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Phase 2 Stock Definitions: §600.305(c) 10 Factor Analysis of 40 Groundfish Species and a Range of Alternatives to Support Council Decision-Making for a Preliminary Preferred Alternative.

Lead Agency: National Marine Fisheries Service, West Coast Region
National Oceanic and Atmospheric Administration
Responsible Official: Jennifer Quan, Regional Administrator
West Coast Regional Office, National Marine Fisheries Service

For further information contact:

Katrina Bernaus

Pacific Fishery Management Council

7700 NE Ambassador Way, Suite 101

Portland, OR 97220

Abbie Moyer

National Marine Fisheries Service

West Coast Region

7600 Sand Point Way Northeast

Seattle, WA 98115

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.

Acronyms and Abbreviations

ABC	Acceptable biological catch
ACL	Annual catch limit
BRMA	Black rockfish management areas
BSIA	Best scientific information available
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
FMU	Fishery Management Unit
GAP	Groundfish Advisory Subpanel
GMT	Groundfish Management Team
LQ	Local quotient
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSST	Minimum Stock Size Threshold
mt	Metric ton
NMFS	National Marine Fisheries Service
NWFSC	Northwest Fisheries Science Center
ODFW	Oregon Department of Fish and Wildlife
OFL	Overfishing limits
OY	Optimal Yield
PacFIN	Pacific Fisheries Information Network
PMFC	Pacific Fishery Management Council (used in references)
RecFIN	Recreational Fisheries Information Network
RCA	Rockfish Conservation Area
RQ	Regional Quotient
SAFE	The stock assessment and fishery evaluation document
SAP	Stock Assessment Prioritization
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 a process to evaluate the groundfish species currently managed in the [Pacific Coast Groundfish Fishery Management Plan](#) (FMP), in order to: 1) identify those species and their stocks in need of conservation and management in the Exclusive Economic Zone (EEZ), and 2) define stock(s) of those species in the FMP. This document scopes a range of alternatives (ROA) for 40 of the currently managed groundfish species, utilizing the ten-factor analysis detailed in 50 CFR §600.305(c) of the [National Standard Guidelines](#). Applying these factors, this action analyzes whether each species is in need of conservation and management in the EEZ and informs the Council in adopting a preliminary preferred alternative (PPA) for each species. This specific action is a subpart of the Council's larger stock definitions process.

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.”

Range of Alternatives

At their March 2025 meeting, the Council adopted the following Range of Alternatives (ROA), consisting of three action alternatives, for the larger Phase 2 stock definitions action. Alternative 1 includes 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.

No Action: The Council would not identify species and their stocks as in need of conservation and management. 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.

The Council adopted Alternatives 1-3 as applicable for 39 of the species evaluated in this document (Table ES 1) in March 2025, and directed staff to complete a full analysis under §600.305(c)'s 10 factors, to assist them in determining which species are in need of conservation and management in the EEZ, in order to adopt a PPA for each species. Those 39 species, plus one (harlequin rockfish, which Council staff recommended for further analysis, bringing the total to 40) are addressed in this document. This section of the National Standards provides 10 non-exclusive factors to evaluate whether a species is in need of conservation and management in the EEZ. This analysis determines whether a species should be retained in the FMP (Alternative 1), removed from the FMP (Alternative 2), or designated as an ecosystem component (EC) species (Alternative 3). If the Council adopts Alternative 1 for any species, they will need to also adopt a stock definition based on the stock delineation options provided in Section 5 of this document.

Figure 1 1. Species considered in this document's §600.305(c) analysis

Black and Yellow Rockfish	Flag rockfish	Pink rockfish
Black rockfish	Freckled rockfish	Pinkrose rockfish
Blue Rockfish	Gopher Rockfish	Pygmy rockfish
Bronzespotted rockfish	Grass Rockfish	Quillback rockfish
Brown Rockfish	Greenblotched rockfish	Rock sole
Butter sole	Halfbanded rockfish	Rosy rockfish
Cabazon	Harlequin rockfish a/	Sand sole
Calico Rockfish	Honeycomb rockfish	Speckled rockfish
Chameleon Rockfish	Kelp greenling	Starry flounder
China Rockfish	Kelp rockfish	Swordspine rockfish
Copper rockfish	Leopard shark	Tiger rockfish
Curlfin sole	Light Dusky Rockfish	Treefish
Deacon Rockfish	Mexican rockfish	
Dwarf-Red Rockfish	Olive rockfish	

a/harlequin rockfish added to analysis after March 2025 meeting; rationale described in text

50 CFR §600.305(c)'s 10 Factor Analysis

This document provides the “10 factor analysis” from §600.305(c) to inform the Council in adopting a PPA for each of the 40 groundfish species evaluated herein.

Figure 1 2. The §600.305(c) ‘10 Factors’

- (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 the 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

The analysis utilizes ‘bins’ of species to apply each of the §600.305(c) 10 factors, fully evaluating the species bin under each factor. These factor-by-factor analyses are synthesized into conclusions for each species bin as to whether each species is in need of conservation and management in the EEZ and, if not, whether there is support to remove the species from the FMP or designate it as an EC species.

Species Bins

Shallow Nearshore: black and yellow rockfish, China rockfish, gopher rockfish, grass rockfish, kelp rockfish, cabezon, and kelp greenling

Deeper Nearshore: black rockfish, blue rockfish, brown rockfish, copper rockfish, deacon rockfish, olive rockfish, quillback rockfish, and treefish

Shallow Shelf: calico rockfish, flag rockfish, freckled rockfish, halfbanded rockfish, honeycomb rockfish, pygmy rockfish, rosy rockfish, speckled rockfish, swordspine rockfish

Deep Shelf: bronzespotted rockfish, chameleon rockfish, greenblotched rockfish, harlequin rockfish, Mexican rockfish, pink rockfish, pinkrose rockfish, and tiger rockfish

No Mortality Species: Dwarf-red rockfish and light dusky rockfish.

Flatfish: butter sole, curlfin sole, rock sole, sand sole, and starry flounder

Leopard Shark

Analysis Overview

The synthesis of the analysis follows the process provided by the National Standard (NS) Guidelines. As the National Standard Guidelines provide, at 50 CFR §600.305(c)(3), “no single factor is dispositive or required. 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.” Further, Factors (i) – (iii) should be considered first when councils consider whether species are in need of conservation and management. The National Standard Guidelines next direct councils to consider Factors (iv) – (ix), which set forth key economic, social, or other reasons which, if answered positively, would argue for maintaining a stock within a FMP.

The findings of the analysis and the synthesis of factors provide the following general conclusions for the species evaluated.

Ecological and Fishery Considerations (Factors(i)-(iii))

In Factor (i), the role of each species in the broader marine ecosystem is a primary consideration. The species in this analysis occupy a diverse range of habitats, depths, and benthic habitats, serving as both predator and prey to other organisms in the ecosystem. Some species may play the same role in the ecosystem, however, and can be considered ecologically interchangeable. The analysis concludes all 40 species are considered important components of the marine ecosystem.

