process to define stocks of the 28 species considered in this action for which stocks were not defined in A31 or A35 was developed in A31 and is incorporated by reference. In brief, when considering stock definitions for a species, the Council must use BSIA. In addition, it must take into account the MSA and the National Standards, as well as the goals, objectives, and existing frameworks in the FMP. Current scientific literature and the advice of the SSC suggests population structure is a foundation to defining a species as a stock and can assist in delineating groundfish stock(s) at an appropriate geographic scale (see Agenda Item H.5.a, Supplemental SSC Report 1, November 2022 and Agenda Item E.3.a, Supplemental SSC Report 1, November 2021). Multiple factors of population structure were investigated (e.g., genetics, larval dispersal, etc.) as part of this analysis. The evaluation also considered SSC recommendations of BSIA; the geographic scale of assessments and historic NMFS stock status determinations areas; and the historic geographic scale of ACLs for the species or stock complex in which the species is managed. As noted above, a literature review was completed for all groundfish species currently managed in the FMP, identifying potential stock units for the 28 species considered for stock definitions under this action.

A quantitative analysis for stock definitions is not possible, therefore, the analysis of the Alternative 1 Options follows a qualitative approach. This qualitative analysis compares and contrasts the tradeoffs between the Alternative 1 Options for each species via two types of metrics; biological risks to the species and management burden. Biological risks may be in the form of localized depletion of the species or the fishery not achieving optimum yield (OY). Management burden relates to potential changes to management measures necessary to achieve, but not exceed, ACLs. These changes could range from smaller scale monitoring or, potentially, arise in the form of allocative management changes. Anticipated effects are described qualitatively, as the actual impacts from applying the HCR framework in the FMP (PFMC, 2024a) to the newly defined stocks would occur in a subsequent harvest specifications and management measures process. Thus, at this time, those impacts, if any, are not certain.

In Chapter 4: Comparisons of the Stock Definition Options below, a series of tables are presented that shows the proposed geographic area stratifications for groundfish stocks and stock complexes in relation to available population structure metrics for each of 28 species which need to have their stocks defined. While on an individual basis, these factors may not definitively identify a population or sub-population, when combined they can indicate population structure. Defining stocks, particularly if those stocks are delineated at a similar geographic scale as those to which current harvest specifications and management measures apply, is not likely to impact fishing effort, harvest levels, or timing and location of fishing and landings. To better gauge the trade-offs of alternative stock definitions, a presumption is made that the harvest specifications framework

in the FMP is applied to the stock defined under each Alternative 1 Option. It is the application of that framework to the stock (which would occur in a future biennial harvest specifications action) that may have differential biological impacts to managed fish species. For this reason, a quantitative analysis for this action is not possible and the analysis of the stock definitions alternatives follows a qualitative approach.

The first step to identifying a stock definition is to use stock structure information from the literature review and research past assessments endorsed by the SSC to gauge the relative potential biological impacts of the stock definition Options. This information was used by the action team to develop the conclusions found herein. The second step is to examine the PPA Alternative 1 species for which stock definitions were not established through A31 or A35 by comparing the relative risk of increasing the management burden for species that would have a stock definition that would differ from status quo harvest specifications and management measures.

For all the Alternatives 1 stock definition Options, the following applies:

- As a direct result of this action, if approved:
    - NMFS would determine status of the stock(s) at the geographic scale identified in the Option;
    - Stock complexes will not change at this time.
- Regarding the groundfish biennial specifications action
    - The OFL/ABC/ACL would be calculated and/or set at the same scale as the stock's geographic delineation;
    - As under current procedures, the ABC/ACL could be further subdivided, but the division would be based on the areal specification;
    - The FMP's harvest specifications framework applies to a stock, and each stock would have a default harvest control rule based on the stock's estimated depletion;
    - For stocks managed in a complex, the OFL/ABC/ACL calculation is apportioned into the stock complex harvest specifications using status quo methods;

2. Description of Alternatives

The Council adopted the ROA for the larger Phase 2 stock definitions action at their March 2025 meeting. The ROA included a No Action alternative and three action alternatives. Alternative 1 included three stock delineation Options. The proposed ROA, as presented to the Council in March 2025, is summarized below. Table 2 provides the preliminary stock delineation Options under Alternative 1 adopted by the Council, by species.

2.1 Range of Alternatives

No Action: All species remain in FMP as currently defined and managed. The list of managed species as shown in Table 3-1 would not be modified. The Council would not define stocks of the species in the FMP other than the ones already defined.

Alternative 1: Species identified as in need of conservation and management and would remain in the FMP. Stocks of the species will be defined as one or more stocks, consistent with the options below.

- **Option 1** would amend the FMP to define the species as a single stock within the Fishery Management Unit (FMU)
- **Option 2** would amend the FMP to define the species as two stocks within the FMU
- **Option 3** would amend the FMP to define the species as three stocks within the FMU

Alternative 2: Species identified as not in need of conservation and management. Stocks of the species will not be defined and the species will be removed from the FMP.

Alternative 3: Species identified as an ecosystem component (EC) species. Stocks of the species will not be defined.

2.2 Modifications to the ROA

The Council modified the ROA stock definition Options for three species at their March 2025 meeting. Option 2 was added to bocaccio and darkblotched and greenspotted rockfishes. Option 3 was added to darkblotched rockfish for consideration.

Under Option 2:

- Bocaccio would be defined as 2 stocks, a stock north of 40°10′ N. lat and a stock south of 40°10′ N. lat.
- Darkblotched rockfish would be defined as 2 stocks, stock north of 42° N. lat. and a stock south of 42° N. lat.
- Greenspotted rockfish would be defined as 2 stocks, a stock north of 34°27′ N. lat and a stock south of 34°27′ N. lat

Under Option 3:

- Darkblotched rockfish would be defined as three stocks, a California stock, an Oregon stock, and a Washington stock within the FMU.

Table 2. Stock delineation Options adopted by Council for species without stock definitions under Alternative 1.

Species	Pop. Struct	Opt 1	Opt 2	Opt 3	Potential Stock Delineations
Arrowtooth Flounder	U				Coastwide
Aurora Rockfish	U				Coastwide
Bank Rockfish	U				Coastwide
Big Skate	U				Coastwide
Blackgill Rockfish	U				Coastwide
Bocaccio Rockfish	U				**Opt1.** Coastwide or **Opt 2.** north/south of 40°10′ N. lat.
California Scorpionfish	U				Coastwide or California-only
Cowcod	Y				**Opt1.** Coastwide or California/Oregon ; **Opt 2.** California and Oregon
Darkblotched Rockfish	U				**Opt1.** Coastwide, **Opt 2.**N/S of 42° N. lat. **Opt. 3** California, Oregon, and Washington
Flathead Sole	U				Coastwide
Greenspotted Rockfish	U				**Opt1**. Coastwide, **Opt 2.** N/S of 34°27′ N. lat.
Greenstriped Rockfish	U				Coastwide
Harlequin Rockfish	U				**Opt1.** Coastwide or Oregon/Washington. **Opt 2**. Oregon, and Washington
Longnose Skate	U				Coastwide
Longspine Thornyhead	U				Coastwide
Pacific Cod	U				Coastwide
Pacific Hake	U				Coastwide
Pacific Ocean Perch	U				Coastwide
Pacific Sanddab	N				Coastwide
Redstripe Rockfish	U				Coastwide
Rosethorn Rockfish	U				Coastwide
Sharpchin Rockfish	U				Coastwide
Shortraker Rockfish	U				Coastwide
Silvergray Rockfish	U				Coastwide
Splitnose Rockfish	U				Coastwide
Starry Rockfish	U				Coastwide or California-only
Stripetail Rockfish	N				Coastwide
Yellowmouth Rockfish	U				Coastwide

2.3 Summary of the Alternatives and the PPA

2.3.1 No Action

Under No Action, the Council would reject the Purpose and Need. The 47 species under consideration in this action would not be identified as in need of conservation and management. Stocks of 28 of those species would remain undefined. Status for the species without definitions could not be determined. The stocks of the 19 species defined under A31 or proposed A35 would remain in the FMP and status for these stocks could be determined. The FMP would not be amended. No Action would continue to allow varying sigma values for sub-area assessments to capture assessment uncertainty. No Action would not make changes to the stock complexes.

2.3.2 Alternative 1

Alternative 1 comprises two parts. First, under Alternative 1, 47 species currently managed under the FMP and their stocks would be identified as in need of conservation and management in the EEZ. These species and their stocks would remain in the FMP and continue to be actively managed by the Council. Additionally, three stock definition Options are offered under Alternative 1 for stocks of those species evaluated which have not previously been defined (28 species). The Options would define the geographic scale of the stock(s) of those species as one area, two areas, or three areas along the U.S. West Coast. The stocks' OFLs, ABCs, and ACLs would then be provided at the scale equivalent to the population's geographic extent on the coast. NMFS would determine status for these species at the same geographic scale as described in the stock definition.

For stocks of species previously defined (Table 3) and for species where stock delineations are under consideration (Table 4), the following applies:

- Overfishing status determination is calculated by comparing mortality to the OFL that is set for a stock. The OFL would be calculated (if managed in a complex) or set (if managed species specific) at the same scale as the stock's geographic delineation;
- For stocks managed in a complex, the OFL calculation is apportioned into the stock complex OFL contributions using status quo methods;
- Overfished status determination (i.e., "overfished"/"not overfished") is calculated by comparing stock depletion relative to biomass reference points (e.g., minimum stock size threshold) and would be made by NMFS at the same scale as the geographic scale identified for a stock;
- Alternative 1 would allow varying sigma values for sub-area assessments to capture assessment uncertainty;
- The harvest control rule is set for the stock as a whole;
- Alternative 1 would not make changes to stock complexes. The alternatives are detailed below and analyzed in comparative fashion in Chapter 3.

The Council adopted Alternative 1 as PPA for the 47 species considered in this action. Based on the factor analysis at §600.305(c), these 47 species would remain in the FMP and their stocks would be actively Federally managed. Of these 47 species, stocks of 19 species were defined under A31 or proposed A35 Table 3). Accordingly, these 19 species are not considered under the stock

definition options, as the stock delineations of these species are not being reconsidered. The stock definitions for these species will therefore remain the same as presented in Table 3, as well as in the FMP

Table 3. Species and their stocks defined under either Amendment 31 (A31) or 35 (A35)[7] identified under Alternative 1 as PPA, which would identify them as stocks in need of conservation and management in the EEZ.

Stock	Stock Definition	Amendment
Blackspotted rockfish	Coastwide	A35
Canary rockfish	Coastwide	A31
Chilipepper rockfish	Coastwide	A35
Dover sole	Coastwide	A31
English sole	Coastwide	A35
Lingcod	North 40°10′ N. lat. South of 40°10′ N. lat.	A31
Pacific spiny dogfish	Coastwide	A31
Petrale sole	Coastwide	A31
Rex sole	Coastwide	A31
Redbanded rockfish	Coastwide	A35
Rougheye rockfish	Coastwide	A31
Squarespot rockfish	Coastwide	A35
Vermilion rockfish	North of 42°N.lat.	A31
Vermilion/Sunset rockfish	South of 42°N.lat.	A31
Sablefish	Coastwide	A31
Shortspine thornyhead	Coastwide	A31
Widow rockfish	Coastwide	A35
Yelloweye rockfish	Coastwide	A35
Yellowtail rockfish	North 40°10′ N. lat. South of 40°10′ N. lat.	A35

In March 2025, the Council adopted Option 1, single area stock definition, as PPA for the remaining 28 species identified under Alternative 1 as PPA (Table 5). Cowcod, greenspotted rockfish, and harlequin rockfish are proposed to be considered under Options 1 and Option 2. Darkblotched rockfish is proposed to be considered under all three options. To be more specific, the Council adopted Option 1, coastwide stock delineation for 25 of the species for which Option 1 was identified as PPA (Table 5). Option 1 was also adopted as PPA for California scorpionfish, Cowcod, and starry and harlequin rockfishes; however, their single stock area delineation was not specified as coastwide. Rather, California scorpionfish, cowcod, and starry rockfish were specified under Option 1 as a south of 42° N. lat. stock (i.e., California-only stock). The stock delineation for harlequin rockfish was specified as a north of 42° N. lat. stock (i.e., an OR/WA stock).

[7] Amendment 35 is in process; a Notice of Availability was published 3/5/2025

The Council also included lingcod and the Oregon/Washington vermilion rockfish stock in the PPA for Alternative 1. These fish had mixed results for principal mortality by water area, as detailed in the ROA Analysis. For both fish, principal mortality in the commercial sector was greater than 25 percent in the EEZ; however, principal mortality was less than 25 percent in the EEZ for the recreational sector. Inclusion of lingcod and vermilion rockfish off Oregon under the PPA for Alternative 1 was recommended by the SSC (Agenda Item H.6.a, Supplemental SSC Report 1, March 2025), the GMT (Agenda Item H.6.a, Supplemental GMT Report 1, March 2025), and the GAP (Agenda Item H.6.a, Supplemental GAP Report 1, March 2025).

In making its recommendation, the SSC noted that the spatial mortality analysis likely underestimated the lingcod mortality in the EEZ as it appeared to be based on numbers and not weight of fish landed. The SSC also noted that redistributions of fishing effort due to restored fishing access to previously closed areas are expected to increase commercial and recreational retention of lingcod in the EEZ. The SSC therefore recommended including lingcod for consideration under Alternative 1. Lingcod mortality was reported as both estimated numbers and weight in Appendix A to the ROA Analysis. The estimated weights, including the recently reported values from Washington, are shown in Table 6. There were only a few species where this occurred and lingcod was not one of them. Numbers of fish were used in the analysis only for species where estimated weights could not be determined (e.g., big skate) in the recreational sector. Numbers of fish were used in the analysis only for species where estimated weights could not be determined (e.g., big skate) in the recreational sector.

Table 4. Estimated lingcod mortality in metric tons for the EEZ and state waters

State	Comm Mort in EEZ (mt)	Rec Mort in EEZ (mt)	Comm Mort in State (mt)	Rec Mort in State(mt)
California	189.62	53.12	44.48	242.92
Oregon	263.23	17.90	90.10	164.94
Washington	61.51	143.74	-	49.95

The SSC also stated that vermilion rockfish off Oregon should be included for consideration under Alternative 1. The basis for this recommendation was that there is considerable uncertainty in the information used to assess stock structure (Agenda Item H.6.a, Supplemental SSC Report 1, March 2025).

Table 5. The Preliminary Preferred Alternative (PPA) Option(s) for species to be analyzed for the 28 groundfish species without defined stocks.

Species	PPA Option	Stocks	Geographic Delineation(s)
Species considered under a single option			
Arrowtooth Flounder	**1**	Single Stock	West Coast
Aurora Rockfish	**1**	Single Stock	West Coast
Bank Rockfish	**1**	Single Stock	West Coast
Big Skate	**1**	Single Stock	West Coast
Blackgill Rockfish	**1**	Single Stock	West Coast
California Scorpionfish a/	**1**	Single Stock	South of 42° N. lat. (California-only)

Species	PPA Option	Stocks	Geographic Delineation(s)
Flathead Sole	**1**	Single Stock	West Coast
Greenstriped Rockfish	**1**	Single Stock	West Coast
Longnose Skate	**1**	Single Stock	West Coast
Longspine Thornyhead	**1**	Single Stock	West Coast
Pacific Cod	**1**	Single Stock	West Coast
Pacific Hake	**1**	Single Stock	West Coast
Pacific Ocean Perch	**1**	Single Stock	West Coast
Pacific Sanddab	**1**	Single Stock	West Coast
Redstripe Rockfish	**1**	Single Stock	West Coast
Rosethorn Rockfish	**1**	Single Stock	West Coast
Sharpchin Rockfish	**1**	Single Stock	West Coast
Shortraker Rockfish	**1**	Single Stock	West Coast
Silvergray Rockfish	**1**	Single Stock	West Coast
Splitnose Rockfish	**1**	Single Stock	West Coast
Starry Rockfish a/	**1**	Single Stock	South of 42° N. lat. (California-only)
Stripetail Rockfish	**1**	Single Stock	West Coast
Yellowmouth Rockfish	**1**	Single Stock	West Coast
Species considered under two options			
Bocaccio Rockfish	**1**	**Single Stock**	**West Coast**
	2	Two Stocks	North/South of 40°10′ N. lat.
Cowcod	**1**	Single Stock	South of 42° N. lat. (California-only)
	2	Two Stocks	California and Oregon
Greenspotted Rockfish	**1**	**Single Stock**	**West Coast**
	2	Two Stocks	North/South of 34°27′ N. lat.
Harlequin Rockfish	**1**	**Single Stock**	**West Coast**
	2	Two Stocks	North of 42° N. lat. (Oregon/Washington)
Species considered under three options			
Darkblotched Rockfish	**1**	**Single Stock**	**West Coast**
	2	Two Stocks	North/South of 42° N. lat. (California and Oregon/Washington)
	3	Three Stocks	California, Oregon, and Washington

2.3.3 Alternative 2

Under Alternative 2 the species considered in this action would not be identified as in need of conservation and management in the EEZ. These species would be species from the FMP and no longer managed by the Council. Stock assessments for these species would not be conducted by NMFS and therefore harvest specifications for the species would not be calculated.

2.3.4 Alternative 3

Under Alternative 3, the species considered in this action would not be identified as in need of conservation and management in the EEZ but, rather, be designated as EC species. While they would no longer be actively managed by the Council they would remain in the FMP. Stock assessments for these species would not be conducted by NMFS and, therefore, harvest specifications for the species would not be calculated. Management measures, similar to shortbelly rockfish, could be set for these species (see FMP §4.4.4 and §600.305(c)(5)).

3. Comparison of the Alternatives

This analysis of whether a species is in need of conservation and management in the EEZ will be completed in this chapter. This evaluation focuses on Factors (i)-(iii) from §600.305(c). Factors (i)-(iii) are as follows: 1) the stock is an important component of the marine environment, 2) the stock is caught by the fishery, and 3) whether an FMP can improve or maintain the condition of the stock. The comparison of the stock definitions Options is found in Chapter 5.

3.1 Alternatives Considered but Not Moved Forward for Full Analysis: Alternative 2 and Alternative 3

his action evaluates 47 groundfish species: the 45 species for which 25 percent or more of their total mortality (catch) was found to occur in Federal waters, and vermilion rockfish off Oregon and lingcod. This analysis evaluates those species under No Action and Alternative 1.

When the 25 percent threshold was applied to analyze groundfish fishery mortality on the U.S. West Coast, 45 species were identified in the ROA Analysis document as having principal mortality in Federal waters. The Council then adopted Alternative 1 was as PPA for these species. The Council also adopted vermilion rockfish off Oregon and lingcod under Alternative 1, based on advice of the GAP, GMT, and SSC. Section 1.5.1 in this document describes how the Council is using the 25 percent threshold adopted by the Council as a tool in its Phase 2 stock definitions process, consistent with the guidance provided in the National Standards at §600.305(c) for identifying stocks in need of conservation and management in the EEZ; particularly Factors 2 and 3. In Section 1.5.1, this analysis notes that, if mortality of a species is greater than 25 percent in the EEZ, species catch is principally attributed to Federal waters for the purposes of evaluating whether that groundfish species is in need of conservation and management under the regulations. Species with principal mortality in the EEZ are categorized "as in the fishery" (i.e., as meeting the Factor (ii) test), which weighs in favor of identifying that species as in need of conservation and management in the EEZ and continued Federal management under the FMP. This is further discussed below. Additionally, as discussed below, we conclude that management under the FMP could improve or maintain the condition of such stocks; thus, they meet the Factor (iii) test. As such those species with principal mortality in the EEZ, would not comport with either Alternative 2 (removal from the FMP) or Alternative 3 (designation as an EC species) and those alternatives are not considered further in this analysis.

This conclusion is consistent with the Council's findings in March 2025. At the March meeting, the Council indicated, in its discussions, that the 47 species evaluated herein should remain in the FMP and do not need to be analyzed through the full 10-factor test at §600.305(c). The remaining groundfish species, for which PPA was not selected in March 2025, will undergo the thorough 10-factor analysis under §600.305(c) and be evaluated under Alternatives 1-3. This analysis is provided in Attachment 2 under this agenda item in the Council's June 2025 Briefing Book.

3.2 Comparison Process – Identifying Stocks in Need of Conservation and Management

3.2.1 No Action

NMFS has advised the Council, both in writing (Agenda Item E.3.a, NMFS Report 1, March 2022) and verbally at the March (Agenda Item E.3), June (Agenda Item F.4), September (Agenda Item G.5) and November (Agenda Item H.5) 2022 Council meetings, that steps must be taken to draw the FMP into compliance with the MSA and the National Standards by defining stocks of the groundfish species identified as in need of conservation and management in the EEZ. If stocks are not defined and delineated on a geographic scale, status cannot not be determined. Status determination is a key tenant to National Standard 1 and NMFS must provide this information to Congress. As such, No Action is not an option for the Council to adopt as it is out of compliance with the MSA and it does not meet the purpose and need for the proposed Amendment.

3.2.2 Alternative 1 - §600.305(c) Factor Analysis

There are two levels of decision making to Alternative 1. First, the Council is to identify if a species is in need of conservation and management in the EEZ and, second, the Council is to adopt the stock definition option for species for those species in need of conservation and management in the EEZ which have not been defined under A31 or A35

The Council adopted Alternative 1 as PPA for all 47 species considered in this action, i.e., the Council preliminarily identified these species as in need of conservation and management.

The National Standard 1 guidelines provide a framework that gives guidance to Councils on how to decide whether a stock requires conservation and management. Specifically, §600.305 provides as follows.

> (c) Stocks that require conservation and management.
>
> (1) Magnuson-Stevens Act section 302(h)(1) requires a Council to prepare an FMP for each fishery under its authority that requires (or in other words, is in need of) conservation and management. 16 U.S.C. 1852(h)(1). Not every fishery requires Federal management. Any stocks that are predominately caught in Federal waters and are overfished or subject to overfishing, or likely to become overfished or subject to overfishing, are considered to require conservation and management. Beyond such stocks, Councils may determine that additional stocks require "conservation and management." (See Magnuson-Stevens Act definition at 16 U.S.C. 1802(5)). Based on this definition of conservation and management, and other relevant provisions of the Magnuson-Stevens Act, a Council should consider the following non-exhaustive list of factors when deciding whether additional stocks require conservation and management:
>
> (i) The stock is an important component of the marine environment.
>
> (ii) The stock is caught by the fishery.
>
> (iii) Whether an FMP can improve or maintain the condition of the stock.
>
> (iv) The stock is a target of a fishery.
>
> (v) The stock is important to commercial, recreational, or subsistence users.
>
> (vi) The fishery is important to the Nation or to the regional economy.

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

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

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

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

Under the regulations, if a species is predominantly caught in Federal waters and overfished or subject to overfishing, or likely to become overfished or subject to overfishing, it requires Federal management. If those criteria are not met, the species must then be evaluated under §600.305(c)(3)'s non-exhaustive 10-factor test. As per §600.305(c)(3), no single factor is dispositive or required in determining which species should be included in an FMP. Therefore, while factors should be applied in a consistent manner, one factor may have more significance in one case than in another, depending on the circumstances of a fishery (see 81 FR 71864, October 18, 2016). Indeed, the guidance at §600.305(c)(3) notes that, if the amount and/or type of catch that occurs in Federal waters is a significant contributing factor to a stock's status, such information would weigh heavily in favor of adding a stock to an FMP (or, in this case, retaining a stock in the FMP). The regulations specifically provide that when considering whether to continue to include a stock in an FMP , factors (i) through (iii) (referred to as Factors i-iii herein) "…should be considered first, as they address maintaining a fishery resource and the marine environment. … These factors weigh in favor of continuing to include a stock in an FMP." 50 C.F.R. §600.305(c)(4).

Consistent with the guidance in the National Standards, this analysis focuses the evaluation of whether the 47 species proposed as the PPA under Alternative 1 are in need of conservation and management in the EEZ, and thus should continue to be included in the Groundfish FMP, on Factors (i)-(iii). These 47 species are binned together for efficiency in the following §600.305(c) analysis; however, species are specifically noted in the accompanying tables.

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

This factor considers whether the stock is an important component of the marine environment. This question is difficult to analyze quantitatively. The question considered in the analysis of this factor is, if unregulated fishing of a species occurs, could it create deleterious impacts on the overall marine environment. Noting, conservation and management in the EEZ of particular species that plays a critical or unique trophic role (for instance a keystone species) may have impacts on the wider ecosystem. Some species of groundfish, however, may play the same role in the ecosystem and may be ecologically interchangeable with others that occupy the same habitat. Therefore, some individual species of groundfish may have less importance than overall groundfish importance.

The Northwest Fisheries Science Center (NWFSC) Stock Prioritization website provides a quantitative mechanism to examine the ecosystem "importance" of West Coast groundfish based on the EcoPath/EcoSim modeling. This site offers a data set related to the importance of the species in terms of predator/prey and a standardized score, to identify rank of the species in comparison to other groundfish. However, the findings are unclear as some of the species considered under this action do not have scores. Experts from the NWFSC also suggest these data should have limited weight on the decision making process due to relative uncertainty regarding the term "importance." What is clear from these data is that the 47 groundfish species being evaluated under the PPA for Alternative 1 are both predator and prey and do have relative importance to the environment.

The SAFE (PFMC, 2024b) provides detailed information on aspects of the life histories and status of managed groundfish. In brief, the SAFE notes these 47 groundfish species are generally found from the shallow landward edge of the continental shelf to the deep slope. This document is updated biennially and is incorporated by reference. The species considered in this action inhabit a diverse range of habitats, depths, and a multitude of benthic habitats and serve both as predator and prey (Freeman et al, 2022; Love et al, 2002, Love et al, 1990;). For example, rockfish larvae and juveniles are known to serve as prey for several fishes including rockfishes themselves, marine mammals, and seabirds (Horn, 1980). These species are ecologically important components of the ecosystem and species such as flatfish are a "major energy pathway for conversion of benthic production into a form suitable for consumption by higher predators (Link et al, 2014)."

Scientific modeling and research (e.g., Bizzaro et al 2023; Tommasi et al, 2021, Koehn et al, 2016) indicate groundfish species fulfill a variety of trophic level niches. Many groundfish, e.g., vermilion rockfish, cowcod, etc., elasmobranchs, and lingcod are considered top predators (Frid and Marlieve, 2010). Pacific hake is an ecologically important species that plays a key trophic role as both predator and prey in the California Current Ecosystem (CCE). Many of the species managed by the Council can be considered higher trophic level predators, but also as key prey species, such as Pacific hake (Vestfals et al, 2023; Ressler et al., 2007). The environmental importance of groundfish was noted as having the potential to play a structuring role in the ecosystem (Pacific Coast Fishery Ecosystem Plan). The Council, while not explicitly declaring these species are important to the ecosystem, de facto manage them as if they are via ecosystem based fishery management (EBFM) directives in the FMP and the Fishery Ecosystem Plan.

Fishing alters the flow of energy through marine ecosystems through the removal of target and nontarget species (Field et al, 2010). The ecological role of groundfish is inherently difficult to evaluate. From a biological perspective, each species plays a certain role in the ecosystem and it is not possible to isolate the importance of a single species to the environment relative to other species. The FMP prescribes precautionary harvest policies which indicate the importance of currently managed species to the Council. The tactics are designed to reduce negative impacts on species that are less abundant, overfished or experience overfishing, or have paucity of scientific data. While the challenge of this factor is to identify whether a species is an important component of the marine environment, and species-specific information may be lacking for some groundfish species, the information from NWFSC's Stock Prioritization and the SAFE document indicate the importance of groundfish species generally to their marine environment. Combined with the fact that catch of the 47 species evaluated as PPA under Alternative 1 principally occurs in Federal waters, and those species are already determined to be considered important by the Council based

on the existing management strategies and tactics, we conclude these 47 species satisfy §600.305(c) Factor (i).

ii. The stock is caught by the fishery

This factor considers if the stock is caught by the Federal fishery. As established in the ROA Analysis, a 25 percent threshold of mortality in the EEZ was used to determine if the species had fishery mortality principally in state or Federal waters. The precautionary threshold of 25 percent reflects management implications over the last 20 plus years and their effects on where and when the fishery operates. The threshold framework was developed with the understanding that some of the managed species have principal mortality in commercial and recreational fisheries operating in the EEZ, and based on the spatial geography of that species' catch and the history of federal management, are good candidates for continued federal management. Past area-based management measures may have restricted the fishery access to a narrow range of fishing grounds and therefore may have impacted the diversity of catch. Meaning, it could appear as if species with historic catch principally attributed to the EEZ are at present primarily caught in state waters, though in low numbers. Additionally, the 25 percent threshold allows for flexibility by incorporating uncertainty in fishery dependent data, interannual variation in fishing, and fish location. Based on recent actions to restore access to the continental shelf and thus more of the EEZ, it is reasonable to foresee that diversity of catch may shift back to reflect the past when more fishing for certain species occurred in the EEZ. Given this and other uncertainties related to the fishery, a low threshold was selected to account for historic and potential future changes in the fishery.

The threshold was applied to state-specific mortality (i.e., to analyze percent catch in the EEZ off each West Coast state) for both commercial and recreational mortality. All of the 47 species considered here, with the exception of lingcod and vermilion rockfish off Oregon, had mortality that exceeded the 25 percent threshold in both sectors in Federal waters off all three West Coast states. The ROA Analysis for the larger Phase 2 stock definitions process presented the mortality results for all groundfish species currently managed in the FMP by state and fishery sector (commercial and recreational) to understand where and for what purpose fish were caught, i.e., the impact each fishery has relative to the total mortality for a species. It is worth noting that the estimated mortality for most species with mortality off of Washington was not available at the time. However, as Washington mortality estimates are available (Appendix A), the total estimated sector combined coastwide mortality in the EEZ has been calculated (Table 6). When examined at the coastwide scale, all 47 species considered under the PPA for Alternative 1 have mortality greater than 25 percent in the EEZ, indicating principal mortality can be attributed to the EEZ and the fisheries that operate there, i.e., these species are determined to be caught by the fishery for the purposes of the Council's §600.305(c) analysis. Additionally, as shown in Figure 1 below, 33 of these 47 species have 95 -100 percent of their mortality attributed to the EEZ and only three species have mortality less than 50 percent §600.305(c) Factor i.

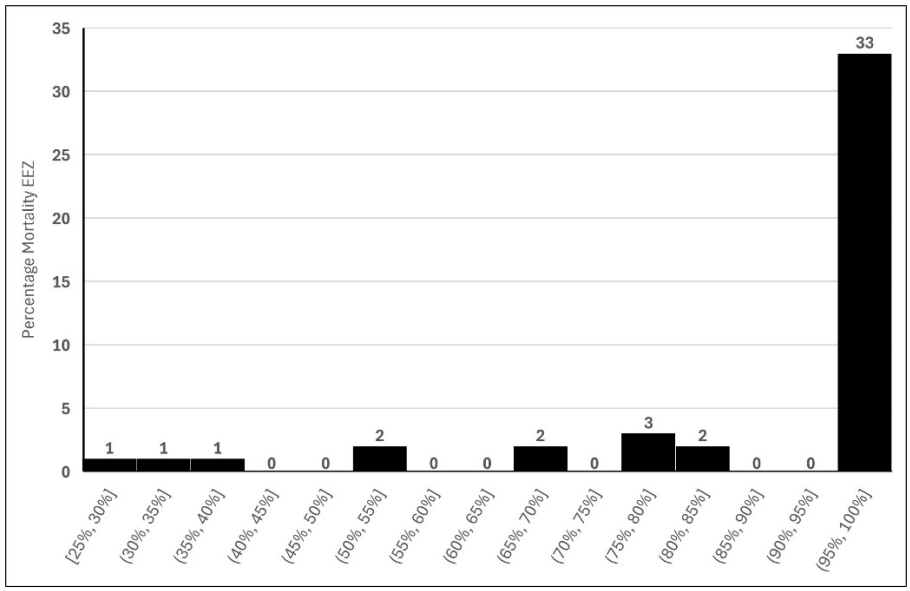

Figure 1. Percent of mortality in the EEZ of species considered in this action.

The SSC (Agenda Item H.6.a, Supplemental SSC Report 1, March 2025), the GMT (Agenda Item H.6.a), and the GAP (Agenda Item H.6.a, Supplemental GAP Report 1, March 2025) recommended inclusion of vermilion rockfish off of Oregon, and lingcod into the list of species considered as PPA for Alternative 1 in this action, for reasons noted under Section 2.3.2 above. On a coastwide scale, mortality of lingcod in Federal waters is 54.8 percent and vermilion is 31.8 percent (Table 6). While at the state level, mortality in the EEZ of vermilion rockfish off Oregon is very low, the SSC does not recommend state-specific exclusion of this species based on uncertainty in stock structure

In summary, when examined at the coastwide scale, all 47 species considered under the PPA for Alternative 1 have mortality greater than 25 percent in the EEZ. For the purposes of its stock definitions process, the Council is using this threshold to identify species for which principal mortality can be attributed to the EEZ and the fisheries that operate there. Accordingly, we conclude that all of these 47 species are determined to be "caught by the fishery" for the purposes of the §600.305(c) Factor (ii) analysis

Table 6. Estimated combined sector mortality in the Exclusive Economic Zone (EEZ; i.e., Federal waters) in metric tons (mt) and percentage (%) for California, Oregon, Washington, and coastwide for species considered under this action..