Factor (ii) considers whether each species is principally caught by the Federal fishery and Factor (iii) considers whether the FMP can improve or maintain the condition of the species. Analysis of Factors (ii) and (iii) applies a 25 percent threshold adopted by the Council in March 2025 to determine whether species are principally caught in Federal waters and, hence, whether an FMP can impact the condition of the stock. The analysis of these factors identified multiple species, notably in the nearshore species bins, but others as well, which have principal mortality in state waters, where Federal management under the FMP may have a limited effect on management of the fishery or stock status. These findings may weigh in favor of these species not needing conservation and management in the EEZ and compel the Council to consider either removal of these species from the FMP (Alternative 2) or EC species designation (Alternative 3). The analysis also identified species with principal mortality in Federal waters. However, for several species, principal mortality in Federal waters tended to be very low (*de minimis*), or there was no recent recorded mortality, which could prompt the Council to reconsider whether those species need to be actively managed. Consequently, the Council may wish to consider either Alternative 2 or Alternative 3 for these species. Alternative 3 would allow for monitoring and conservation measures without full management under the FMP.

Economic and Social Factors (Factors (iv)-(vi), (viii)-(ix))

Economic contributions to Federal commercial and recreational fisheries are key considerations in the analysis through the evaluation of factors (iv) through (ix). Species that are considered direct targets in Federal commercial and recreational fisheries, generate significant local or regional revenues, support recreational fishing experiences, or are fished within the same stock complexes may be considered important species. These aspects, considered, with other factors, could provide support to the Council for identifying the species as in need of conservation and management in the EEZ, to be retained in the FMP, and have their stocks defined, i.e., Alternative 1. Conversely, for species with minimal economic or social importance stemming from the Federal fishery, the analysis is more likely to support a determination that these species are not in need of conservation and management in the EEZ, when considered with other factors. The analysis also considered whether there are developing fisheries in the EEZ or fisheries in need of more efficient utilization that may require Federal management, though it is generally acknowledged that the West Coast groundfish fishery is fully utilized and no longer developing.

Governance (Factors (vii), (x))

The analysis also addresses the role of the FMP and other state/Federal institutions. Broadly, management of species in the FMP provides a potential avenue for conflict mitigation and resolution between states, sectors, and individual fishermen participating in the fishery. This benefit, however, may not apply to species whose depth and/or geographic range do not span multiple jurisdictions or for species for which states are already the primary institutions working to resolve conflicts between sectors and participants. For many nearshore species, there are robust state management programs. This analysis acknowledges, but does not seek to evaluate the effectiveness of these programs, however. Where Federal management is not considered to add significant value, species may be considered for removal or for EC designation.

Synthesis of the 10 Factor Analysis

Section 4 of this document combines the analyses of each factor and describes, for each species, organized by species bin, whether there is support from each factor to determine whether the species is in need of conservation and management in the EEZ and, if not, could be removed from the FMP or designated as an EC species.

Stock Definitions

If any of the species are adopted under Alternative 1, the Council would need to identify definition(s) for their stocks(s). Draft stock definition Options for each of these species are provided for Council consideration in this analysis. These definitions are based on the literature review conducted for the Phase 2 stock definitions process ([Agenda Item H.6, Attachment 3, March 2025](#)).

1. Introduction

The Council is required to identify stocks¹ 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 50 CFR [§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 all managed species as stocks, e.g., geographic boundaries, etc. In 2022, the Council began work to define stocks for all managed groundfish species. A31 and A35 were part of Phase 1 of that larger stock definitions process. This action is a continuation of that effort and part of Phase 2 of the larger stock definitions process.

The goals of this specific action, which is a subpart of the larger stock definitions process, are to determine if a set of 40 managed groundfish are: 1) in need of conservation and management in the EEZ, 2) to define the stocks of any species that have not yet been defined and which are found to be in need of conservation and management, and 3) to determine whether any species not found to be in need of conservation and management in the EEZ should be removed from the FMP or designated as ecosystem component (EC) species. The bulk of the analysis contained in this document focuses on evaluating whether the 40 species are in need of conservation and management in the EEZ through the 10-factor analysis provided in §600.305(c), and as was requested by the Council in March 2025. Section 5 of this document outlines the potential stock definition Options for species evaluated in this document, based on the same analytical framework as that outlined for those species for which stocks are proposed to be defined in Attachment 1. This framework applies current scientific literature and the advice of the Scientific and Statistical Committee (SSC), which suggests that 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, the 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 and 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

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)).

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 those species out of the 40 species described Table 1 that are in need of conservation and management in the EEZ; 2) define stocks for those species in need of conservation and management; and 3) of those species not in need of conservation and management in the EEZ, determine which species should be removed from the FMP or designated as EC species. 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. 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 Section 5.1 of the Groundfish FMP, which the Council will begin work on in June 2025.

Table 1. Species considered in this analysis, for potential PPA in June 2025.

Black and Yellow Rockfish	Flag rockfish	Pink rockfish
Black rockfish	Freckled rockfish	Pinkrose rockfish
Blue Rockfish	Gopher Rockfish	Pygmy rockfish
Bronzespotted rockfish	Grass Rockfish	Quillback rockfish
Brown Rockfish	Greenblotched rockfish	Rock sole
Butter sole	Halfbanded rockfish	Rosy rockfish
Cabazon	Harlequin rockfish ^{a/}	Sand sole
Calico Rockfish a/	Honeycomb rockfish	Speckled rockfish
Chameleon Rockfish	Kelp greenling	Starry flounder
China Rockfish	Kelp rockfish	Swordspine rockfish
Copper rockfish	Leopard shark	Tiger rockfish
Curlfin sole	Light Dusky Rockfish	Treefish
Deacon Rockfish	Mexican rockfish	
Dwarf-Red Rockfish	Olive rockfish	

a/harlequin rockfish added to analysis after March 2025 meeting; rationale described in text

The proposed action would define the stocks for species currently managed in the FMP that are in need of conservation and management in the EEZ and thus allow for NMFS to make stock status determinations (i.e., overfished/not-overfished) and evaluate depletion relative to the management target (B_{MSY}) 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 Groundfish FMP describes the harvest specification process used to set the overfishing fishing limit (OFL),

acceptable biological catch (ABC), and annual catch limits (ACL) for managed groundfish species. The Stock Assessment and Fishery Evaluation (SAFE) document details the harvest specification factors for these species, such as harvest control rules (HCR), OFLs, and ABCs, on a biennial basis, based on the BSIA for each groundfish species in the fishery. 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 would 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 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, 2024a).

1.3 History of this 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. This history is also detailed in parallel in Attachment 1 under Agenda Item G.6 (June 2025, also referred to as 'Attachment 1' in this document). 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 in the EEZ 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 a proposed analytical framework for 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 in the EEZ. 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 Phase 2 for consideration at the March 2025 meeting.

The Council's initial analysis of the species currently defined in the FMP ([Agenda Item H.6, Supplemental Revised Attachment 1, March 2025](#)) focused on Factors (ii) and (iii) 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 (i) - (iii) 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 the factors outlined at §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 EC species.

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 and proposes to evaluate those species for removal from the FMP. Alternative 3 would identify those species not in need of conservation and management and proposes to evaluate those species for classification as an EC species in the FMP. For those species identified as in need of conservation and management in the EEZ, the Council also adopted three stock definition 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. The Council recommended that the remaining set of 39 species (Table 1) be analyzed under a full 10-factor analysis to guide their decision making process. Those 39 species, plus one (harlequin rockfish, which Council staff recommended for further analysis, bringing the total number of species to 40) are addressed in this document. The goal of this part of

the action is for the Council to adopt a PPA for these species based on the 10-factor analysis. This action, though tied to other actions within the Council's larger stock definitions process, will move along its own track and timeline.

In March 2025, the Council adopted Alternative 1 as PPA for 47 species; those species from Group 1 that the Council did not consider requiring the full 10-factor evaluation. Those 47 species considered 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 (vermillion rockfish off Oregon and lingcod). Details on the preliminary stock definition Options for these species are described in Attachment 1, section 1.4. The action evaluating these 47 species can be considered separate from the full 10-factor analysis requested by the Council, which is contained in this document, and will be completed on a separate track within the Council's larger stock definitions process. The Council is expected to consider FPA for those 47 species in June of 2025.