	California Mortality EEZ		Oregon Mortality EEZ		Washington Mortality EEZ		Coastwide Mortality EEZ	
Species	**mt**	**%**	**mt**	**%**	**mt**	**%**	**mt**	**%**
Arrowtooth Flounder	48.38	99.4%	873.05	99.5%	31.64	100.0%	957.76	99.5%
Aurora Rockfish	9.47	92.8%	22.96	100.0%	3.35	100.0%	36.52	98.0%
Bank Rockfish	36.45	97.4%	1.93	99.9%	0.05	100.0%	39.43	97.5%
Big Skate	26.03	98.8%	132.64	99.2%	8.60	100.0%	168.68	99.2%
Blackgill Rockfish	35.83	83.7%	4.14	95.9%	0.08	100.0%	47.20	84.8%
Bocaccio Rockfish	349.18	79.8%	25.21	99.0%	13.16	100.0%	479.22	81.4%
California Scorpionfish	90.83	76.7%	0.00	0.0%	0.00	0.0%	280.38	76.7%
Canary Rockfish	123.47	65.5%	224.80	85.3%	66.62	97.9%	533.11	79.8%
Chilipepper Rockfish	554.28	98.0%	40.93	100.0%	0.01	87.9%	607.39	98.1%
Cowcod	3.98	74.9%	0.02	93.8%	0.00	0.0%	17.28	75.0%
Darkblotched Rockfish	23.42	99.2%	233.54	99.8%	12.71	100.0%	270.32	99.8%
Dover Sole	1,585.49	99.9%	3,917.58	100.0%	250.35	100.0%	5,755.01	100.0%
English Sole	97.40	99.2%	121.17	99.9%	2.45	100.0%	221.95	99.6%
Flathead Sole	0.00	100.0%	23.17	100.0%	0.00	0.0%	23.17	100.0%
Greenspotted Rockfish	25.13	67.0%	0.59	89.0%	0.00	100.0%	38.95	67.3%
Greenstriped Rockfish	9.13	88.0%	37.21	99.8%	1.37	100.0%	49.34	97.3%
Harlequin Rockfish	0.00	0%	0.01	100.0%	0.01	100.0%	0.02	100.0%
Lingcod	233.00	44.8%	281.13	52.4%	205.25	80.4%	1,440.03	54.8%
Longnose Skate	136.19	98.9%	488.29	99.6%	67.43	100.0%	695.43	99.5%
Longspine Thornyhead	217.74	98.7%	182.52	100.0%	3.71	100.0%	406.84	99.3%
Pacific Cod	0.00	100.0%	11.87	99.9%	3.63	91.5%	15.85	97.8%
Pacific Hake	84.85	99.6%	117,441.21	100.0%	19,818.74	100.0%	137,345.28	100.0%
Pacific Ocean Perch	0.35	96.2%	280.30	100.0%	44.47	100.0%	325.13	100.0%
Pacific Sanddab	61.94	76.3%	42.48	99.9%	0.00	0.0%	126.47	83.7%

	California Mortality EEZ		Oregon Mortality EEZ		Washington Mortality EEZ		Coastwide Mortality EEZ	
Species	**mt**	**%**	**mt**	**%**	**mt**	**%**	**mt**	**%**
Pacific spiny dogfish	121.98	98.0%	335.07	99.2%	89.89	100.0%	558.74	99.1%
Petrale Sole	635.81	98.9%	1,796.55	99.9%	151.74	100.0%	2,592.89	99.7%
Redbanded Rockfish	9.75	96.1%	16.59	96.3%	11.70	100.0%	39.07	97.4%
Redstripe Rockfish	0.00	0%	35.47	100.0%	3.17	100.0%	38.64	100.0%
Rex Sole	81.50	100.0%	338.71	100.0%	7.26	100.0%	427.48	100.0%
Rosethorn Rockfish	0.20	69.1%	6.60	99.0%	7.10	100.0%	14.06	98.9%
Rougheye/Blackspotted Rockfish	0.95	94.6%	41.94	94.0%	24.74	100.0%	70.37	96.1%
Sablefish	1,409.61	97.2%	2,486.81	99.2%	647.04	100.0%	4,605.20	98.7%
Sharpchin Rockfish	0.03	99.9%	32.46	100.0%	1.32	100.0%	33.81	100.0%
Shortraker Rockfish	0.08	100.0%	5.39	99.9%	3.92	100.0%	9.40	99.9%
Shortspine Thornyhead	232.44	94.3%	415.09	100.0%	26.26	100.0%	687.85	98.0%
Silvergray Rockfish	0.38	100.0%	37.86	99.7%	16.82	100.0%	55.16	99.8%
Splitnose Rockfish	15.36	99.8%	79.94	100.0%	8.57	100.0%	103.90	100.0%
Squarespot Rockfish	9.84	65.2%	0.00	0.0%	0.00	0.0%	16.37	65.2%
Starry Rockfish	14.37	35.2%	0.00	0.0%	0.00	0.0%	46.01	35.2%
Stripetail Rockfish	18.83	99.9%	33.91	100.0%	0.00	0.0%	52.76	100.0%
Vermilion/Sunset Rockfish a/	111.22	32.4%	0.75	7.4%	0.90	64.1%	365.47	31.8%
Widow Rockfish	150.39	93.7%	7,470.46	100.0%	1,318.14	100.0%	8,950.07	99.9%
Yelloweye Rockfish	3.70	52.3%	2.29	40.1%	2.98	82.1%	38.00	54.6%
Yellowmouth Rockfish	0.15	100.0%	18.01	99.9%	4.70	100.0%	22.89	99.9%
Yellowtail Rockfish	47.19	41.8%	2,498.28	99.3%	549.55	99.8%	3,186.12	97.3%

a/ sunset rockfish is a stock off of CA only.

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

The FMP is expected to maintain and/or improve the condition of these species adopted as PPA under Alternative 1, the. The FMP sets a harvest specification framework which requires biomass targets for groundfish in an effort to prevent overfishing and achieve optimum yield (National Standard 1). The management target for rockfish under the Groundfish FMP is a depletion level of 40 percent (i.e., $B_{40\%}$), unless specified otherwise, and for flatfish it is a depletion level of 25 percent (i.e., $B_{25\%}$), unless specified otherwise. For species where B_{MSY} cannot be calculated, default proxy values are used for B_{MSY} target: $B_{30\%}$ for flatfish and $B_{50\%}$ for rockfish and elasmobranchs (FMP §4.6.1). The FMP harvest specification framework prescribes precautionary management measures when biomass falls below management target, which includes the "40-10" adjustment for species managed to $B_{40\%}$ and the "25-5" adjustment to flatfish below $B_{25\%}$ (FMP §4.6.1). Further, the FMP requires rebuilding plans to be implemented for species that are determined to be overfished, the biomass falls below minimum stock size threshold as determined by the SSC.

All of the 47 species considered in this specific action have principal mortality in the EEZ and are subject to the harvest specifications framework as detailed in the FMP. To meet the goals and objectives of the FMP, management measures should be implemented to prevent overfishing and rebuild overfished.[8] The FMP also directs the Council to apply management measures to species within the precautionary zone in order to improve the condition of the stock, i.e., reach or exceed management target.[9] Of the species considered in this action, population segments or the entire population for five species are below management targets in terms of biomass (Table 7), which is where biomass is above the minimum stock size threshold but below the management target. Each of these species have ACLs set below the ABC to reduce catch and increase the potential for the species to reach management targets in as short a period as possible. One species, yelloweye rockfish, is rebuilding and strict management measures have been applied to the fishery to rebuild it in as short a time as possible. For the remaining species, or population segments, the biomass is either above management target or unknown (Table 6). Overall, the status for the majority of species is considered above management target.

Strict management measures, such as area-based closures, have been used as tools in the past to help improve the condition of overfished groundfish species. As an example, the Non-Trawl Rockfish Conservation Area (RCA) is an area based closure initiated as part of an emergency rule in January 2003 to mitigate impacts to overfished groundfish species (PFMC 2024a). As of July 2022, with one exception, the groundfish species that were the main driver for creation of the Non-Trawl RCA have been rebuilt. Only one of those species, yelloweye rockfish, is still currently under a rebuilding plan and based on the most recent stock assessment it is projected to be rebuilt by 2029. Other management tools in the FMP include, but are not limited to, gear restrictions, catch restrictions, and time/area closures. However, it is important to note that the effects of any management measures contained in the FMP will be limited to the portion of the species range found in the EEZ

[8] Chapter 2, Objective 1 of the FMP
[9] Chapter 4 of the FMP

Table 7. Population assessment relative to biological thresholds as indicated by stock assessments: above management target (AT), below management target (BT) and U = unknown. (source PFMC, 2024b).

Species	Pop. Assess.		Species	Pop. Assess.
Arrowtooth flounder	AT		Pacific sanddab	AT
Aurora rockfish	AT		Pacific spiny dogfish	AT
Bank rockfish	AT		Petrale sole	AT
Big skate	AT		Redbanded rockfish	U
Blackgill rockfish	N 4010 = U S 4010 = AT		Redstripe rockfish	U
Bocaccio rockfish	N 4010 = U S 4010 = AT		Rex sole	AT
Blackspotted rockfish	AT		Rosethorn rockfish	U
California scorpionfish	AT		Rougheye rockfish	AT
Canary rockfish	BT		Sablefish	AT
Chilipepper rockfish	N 4010 = U S 4010 = AT		Sharpchin rockfish	AT
Cowcod	N 4010 = U S 4010 = AT		Shortraker rockfish	U
Darkblotched rockfish	AT		Shortspine thornyhead	BT
Dover sole	AT		Silvergray rockfish	U
English sole	AT		Splitnose rockfish	AT
Flathead sole	U		Squarespot rockfish	BT
Greenspotted rockfish	WA/OR = U 3427-42 = BT S 3427 = AT		Starry rockfish	U
Greenstriped rockfish	AT		Stripetail rockfish	AT
Harlequin rockfish	U		Sunset rockfish	AT
Lingcod	N 4010 = AT S 4010 = BT		Vermilion rockfish	AT
Longnose skate	AT		Widow rockfish	AT
Longspine thornyhead	AT		Yelloweye rockfish	Rebuilding
Pacific cod	U		Yellowtail rockfish	N 4010 = AT S 4010 = U
Pacific hake	AT		Yellowmouth rockfish	U
Pacific Ocean perch	N 4010 = AT S 4010 = U			

3.3 Conclusions

As stated above, the National Standard Guidelines provide, at §600.305(c)(3), that "no single factor is dispositive or required [in determining whether a stock is in need of conservation or management]. One or more of the above factors, and any additional considerations that may be relevant to the particular stock, may provide the basis for determining that a stock requires

conservation and management." The Guidelines further emphasize the importance of §600.305(c) Factors (i)-(iii) in completing this evaluation in the context of whether to add or retain a species in an FMP. Accordingly, the analysis contained in this document focuses on §600.305(c) Factors (i)-(iii).

In considering these first three factors, we conclude that the 47 species evaluated herein are important components of the marine environment (Factor (i)) and are caught by the Federal fishery (Factor (ii)). Further, for the reasons provided above, we conclude that the FMP is expected to improve or maintain the condition of these 47 species and/or stocks (Factor (iii)). The Groundfish FMP establishes management measures specific to Federal waters to meet its goals and objectives and, based on the analysis above, we find that these 47 species are in need of conservation and management per the §600.305(c) guidelines and continued management of these species under the FMP is appropriate. As such, these 47 species should all be moved to step 2 in this specific action's process and each be defined as one or more stocks

3.3.1 Additional Considerations

Another consideration outside the 10 factors, but related to the condition of the stock is the productivity, susceptibility, and vulnerability of each species. The goals and objectives of the FMP indicate that if a species is vulnerable to overfishing or is overfished, the Council has stewardship responsibilities to address those issues with appropriate management measures. Assessing the productivity, susceptibility, and vulnerability of each species can help in understanding if these species are in need of conservation and management in the EEZ based on the potential for overfishing and/or becoming overfished. This information, while outside 305(c) factors, fits into the 'other considerations' that may be useful in determining whether a stock is in need of conservation and management in the EEZ.

Productivity and susceptibility [to overfishing] were defined in Patrick et al (2009). National Standard 1 (§600.310(b)(4)) defines productivity as "the capacity of the stock to produce MSY and to recover if the population is depleted" and, as noted in Patrick et al. (2009), can be estimated by species life-history attributes (e.g., age at maturity, fecundity, etc.). Susceptibility (§600.310(b)(4)) is the "potential for the stock to be impacted by the fishery, which includes direct captures, as well as indirect impacts of the fishery (e.g., loss of habitat quality)" or, in different terms, susceptibility is the degree to which a fishery can negatively impact the species (Patrick et al. 2009). Vulnerability (§600.310(b)(4)), is "a combination of its productivity, which depends on its life history characteristics, and its susceptibility to the fishery". Cope et al. (2011) expanded on this definition noting vulnerability refers to the [species] potential to become overfished under current fishery conditions. The vulnerability of these species to fishing is influential in the Council's decision-making in accordance with the FMP's goals and objectives.

It is important to state at the outset that the productivity and susceptibility analysis (PSA) is from the Cope et al. (2011) paper. Cope et al (2011) conducted a PSA on all the managed groundfish species at the coastwide scale and estimated the vulnerability of managed species (Table 8). For all these species, the Council adopted a coastwide stock definition (Option 1) as their PPA, thus the scale of the PPA matches the scale used by Cope et-al (2011) in their paper. While this analysis is dated, the information is useful as adjunct information for Council consideration; however, there are key caveats to understand when considering these data. Some advances in the understanding of the productivity of each species may have occurred in these species. The susceptibility of each

species to fishing may have changed since this paper was written. A key reason to bring this information forward at this stage, however, is it has been noted multiple times in Council, GMT, and SSC discussions as data that is of interest in decision making process for the Phase 2 stock definition process.

In Table 8, the vulnerability score columns indicate that species with values less than 1.8 are of low concern, values between 1.8 and 2.0 are of medium concern, values between 2.0 and 2.2 are of high concern, and values greater than 2.2 are of major concern. In sum, three species were identified in the major concern bin, 16 in the high concern bin, 13 in the medium concern bin, and 14 in the low concern bin.

Rockfish are generally considered species of high or major concern to overfishing or becoming overfished, 17 of the 28 rockfish analyzed in this action rank above 2.0 and 11 are of medium concern in the vulnerability scale shown in Table 8. Most non rockfish species, except big skate and Pacific spiny dogfish, are of medium to low concern.

Table 8. Productivity (P), susceptibility (S), and vulnerability (v) scores from Cope et al (2011) . Productivity is scored based on a rating of 1, 2, or 3; where 1 is the highest productivity. Susceptibility is scored in the same manner, where 3 is the most susceptible to fishing. Vulnerability scores of less than 1.8 are of low concern, values between 1.8 and 2.0 are of medium concern, values between 2.0 and 2.2 are of high concern, and values greater than 2.2 are of major concern of being overfished based on their productivity and susceptibility.

Species	P	S	V	Species	P	S	V
Arrowtooth flounder	1.95	1.60	1.21	Pacific sanddab	2.40	2.10	1.25
Aurora rockfish	1.33	2.29	2.10	Pacific spiny dogfish	1.11	1.98	2.13
Bank rockfish	1.25	2.00	2.02	Petrale sole	1.70	2.44	1.94
Big skate	1.37	2.14	1.94	Redbanded rockfish	1.28	2.05	2.02
Blackgill rockfish	1.33	2.00	2.08	Redstripe rockfish	1.31	2.33	2.16
Bocaccio rockfish	1.89	2.29	1.93	Rex sole	2.05	1.86	1.28
Blackspotted rockfish a/	-	-	-	Rosethorn rockfish	1.19	2.05	2.09
California scorpionfish	1.80	1.83	1.41	Rougheye rockfish	1.17	2.33	2.27
Canary rockfish	1.28	2.04	2.01	Sablefish	1.61	1.88	1.64
Chilipepper rockfish	1.83	1.68	1.35	Sharpchin rockfish	1.36	2.24	2.05
Cowcod	1.06	1.88	2.13	Shortraker rockfish	1.22	2.38	2.25
Darkblotched rockfish	1.39	2.04	1.92	Shortspine thornyhead	1.33	1.68	1.80
Dover sole	1.80	1.96	1.54	Silvergray rockfish	1.22	1.95	2.02
English sole	2.25	1.92	1.19	Splitnose rockfish	1.28	1.60	1.82
Flathead sole	2.30	2.05	1.26	Squarespot rockfish	1.91	2.24	1.86
Greenspotted rockfish	1.39	2.14	1.98	Starry rockfish	1.25	2.14	2.09
Greenstriped rockfish	1.28	1.76	1.88	Stripetail rockfish	1.33	2.00	1.80
Harlequin rockfish	1.31	1.95	1.94	Sunset rockfish a/	-	-	-
Lingcod	1.75	1.92	1.55	Vermilion rockfish	1.22	2.02	2.05
Longnose skate	1.53	1.80	1.68	Widow rockfish	1.31	2.16	2.05
Longspine thornyhead	1.47	1.16	1.54	Yelloweye rockfish	1.22	1.92	2.00
Pacific cod	2.11	2.00	1.34	Yellowtail rockfish	1.33	1.88	1.88

Species	P	S	V	Species	P	S	V
Pacific hake b/	2.00	2.36	1.69	Yellowmouth rockfish	1.61	2.38	1.96
Pacific Ocean perch	1.44	1.67	1.69				

a/ blackspotted and sunset rockfishes were not assessed in Cope et al (2011); however, they are cryptic pairs of rougheye and vermilion rockfishes, respectively, and may share the same P, S, and V values.

4. Comparison of the Stock Definition Options

The following analysis assumes that the 47 species considered in this action have been adopted under Alternative 1, i.e., are in need of conservation and management in the EEZ and will continue to be managed in the Groundfish FMP. As discussed in Chapter 2, the potential stock definitions for these species are represented under Alternative 1 as Options, where the Option number indicates the number of stock units for the species, i.e., Option 1 would define stocks of these species as a single geographical unit, Option 2 indicates two stock areas, etc. The Council adopted Option 1 as their PPA stock definition for the following 28 species that have not had their stocks defined under A31 or A35. (Table 9).

Table 9. Preliminary preferred alternative (PPA) stock definition for the 28 species considered under this action with stocks not defined under previous actions.

Species	PPA Proposed Stock Definition	# of stocks	Species	PPA Proposed Stock Definition	# of stocks
Arrowtooth Flounder	Coastwide	1	Longspine Thornyhead	Coastwide	1
Aurora Rockfish	Coastwide	1	Pacific Cod	Coastwide	1
Bank Rockfish	Coastwide	1	Pacific Hake	Coastwide	1
Big Skate	Coastwide	1	Pacific Ocean Perch	Coastwide	1
Blackgill Rockfish	Coastwide	1	Pacific Sanddab	Coastwide	1
Bocaccio Rockfish	Coastwide	1	Redstripe Rockfish	Coastwide	1
California Scorpionfish	CA-only	1	Rosethorn Rockfish	Coastwide	1
Cowcod	CA-only	1	Sharpchin Rockfish	Coastwide	1
Darkblotched Rockfish	Coastwide	1	Shortraker Rockfish	Coastwide	1
Flathead Sole	Coastwide	1	Silvergray Rockfish	Coastwide	1
Greenspotted Rockfish	Coastwide	1	Splitnose Rockfish	Coastwide	1
Greenstriped Rockfish	Coastwide	1	Starry Rockfish	CA-only	1
Harlequin Rockfish	OR/WA	1	Stripetail Rockfish	Coastwide	1
Longnose Skate	Coastwide	1	Yellowmouth Rockfish	Coastwide	1

The Options are compared to one another to understand the tradeoffs between the biological risks to the species and management burden of the stock definition Options, as described in Section 1.5 above. For reference, the biological risks may be in the form of localized depletion or the fishery not achieving OY; whereas, the management burden would be in the form of changed management compared to status quo, including the potential increased need for an allocative decision. Status quo management is characterized by the 2025-26 harvest specifications and management measures (PFMC, 2024a).

These metrics for evaluating stock definitions Options are described qualitatively, as the actual impacts from applying the harvest control rule framework to the newly defined stocks will occur in future harvest specifications processes. Thus, at this time, the impacts are not certain. Table 10provides the geographic area stratification of the four different indicators that are presented for this analysis: 1) BSIA population structure; 2) NMFS's current stock status determination area, if

applicable; 3) ACL scale of current harvest management; and 4) the stock's current assessment stratification and assessment category

Table 10. The combined option, delineation, population structure (Pop Struct), annual catch limit (ACL scale), assessment year (Assess Yr.),, assessment category and area stratification for the species without defined stocks considered under this Action. The Preliminary Preferred Alternative (PPA) is identified. The left side shows the species, the alternative(s) it is considered under, and the resulting geographic delineation of the alternative. North = N, South = S, Washington = WA, Oregon = OR, California = CA, and CW = coastwide

Species	Option	Potential Stock Delineations	Pop. Struct	Current Management Scale	NMFS Status Area	Assess Yr	Category & Stratification	Notes
Arrowtooth flounder	1 (PPA)	**Coastwide (PPA)**	U	Coastwide	Pacific Coast	2017	2 CW	
Aurora rockfish	1 (PPA)	**Coastwide (PPA)**	U	Slope Rockfish Complex N/S of 40° 10′ N. lat..	Pacific Coast	2013	1 CW	
Bank rockfish	1 (PPA)	**Coastwide (PPA)**	U	Slope Rockfish Complex N/S of 40° 10′ N. lat..	Slope N/S 40 10 Complex	2011	3 CW	
Big skate	1 (PPA)	**Coastwide (PPA)**	N	Coastwide	Pacific Coast	2019	2 CW	
Blackgill rockfish	1 (PPA)	**Coastwide (PPA)**	U	Slope Rockfish Complex N/S of 40° 10′ N. lat..	Southern California	2011 (N 4010), 2017 (S 4010)	3 (N4010), 1 (S 4010)	
Bocaccio rockfish	1 (PPA)	**Coastwide (PPA)**	U	Shelf Rockfish Complex N of 40° 10′ N. lat.. South of 40° 10′ N. lat..	Southern California / N of 40° 10′ N. lat.	2011 (N 4010) 2019 (S 4010)	3 (N4010), 1 (S 4010)	
California scorpionfish	1 (PPA)	Coastwide or **CA-Only (PPA)**	U	Coastwide	Southern California	2017	1 (S 3427	range = CA
Cowcod	1 (PPA)	Coastwide	Y	South of 40°10 N lat.	Southern California	2019	2 (S 3427) 3 (N 3427)	range = CA & OR
	1 (PPA)	**CA-Only (PPA)**						
	1 (PPA)	CA/OR						
	2	CA/OR						
Darkblotched rockfish	1 (PPA)	Coastwide	U	Coastwide	Pacific Coast	2017	1 CW	
Flathead sole	1 (PPA)	Coastwide (PPA)	U	Coastwide	Other Flatfish complex	-	3 CW	
Greenspotted rockfish	1 (PPA)	Coastwide (PPA)	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Pacific Coast	2011	3 (OR/WA) 2 CA	
Greenstriped rockfish	1 (PPA)	**Coastwide (PPA)**	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Pacific Coast	2009	3 CW	

Species	Option	Potential Stock Delineations	Pop. Struct	Current Management Scale	NMFS Status Area	Assess Yr	Category & Stratification	Notes
Harlequin rockfish	1 (PPA)	Coastwide	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Shelf N/S 40 10 Complex	N/A	3 NA	range = OR & WA
		OR/WA (PPA).						
	2	OR and WA						
Longnose skate	1 (PPA)	**Coastwide (PPA)**	U	Coastwide	Pacific Coast	2019	2 CW	
Longspine thornyhead	1 (PPA)	**Coastwide (PPA)**	U	North/South of 34° 27′ N. lat.	Pacific Coast	2013	2 CW	
Pacific cod	1 (PPA)	**Coastwide (PPA)**	U	Coastwide	Pacific Coast	-	3 CW	
Pacific hake	1 (PPA)	**Coastwide (PPA)**	U	Coastwide	Pacific Coast	2023	-	
Pacific Ocean perch a/	1 (PPA)	**Coastwide (PPA)**	U	North of 40° 10′ N. lat. Shelf Rockfish Complex S of 40° 10′ N. lat	Pacific Coast	2017	2 CW	
Pacific sanddab	1 (PPA)	**Coastwide (PPA)**	N	Coastwide	Pacific Coast	2011	3 CW	
Redstripe rockfish	1 (PPA)	**Coastwide (PPA)**	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Shelf N/S 40 10 Complex	2011	3 CW	
Rosethorn rockfish	1 (PPA)	**Coastwide (PPA)**	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Shelf N/S 40 10 Complex	2011	3 CW	
Sharpchin rockfish	1 (PPA)	**Coastwide (PPA)**	U	Slope Rockfish Complex N/S of 40° 10′ N. lat..	Slope N/S 40 10 Complex	2013	2 CW	
Shortraker rockfish	1 (PPA)	**Coastwide (PPA)**	U	Slope Rockfish Complex N/S of 40° 10′ N. lat..	Slope N/S 40 10 Complex	2011	3 CW	
Silvergray rockfish	1 (PPA)	**Coastwide (PPA)**	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Shelf N/S 40 10 Complex	2011	3 CW	
Speckled rockfish	1 (PPA)	**Coastwide (PPA)**	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Shelf N/S 40 10 Complex	2011	3 CW	
Splitnose rockfish	1 (PPA)	**Coastwide (PPA)**	N	Slope Rockfish Complex N/S of 40° 10′ N. lat..	Slope N/S 40 10 Complex	2011	3 CW	
Starry rockfish	1 (PPA)	Coastwide	U	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Shelf N/S 40 10 Complex	2011	3 CW	range = CA
		CA-Only (PPA)						
Stripetail rockfish	1 (PPA)	**Coastwide (PPA)**	N	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Pacific Coast	2011	3 CW	
Yellowmouth rockfish	1 (PPA)	**Coastwide (PPA)**	U	Slope Rockfish Complex N/S of 40° 10′ N. lat..	Slope N/S 40 10 Complex	2011	3 CW	

4.1 Stock Delineation Overview

During development of A31, the SSC recommended that the most conclusive sources of information on population structure are typically genetic differences (if they exist), while less conclusive information on population structure includes the exchange or movement of adults, followed by larval dispersal (Agenda Item E.3.a, Supplemental SSC Report 1, November 2021). The lowest tier of information on population structure is demographic differences, such as size at age.

Identifying population structure requires fine scale data that does not always exist for every species. While fine scale data may not always be available, assuming population structure based on limited information does have its risks. Through simulation, Punt et al. (2016) demonstrated the consequences of assuming a certain spatial structure for a species while missing critical differences due to limited information. Among simulations, models capturing all spatial differences between two areas performed best, but simulations assuming spatial structure, yet incorrectly assuming constant growth between the areas, performed no better than assuming a single homogeneous area. This finding contrasts with Bosely et al. (2022) who found that allowing for incomplete spatial population structure is likely to be less detrimental than ignoring it completely. Bosley et al. (2022) found that allowing assessments flexibility in their movement estimation inputs could mitigate against the risk of not knowing the correct underlying spatial structure.

Large and fine scale habitat and oceanographic features are often considered to be key drivers of population or stock structure for marine species, where such structure exists. Within the CCE, the nearshore, shelf, slope and offshore regions generally have their greatest changes in physical and biological characteristics at major promontories (e.g. edges of landmasses, etc.), with Point Conception (34° 27` N), Cape Mendocino (40° 30` N), and Cape Blanco (42° 50` N) generally considered to be among the most important biogeographic features along the U.S. West coast (Hickey 1979; Checkley and Barth 2009; Gottscho 2014). These features typically reflect strong shifts in biological community structure and other ecological features (Horn et al. 2006; Tolimieri and Levin 2006; Tolimieri 2007), and are regions in which greater genetic diversity within species is observed (Sivasundar and Plumbi 2010; Hess et al. 2011; others). However, within species or populations, differences in depth and habitat distributions, seasonality of reproduction, larval durations, and both juvenile and adult movement patterns also factor into the degree of population structure or connectivity over larger spatial scales, and a wide range of potential population structure "types" is possible depending on a suite of life history factors.

4.2 Species Considered under Multiple Options

Bocaccio, cowcod, darkblotched, greenspotted, and harlequin rockfishes are considered under multiple Options (Table 11W). Bocaccio is considered under Option 1 (single stock coastwide) and Option 2 (two stocks, north and south of 40° 10′ N. lat). Cowcod is considered under Option 1 (single stock coastwide) and Option 2 (two stocks, north and south of 34°27′ N. lat.). Darkblotched rockfish is considered under Option 1 (single stock coastwide), Option 2 (two stocks, California stock and Oregon/Washington stock [north and south of 42° N. lat.]), and Option 3 (three stocks, California stock, Oregon stock, and Washington stock). Greenspotted rockfish is considered under Option 1 (single stock coastwide) and Option 2 (two stocks, north and south of

34°27′ N. lat.). Harlequin rockfish is considered under Option 1 (single stock, Oregon/Washington).

Table 11. Species considered under multiple stock delineation options

Species	Option	# stocks	Stock Area Delineation(s) by Option a/
Boccacio	**1(PPA)**	One	Coastwide
	2	Two	N. of 40° 10′ N. lat. stock & a S. 40° 10′ N. lat. stock
Cowcod	**1(PPA)**	One	A California stock
	2	Two	A S of 34°27′ S. lat. stock & a N of 34°27′ N. lat. stock
Darkblotched rockfish	**1(PPA)**	One	Coastwide
	2	Two	A California stock An Oregon/Washington stock
	3	Three	A California Stock, an Oregon Stock, and a Washington Stock
Greenspotted rockfish	**1(PPA)**	One	Coastwide
	2	Two	N. of 40° 10′ N. lat. stock & a S. 40° 10′ N. lat. stock
Harlequin rockfish	**1(PPA)**	One	An Oregon/Washington stock
	2	Two	An Oregon stock & a Washington stock

a/ CA is defined as south of 42°N. lat. stock, Oregon is defined as 42° N. lat to 46°16′ N. lat.; and WA as N of 46°16′ N. lat.

The rationale for considering boccaccio under the two options relates to the stock assessment stratification. Option 1 addresses the range of the species on the West Coast. Option 2 relates to the geographic scale of the sub-area assessments. As discussed in the literature review, population structure is uncertain; however, the 2017 update stock assessment (Field and He, 2017) noted that there are unresolved questions related to the relative levels of demographic mixing of the southern and northern populations. The action team for the Phase 2 stock definitions process, therefore, suggested consideration of a stock delineation at 40°10′ N. lat. as it comports directly to current management of the species. In March 2025, the Council adopted Option 1 as PPA for bocaccio.

The rationale for considering cowcod under two options is related to its dominant area of mortality and geographical population structure. Mortality of cowcod is predominantly in California, specifically south of 34°27′ N. lat. (Dick and He, 2019), though rare catches have been observed in Oregon.[10] While the range of cowcod is from northern Oregon into Mexico, the fishery mortality data and other relevant information (e.g., Love et al, 2002) suggest the species is concentrated in California. The ROA Analysis offered Option 2 as an option for cowcod with a California stock and an Oregon stock. However, after review of the available literature, a stock north and south of 34° 27′ N. lat. is more consistent with population structure. Therefore, this definition is offered here for consideration. Based on the scientific information to date, (e.g., Hess et al. 2014; Dick and He 2019), cowcod has population structure and there are at least two phylogenies based on genetic differences for this species: one above Point Conception (34°27′ N.

[10] Pers. comm. Christian Heath, ODFW, September 2024.

lat.) and at least one below Point Conception. In March 2025, the Council adopted Option 1, a California stock, as PPA for cowcod.

Greenspotted rockfish was presented to the Council in the March 2025 ROA document only under Option 1, as a coastwide stock, as the literature review indicated stock structure was uncertain. However, the SSC recommended that greenspotted rockfish be considered under Option 2 to account for differences in growth rates and exploitation histories along the coast (Agenda Item H.6.a, Supplemental SSC Report 1, March 2025).

In March 2025, darkblotched rockfish was presented to the Council in the March 2025 ROA document only under Option 1, as a coastwide stock, as the literature review indicated stock structure was uncertain. There was some evidence of genetic differences among darkblotched rockfish, spatial variation in life history traits, and limited larval dispersal, however. The SSC recommended to add Option 2 (two stock areas) and Option 3 (three stock areas) to darkblotched rockfish to account for genetic differences between Washington and northern California (Agenda Item H.6.a, Supplemental SSC Report 1, March 2025). The SSC did not specify proposed stock boundaries and the Council adopted a California stock and an Oregon/Washington stock for Option 2 and state-specific stocks for Option 3.

Harlequin rockfish is considered under two options as the species could be considered two stocks based on its geographic range, which is limited to Oregon and Washington (Love et al, 2002). Harlequin rockfish does not have stock structure presently defined; however, its range is limited to Oregon and Washington. Its geographic range indicates that it could be considered as two stocks (Option 2), an Oregon and a Washington stock, or as a combined single area stock (Option 1)..

4.3 Species with Multiple Sub-Area Assessments

Bocaccio, blackgill rockfish, cowcod, and greenspotted rockfish, have sub-area assessments (Table 12). The sub-area assessments for these species are of different categories. At present, the only species of this subset that is managed as a single unit along the coast is cowcod. Under Option 1, sub-area assessments would need to be pooled to determine stock status (e.g., not overfished or overfished) and OFL/ABC/ACL for the stock. If multiple sub-area assessments are conducted for a single stock there is the potential of an overfished declaration being driven by the estimates from one or more of the sub-area assessments, if that area represents a large proportion of the stock's biomass. However, the rebuilding plan would apply at the level at which the stock is defined. As noted above, combining assessments can mask areas of localized depletion; whereas, sub-area assessments are more likely to reveal localized depletion.