1.4 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.”

1.5 Range of Alternatives

The Council adopted the ROA for the larger Phase 2 stock definitions action at their March 2025 meeting. The ROA was adopted for all 40 species included in this action, with the 10-factor analysis requested by the Council to inform adoption of a PPA for these species at the June 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, by species for those species evaluated in this document.

1.5.1 Range of Alternatives

No Action: All species remain in FMP as currently defined and managed. The list of managed species as shown in the FMP Chapter 3, 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 in the EEZ 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 (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.

Table 2. Potential stock definitions options (Opt) for species included in this document . Species previously defined are not shown. Population structure (Pop. Struct.) is denoted by U =unknown, Y =yes, or N = no. Options relevant to species are noted. Source: [Agenda Item I.8, Attachment 1, September 2024](#). Stocks of black rockfish, copper rockfish, and quillback rockfish have already been defined, through Amendment 31, and are therefore not considered for definition in this action and are not included in the table below.

Species	Pop. Struct	Opt 1	Opt 2	Opt 3	Proposed Stock Delineations	Notes
Black and yellow rockfish a/	Y	*	*		Opt 1 Coastwide or California/Oregon or Opt 2 California and Oregon	Range = CA & OR
Blue rockfish a/	Y	*	*	*	Opt 1 Coastwide, Opt 2 N/S of 42° N. lat. Opt 3 state-specific,	
Bronzespotted rockfish	U	*			Opt1 Coastwide or California-only	Range = CA
Brown Rockfish a/	Y	*	*	*	Opt 1 Coastwide, Opt 2 N/S of 42° N. lat. Opt 3 state-specific,	
Butter sole	U	*			Opt 1 Coastwide	
Cabazon	Y	*	*	*	Opt 1 Coastwide, Opt 2 N/S of 42° N. lat. Opt 3 state-specific,	
Calico rockfish a/	Y	*			Opt 1 Coastwide or California-only	Range = CA
Chameleon rockfish	Y	*			Opt 1 Coastwide or California-only	Range = CA
China rockfish a/	Y	*	*	*	Opt 1 Coastwide, Opt 2 N/S of 42° N. lat. Opt 3 state-specific,	
Curlfin sole	U	*			Opt 1 Coastwide	
Deacon rockfish a/	Y	*	*	*	Opt 1 Coastwide, Opt 2 N/S of 42° N. lat. Opt 3 state-specific,	
Dwarf-red rockfish	U	*			Opt 1 Coastwide or California-only	Range = CA
Flag rockfish	U	*			Opt 1 Coastwide or California/Oregon or Opt 2 California and Oregon	Range = CA & OR
Freckled rockfish	U	*			Opt 1 Coastwide or California-only	Range = CA
Gopher rockfish a/	Y	*	*		Opt 1 Coastwide or California/Oregon or Opt 2 California and Oregon	Range = CA & OR
Grass rockfish a/	Y	*	*		Opt 1. Coastwide or California/Oregon or Opt 2 California and Oregon	Range = CA & OR
Greenblotched rockfish	U	*			Opt 1 Coastwide	
Halfbanded rockfish	U	*			Opt 1 Coastwide	
Harlequin rockfish	U	*	*		Opt 1 Coastwide or Oregon/Washington. Opt 2. Oregon, and Washington	range = OR & WA
Honeycomb rockfish	U	*			Opt 1 Coastwide or California-only	Range = CA
Kelp greenling	Y	*	*	*	Opt 1 Coastwide, Opt 2 N/S of 42° N. lat. Opt 3 state-specific,	
Kelp rockfish a/	Y	*	*		Opt 1 Coastwide or California/Oregon or Opt 2. California and Oregon	Range = CA & OR
Light dusky rockfish	U	*			Opt 1 Coastwide or Oregon/Washington. Opt 2. Oregon, and Washington	range = OR & WA

Species	Pop. Struct	Opt 1	Opt 2	Opt 3	Proposed Stock Delineations	Notes
Leopard shark	U	*	*		Opt 1 Coastwide or California/Oregon or Opt 2. California and Oregon	Range = CA & OR
Mexican rockfish	Y	*			Opt 1 Coastwide or California-only	Range = CA
Olive rockfish a/	Y	*	*		Opt 1 Coastwide or California/Oregon or Opt 2 California and Oregon	Range = CA & OR
Pink rockfish	U	*			Opt 1 Coastwide or California/Oregon or Opt 2 California and Oregon	Range = CA & OR
Pinkrose rockfish	U	*			Opt 1 Coastwide or California-only	Range = CA
Pygmy rockfish	U	*			Opt 1 Coastwide	
Rock sole	U	*			Opt 1 Coastwide	
Rosy rockfish	U	*			Opt 1 Coastwide	
Sand sole	U	*			Opt 1 Coastwide	
Speckled rockfish	U	*			Opt 1 Coastwide	
Starry flounder	U	*			Opt 1 Coastwide	
Swordspine rockfish	U	*			Opt 1 Coastwide or California-only	Range = CA
Tiger rockfish	U	*			Opt 1 Coastwide	
Treefish a/	U	*			Opt 1 Coastwide or California-only	Range = CA

a/based on SSC recommendations, all nearshore rockfish are presumed to have stock structure, based on their published range, and are therefore considered under three Options: Opt 1 Single Area, Opt 2 Two Areas, and Opt 3 Three Are

2 Introduction of the 10-Factor Analysis

The following analysis under 50 CFR §600.305(c) is undertaken to: 1) evaluate whether a subset of managed groundfish species are in need of conservation and management in the EEZ, through a comprehensive evaluation of the factors identified under §600.305(c); 2) determine appropriate geographic boundaries for stocks of those species identified as such; and 3) determine appropriate action to remove a species from the FMP, or designate it as an EC species, if not identified as such.

2.1 Conservation and Management in the EEZ

As described above, the Council is following the analytical approach from the National Standards Guidance for determining whether a species from the group of 39 species, identified as principally caught in state waters or with little to no catch in Federal waters using the 25 percent threshold (and the additional staff recommended species, harlequin rockfish), is in need of conservation and management in the EEZ. Based on the determination of the Council in March 2025, the species in Table 1 require comprehensive evaluation under the §600.305(c) factors to inform the Council in its consideration of whether each species is in need of conservation and management in the EEZ, which then informs the Council's consideration of that species under the alternatives.

The [National Standard 1](#) Guidelines provide a framework that gives guidance to the regional councils on how to decide whether a stock requires conservation and management in the EEZ. 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.

This document provides an analytical approach to that evaluation of the groundfish species identified by the Council for a thorough analysis in March 2025, using the framework set forth in §600.305(c). Species determined to be in need of conservation and management in the EEZ will be defined as one or more stocks under Alternative 1. Species determined to not be in need of conservation and management in the EEZ will be considered either for removal from the FMP (Alternative 2) or designated as ecosystem component (EC) species (Alternative 3). The §600.305(c) factors are considered to be non-exhaustive and no single factor is dispositive or required in determining which species should be included in an FMP. Any one or more of the factors may provide the basis for the conclusion that a stock requires conservation and management in the EEZ and should be included in an FMP. For a species to be considered for removal from an FMP or to be designated as an EC species, an exhaustive analysis of the ten §600.305(c) factors should be completed. The specific circumstances, biological considerations, socio-economic concerns, and available scientific information for a particular species and fishery should also be taken into account. One additional consideration – the vulnerability of a species to the fishery – was included in this analysis of whether the species evaluated in this document are in need of conservation and management in the EEZ. This additional consideration was recommended by the SSC, who in March 2025 suggested that the results of the productivity–susceptibility analysis conducted in 2011 (Cope et al. 2011) should be utilized when evaluating candidates for EC designation ([Agenda Item H.6.a Supplemental SSC Report 1, March 2025](#)). This consideration is reviewed in Section 3.10 of this document.

Species are evaluated via the §600.305(c) factors to inform the Council in their decision of whether the species is in need of conservation and management in the EEZ through the following sequence:

1. Address Factors (i) - (iii), considering the stock's role as a fishery resource and component of the marine environment.
2. Address Factors (iv) – (ix), considering the key economic and social reasons for conservation and management in the EEZ.

3. Consider Factor (x) before deciding whether to remove a stock from or continue to include a stock in the FMP.

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 certain species or 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\(c\)\(4\)](#).

Based on this regulatory guidance, the following framework was developed to analyze the 39 species the Council identified in March 2025 to be comprehensively reviewed under the §600.305(c) factors. Council staff have identified one additional species to be evaluated under the full 10-factor test (harlequin rockfish), bringing the total number of groundfish species evaluated in this document to 40. Aspects of some factors have already been evaluated, through the Range of Alternatives (ROA) analysis presented [Agenda Item H.6, Supplemental Revised Attachment 1, March 2025](#); particularly with respect to the 25 percent threshold applied therein to identify species with principal mortality in the EEZ. Other factors are analyzed in joint steps, through multiple analytical inputs, herein.

2.2 Analytical Framework for the §600.305(c) Analysis

2.2.1 Species Bins

Species are grouped into bins based on common ecological and fishery characteristics to help organize the analysis. Throughout the document, species and their analysis under each factor may be referred to in terms of their respective "bin." However, while species within a bin may share many similar attributes, and can be described as such, each species will ultimately be considered under Alternatives 1-3 separately.

Based on information in the Stock Assessment and Fishery Evaluation document (SAFE) (PFMC, 2024), Cope et al (2011), Love et al (2002), the literature review (Agenda Item H.6, Attachment 3, March 2025), and expert advice from industry representatives, the following species bins were developed. Rockfish comprise the majority of species in the first five bins; however, cabezon and kelp greenling were included in the first bin due to the depth-based characteristics of their life histories (see Love 2011). All flatfish were included in one bin and leopard shark was considered separately due to its different biology and fishery characteristics. Further, the rockfish in the shallow nearshore and deeper nearshore bins reflect the California commercial fishing permit species groupings (pers. comm. T. Banez, CDFW, March 2025).

Harlequin rockfish was not recommended by the Council for comprehensive evaluation under the 10 §600.305(c) factors; however, it was identified by Council staff as a species with *de minimis* catch in the EEZ. This finding indicated the Council may wish to consider it under Alternatives 1-3. Harlequin rockfish is therefore included in the analysis of factors (i) through (iii), for which data was available, for informational purposes. Staff added this species to the Deep Shelf species bin based on information from Cope et al (2011), who considered harlequin rockfish as a deep shelf species. This is also correlated by their depth of abundance, as presented in Table 2-1 in the SAFE (PFMC 2024).

Species Bins

Shallow Nearshore

The shallow nearshore bin consists of black and yellow rockfish, China rockfish, gopher rockfish, grass rockfish, kelp rockfish, cabezon, and kelp greenling.

Deeper Nearshore

The deeper nearshore bin consists of black rockfish, blue rockfish, brown rockfish, copper rockfish, deacon rockfish, olive rockfish, quillback rockfish, and treefish.

Shallow Shelf

The shallow shelf bin consists of calico rockfish, flag rockfish, freckled rockfish, halfbanded rockfish, honeycomb rockfish, pygmy rockfish, rosy rockfish, speckled rockfish, and swordspine rockfish.

Deep Shelf

The deep shelf bin consists of bronzespotted rockfish, chameleon rockfish, greenblotched rockfish, harlequin rockfish, Mexican rockfish, pink rockfish, pinkrose rockfish, and tiger rockfish.

No Mortality off the West Coast

This bin consists of light dusky rockfish and dwarf-red rockfish, which have no recent recorded mortality off the West Coast.

Flatfish

The flatfish bin consists of butter sole, curlfin sole, rock sole, sand sole, and starry flounder.

Leopard shark

The leopard shark is analyzed on its own, as the sole elasmobranch included in this analysis.

Each of these species bins will undergo a comprehensive analysis of each of the ten §600.305(c) factors, as well as any additional considerations deemed relevant for a particular stock or species. The analysis will be minimal for two species - dwarf-red rockfish and light dusky rockfish - which are identified in the No Mortality off West Coast bin above; have no recent recorded landings on the U.S. West Coast; and therefore have no data available to base an analysis upon. These two species are not found in significant numbers within the area covered by the Groundfish FMP, do not seem to be susceptible to the fisheries, and thus are unlikely to be subject to overfishing or

being overfished. These species were considered for removal from the FMP under [Amendment 23](#). While removal of these two species was disapproved by NMFS under [Amendment 23](#), the rationale behind this disapproval was not that the species were in need of conservation in management in the EEZ. Rather, NMFS requested a “comprehensive look” at all species, before removing any species on an ad-hoc basis. Here, we present that “comprehensive look” by fully analyzing all species that are recommended to be considered for removal or for EC species designation by the Council.

2.2.2 Approach

The evaluation of Factors (i) through (x) in [§600.305\(c\)](#) should consider the specific circumstances of the fishery and each species. Based on BSIA, this evaluation will determine whether there are biological, economic, social and/or operational concerns that can and should be addressed by continued Federal management.

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 circumstances of the species or fishery (see 81 FR 71864, October 18, 2016). The Guidelines at 50 CFR §600.305(c)(3) note, however, that, if the amount and/or type of catch that occurs in Federal waters is a significant contributing factor to the stock's status, such information would weigh heavily in favor of adding a stock to an FMP.

The Council’s decision to remove a species from the FMP or designate a species as an EC species should be based on a holistic consideration of the factors at §600.305(c). Therefore, for each species or bin of species, each of the ten factors is considered separately, then synthesized into conclusions to assist the Council in their decision making on a preferred alternative for that species or bin.

§600.305(c) guides how factors should be relatively considered in the synthesis of the evaluation. Factors (i) through (iii), addressing the maintenance of the fishery resource and the marine environment should be considered first. Factors (iv) through (ix), which set forth key economic, social, and other reasons for FMP actions under the MSA, should be the next factors considered. Lastly, Factor (x) should be considered before deciding to remove a stock from, or continue to include a stock in, an FMP.

2.3 Stock Definitions

If the Council adopts Alternative 1 – continued management in the FMP – as PPA for any of the groundfish species considered in this action, the next step is to identify a preliminary preferred stock definition Option for analysis. Section 5 provides preliminary proposed stock definitions based on the information in the literature review. Stocks of black rockfish, copper rockfish, and quillback rockfish have already been defined, through Amendment 31, and are therefore not considered for definition under Alternative 1 in this action.

3 Analysis of the Ten Factors

3.1 Factor (i) - Species is an Important Component of the Marine Environment

This factor considers whether the stock is an important component of the marine environment. The analysis of Factor (i) therefore evaluates the role of the species in an ecosystem. 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.