Table 12. Species under the preliminary preferred Option 1stock delineation with multiple sub-area assessments, and their assessment category, compared to the current scale of the annual catch limit (ACL)

Species	PPA Option 1 Delineation	Current Management Scale	Category & Assessment Stratification
Bocaccio a/	Coastwide	North/South of 40° 10′ N. lat.	3 (N4010), 1 (S 4010)
Blackgill rockfish a/	Coastwide	North/South of 40° 10′ N. lat.	3 (N of 40° 10′ N. lat.) 1 (S of 40° 10′ N. lat..)
Cowcod	California	South of 40°10 N lat.	3 (N 34°27′ N. lat) 2 (S 34°27′ N. lat.)
Greenspotted rockfish b/	Coastwide	North/South of 40° 10′ N. lat.	3 OR/WA 2 CA

a/ Blackgill rockfish and bocaccio are managed a single species south of South of 40° 10′ N. lat. but with the slope and shelf rockfish complex north of 40° 10′ N. lat., respectively.
b/ Greenspotted rockfish is managed as a component species of the shelf rockfish complex, N/S of 40°10′ N . lat.

The FMP allows the Council to implement existing and/or develop new measures to address needs of the fishery. As the Council does at present, the FMP allows the Council to adopt measures specific to area and fishery sector, when appropriate. If it was determined the fishery within the assessed sub-area was in need of management in order to meet overall conservation goals, the Council could act in a variety of ways to address the issue. Examples of management measures range from routine measures, e.g., inseason action, to area specific measures, e.g., annual catch targets or other harvest specification methods.

As described in Section 4.2 of the FMP, three Categories of species assessments are identified. The FMP provides status determination criteria (SDC) for species with Category 1 and 2 assessments (PFMC, 2024a). Category 1 and 2 assessments inform stock status; whereas, Category 3 assessments do not (PFMC, 2024a). Category 1 assessments are those with data-rich quantitative assessments where the OFL is based on F_{MSY} or F_{MSY} proxy from model output. ABC based on P* buffer.[11] Category 2 assessments are data-moderate where the OFL is derived from model output (or natural mortality).[12] Category 3 assessments are data-limited and the OFL is, generally, derived from historical catch.[13] In some cases, data-moderate assessments can be classified as Category 3 assessments.

The species noted in Table 12 have multiple sub-area assessments, which include Category 3 assessments, and combining them to comport to an Option 1 stock definition may impact NMFS's ability to make status determinations for each stock under current SDCs in the FMP (Section 4.4.3). The Category recommendation of a stock assessment is within the purview of the SSC, per the Terms of Reference (TOR) (PFMC, 2024c). Based on a comprehensive review of Chapter 4 of the FMP, if the stock is defined as a single area, the assessment results, e.g., OFL must be reported at that defined level with a single SSC-endorsed Category.

If the Council adopts Option 1 for the species in Table 12, the SSC should advise them regarding the assessment Category for the newly defined stocks. Ideally, the methodology used post-A31 to

[11] See the FMP, §4.4 for additional detail.
[12] *Id.*
[13] *Id.*

combine the unequal Category assessments for Oregon/Washington stocks of vermilion rockfish and copper rockfish would be applicable to these species. The action team acknowledges that it is not the responsibility of the SSC to develop such a methodology, but rather the purview of the Council's science advisors or stock assessment teams. The methodology is then approved by the SSC for how to formulate, and ultimately recommend, a single combined Category for a stock that has multiple sub-area assessments.

The combination of two different assessment categories is a substantive issue, especially for Category 3 stocks, as intimated in FMP in Section 4.4.3. In general, there may not be sufficient data to determine overfished status for Category 3 species. If status for a Category 3 species cannot be determined, a question arises regarding how (or whether) stock status could/should be determined for a stock that contains one or more Category 3 sub-area assessments. Due to the uncertainty regarding status determination and Category 3 species, a discussion among the Council's science advisors is necessary to resolve how to combine assessments of different categories for these species.

4.4 Species-Specific Comparison of Options.

4.4.1 Species considered under Option 1 only

Because stocks were defined for some of the 47 species being evaluated under §600.305(c) Factors 1-3 above under A31 and A35, a total of 28 species are being considered for stock definitions in this action. A total of 23 species (Table 13) are only considered under Option 1, stock definition as a single stock unit. California scorpionfish and starry rockfish are considered under Option 1 as California-only stocks, due to their known geographic range (PFMC 2024, Love et al, 2002); whereas the stocks for the other Option 1-only species are proposed to be defined as coastwide stocks. There is no alternative Option for these species and if these species are not adopted under Alternative 1, there would be no need to define their stock units.

Table 13. Species considered only under Option 1, single stock

Arrowtooth flounder	Flathead sole	Pacific Ocean perch	Silvergray rockfish
Aurora rockfish	Greenstriped rockfish	Pacific sanddab	Splitnose rockfish
Bank rockfish	Longnose skate	Redstripe rockfish	Starry rockfish
Big skate	Longspine thornyhead	Rosethorn rockfish	Stripetail rockfish
Blackgill rockfish	Pacific cod	Sharpchin rockfish	Yellowmouth rockfish.
California scorpionfish	Pacific hake	Shortraker rockfish	

Biological: Genetics, larval dispersal, and/or adult movement data do not support, at present, delineating these 23 species on a finer geographic scale than coastwide basis or as less than a single stock, except for a California-only stock of starry rockfish and California scorpionfish, which can be more finely defined based on their known geographic range. All of these 23 species, except for blackgill rockfish, have been consistently considered a single population, assessed as a single geographic unit, and have historically had a single OFL.

The assessments of these species were recommended by the SSC as BSIA, adopted by the Council (PFMC 2024b) and determined as BSIA by NMFS. Bank, blackgill (N of 40°10′ N. lat.), greenstriped, redstripe, rosethorn, shortraker, silvergray, starry, yellowmouth rockfishes, Pacific

sanddab, flathead sole, and Pacific cod are Category 3 assessments (Table 14). Category 3 assessments are not used to estimate status, per the FMP. Arrowtooth flounder, aurora rockfish, big and longnose skates, longspine thornyhead, and Pacific ocean perch are Category 2 assessments (Table 14). California scorpionfish is a Category 1 assessment. Defining stocks of these species as less than a single population, and at the Option 1 geographic scale, would require new information. Additionally, no new information has been found since the completion of the literature review.

Blackgill rockfish has two sub-area assessments. The assessment south of 40°10′ N. lat is a Category 1 assessment, whereas the assessment north of 40°10′ N. lat is a Category 3. There is a question of whether combining Category 3 and Category 1 assessments would result in a stock assessment that meets the criteria in the FMP as being appropriate for NMFS's status determinations. These assessments would need to be combined to generate harvest specifications at the coastwide scale. While the combination of these assessments is more likely to be representative of the species range, adopting stock definitions Option 1 for this species could create the risk of resulting in a combined coastwide status determination that may not be reflective of differences in localized population dynamics (e.g., localized depletion, exploitation history, etc.). Therefore, how the Council defines the stock of blackgill rockfish may have biological implications within the context of the harvest specifications framework in the FMP

A California-only stock definition for California scorpionfish and starry rockfish may reflect the range of these species; however, it could restrict future stock assessment considerations if their ranges change. The SSC recommended that these species with no evidence of stock structure, but limited ranges (e.g., "California only"), should be delineated as coastwide stocks to allow for potential northward shifts in distribution as oceanic and other environmental conditions continue to change (Agenda Item H.6.a, Supplemental SSC Report 1, March 2025).

Management: Option 1 is unlikely to require the Council to consider changes to management such as changes to formal or informal allocations, for most of the 23 species considered under Option 1 only, during future harvest specifications and management measures processes. Such changes could potentially be controversial, as with any action that adjusts allocations.

The species managed as single stocks (arrowtooth flounder, big and longnose skates, Pacific cod, Pacific hake, and California scorpionfish) and the two flatfish in the Other Flatfish Complex (Pacific sanddab and flathead sole) are currently managed at a coastwide scale and have harvest specifications set equivalent to that scale. Longspine thornyhead is managed north and south of 34°27′ N. lat. A coastwide stock definition would not alter management of longspine thornyhead, however, as at present the species has a coastwide OFL and ABC, but the ACL is proportionally divided into the two regions based on the average swept area biomass from the NMFS trawl survey

With two exceptions, all of the rockfish species considered under Option 1 (bank, blackgill (N of 40°10′ N. lat.), greenstriped, POP (S of 40°10′ N. lat), redstripe, rosethorn, shortraker, silvergray, starry, and yellowmouth rockfishes) are managed in either the Shelf Rockfish or Slope Rockfish Complexes. These species, except blackgill rockfish, have coastwide assessments and their harvest specifications are proportioned to the scale of the complex. A coastwide definition would therefore have no impact on management or allocations for most of these species.

The exceptions to the above are blackgill rockfish and POP. Blackgill rockfish is managed as a single species south of 40°10′ N. lat and as a component of the Slope Rockfish Complex North of 40°10′ N. lat. POP is managed as a single species north of 40°10′ N. lat and as a component of the Slope Rockfish Complex South of 40°10′ N. lat. If stocks of these species are defined as coastwide, the current management scale of north/south of 40°10′ N. lat. could be continued; however, the Council could consider, under the future harvest specifications and management measures processes, to manage these species as single stocks, i.e., not within the Slope Rockfish Complexes. For POP, no impacts to management or allocations are expected if it is removed from the Slope Rockfish Complex as, at present, POP has a 0 mt OFL/ABC contribution to the complex. Removing blackgill rockfish from the Slope Rockfish Complex North of 40°10′ N. lat. would reduce that complex's harvest specifications by the amount blackgill contributes to the complex.

Option 1 would define California scorpionfish and starry rockfish as California-only stocks. California scorpionfish is currently managed as a single species south of 34°27′ N. lat. Defining the stock of California scorpionfish as a California-only stock would likely incur little impact to management. The SAFE (PFMC 2024b) indicates that in most years 99 percent of the mortality of this species is south of 34°27′ N. lat. Management could remain the same as present with little risk to the ACL arising from the negligible amount of mortality north of 34°27′ N. lat.

Starry rockfish is currently managed with the Shelf Rockfish Complex north and south of 40°10′ N. lat. Option 1 would define the stock of starry rockfish as California only. Therefore, the contribution of OFL/ABC from starry rockfish to the complex north of 40°10′ N. lat. would be limited to 42° N. lat. (i.e., Oregon border). This change would reduce the overall allocation of the Shelf Rockfish Complex to fishing sectors north of 40°10′ N. lat. However, it should be noted that during the period used for this analysis (2018-2023, excl. 2020) there has been no mortality in Oregon or Washington of starry rockfish. Given the 2025-26 contribution to the Shelf Complex North of 40°10′ N. lat. OFL is 0.004 mt and to the ACL 0.003 mt annually, the overall impact to allocations of this complex north of 40°10′ N. lat. is negligible.

Synthesis: Option 1 would define these species as single stocks within a single geographic range set as the U.S. West Coast. A single stock definition is appropriate when no population structure is present or when the species has unknown population structure. A single area stock indicates that harvest in one area could affect the trajectory of the stock in all areas. The Council will need to be advised of the potential impacts of combining the sub-area assessments for blackgill rockfish and POP. The coastwide definition for these species may require reconsideration of the management unit in the next harvest specification process, with the consideration of a sub-ACL structure to formalize managing part of the stock independently from the part managed in a complex. Status determinations for these stocks would be at the coastwide scale. Option 1 is the most consistent within the regulatory framework for these species. Option 1 was recommended by the GMT (Agenda Item H.6.a, Supplemental GMT Report 1, March 2025) and the GAP (Agenda Item H.6.a, Supplemental GAP Report 1, March 2025 for these 23 species. As discussed, Option 1 presents few new management implications, with no new management implications for the majority of these species

Table 14. Comparison of the Council recommended Preliminary Preferred Alternative (PPA) to the annual catch limit (ACL) scale of species, NMFS status area, scientific and statistical committee (SSC) recommendation for population (Pop) structure recommendation, the most recent assessment stratification, and assessment stratification for species only considered under Option 1 . North = "N." and South = "S."

Species	PPA Opt. 1 Stock Delineation	Management Scale	NMFS Status Area	SSC Pop Structure Recomm.	Assessment & Stratification	Category
Arrowtooth flounder	Coastwide	Coastwide	Pacific Coast	Coastwide	Coastwide	2
Aurora rockfish	Coastwide	N/S of 40° 10′ N. lat..	Pacific Coast	Coastwide	Coastwide	2
Bank rockfish	Coastwide	N/S of 40° 10′ N. lat..	Slope N/S 40 10 Complex	Coastwide	Coastwide	3
Big skate	Coastwide	Coastwide	Pacific Coast	Coastwide	Coastwide	2
Blackgill rockfish	Coastwide	N/S of 40° 10′ N. lat..	Southern California	Coastwide	N/S of 40° 10′ N. lat..	3 N 4010 2 S 4010
California scorpionfish	California	Coastwide	Southern California	Coastwide	S of 34°27′ N. lat.	1
Flathead sole	Coastwide	Coastwide	Pacific Coast	Coastwide	Coastwide	3
Greenstriped rockfish	Coastwide	N/S of 40° 10′ N. lat..	Pacific Coast	Coastwide	Coastwide	3
Longnose skate	Coastwide	Coastwide	Pacific Coast	Coastwide	Coastwide	2
Longspine thornyhead	Coastwide	N/S of 34° 27′ N. lat.	Pacific Coast	Coastwide	Coastwide	2
Pacific cod	Coastwide	Coastwide	Pacific Coast	Coastwide	Coastwide	3
Pacific hake	Coastwide	Coastwide	Pacific Coast	Coastwide	-	-
Pacific Ocean perch	Coastwide	N/S of 40° 10′ N. lat..	Pacific Coast	Coastwide	Coastwide	2
Pacific sanddab	Coastwide	Coastwide	Pacific Coast	Coastwide	Coastwide	3
Redstripe rockfish	Coastwide	N/S of 40° 10′ N. lat..	Shelf N/S 40° 10′ N. lat. Complex	Coastwide	Coastwide	3
Rosethorn rockfish	Coastwide	N/S of 40° 10′ N. lat..	Shelf N/S 40° 10′ N. lat. Complex	Coastwide	Coastwide	3
Sharpchin rockfish	Coastwide	N/S of 40° 10′ N. lat..	Slope N/S 40° 10′ N. lat. Complex	Coastwide	Coastwide	2
Shortraker rockfish	Coastwide	N/S of 40° 10′ N. lat..	Slope N/S 40° 10′ N. lat. Complex	Coastwide	Coastwide	3
Silvergray rockfish	Coastwide	N/S of 40° 10′ N. lat..	Shelf N/S 40° 10′ N. lat. Complex	Coastwide	Coastwide	3
Splitnose rockfish	Coastwide	N/S of 40° 10′ N. lat..	Shelf N/S 40° 10′ N. lat. Complex	Coastwide	Coastwide	3
Starry rockfish	California	N/S of 40° 10′ N. lat..	Shelf N/S 40° 10′ N. lat. Complex	Coastwide	Coastwide	3
Stripetail rockfish	Coastwide	N/S of 40° 10′ N. lat..	Shelf N/S 40° 10′ N. lat. Complex	Coastwide	Coastwide	3
Yellowmouth rockfish.	Coastwide	N/S of 40° 10′ N. lat..	Slope N/S 40° 10′ N. lat Complex	Coastwide	Coastwide	3

4.4.2 Species Considered under Multiple Options

Bocaccio

Bocaccio is considered under Option 1 (Coastwide) and Option 2 (north/south of 40°10′ N. lat.; Table 15). The Council adopted Option 1 as PPA. The SSC (Agenda Item F.4.a, Supplemental SSC Report 1, June 2017) and NMFS endorsed the 2018 bocaccio update assessment (He and Field, 2018) as BSIA. Status can be reported for the portion of the population south of 40°10′ N. lat. as it is a Category 1 assessment; whereas the assessment for the portion north of 40°10′ N. lat. is a Category 3. The assessment assumed bocaccio was a coastwide population even though there were demographic differences (PFMC, 2024b; He and Field, 2018)

Table 15. Comparison of the Council recommended Preliminary Preferred Alternative (PPA) for bocaccio to the annual catch limit (ACL) scale of species, NMFS status area, scientific and statistical committee (SSC) recommendation for population (Pop) structure recommendation, and the most recent assessment for black rockfish.