3.1.1 Description of Ecology

The SAFE document (SAFE, PFMC, 2024) provides detailed information on aspects of the life histories and status of managed groundfish. In brief, the SAFE notes that all managed groundfish species are generally found from the shallow edge of the shelf to the deep slope. The SAFE document is updated biennially and is incorporated by reference. The 40 species considered in this specific 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). Groundfish are important components of the marine environment, and species such as flatfish, for example, 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. Some species of groundfish, like vermilion rockfish and lingcod, are considered top predators (Frid and Marlieve, 2010). Upper trophic level predators likely have important community-wide effects. Studies have found leopard sharks (one of the elasmobranchs currently managed in the Groundfish FMP and being evaluated herein) to play an important role in productive and threatened estuarine ecosystems (Musick et al. 2000; Stevens et al. 2000; Bascompte et al. 2005).

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 ecological role of each groundfish species, however, is inherently difficult to evaluate. From a biological perspective, each species plays an important role in the marine environment and it is not possible to isolate the importance of a single species to the environment relative to other species. Additionally, some species of groundfish 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 Council is invested in ecosystem-based fishery management (EBFM) and implements EBFM policies in the FMP, such as weak stock management and precautionary harvest policies that are designed to reduce negative impacts on species that are less abundant, overfished or experience overfishing, or have a paucity of scientific data available about them. While the challenge of this factor is to identify if a species is an important component of the marine environment, it is arguable

that the federally managed groundfish species are already considered important by the Council based on their historic management strategies and tactics.

3.1.2 Index Score Ranking

Quantitative analysis for Factor (i) was performed for the 40 species evaluated in this document based on ecosystem importance scores derived from an Ecopath model for the California Current Ecosystem ([Koehn et. al. 2016](#)). The ecosystem importance scores are currently utilized by the Northwest Fisheries Science Center's (NWFSC) stock assessment team to prioritize groundfish species for assessments (hereafter 'Stock Assessment Prioritization tool' or 'SAP tool', via Wetzel et. al. 2025), hosted on the [Stock Assessment Prioritization website](#). The ecosystem importance score sums top-down and bottom-up components of the Ecopath model, creating an index that represents the importance of each species as a predator and as a prey species in its ecosystem. Scores equalling zero or close to zero indicate little to no trophic contribution rather than a lack of data. Each species is assigned an ecosystem Index (a.k.a. 'Factor') Score, available in the SAP database. Table 1-1 summarizes these scores for all species for which index scores were generated, to provide context to the values for those species evaluated in this document. However, findings are somewhat unclear, as some of the species considered in this action do not have scores. Of the 40 groundfish species evaluated in this action the species not included in this scoring, due to lack of data, include bronzed spotted rockfish, butter sole, calico rockfish, chameleon rockfish, dwarf-red rockfish, freckled rockfish, greenblotched rockfish, halfbanded rockfish, light dusky rockfish, Mexican rockfish, pink rockfish, pinkrose rockfish, pygmy rockfish, swordspine rockfish, and tiger rockfish. Harlequin rockfish is also not included in this scoring. 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, however, is that all species included in this analysis are both predator and prey, and have relative importance in the environment, though some species have relatively higher trophic importance than others.

For each included species, the ecosystem importance score is defined, then binned into quantile thresholds of low, medium, and high importance (see Table 1-1). Thresholds have been previously used to analyze proxy variables for the ten §600.305(c) factors by the Western Pacific Fishery Management Council (Western Pacific Fishery Management Council 2018). As the distribution of scores was heavily skewed towards zero (Figure 1-1), quantiles were used to create thresholds rather than standard deviations from the mean. Based on the mean (0.05) and the 80th percentile (0.62) of the scores, each species is also assigned a relatively low, medium, or high importance ranking (See Table 1-1 for scoring thresholds, Table 1-2 for scoring per species). Scores equal to or close to zero represent true minimal trophic contributions at scale, while omission from scoring represents a lack of data available.

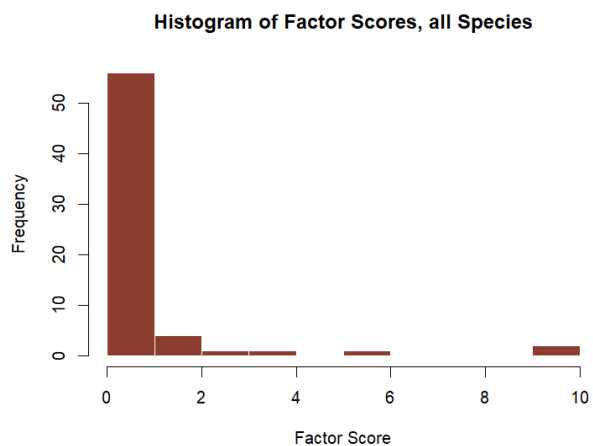


Figure 1 -1. Histogram of ecosystem index scores (0-10) for all species with data to evaluate

Table 1-1. Threshold categorization of index scores for ecosystem importance

Factor Score	Relative Ecosystem Importance
score < 0.05	Low
0.62 > score ≥ 0.05	Medium
score > 0.62	High

Table 1-2. Summary of Index Scores for ecosystem importance for those groundfish species with data to evaluate. Highlighted species denote those included for further evaluation in this analysis.

Species	Rank	Index Score	Top Down Scaled	Bottom Up Scaled	Relative Ecosystem Importance
Pacific spiny dogfish	1	10	7.02	0.32	High
Sablefish	2	9.59	6.67	0.38	High
Arrowtooth flounder	3	5.72	4.04	0.17	High
Lingcod	4	3.09	2.13	0.14	High
Shortspine thornyhead	5	2.01	1.02	0.46	High
Yellowtail rockfish	6	1.99	1.2	0.26	High
Dover sole	7	1.88	0.06	1.32	High
Longnose skate	8	1.64	1.1	0.11	High
Chilipepper	9	1.18	0.77	0.1	High
Bocaccio	10	0.98	0.64	0.08	High
Black rockfish	11	0.94	0.64	0.06	High
Petrale sole	12	0.73	0.5	0.04	High
Big skate	13	0.69	0.46	0.05	High
Widow rockfish	14	0.6	0.24	0.2	Medium
Leopard shark	15	0.46	0.32	0.01	Medium
California scorpionfish	16	0.39	0.16	0.12	Medium
Pacific cod	17	0.39	0.16	0.12	Medium
Longspine thornyhead	18	0.27	0.02	0.18	Medium
Cabazon	19	0.26	0.18	0.01	Medium
English sole	20	0.22	0.01	0.15	Medium
Splitnose rockfish	21	0.21	0.01	0.15	Medium
Pacific ocean perch	22	0.12	0.02	0.07	Medium
Vermilion/Sunset rockfish	23	0.12	0.08	0.01	Medium
Yelloweye rockfish	24	0.12	0.08	0	Medium
Pacific sanddab	25	0.1	0	0.07	Medium
Greenstriped rockfish	26	0.09	0.02	0.05	Medium
Canary rockfish	27	0.08	0.02	0.04	Medium
Gopher/Black and Yellow rockfish	28	0.07	0.04	0.01	Medium
Silvergray rockfish	29	0.07	0.04	0.01	Medium
Rex sole	30	0.06	0	0.04	Medium
Blue/Deacon rockfish	31	0.05	0.03	0.01	Medium
Darkblotched rockfish	32	0.05	0	0.03	Medium
Kelp greenling	33	0.05	0.03	0.01	Medium
Bank rockfish	34	0.03	0	0.02	Low
Copper rockfish	35	0.03	0.02	0.01	Low
Olive rockfish	36	0.03	0.01	0	Low

Redstripe rockfish	37	0.03	0.02	0.01	Low
Sharpchin rockfish	38	0.03	0	0.02	Low
Starry rockfish	39	0.03	0.02	0	Low
Stripetail rockfish	40	0.03	0.02	0	Low
Brown rockfish	41	0.02	0.01	0	Low
China rockfish	42	0.02	0.01	0	Low
Sand sole	43	0.02	0	0.01	Low
Speckled rockfish	44	0.02	0.01	0	Low
Starry flounder	45	0.02	0	0.01	Low
Aurora rockfish	46	0.01	0	0	Low
Blackgill rockfish	47	0.01	0	0.01	Low
Cowcod	48	0.01	0.01	0	Low
Flag rockfish	49	0.01	0.01	0	Low
Grass rockfish	50	0.01	0	0	Low
Greenspotted rockfish	51	0.01	0.01	0	Low
Rosethorn rockfish	52	0.01	0	0	Low
Rosy rockfish	53	0.01	0	0	Low
Rougheye/Blackspotted rockfish	54	0.01	0	0.01	Low
Yellowmouth rockfish	55	0.01	0	0.01	Low
Curlfin sole	56	0	0	0	Low
Flathead sole	57	0	0	0	Low
Honeycomb rockfish	58	0	0	0	Low
Kelp rockfish	59	0	0	0	Low
Quillback rockfish	60	0	0	0	Low
Redbanded rockfish	61	0	0	0	Low
Rock sole	62	0	0	0	Low
Shortraker rockfish	63	0	0	0	Low
Squarespot rockfish	64	0	0	0	Low
Treefish	65	0	0	0	Low

3.1.3 Summary of Quantitative Findings

The majority of the species in this analysis scored relatively low on ecosystem importance via the SAP index score. Out of the species included in this analysis, black rockfish had the highest ecosystem importance score and it was the only species with a score passing the relatively “high importance” threshold in the 80th percentile of all species in the SAP tool. Leopard shark, cabezon, gopher rockfish, black and yellow rockfish, blue rockfish, deacon rockfish, and kelp greenling all had ecosystem importance scores higher than the median value of all species in the SAP tool. These species were labeled with a relative “medium importance.” The remainder of the species in

the index scoring were below the median index score, denoting relatively lower trophic importance. Curlfin sole, honeycomb rockfish, kelp rockfish, quillback rockfish, rock sole and treefish each scored the minimum index score of 0. Those species that are not included in the list are not necessarily unimportant in the marine environment but are rather not included in the quantitative data in the SAP database, as they are not typically assessed. However, the fact that these species are not assessed may also demonstrate relatively lower importance in addition to lower data availability, as compared to those species that are assessed.

3.1.4 Conclusion

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 indicates the importance of groundfish species generally to their marine environment.

3.2 Factor (ii) - The stock is caught by the fishery

Factor (ii) at §600.305(c) considers whether “the stock is caught by the fishery.” The fishery in this case is interpreted as the fishery that occurs in the EEZ. As established in the ROA Analysis ([Agenda Item H.6, Supplemental Revised Attachment 1, March 2025](#)), a 25 percent threshold of mortality in the EEZ was used to determine if a species had fishery mortality principally in Federal waters. 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). 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).

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, however, and therefore may have impacted the diversity of catch. Meaning, it could appear as if species with historic catch principally attributed to the EEZ in the past are, at present, primarily caught in state waters, even if in low numbers. Additionally, the 25 percent allows for flexibility by incorporating uncertainty in fishery dependent data and also 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 is likely to shift back to reflect the past. Given this and other uncertainties related to the fishery, a low threshold was selected to account for 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, and the results are organized by species bin, below. For several of the evaluated species, there is either known or expected population structure that lends well to the state by state consideration, for other species without expected population structure, ultimately the state by state results would be combined to provide a comprehensive view for a species throughout its population range

3.2.1 Shallow Nearshore Bin

None of the species in the shallow nearshore bin exceed 12 percent mortality in the EEZ off any of the three states as indicated in Table 2-1. On average, less than three metric tons of each species is attributed to the EEZ off each state annually. The average coastwide mortality attributed to the EEZ for species in this bin is less than 6 percent. While each species in this group has mortality in the EEZ, it is well below the 25 percent threshold established in the ROA Analysis. Therefore, principal mortality for all species in the shallow nearshore bin is attributable to state waters and not the EEZ. This finding is consistent with the finding that the principal mortality for all of these species, on a coastwide basis, is in state waters.

Table 2-1. Average combined non-Tribal commercial and recreational sector mortality at the state and coastwide scale in metric tons (mt) and percentage of mortality in the EEZ for the species in the Shallow Nearshore Species Bin for years 2018-19 & 2021-23.

	California Mortality EEZ			Oregon Mortality EEZ			Washington Mortality EEZ			Coastwide Mortality EEZ	
Species	mt	%		mt	%		mt	%		mt	%
Shallow Nearshore											
Black and Yellow Rockfish	0.50	2.5%		0.0	0.0%		0.00	0%		0.50	2.5%
China Rockfish	1.73	11.8%		0.32	3.5%		0.04	1.8%		2.09	8.8%
Gopher Rockfish	2.43	3.4%		0.001	1.5%		0.00	0%		2.43	3.4%
Grass Rockfish	0.12	1.0%		0.01	4.2%		0.00	0.0%		0.13	1.1%
Kelp Rockfish	0.32	6.3%		0.001	7.1%		0.00	0%		0.32	6.3%
Treefish Rockfish	0.95	9.2%		0.00	0%		0.00	0%		0.95	9.2%
Cabazon	2.92	6.2%		1.56	3.8%		0.91	9.3%		5.39	6.0%
Kelp Greenling	0.16	2.8%		0.46	3.5%		0.07	3.7%		0.69	3.7%

3.2.2 Deeper Nearshore Bin

The Deeper Nearshore Species Bin comprises seven rockfish species. The mortality in the EEZ for these species off of California and Oregon are below the 25 percent threshold (Table 2-2). Nearly 80 percent of the California quillback rockfish stock mortality is attributed to California state waters. Three species off of Washington have mortality greater than 25 percent attributed to

the EEZ: black rockfish at 42 percent, copper rockfish at 30.7 percent, and quillback rockfish at 45.9 percent.

The mortality for all of the deeper nearshore species off of California and Oregon, as well as blue and brown rockfishes off of Washington, is principally in state waters. The mortality for black, copper, and quillback rockfishes off of Washington is principally attributable to the EEZ. On the coastwide scale, however, all species have mortality principally attributable to state waters. While the analytical results may seem inconsistent with the Oregon and California findings, it is likely a factor of biogeography off of coastal Washington that drives the differences rather than differences in fishing strategies. Coastal Washington has little nearshore structure in the south where black rockfish are primarily caught, thus anglers need to travel offshore to target them (pers comm. Lorna Wargo, March 2025). In northern Washington, shallow rocky reef structure is found offshore, which has habitat correlations for copper and quillback rockfishes (pers comm. Lorna Wargo, March 2025). The Council has a history of managing nearshore rockfish, notably black rockfish, on a state by state basis. A31 addresses these management concerns in detail and is incorporated by reference. In brief, from the management perspective, if these species were to remain in the FMP for Washington-only, the management impacts would likely be similar to status quo.