Option	Options	Current ACL Scale	NMFS Status Area	Assess Yr	Category & Stratification
1 (PPA)	Coastwide stock	Shelf Rockfish Complex N of 40° 10′ N. lat. & South of 40° 10′ N. lat..	Southern California	2011 (N of 4010) 2017 (S of 43)	3 (N4010), 1 (S 4010)
2	N and S of 40° 10′ N. lat. stocks				

Biological: Based on the literature review and He and Field, 2018, Option 1 is likely more representative of the regional dynamics of bocaccio, as the current knowledge of genetics, larval dispersal, and/or adult movement data do not support delineating this species on a geographic scale finer than coastwide or as less than a single stock. However, Option 1 would require pooling of the two assessments, which are of unequal categories. Option 2 indicates there is population separation at 40°10′ N. lat., which may not be consistent with BSIA. Option 2 is more precautionary than Option 1, in that it recognizes two demographic centers to the population, as acknowledged in the assessment (He and Field 2018), and indicates that each population has its own regional dynamics. Thus, Option 2 could have reduced risk of localized depletion when compared to Option 1. Option 1 would require a single OFL and ABC, whereas Option 2 would continue the status quo of an OFL and ABC north and south of 40°10′ N .lat

Management: Bocaccio is managed at present as a single species south of 40°10’ N. lat. and as a component of the Shelf Rockfish Complex North of 40°10′ N. lat. Option 1 does not reflect how the species is currently managed; however, the Council could manage the stock on a smaller-than coastwide basis using sub-ACLs as it does with other species (e.g., longspine thornyhead, sablefish, etc.). Option 2 is consistent with status quo management. Accordingly, the management burden may increase under Option 1 if the Council decides to manage the species on a coastwide scale. However, if the Council continued to manage bocaccio in the way it does at present, using sub-ACLs, then the impact to management under both options is likely.

Summary: Option 1 would define the stock as a single coastwide population, which aligns with BSIA. Option 2 reflects the knowledge that there are two demographic groups of bocaccio, as well as the current state of knowledge regarding stock structure is uncertain. Option 1 likely reduces the risk of negative biological implications within the context of the harvest specifications

framework of the FMP, but may increase the risk of sub-area depletion. Option 2 may reduce the risk of sub-area depletion and reflects how the species is managed at present. Option 1 may increase management burden relative to Option 2 if the Council decides to change its management strategy for bocaccio.

Cowcod

Cowcod is considered under Option 1 (California-only stock) and Option 2 (California stock, Oregon stock). Cowcod was last assessed in 2019 with two sub-areas: south of 34°27′ N. lat. (Category 2) and north of 34°27′ N. lat. (Category 3). The ACL and NMFS status area are the same for cowcod; however, the PPA and stock assessment stratification differ both from each other and from the ACL scale and NMFS status area. Both Options 1 and 2 would require the assessments to be pooled; however, cowcod is managed south of 40°10 N .lat. as a single unit at present, indicating pooling of the assessments is the current practice. Though, cowcod is considered under Option 1 (California-only stock) and Option 2 (California stock, Oregon stock), the cowcod population off Oregon was not explored in the assessment. Under either Option, it is likely that a new assessment would need to be conducted to understand the populations north of 40°10′ N. lat. The SSC endorsed the 2019 assessment as BSIA (Agenda Item H.5.a, Supplemental SSC Report 1, September 2019), and status is determined for the population south of 34°27′ N. lat. Additionally, Cowcod is currently delineated at a less than a California-scale across all evaluated metrics (Table 16).

Table 16. Comparison of the Council recommended Preliminary Preferred Alternative (PPA) for Cowcod to the annual catch limit (ACL) scale of species, NMFS status area, scientific and statistical committee (SSC) recommendation for population (Pop) structure recommendation, and the most recent assessment for black rockfish.

Options	Delineation	Current ACL Scale	NMFS Status Area	Assess Yr	Category & Stratification
1 (PPA)	CA-only stock	South of 40°10 N lat.	Southern California	2019	2 (S 3427)
2	CA and OR stocks				3 (N 3427)

Biological: Cowcod has a distinct population structure, north and south of 34°27′ N. lat. The bulk of the species is south of 34°27′ N. lat. (Dick and He, 2019). Both Options would require pooling of sub-area assessments. As noted above, combining assessments can mask areas of localized depletion; whereas, sub-area assessments are more likely to reveal localized depletion. However, between the two Options, Option 1 is closer to BSIA than Option 2 as Option 2 includes Oregon, which has not been assessed. Option 1 may require science to develop harvest specifications for the area between 40°10′ and 42° N. lat; whereas, Option 2 would require harvest specifications for Oregon to be developed as an Oregon stock is yet unassessed. Option 1 is also less likely to have negative biological implications, within the context of the harvest specification framework, than Option 2. Option 1 and Option 2 (only for the California portion) both have similar risks that a California status determination, based on pooling the sub-area assessments, may not be reflective of differences in localized population dynamics (e.g., localized depletion, exploitation history, etc.)

Management: Cowcod is, at present, managed south of 40°10′ N. lat. as a single unit. Option 1 would increase the geographic scale of management to south of 42° N. lat. (i.e., California-only).

This is unlikely to demonstrably change the management burden, as Option 1 is more similar to current management delineations than Option 2. Option 2 would increase the scale of the management units into two state management units and, therefore, is likely to change the management burden. Option 2 may require development of management measures off of Oregon. Therefore, in sum, Option 2 may have increased management burden relative to Option 1. Both Options may also require reconsideration of allocations, as the scale of the harvest specifications would expand. This may be controversial, as is the case for most allocative decision

Option 1 would increase the geographic scale of management to south of 42° N. lat. (i.e., California-only), though is unlikely to demonstrably change the management burden due to the increased rarity of cowcod morality in that area (Dick and He, 2019). Developing harvest specifications for either Option 1 or Option 2 may be delayed until science is able to address the lack of assessments for the areas noted above. Based strictly on the potential areal delineations, Option 1 is more similar to the current scale of management; whereas, Option 2 would increase the scale of management into two state management units. Option 1 is more similar to current management delineations than Option 2. Therefore Option 2 is likely to increase the management burden more than Option 1

Summary: Option 1 is more consistent with BSIA and current management than Option 2. Accordingly, Option 1 may increase the biological risk to the portion of the population north of 34°27′ N. lat., but would not increase the management burden. Option 2 is reflective of the species' biological range; however, it is not consistent with BSIA and current management. Cowcod are rare in Oregon, as is indicated by the lack of fishery morality in the EEZ off of that state (Table 6). Therefore, a defined Oregon stock may not be warranted and it may not be feasible to generate harvest specifications.

Based on the stock assessment and BSIA, the action team suggests that the Council may wish to modify Option 2 to define cowcod as a stock north and a stock south of 34°27′ N. lat. In the same vein, the Council could consider modifying Option 1 to define cowcod as a single stock south of 40°10′ N. lat. These delineations would better comport with the assessments and BSIA. Additionally, a south of 40°10′ N. lat. delineation would be equivalent to how cowcod are managed at present. A south of 40°10′ N. lat. stock could, however, increase the risk of sub-area depletion, whereas a two area stock definition, with stocks north and south of 34°27′ N. lat., would better address localized depletion and is consistent with the scale used in the 2019 assessment.

Darkblotched Rockfish

Darkblotched rockfish is considered under Option 1 (coastwide stock), Option 2 (a stock north and a stock south 40°10′ N. lat), and Option 3 (a California stock, an Oregon stock, and a Washington stock). The Council's PPA, a coastwide stock definition, is consistent across all metrics presented in Table 17 (e.g., current management, stock assessment area, etc.). By contrast, Option 2 and Option 3 are not consistent with those metrics. The 2017 assessment (Wallace and Gertseva, 2017) treated the species as a single coastwide stock, due to the lack of biological and genetic data supporting the presence of multiple stocks. At present, status is determined at the coastwide scale. The literature review and the assessment both noted microsatellite analyses of spatial genetic structure in darkblotched rockfish (Gomez-Uchida and Banks, 2005) and indicated some level of genetic differentiation in the stock along the coast, but the level of differentiation was low, sample size was small, and supported by a limited genetic study. The literature review

found the information to support darkblotched rockfish population structure was limited. The update stock assessment (Wallace and Gertseva, 2017) treated as darkblotched rockfish as a single coast wide stock, due to the lack of biological and genetic data supporting the presence of multiple stocks. The SSC endorsed the assessment as BSIA (Agenda Item F.4.a, Supplemental SSC Report 1, June 2017) treated darkblotched as a single stock. At the March 2025 meeting, the SSC recommended consideration of Option 2 and Option 3, based on the limited genetic information which suggests population structure, and therefore would support delineation of more than one stock

Table 17. Comparison of the Council recommended Preliminary Preferred Alternative (PPA) for darkblotched rockfish to the annual catch limit (ACL) scale of species, NMFS status area, scientific and statistical committee (SSC) recommendation for population (Pop) structure recommendation, and the most recent assessment for black rockfish.

Option	Delineation	Current ACL Scale	NMFS Status Area	Assess Yr	Category & Stratification
1 (PPA)	Coastwide stock	Coastwide	Pacific Coast	2017	1 CW
2	N and S of 40° 10′ N. lat. stocks				
3	California, Oregon, Washington stocks				

Biological: Current BSIA, based on the literature review, indicates darkblotched rockfish may have population structure. However, the data to support this finding is limited and the assessment did not consider separate populations along the coast. Option 1 would define the species as a single coastwide stock, which comports to the assessment. Option 2 and Option 3 align with the limited genetic information that suggests population structure may exist on a finer scale than coastwide. Option 1 has slightly more risk of negative biological implications within the context of the harvest specifications framework of the FMP, than Option 2 or Option 3, because if population structure exists on less than a coastwide scale Option 1 could mask localized depletions. Options 2 and Option 3 may, therefore, be more consistent with the species' population structure and dynamics. Option 1 is, however, consistent with the 2017 assessment. Accordingly, Options 2 and 3 would require either new assessments or efforts to calculate harvest specifications at geographic scale of the Option adopted. Currently, it is unclear whether there is any distinguishable difference between Options 2 and 3 with regards to potential biological risks due to the lack of information regarding population boundaries and related genetic differences. Given the uncertainty regarding the population structure of darkblotched rockfish at present, Option 1 would better align with how current harvest specifications are calculated than Options 2 or 3

Management: Darkblotched rockfish is currently managed on a coastwide scale. Option 1 would not require modifications of allocations between sectors; whereas, Options 2 or 3 may initiate considerations of state-specific or regional-specific allocations by the Council, which could be potentially controversial, as with any allocative action. State or regional stock definitions may also require refined management measures to achieve, but not exceed, ACLs at those scales. Therefore, Options 2 and 3 are more likely to result in an increased management burden than Option 1, which is reflective of status quo management.

Summary: Darkblotched rockfish has been consistently delineated at the coastwide scale. Option 1 is more akin to the current assessment structure; whereas Option 2 and 3 are more consistent with the information available on potential genetic differences between populations. However, it is unclear which of these two Options better comports to the stock definitions proposed by the SSC. Option 1 is consistent with current management measures and would not require reconsideration of allocations. Options 2 and 3 may require additional management to achieve but not exceed ACLs. Overall, Option 1 is least likely to result in increased biological risks and management burden compared to Options 2 and 3.

Greenspotted Rockfish

Greenspotted rockfish is considered under Option 1 (coastwide) and Option 2 (north of and south of 34°27′ N. lat. stocks). The PPA stock definition for greenspotted rockfish is Option 1, a coastwide stock. This stock delineation would be inconsistent with two of the three metrics in Table 18. The species is currently managed on less than a coastwide scale and the greenspotted rockfish assessment has two sub-areas. The only assessment (Dick et al, 2011) is for California only and the species was split at Point Conception as two separate stocks based on evidence of differences in growth and exploitation history. The SSC endorsed the assessment as BSIA (Agenda Item G.4.b, Supplemental SSC Report, September 2011). The OFL contribution for the portion of the stock occurring north of 42° N. lat. was derived using data poor methods (PFMC, 2024b). The SSC categorized the assessed portion of the stock (i.e., off California) as a Category 2 stock and the unassessed portion (i.e., north of 42° N. lat.) as a Category 3 stock. Options 1 and 2 are not consistent with the current scale of the ACL for the species or the assessment stratification. Option 1 is consistent with the NMFS status area

Table 18. Comparison of the Council recommended Preliminary Preferred Alternative (PPA) for greenspotted rockfish to the annual catch limit (ACL) scale of species, NMFS status area, scientific and statistical committee (SSC) recommendation for population (Pop) structure recommendation, and the most recent assessment for black rockfish.

Option	Delineation	Current Management Scale	NMFS Status Area	Assess Yr	Category & Stratification
1 (PPA)	Coastwide	Shelf Rockfish Complex N/S of 40° 10′ N. lat.	Pacific Coast	2011	3 (OR/WA) 2 CA
2	N and S of 34°27′ N. lat. stocks				

Biological: Under Option 1 there would be a coastwide OFL and ABC, and under Option 2 there would be a separate OFL north and south of 34°27′ N. lat. Current BSIA indicates greenspotted rockfish have a population structure at less than a coastwide scale. Accordingly, the assessment describes regional dynamics that do not align with the current ACL scale. Option 1 would require pooling of the sub-area assessments. Option 2 would not. Option 1 has a higher risk of resulting in a combined coastwide status determination that may not be reflective of localized population dynamics. Option 2 is therefore more likely to be representative of the region-based status of the species than Option 1. Additionally, Option 2 is less likely to have potentially negative biological implications within the context of the current harvest specifications framework.

Management: Option 2 is more similar to current management of greenspotted rockfish than is Option 1. However, harvest specifications under either Option 1 or 2 would not match the current scale of management for the Shelf Rockfish Complexes. This finding is unlikely to change the

management burden, however, as the assessments do not comport to the current management units either. Option 2 may require additional monitoring specific to the stock south of 34°27′ N. lat. to ensure ACLs are not exceeded. Option 2 reflects a scale reduction of the harvest specifications from 40°10′ N. lat. to 34°27′ N. lat. Neither Option is likely to demonstrably increase the management burden.

Summary: Option 1 reflects the range of the species, but not the assessment stratification or current management units. Option 2 is a reflection of the assessment, but not the management units. Option 1 has an increased risk of negative implications on population dynamics, whereas Option 2 reduces those risks and acknowledges localized population dynamics. If the species is managed in the future as it is at present, little impact to management burden could be expected from either option.

Harlequin Rockfish

Harlequin rockfish is considered under Option 1 (Oregon/Washington stock) and Option 2 (Oregon stock and a Washington stock). A north of 42° N. lat. stock definition (i.e., an Oregon/Washington stock) is proposed for harlequin rockfish as the PPA. This geographic scale is inconsistent with the ACL scale and NMFS status area for this species (Table 19). Harlequin rockfish has never been assessed and, at present, has no harvest specifications. It is managed in the Shelf Rockfish Complex north and south of 40°10′ N. lat., with a 0 mt OFL/ABC in both complexe**s.**

Table 19. Comparison of the Council recommended Preliminary Preferred Alternative (PPA) for harlequin rockfish to the annual catch limit (ACL) scale of species, NMFS status area, scientific and statistical committee (SSC) recommendation for population (Pop) structure recommendation, and the most recent assessment for black rockfish.

Option	Delineation	Current Management Scale	NMFS Status Area	Assess Yr	Category & Stratification
1 (PPA)	Oregon/Washington	Shelf Rockfish Complex N/S of 40° 10′ N. lat..	Pacific Coast	n/a	n/a
2	Oregon and Washington stocks				

Biological: There are no biological reference points which can be used to discern the impact of the fishery of this species. The species, as noted, has never been assessed and is rarely observed off the West Coast. A meaningful comparison of the biological impacts between Option 1 and Option 2 is not possible as there is no information to compare.

Management: This species is managed as a component species in the Shelf Rockfish Complex. Management measures and allocations are specific to the complex and not the species. While the species is actively managed under the Complex, it has no harvest specifications; therefore, the management burden under each option is the same. However, when compared to status quo, the management burden is lower under either Option, as the Council could consider removing this species from the Shelf Rockfish Complex south of 40°10′ N. lat. due to lack of presence in that area.

Summary: Biologically, there are no tradeoffs to compare between the Options, as there is no information available to compare a potential impact of one option as opposed to the other..

Similarly, the species is managed under a complex that would include both Option 1 and Option 2 in toto, i.e., Shelf Rockfish Complex north of 40°10′ N. lat..

The GAP recommended considering this species under §600.305(c)'s 10-factor analysis (Agenda Item H.6.a, Supplemental GAP Report 1, March 2025), as this species is exceedingly rare in the West Coast groundfish fishery. In the last 21 years, mortality has averaged less than 0.01 mt per year, for a total of 0.23 mt for the entire period. In the 5 years studied (2018-19, 2021-23), harlequin rockfish had a total mortality of 0.006 mt (@Somers et al, 2024). Given that the species has never been assessed and has both an exceedingly low mortality and encounter rate in the fishery, Council staff also analyzed it under the 10-factor analysis in order for the Council to consider if it should continue to be managed in the FMP and have its stock(s) defined, if it should be removed from the FMP or if it should be identified as an EC species. (Attachment 2).

5. Magnuson-Stevens Act National Standards

Below are the 10 National Standards (NS) contained in the Magnuson-Stevens Act, and a brief discussion of how each alternative is consistent with the National Standards, where applicable. In recommending a preferred alternative, the Council must consider how to balance the National Standards.