Table 2-2. Average combined non-Tribal commercial and recreational sector mortality at the state and coastwide scale in metric tons (mt) and percentage of mortality in the EEZ for the species in the Deeper Nearshore Species Bin for years 2018-19 & 2021

	California Mortality EEZ			Oregon Mortality EEZ			Washington Mortality EEZ			Coastwide Mortality EEZ	
Species	mt	%		mt	%		mt	%		mt	%
Deeper Nearshore											
Black Rockfish a/	14.22	7.7%		11.32	2.6%		89.20	42.0%		114.74	16.2%
Blue Rockfish	12.36	7.4%		0.32	2.7%		0.15	7.3%		12.83	7.2%
Brown Rockfish	16.05	15.8%		0.03	10.6%		0.02	18.6%		16.10	15.8%
Copper Rockfish a/	19.68	16.1%		0.39	4.3%		0.87	30.7%		20.94	15.8%
Deacon rockfish	0.00	0.0%		0.55	3.5%		0.00	0%		0.55	3.5%
Olive Rockfish	4.03	10.2%		<0.001	1.1%		0.00	0%		4.03	10.2%
Quillback Rockfish a/	2.51	20.3%		0.56	6.4%		1.09	45.9%		23.51	17.7%

a/ stocks of these species defined under Amendment 31

3.2.3 Shallow Shelf Bin

The Shallow Shelf Bin is comprised of nine species. At the state scale, all species in this bin have either no mortality or have greater than 25 percent of their mortality attributed to the EEZ, except calico and rosy rockfishes (Table 2-3). An estimated 17.2 percent of calico rockfish and 24 percent of rosy rockfish mortalities are attributed to the EEZ off of California, indicating principal mortality for these species is in state waters. Rosy rockfish has mortality off of Oregon as well, at 56.2 percent in the EEZ; however, while this percentage is high, the average annual mortality in metric tons averages less than 0.02 mt (Table 2-3). This finding indicates, relative to California, rosy rockfish mortality is *de minimis* off of Oregon. Another aspect for the Council to consider when considering overall mortality for each species, is that the range of calico, freckled, halfbanded, honeycomb, and swordspine rockfishes is limited to California (Love et al, 2002),

which is likely an important reason there is no mortality of these species off of Oregon and Washington. Additionally, none of the shallow shelf species have mortality off of Washington. On a coastwide scale, seven of the nine species have principal mortality in the EEZ. Calico and rosy rockfishes are the exceptions and have principal mortality in state waters.

Table 2-3. Average combined non-Tribal commercial and recreational sector mortality at the state and coastwide scale in metric tons (mt) and percentage of mortality in the EEZ for the species in the Shallow Shelf Species Bin for years 2018-19 & 2021-23

	California Mortality EEZ			Oregon Mortality EEZ			Washington Mortality EEZ			Coastwide Mortality EEZ	
Species	mt	%		mt	%		mt	%		mt	%
Shallow Shelf											
Calico Rockfish	0.08	17.2%		0.00	0.0%		0.00	0.0%		0.08	17.2%
Flag Rockfish	4.02	44.8%		0.01	73.7%		0.00	0.0%		4.03	44.8%
Freckled Rockfish	0.01	48.2%		0.00	0.0%		0.00	0.0%		0.01	45.8%
Halfbanded Rockfish	1.19	55.0%		0.00	0.0%		0.00	0.0%		1.19	55.1%
Honeycomb Rockfish	1.55	47.5%		0.00	0.0%		0.00	0.0%		1.55	47.6%
Pygmy Rockfish	0.00	0.0%		0.004	100%		0.00	0.0%		0.004	100%
Rosy Rockfish	2.70	24.2%		0.02	56.2%		0.00	0.0%		2.72	24.2%
Speckled Rockfish	5.17	62.8%		<0.001	40.0%		0.00	0.0%		5.17	62.8%
Swordspine Rockfish	0.24	89.7%		0.00	0.0%		0.00	0.0%		0.24	88.2%

3.2.4 Deeper Shelf Bin

The Deeper Shelf Bin is comprised of eight species. Similar to the Shallow Shelf Bin, all of the species in this bin, except tiger rockfish, have either principal mortality attributable to the EEZ or no mortality records (Table 2-4). The range of bronzespotted, chameleon, Mexican, and pinkrose rockfishes is limited to California (Love et al, 2002), which likely explains why there is no mortality off of Oregon and Washington. The range of harlequin rockfish is limited to Oregon and Washington (Love et al, 2002). With the exception of greenblotched and Mexican rockfishes, the average annual mortality for the species in this bin ranges from 0.0 mt to 0.3 mt. The mean annual mortality of chameleon, harlequin, pink, and pinkrose rockfish does not exceed 0.01 mt off of any state. Greenblotched rockfish is predominantly caught off California, with an average of 9.2 mt annually. It has no mortality off of Washington and minimal mortality off of Oregon; an annual average of 0.03 mt. The mortality of tiger rockfish off of California and Oregon is 24.2 percent and 15.4 percent attributable to the EEZ, respectively; whereas, off of Washington the estimated mortality in the EEZ is 67.2 percent. Therefore, tiger rockfish mortality off California and Oregon is principally in state waters and off Washington, it is principally in the EEZ. At a coastwide scale, all of the deeper shelf species, including tiger rockfish, have principal mortality in the EEZ.

Table 2-4. Average combined non-Tribal commercial and recreational sector mortality at the state and coastwide scale in metric tons (mt) and percentage of mortality in the EEZ for the species in the Deeper Shelf Species Bin for years 2018-19 & 2021-23.

	California Mortality EEZ			Oregon Mortality EEZ			Washington Mortality EEZ			Coastwide Mortality EEZ	
Species	mt	%		mt	%		mt	%		mt	%
Deep Shelf											
Bronzespotted Rockfish	a/	100.0%		0.0	0%		0.00	0%		0.11	100.0%
Chameleon Rockfish	0.01	100.0%		0.00	0%		0.00	0%		0.01	100.0%
Greenblotched Rockfish	9.15	90.6%		0.03	96.3%		0.00	0%		9.18	90.6%
Harlequin Rockfish	0.00	0%		0.003	100.0%		0.00	0%		0.003	100.0%
Mexican Rockfish	9.71	93.7%		0.00	0%		0.00	0%		9.71	93.7%
Pink Rockfish	0.01	100.0%		0.00	0%		0.00	0%		0.01	100.0%
Pinkrose Rockfish	0.004	100.0%		0.00	0%		0.00	0%		0.004	100.0%
Tiger Rockfish	0.17	24.2%		0.20	15.4%		0.30	67.2%		0.67	27.2%

a/ 104 bronzespotted rockfish (estimated) with mortality in EEZ, 20 (estimated) with mortality in state waters. No weights reported in RecFIN; therefore, percentage of mortality in EEZ based on numbers of fish not weight.

3.2.5 No Mortality Bin

The two species in this bin had no mortality on the West Coast attributable to the groundfish fishery during the investigative period (Table 2-5). There is no recorded mortality for dwarf-red rockfish in the groundfish fishery on the West Coast in at least the last 21 years (NMFS, 2024). The only recorded light dusky rockfish mortality in the groundfish fishery occurred in 2002 and 2003.