This action is consistent with the authority provided in the Magnuson-Stevens Act. Section §302(h)(1) requires a Council to prepare an FMP for each fishery under its authority that requires (or in other words, is in need of) conservation and management.

5.1 National Standard 1 – Optimum Yield

NS1 provides that conservation and management measures should prevent overfishing while achieving, on a continuing basis, the optimum yield from a fishery. Alternative 1 would improve the FMP's alignment with NS1, as compared to No Action. Under Alternative 47 groundfish species would be identified as in need of conservation and management. Stocks of 28 species would be defined. Currently, the FMP does not include this precision. Once species and their stocks are identified, there would be a sufficient basis in the FMP for NMFS to make status determinations for each stock of these 47 species. Status determinations are needed to understand if conservation and management measures achieve OY. Accordingly, Alternative 1 should allow for the Council to adopt harvest specifications and management measures (in a separate, future action) that better achieve OY from the stocks of these 47 species, and in turn, from the fishery. Subsequent actions would build on this specific action until all managed groundfish species are defined as stocks.

The FMP (§4.5) describes the use of minimum stock size threshold (MSST) and the maximum fishing mortality threshold (MFMT) in status determination. Assessments calculate MSST, MFMT, and MSY for the assessed species and areas, which may then be used to inform overfished status determinations. The Council has adopted OFLs and related harvest specifications, including accountability measures, for all managed species and has sector specific management measures designed to achieve, but not exceed, harvest specification reference points (PFMC 2024a, PFMC, 2024b). These reference points are used to determine the overfished status of the stocks, as defined in the FMP by this action, or by comparing catch to OFLs to determine whether overfishing is occurring.

It is unlikely that sufficient information is or will be available for many groundfish species to be certain that a stock's definition aligns with the biogeography of a species. However, upon definition, we may be able to measure whether a stock's definition is making an appreciable difference in our ability to achieve OY from a stock. When a coastwide-ranging stock has multiple assessment areas, and one area appears to have a much higher rate of depletion, or if one area has an abundance trajectory that is much different from other assessed areas, this may be an indicator that, for the portion of the population with higher depletion, the Council is failing to achieve OY.

If status determinations, which are a key trigger to hold Councils accountable for meeting the requirements under NS1, are made at a scale that is mis-aligned with population structure of a

species within the FMU, then the stock definition is more likely to fail to achieve OY. Management measures taken at a finer scale may substantially mitigate the risks of failing to achieve OY; however, under NS1, such mitigation is not an adequate substitute for stock definitions that yield status determinations designed to achieve OY.

5.2 *National Standard 2 –Best Scientific Information Available*

NS2 provides that conservation and management measures shall be based upon the best scientific information available (BSIA). This action applies the BSIA. Stock definitions are a Council decision. Councils have discretion to make a policy decision on how to define stocks. That said, conservation and management measures (including stock definitions and SDC) must be based on BSIA. If BSIA indicates population structure at a finer scale than would be expected in a single stock, the Council should strongly consider this information, in light of other fishery management objectives. When considering combining sub-area assessments, the Council should seek input from the SSC. Rationale for combining sub-area assessments for stock definitions (and also, therefore, for status determinations), especially if not SSC-recommended, would need to be outlined by the Council. NMFS would evaluate whether the rationale adequately demonstrates consistency of the Council's decision with BSIA.

BSIA is informed by, but not limited to, stock assessments, research, published scientific literature, and technical reports. Appendix A: Biological Information consolidates and synthesizes available information for the priority species. Stock assessments incorporate established information as well as consider new and emerging concepts. The SSC and the Council are informed at multiple stages by NMFS's NWFSC and SWFSC leadership regarding stock assessment planning and how the assessment(s) will be structured. The pre-assessment workshops aid in verifying and validating all sources of data that can be used in the assessment. Ultimate determination of BSIA for federal fisheries management lies with the Secretary of Commerce, as informed by advice from NMFS, as described in the West Coast BSIA Regional Framework documentation.

Assessments are open to the public and are peer reviewed through the Council's Stock Assessment Review (STAR) process or by the SSC itself. The SSC is tasked by the Council to review the findings of the assessment and STAR Panel. The SSC independently assesses that process and provides recommendations to the Council regarding whether the stock assessment is sufficient to provide management advice. The SSC will also recommend if the assessment is BSIA and what Category the assessment is (i.e., if it is robust enough for informing overfished status determinations). The SSC may also make recommendations for the Council's consideration regarding the geographic scale of the stock. Assessments are summarized in the SAFE (PFMC, 2024b) and available on the Council's website .

46 of the 47 species considered in this action have been assessed previously. The SSC has endorsed these past assessments. Harlequin rockfish has not been assessed. The SSC has recommended for Council consideration the scale for status determination of each species. The analysis in this document states the BSIA findings from each assessment (and SSC recommendations). Regarding the species, the population structure of certain species, notably rockfish, may not support a single stock (coastwide) definition.

A literature review was conducted for all species to determine the available population structure information available. The SSC endorsed the literature review as BSIA (Agenda Item I.8.a,

Supplemental SSC Report 1, September 2024). The SSC endorsed the preliminary stock definitions adopted as indicated in the ROA document and recommended the addition of additional Options for darkblotched and greenspotted rockfish (H.6.a, Supplemental SSC Report 1, March 2025)

5.3 National Standard 3 – Management Units

NS3 provides that, to the extent practicable, stocks of fish should be managed as a unit throughout their range, and interrelated stocks should be managed as a unit or in close coordination. This action would identify current groundfish species that are in need of conservation and management and provide stock definitions for those species. This is a necessary step to determining whether stocks of fish are managed appropriately, as a unit or in close coordination. Further, this action would not change management measures, so it would not impact the current structure of managing stocks as a unit throughout their range. The PFMC manages groundfish species specified in the FMP in Federal waters off of California, Oregon, and Washington. If a species range is greater than the Council's jurisdictional geographic scale, those areas are not considered within the scope of this action or the Council's management authority

5.4 National Standard 4 – Allocations

NS4 provides that conservation and management measures should not discriminate between residents of different states and that allocations should be fair and reasonable and designed to promote conservation. Alternative 1 does not include (or impact) any allocation of fishing privileges within the fishery. Allocations occur through the biennial harvest specifications process. Therefore, there would be no impacts on allocation resulting from the PPA.

It is presumed that, subsequent to this action, the harvest specifications for each stock will continue to be based on the harvest specifications framework in the FMP and will be based on BSIA. Under Alternative 1, Option 1 stocks would be defined as coastwide. Three species under Option 1 have two sub-area assessments. Under Option 2 and 3, stocks would be defined at less than coastwide. In this case, the amount of harvestable surplus available off the coast of each state would be established based on BSIA, and not decided by an allocation. Under Options 1, 2, and 3, a stock may span multiple states. In such cases, an allocative decision to apportion harvestable surplus among states may be necessary in a future action. Allocative decisions must be made consistent with NS4, the allocation framework in the FMP, and other applicable laws and policies. Additionally, harvestable surplus off the coast of each state will be based on BSIA. Because this action does not directly allocate harvestable surplus among states and is not intended to be allocative in nature, this action will not discriminate between residents of different states and is consistent with NS4.

5.5 National Standard 5 – Efficiency

NS5 provides that conservation and management measures must, where practicable, consider efficiency in the utilization of fishery resources. This action would define stocks based on BSIA. BSIA, notably stock assessments, take into account the biology of and the fishery activity on a species or stock. BSIA is expected to inform opportunities to harvest the OY of the stock in a manner that reflects the historical and recent fishing activity in a given region. Adoption of the alternative and options that more closely align with current management would be expected to maintain the state of the fishery at present and to preserve existing efficiencies. Adopting an

alternative or option that is expected to result in different management measures could alter efficiencies in current harvest strategies. This, in turn, could impact the ability of the fishery to achieve OY. For the most part, this action is expected to maintain the state of the fishery at present, preserving existing efficiencies. The PPA contains no economic allocation. Therefore, there are no economic impacts or impacts to efficiency beyond those within the scope of No Action

5.6 National Standard 6 – Variations and Contingencies

NS6 provides that conservation and management measures must take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches. This action is consistent with NS6, as this action is necessary to provide enough information on the boundaries of stocks managed in the FMP to inform NMFS's status determinations. This action is designed to reflect current scientific knowledge of fishery resources, while accounting for variations and contingencies in our scientific understanding of the resources as they relate to the management reference points in the FMP. Specificity in geographic or latitudinal boundaries (e.g., north and south of 40° 10' N. lat.) can and should be used to set harvest specifications and to set management measures in regulations that have on-the-water effects, such as impacts on fishing activity, fishery monitoring, and enforcement of fishing prohibitions.

5.7 National Standard 7 – Costs and Benefits

NS 7 provides that conservation and management measures should, where practicable, minimize costs and avoid unnecessary duplication. This action would be consistent with NS7 as the proposed action is administrative in nature and will not modify any harvest specifications or management measures in a manner that would change or create new costs, duplicity in regulations, or burden on user groups within the fishery. This action evaluates those species currently managed in the FMP to identify those in need of conservation and management in the EEZ and defines stocks for those species meeting that criteria. Harvest specifications and management measures for those defined stocks will be developed in future rulemaking actions, with the costs and benefits of those specifications and management measures evaluated in those future actions

5.8 National Standard 8 – Communities

NS8 provides that conservation and management measures must take into account the importance of fishery resources to fishing communities by utilizing economic and social data to provide for the sustained participation of such communities, and to the extent practicable, minimize adverse economic impacts on these communities. This action would be consistent with NS8 as the proposed action does not make changes to any conservation and management measures that directly impact fishing communities. Although the stock definition options that define stocks at smaller geographic scales could result in future harvest specifications and management measures that would have a more localized effects on fishing communities, those future harvest specifications and management measures, including any future rebuilding plans, would be developed and evaluated in a future rulemaking action. Defining stocks is a largely administrative action and will not directly cause socioeconomic impacts to port communities. Thus, the impacts of this specific action to fishing communities is considered neutral.

5.9 National Standard 9 – Bycatch

NS9 provides that conservation and management measures must, to the extent practicable, minimize bycatch and, to the extent bycatch cannot be avoided, minimize the mortality of such bycatch. This action does not make changes to any conservation and management measures that influence or minimize bycatch.

5.10 National Standard 10 – Safety of Life at Seas

NS10 provides that conservation and management measures must, to the extent practicable, promote the safety of human life at sea. This action is not expected to change any aspect of conservation and management measures that could compromise the safety of human life at sea

5.11 Consistency of Proposed Action with Other Applicable MSA Provisions

5.11.1 MSA Section 203

Section 303(a)(9) of the Magnuson-Stevens Act requires that a fishery impact statement be prepared for each FMP or FMP amendment. A fishery impact statement is required to assess, specify, and analyze the likely effects, if any, including the overall conservation, economic, and social impacts, of the conservation and management measures on, and possible mitigation measures for, (a) participants in the fisheries and fishing communities affected by the plan amendment; (b) participants in the fisheries conducted in adjacent areas under the authority of another Council; and (c) the safety of human life at sea, including whether and to what extent such measures may affect the safety of participants in the fishery.

The likely effects of this action are limited to administrative changes via the plan amendment, which would not have direct impacts on the fishery, fisheries in adjacent areas, or fishery participants or fishing communities. Any future indirect impacts to the fisheries and fishery participants/communities, including those resulting from the stock definitions process, will be evaluated as part of future harvest specifications and management measure actions. These potential effects on fisheries, participants in the fisheries and fishing communities cannot be meaningfully evaluated until those future harvest specification and management measures are proposed and, therefore, are not analyzed in this document. The effects of the action on safety of human life at sea are evaluated above in Section 5.10, NS10. This action is not expected to result in any impacts to the safety of human life at sea.

5.11.2 MSA Section 600.305

§600.305(c)(1) includes a non-exhaustive list of 10 factors that a Council should consider when evaluating whether stocks that require conservation and management in the EEZ. In addition, §600.305(c)(3) notes that additional considerations may be relevant to this analysis on a species-by-species or stock-by-stock basis. For the 47 species currently managed in the Groundfish FMP that are evaluated in this specific action, to determine whether continued management under the FMP is warranted, consistent with the guidance in the regulations, the analysis focuses on §600.305(c) Factors 1-3.

The non-exhaustive list of factors at §600.305(c) demonstrates that the inquiry into whether a stock is in need of conservation and management in the EEZ is not a scientific inquiry alone; that other factors and information are relevant; and that the Councils can meet the National Standards

Guidelines with limited or otherwise incomplete scientific information on species and stocks. Indeed, the interaction between NS1 (the obligation to prevent overfishing while seeking to achieve OY) and NS2 (the requirement to apply BSIA) is considered at §600.305(e)(1), which describes using proxies and making an effort to identify and gather available information.

Recognizing the need to make stock definition recommendations with incomplete scientific information to inform these decisions, a thorough literature review was conducted as part of this action, to synthesize the best available scientific information regarding population structure for the species evaluated (Agenda item H.6, Attachment 3, March 2025). Consistent with NS2, this review allowed the Council, paired with the advice of its SSC, to make recommendations for stock definitions for the species proposed for definition in this action that were based on BSIA,.

Additionally, the Council recognized the importance of NS1, NS2 and NS3 considerations when shaping the purpose and need and range of alternatives for the larger Phase 2 stock definitions process, of which this action is part. These three National Standards intersect in the context of the purpose and need and, as applied, in the current frameworks for developing harvest specification and management measures in the FMP. For example, reference points in the FMP pertain to the managed stocks, as they would be defined through this action14. Additionally, it became clear that default ACL control rules in the FMP would also pertain to the stock, as defined through this action

[14] This interpretation is consistent with §600.305(e)(2), which contemplates the relationship of NS3 to NS1, and §600.310(e)(1)(ii), which defines MSY for stocks

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Appendix A

Data

Commercial Sector Data

National Marine Fisheries Service (NMFS) staff developed a model to estimate the distribution of commercial sector mortality between Federal/state waters off the U.S. West Coast (Agenda Item I.8.a, NMFS Report 1, September 2024), which was endorsed by the Council's Science and Statistical Committee (SSC, Agenda Item I.8.a, Supplemental SSC Report 1, September 2024). The methodology is incorporated by reference. In brief, the model utilized four sources of data (1) the Groundfish Estimated Multiyear Mortality (GEMM) product (2) the Pacific Coast Fisheries Information Network (PacFIN) database, and (3) haul-level West Coast Groundfish Observer Program(WCGOP) data, and (4) haul-distributed electronic monitoring (EM) data. The most recent five-year period of complete set of data available was used for the analysis (2017- 2021).

Recreational Sector Data

Estimated recreational mortality by water area and state is available via the Recreational Fishery Information Network (RecFIN) resource and the GEMM for groundfish for all three states. Recreational sector data for a five year period (2018-19, 2021-23)8F[15] per the SSC's September 2024 recommendation was used to determine the species specific mortality by Federal/state waters and by state,.

A key aspect of recreational sector weight data. Based on field sampling protocols it is possible for all species enumerated/sampled to not be weighed. Correspondingly, it is possible to have an estimated number of fish but not have a corresponding weight estimate. Therefore, estimated number of fish offers a more robust set of data for analysis than does weight for the recreational sector. It is important to note, that very few species have missing weights.

There are other caveats to recreational data specific to state. California is the only state to report mortality estimates by water area (i.e., state or EEZ). Oregon and Washington do not. Oregon; however, does collects water area information related to catch of as part of their sampling protocols, which makes it possible to estimate proportion of mortality by water area.

Data Tables

The following provides the definitions for columns (variables) and their function

Each table presents the complete results of the analysis for California, Oregon, and Washington. The same variables are used for each state. The first four columns are used to understand the mortality of each sector's total mortality in the EEZ. The percentage of mortality reflects the estimated percentage of total mortality by sector by species.

[15] 2020 was excluded due to the anomalous recreational fishery impacts due to Covid

% in EEZ Com: This column shows the percentage of mortality for each species caught by the commercial sector in the EEZ. This information was obtained from Agenda Item I.8.a, NMFS Report 1, September 2024)..

Comm mt EEZ mean: This column shows the annual mean weight for each species in the EEZ. These data are a function of multiplying the percentage of commercial mortality in the EEZ against the mean mortality of each species, as presented in Agenda Item I.8.a, NMFS Report 1, September 2024).

Rec Mt EEZ mean: This column reports estimated mortality in terms of weight for each species in the EEZ.

- California: California provides estimates for EEZ and state waters. The values from the study years were averaged. Not all species have weights; those species are identified by an "*."
- Oregon: Oregon does not estimate by water area but for all waters as a whole (i.e., state and EEZ), therefore, the mean is calculated by multiplying the percent of mortality (based on the sample proportions by water area) against the total estimated mortality for all waters.
- Washington: RecFIN data complimented by industry knowledge was used to calculate these estimates. See below for further information.

% in EEZ Rec: This column shows the percentage of mortality for each species caught by the recreational sector in the EEZ for the study period (2018-19, 2021-21). These data are based on numbers of fish, not weight. These data were obtained from RecFIN. Number are a more reliable estimate as not all catch is weighed and thus, no estimated derived.

- California: These data are a function of dividing estimated mortality in numbers of fish for the species caught in the EEZ by all waters (EEZ+ State) mortality in numbers of fish.
- Oregon: These data are a function of dividing sample data in numbers of fish for the species caught in the EEZ by all species waters (EEZ+ State) sample data in numbers of fish
- Washinton: The percentages were calculated by dividing the estimated EEZ mortality by the total mortality of the species.

Total EEZ Mean Weight: This value is the sum of the commercial mean EEZ weight and the recreational mean EEZ weight.

% in EEZ is calculated by the total EEZ weight estimate divided by all water area weight estimate (not shown).

Table A 1. Average annual mortality for the species in this Action by sector and combined sectors for the years 2018-19 and 2021-23 in the Exclusive Economic Zone (EEZ) off of California. NW indicates no weight, percentage in EEZ calculated based on number of fish estimated.* indicates percentage reflective of commercial data only.

Species	Comm EEZ mean weight (mt)	% in EEZ Comm	Rec EEZ mean weight (mt)	% in EEZ Rec	Total EEZ mean weight (mt)	% in EEZ
Arrowtooth Flounder	48.38	99.4%	NW	89.6%	48.38	99.4%*
Aurora Rockfish	9.47	92.8%	0.0	0.0%	9.47	92.8%
Bank Rockfish	33.07	99.1%	3.4	83.3%	36.45	97.4%
Big Skate	26.03	98.8%	NW	71.2%	26.03	98.8%*
Blackgill Rockfish	35.83	83.7%	NW	93.3%	35.83	83.7%*
Bocaccio Rockfish	291.04	97.1%	58.1	42.1%	349.18	79.8%
California Scorpionfish	0.20	25.8%	90.6	77.0%	90.83	76.7%
Canary Rockfish	107.96	89.3%	15.5	22.9%	123.47	65.5%
Chilipepper Rockfish	523.89	99.5%	30.4	77.2%	554.28	98.0%
Cowcod	0.94	100.0%	3.0	69.6%	3.98	74.9%
Darkblotched Rockfish	23.42	99.2%	0.0	0.0%	23.42	99.2%
Dover Sole	1,585.49	99.9%	0.0	0.0%	1,585.49	99.9%
English Sole	97.40	99.2%	0.0	0.0%	97.40	99.2%
Flathead Sole	0.00	100.0%	0.0	0.0%	0.00	100.0%
Greenspotted Rockfish	4.17	90.8%	21.0	63.6%	25.13	67.0%
Greenstriped Rockfish	6.15	93.4%	3.0	78.6%	9.13	88.0%
Harlequin Rockfish	0.00	-	0.0	0.0%	0.00	100.0%
Lingcod	189.62	81.0%	43.4	15.2%	233.00	44.8%
Longnose Skate	136.19	98.9%	0.0	0.0%	136.19	98.9%
Longspine Thornyhead	217.74	98.7%	0.0	0.0%	217.74	98.7%
Pacific Cod	0.00	0.0%	0.0	0.0%	0.00	100.0%
Pacific Hake	84.72	99.6%	0.1	81.5%	84.85	99.6%
Pacific Ocean Perch	0.35	96.2%	0.0	0.0%	0.35	96.2%
Pacific Sanddab	48.52	91.2%	13.4	48.0%	61.94	76.3%
Pacific spiny dogfish	121.60	99.2%	0.4	20.1%	121.98	98.0%
Petrale Sole	632.11	99.5%	3.7	47.2%	635.81	98.9%
Redbanded Rockfish	9.75	96.1%	NW	100.0%	9.75	96.1%*
Redstripe Rockfish	0.00	0.0%	NW	42.0%	-	-
Rex Sole	81.50	100.0%	0.0	100.0%	81.50	100.0%
Rosethorn Rockfish	0.13	60.4%	0.1	97.1%	0.20	69.1%
Rougheye/Blackspotted Rockfish	0.95	94.6%	0.0	100.0%	0.95	94.6%
Sablefish	1,405.96	97.2%	3.6	88.2%	1,409.61	97.2%
Sharpchin Rockfish	0.03	99.9%	0.0	100.0%	0.03	99.9%
Shortraker Rockfish	0.08	100.0%	0.0	100.0%	0.08	100.0%
Shortspine Thornyhead	232.44	94.3%	0.0	100.0%	232.44	94.3%
Silvergray Rockfish	0.38	100.0%	NW	100.0%	0.38	100.0%*
Splitnose Rockfish	15.36	99.8%	0.0	100.0%	15.36	99.8%

Species	Comm EEZ mean weight (mt)	% in EEZ Comm	Rec EEZ mean weight (mt)	% in EEZ Rec	Total EEZ mean weight (mt)	% in EEZ
Squarespot Rockfish	0.04	46.9%	9.8	65.3%	9.84	65.2%
Starry Rockfish	0.83	56.2%	13.5	34.4%	14.37	35.2%
Stripetail Rockfish	18.77	99.9%	0.1	89.7%	18.83	99.9%
Vermilion/Sunset Rockfish	36.47	66.1%	74.8	25.9%	111.22	32.4%
Widow Rockfish	146.14	99.4%	4.2	31.3%	150.39	93.7%
Yelloweye Rockfish	1.02	70.5%	2.7	47.6%	3.70	52.3%
Yellowmouth Rockfish	0.15	100.0%	0.0	100.0%	0.15	100.0%
Yellowtail Rockfish	12.17	64.4%	35.0	37.2%	47.19	41.8%

Table A 2. Average annual mortality for the species in this Action by sector and combined sectors for the years 2018-19 and 2021-23 in the Exclusive Economic Zone (EEZ) off of Oregon

Species	Comm EEZ mean weight (mt)	% in EEZ Comm	Rec EEZ mean weight (mt)	% in EEZ Rec	Total EEZ mean weigh (mt)	% in EEZ
Arrowtooth Flounder	877.38	99.5%	0.05	91.0%	873.05	99.5%
Aurora Rockfish	22.96	100.0%	0.00	0.0%	22.96	100.0%
Bank Rockfish	1.93	99.9%	0.00	0.0%	1.93	99.9%
Big Skate	133.65	99.2%	0.06	78.2%	132.64	99.2%
Blackgill Rockfish	4.32	95.9%	0.00	0.0%	4.14	95.9%
Bocaccio Rockfish	24.24	99.4%	1.12	91.4%	25.21	99.0%
California Scorpionfish	0.00	0.0%	0.00	0.0%	0.00	#DIV/0!
Canary Rockfish	216.60	97.7%	13.18	28.1%	224.80	85.3%
Chilipepper Rockfish	40.88	100.0%	0.05	91.4%	40.93	100.0%
Cowcod	0.02	100.0%	0.002	20.0%	0.02	93.8%
Darkblotched Rockfish	234.00	99.8%	0.01	87.0%	233.54	99.8%
Dover Sole	3,917.58	100.0%	0.006	4.7%	3,917.58	100.0%
English Sole	121.29	99.9%	0.00	4.8%	121.17	99.9%
Flathead Sole	23.17	100.0%	0.00	0.0%	23.17	100.0%
Greenspotted Rockfish	0.32	90.7%	0.30	87.5%	0.59	89.0%
Greenstriped Rockfish	37.15	99.8%	0.13	94.7%	37.21	99.8%
Harlequin Rockfish	0.01	100.0%	0.00	0.0%	0.01	100.0%
Lingcod	353.33	74.5%	17.90	9.8%	281.13	52.4%
Longnose Skate	490.14	99.6%	0.10	66.4%	488.29	99.6%
Longspine Thornyhead	182.52	100.0%	0.00	0.0%	182.52	100.0%
Pacific Cod	11.81	100.0%	0.06	85.9%	11.87	99.9%
Pacific Hake	117,441.16	100.0%	0.06	100.0%	117,441.21	100.0%
Pacific Ocean Perch	280.30	100.0%	0.00	72.0%	280.30	100.0%
Pacific Sanddab	42.31	100.0%	0.17	78.5%	42.48	99.9%
Pacific spiny dogfish	337.75	99.2%	0.03	74.6%	335.07	99.2%
Petrale Sole	1,794.29	100.0%	2.26	70.1%	1,796.55	99.9%

Species	Comm EEZ mean weight (mt)	% in EEZ Comm	Rec EEZ mean weight (mt)	% in EEZ Rec	Total EEZ mean weigh (mt)	% in EEZ
Redbanded Rockfish	17.21	96.3%	0.02	84.8%	16.59	96.3%
Redstripe Rockfish	35.41	100.0%	0.07	98.7%	35.47	100.0%
Rex Sole	338.71	100.0%	0.00	0.0%	338.71	100.0%
Rosethorn Rockfish	6.62	99.3%	0.03	55.2%	6.60	99.0%
Rougheye/Blackspotted Rockfish	44.62	94.0%	0.00	0.0%	41.94	94.0%
Sablefish	2,504.87	99.2%	1.98	84.6%	2,486.81	99.2%
Sharpchin Rockfish	32.46	100.0%	0.00	0.0%	32.46	100.0%
Shortraker Rockfish	5.40	99.9%	0.00	0.0%	5.39	99.9%
Shortspine Thornyhead	415.09	100.0%	0.004	100.0%	415.09	100.0%
Silvergray Rockfish	37.30	99.8%	0.63	96.4%	37.86	99.7%
Splitnose Rockfish	79.94	100.0%	0.00	0.0%	79.94	100.0%
Squarespot Rockfish	0.00	0.0%	0.00	0.0%	0.00	#DIV/0!
Starry Rockfish	0.00	0.0%	0.00	0.0%	0.00	#DIV/0!
Stripetail Rockfish	33.91	100.0%	0.00	0.0%	33.91	100.0%
Vermilion Rockfish	3.24	4.9%	0.59	8.6%	0.75	7.4%
Widow Rockfish	7,465.65	100.0%	4.81	84.4%	7,470.46	100.0%
Yelloweye Rockfish	1.42	71.9%	1.27	29.5%	2.29	40.1%
Yellowmouth Rockfish	17.95	100.0%	0.06	76.9%	18.01	99.9%
Yellowtail Rockfish	2,470.22	100.0%	28.06	61.4%	2,498.28	99.3%

Washington Data:

In the ROA, Washington recreational data was not presented as Washington Department of Fish and Wildlife (WDFW) was developing a method to proportionally estimate mortality by water area. These data, as shown below in Table A-3 represents the outcomes of those efforts. The process to calculate these estimates are described here.

Washington's Ocean Sampling Program produces estimates of catch and effort for state and federal waters by Marine Catch Area (MCA). Except for areas within the Strait of Juan de Fuca, OSP's estimates do not differentiate between state and federal waters. To address the Council's interest in evaluating state versus federal water catches, WDFW conducted angler-intercept interviews to solicit expert opinion. The interviews were conducted primarily with charter captains possessing 20–45 years of bottomfish experience. Specifically, anglers were asked to provide species-specific estimates of the proportion of their catch occurring in federal waters. Conceptually, this approach is similar to the information used for the Oregon and California analyses.

Under Washington's recreational management framework, the legally defined Marine Catch Areas serve as the finest-scale spatial units available for Council managed waters(MCAs 1–4). To estimate the distribution of catch for each species, individual estimates derived from the interviews were averaged to produce area specific percentages of recreational mortality in federal waters.

Bottomfish abundance, species composition, marine habitats, and catch volumes vary markedly along the Washington coast, as do fishing effort, strategies, and regulatory depth restrictions designed to protect yelloweye rockfish. These factors and angler preferences combine to constrain effort and catch of many species almost exclusively to state waters along the biologically diverse north coast (MCA 4, "La Push, Neah Bay"). In contrast, catch and effort tend to be deeper and in federal waters on the south coast (MCA 2, "Westport"). MCA 2 also sees higher overall catch, especially for black rockfish, and somewhat less diverse landings. Both species catch diversity and catch volume are lowest within the Columbia River region (MCA 1, "Ilwaco"). To integrate the differences among MCAs, each species' estimated proportion of mortality in federal waters was weighted by its catch (metric tons) by MCA. Recreational catch data (metric tons) for Washington were retrieved from RecFIN for the five-year period 2018–19 and 2021–23, matching the timeframe used for the California and Oregon analyses. This approach yields a statewide estimate of the proportion of recreational harvest occurring principally in federal waters for each species.

Table A 3. Average annual mortality for the species in this Action by sector and combined sectors for the years 2018-19 and 2021-23 in the Exclusive Economic Zone (EEZ) off of Washington

Species	Comm EEZ mean weight (mt)	%in EEZ Comm	Rec EEZ mean weight (mt)	% in EEZ Rec	Total EEZ mean weigh (mt)	% in EEZ
Arrowtooth Flounder	31.35	100.0%	0.29	97.4%	31.64	100.0%
Aurora Rockfish	3.35	100.0%	0.00	0.0%	3.35	100.0%
Bank Rockfish	0.05	100.0%	0.00	0.0%	0.05	100.0%
Big Skate	8.60	100.0%	0.00	0.0%	8.60	100.0%
Blackgill Rockfish	0.08	100.0%	0.00	0.0%	0.08	100.0%
Bocaccio Rockfish	5.54	100.0%	7.62	100.0%	13.16	100.0%
California Scorpionfish	0.00	0.0%	0.00	0.0%	0.00	0.0%
Canary Rockfish	43.78	100.0%	22.84	94.1%	66.62	97.9%
Chilipepper Rockfish	0.01	100.0%	0.00	27.1%	0.01	87.9%
Cowcod	0.00	0.0%	0.00	0.0%	0.00	0.0%
Darkblotched Rockfish	12.71	100.0%	0.00	0.0%	12.71	100.0%
Dover Sole	250.35	100.0%	0.00	0.0%	250.35	100.0%
English Sole	2.45	100.0%	0.00	98.2%	2.45	100.0%
Flathead Sole	0.00	0.0%	0.00	0.0%	0.00	0.0%
Greenspotted Rockfish	0.00	100.0%	0.00	0.0%	0.00	100.0%
Greenstriped Rockfish	1.34	100.0%	0.03	100.0%	1.37	100.0%
Harlequin Rockfish	0.01	100.0%	0.00	0.0%	0.01	100.0%
Lingcod	61.51	100.0%	143.74	74.2%	205.25	80.4%
Longnose Skate	67.43	100.0%	0.00	0.0%	67.43	100.0%
Longspine Thornyhead	3.71	100.0%	0.00	0.0%	3.71	100.0%
Pacific Cod	1.11	100.0%	2.52	88.2%	3.63	91.5%
Pacific Hake	19,818.74	100.0%	0.00	100.0%	19,818.74	100.0%
Pacific Ocean Perch	44.47	100.0%	0.00	0.0%	44.47	100.0%
Pacific Sanddab	0.00	0.0%	0.00	0.0%	0.00	0.0%
Pacific spiny dogfish	89.89	100.0%	0.00	0.0%	89.89	100.0%

Species	Comm EEZ mean weight (mt)	%in EEZ Comm	Rec EEZ mean weight (mt)	% in EEZ Rec	Total EEZ mean weigh (mt)	% in EEZ
Petrale Sole	151.70	100.0%	0.04	91.0%	151.74	100.0%
Redbanded Rockfish	11.58	100.0%	0.12	100.0%	11.70	100.0%
Redstripe Rockfish	3.17	100.0%	0.00	100.0%	3.17	100.0%
Rex Sole	7.26	100.0%	0.00	0.0%	7.26	100.0%
Rosethorn Rockfish	7.10	100.0%	0.00	72.8%	7.10	100.0%
Rougheye/Blackspotted Rockfish	24.74	100.0%	0.00	100.0%	24.74	100.0%
Sablefish	641.67	100.0%	5.37	100.0%	647.04	100.0%
Sharpchin Rockfish	1.32	100.0%	0.00	0.0%	1.32	100.0%
Shortraker Rockfish	3.92	0.0%	0.00	0.0%	3.92	100.0%
Shortspine Thornyhead	26.26	100.0%	0.00	100.0%	26.26	100.0%
Silvergray Rockfish	16.69	100.0%	0.14	99.6%	16.82	100.0%
Splitnose Rockfish	8.57	100.0%	0.00	0.0%	8.57	100.0%
Squarespot Rockfish	0.00	0.0%	0.00	0.0%	0.00	0.0%
Starry Rockfish	0.00	0.0%	0.00	0.0%	0.00	0.0%
Stripetail Rockfish	0.00	100.0%	0.00	0.0%	0.00	0.0%
Vermilion/Sunset Rockfish a/	0.00	0.0%	0.90	64.1%	0.90	64.1%
Widow Rockfish	1,316.42	100.0%	1.73	99.8%	1,318.14	100.0%
Yelloweye Rockfish	0.27	100.0%	2.71	80.7%	2.98	82.1%
Yellowmouth Rockfish	4.70	100.0%	0.00	0.0%	4.70	100.0%
Yellowtail Rockfish	489.68	100.0%	59.87	97.8%	549.55	99.8%