Table 2-5. Average combined non-Tribal commercial and recreational sector mortality at the state and coastwide scale in metric tons (mt) and percentage of mortality in the EEZ for species with no mortality in any groundfish sector for years 2018-19 & 2

	California Mortality EEZ			Oregon Mortality EEZ			Washington Mortality EEZ			Coastwide Mortality EEZ	
Species	mt	%		mt	%		mt	%		mt	%
No Mortality											
Dwarf-red Rockfish	0.00	0.0%		0.00	0%		0.00	0%		0.00	0%
Light Dusky Rockfish	0.00	0.0%		0.00	0%		0.00	0%		0.00	0%

a/20 fish estimated released dead, not weight taken by recreational sampler, in EEZ

3.2.6 Flatfish

The Flatfish Bin is comprised of six species. The mortality for all these flatfish species is principally attributed to the EEZ, except for rock and sand soles off of Washington (Table 2-6). Rock and sand soles have less than 7.5 percent and 3.3 percent, respectively, of their mortality attributed to the EEZ off of Washington; therefore, the mortality for these species is principally attributed to Washington state waters. It is important to note that the mean mortality for each of the flatfish species off of California, Oregon, and Washington is less than 1 mt, 2 mt, 0.02 mt, respectively, in the EEZ. Notably, the mortality in the EEZ off of Washington for all the flatfish in this bin is minimal (with the average annual mortality of rock sole being 0.004 mt, sand sole

being 0.002 mt, and starry flounder being 0.02 mt) when compared to mortality of these species off of California and Oregon.

Table 2-6. Average combined non-Tribal commercial and recreational sector mortality at the state and coastwide scale in metric tons (mt) and percentage of mortality in the EEZ for the species in the Flatfish group for years 2018-19 & 2021-23.

	California Mortality EEZ			Oregon Mortality EEZ			Washington Mortality EEZ			Coastwide Mortality EEZ	
Species	mt	%		mt	%		mt	%		mt	%
Flatfish											
Butter Sole	0.00	100.0%		0.01	59.4%		0.00	0%		0.01	66.7%
Curlfin Sole	0.46	98.9%		0.09	100.0%		0.00	0%		0.55	98.0%
Rock Sole	0.59	30.4%		0.76	98.5%		0.004	7.5%		1.35	48.7%
Sand Sole	0.11	39.4%		1.15	85.3%		0.002	3.3%		1.26	74.4%
Starry Flounder	0.61	66.3%		1.28	74.6%		0.02	48.6%		1.91	71.3%

3.2.7 Leopard Shark

Leopard shark mortality, at 3.4 percent in the EEZ, is principally attributable to state waters (Table 2-7). While the range of this species includes Oregon, the only records are from California.

Table 2-7. Average combined non-Tribal commercial and recreational sector mortality at the state and coastwide scale in metric tons (mt) and percentage of mortality in the EEZ for the leopard shark for years 2018-19 & 2021-23.

	California Mortality EEZ			Oregon Mortality EEZ			Washington Mortality EEZ			Coastwide Mortality EEZ	
Species	mt	%		mt	%		mt	%		mt	%
Leopard Shark											
Leopard Shark	0.19	3.4%		0.00	0%		0.00	0%		0.19	3.4%

3.2.8 Conclusions

The analysis of Factor (ii) indicates three categories of species: caught by the fishery, not caught by the fishery, and uncertain. These categories follow the 25 percent threshold in that species with total mortality greater than 25 percent in the EEZ are considered caught by the fishery and those with mortality less than 25 percent in the EEZ are not. Table 2-8 shows the species by categories. A detailed description of the results follows the table.

Table 2-8. Factor (ii) analysis results summarized

Not caught by the fishery	Caught by the fishery	Uncertain
<ul style="list-style-type: none"> · Black and Yellow rockfish · Black rockfish (CA/OR) · Blue rockfish · Brown rockfish · Cabezon · Calico rockfish · China rockfish · Copper rockfish (CA/OR) · Deacon rockfish · Gopher rockfish · Grass rockfish · Kelp greenling · Kelp rockfish · Leopard shark · Olive rockfish · Quillback rockfish (ca/or) · Rock sole (WA) · Rosy rockfish (CA) · Sand sole (WA) · Tiger rockfish (CA/OR) · Treefish rockfish 	<ul style="list-style-type: none"> · Black rockfish (WA) · Bronzespotted rockfish · Butter sole · Chameleon rockfish · Copper Rockfish (WA) · Curlfin sole · Flag rockfish · Freckled rockfish · Greenblotched Rockfish · Halfbanded rockfish · Harlequin rockfish · Honeycomb rockfish · Mexican rockfish · Pink rockfish · Pinkrose rockfish · Pygmy rockfish · Quillback rockfish (WA) · Rock sole (CA/OR) · Rosy rockfish · Sand sole (CA/OR) · Speckled rockfish · Starry Flounder · Swordspine rockfish · Tiger rockfish (WA) 	<ul style="list-style-type: none"> · Light dusky rockfish · Dwarf-red rockfish

The mortality for all of the species in the Shallow Nearshore Bin is principally attributable to state waters based on the 25 percent threshold and the species in this bin are thus considered not caught by the fishery.

The mortality for the species in the Deeper Nearshore Bin, except for black, copper, and quillback rockfishes off of Washington, is principally attributable to state waters based on the 25 percent threshold and, with those exceptions, the species in this bin are thus considered not caught by the fishery. The mortality for black, copper, and quillback rockfishes off of Washington exceeds the 25 percent threshold in the EEZ. Therefore, those species are considered principally caught in the EEZ off Washington and thus considered ‘caught by the fishery’. This finding is not consistent for these species off of California and Oregon, where their mortality was highly attributable to state waters. The SSC recommended against state-specific exclusion of species in the FMP, due to considerable uncertainty in the information used to define stock structure ([Agenda Item H.6.a, Supplemental SSC Report 1, March 2025](#)). However, the SSC also recommended nearshore

rockfish in general be managed at a finer-scale than coastwide, even in the absence of species-specific information on stock structure ([Agenda Item H.5.a Supplemental SSC Report 1, November 2022](#)). For species considered to have population structure that supports separate management (i.e., at a geographic scale smaller than coastwide), individual stocks of a species may be considered differently in terms of whether they are ‘caught by the fishery,’ especially given the differences on a state-by-state basis of where these fish occur and the nature of the fishing for them.

Based on the 25 percent threshold, the mortality for the species in the Shallow Shelf Bin, except for calico and rosy rockfishes, is principally attributed to the EEZ and these species are therefore considered caught by the fishery. Calico rockfish mortality is principally attributed to state waters based on the 25 percent threshold and therefore is not considered caught by the fishery. Rosy rockfish is principally attributed to state waters only off of California; however, rosy rockfish is on the cusp of the 25% mortality threshold at 24.2 percent. Whereas, off of Oregon, mortality of rosy rockfish has strong association with the EEZ. Based on SSC comments in a March 2025 report ([Agenda Item H.6.a, Supplemental SSC Report 1, March 2025](#)) rosy rockfish “...catches in the EEZ are likely to exceed the state-Federal threshold in the near future.” Specifically, the locality of mortality for rosy rockfish off of California may be an effect of depth-based management and, due to recent changes in the fishery, mortality may increase in the EEZ.

With the exception of tiger rockfish, the mortality of the Deep Shelf Species is principally attributed to the EEZ based on the 25 percent threshold and these species are therefore considered caught by the fishery. The use of the 25 percent threshold indicates tiger rockfish mortality off California and Oregon is principally in state waters and thus tiger rockfish is not considered caught by the fishery off California and Oregon; however, off Washington, tiger rockfish is principally in the EEZ and considered caught by the fishery. At a coastwide scale, all of the Deeper Shelf Species, including tiger rockfish, have principal mortality in the EEZ. Tiger rockfish is also the only species that has mortality in all three states. As a point of additional consideration, greenblotched and Mexican rockfish are the only species in this bin with mortality greater than 0.7 mt at the coastwide scale (Table 2-2). Chameleon, harlequin, pink, pinkrose rockfishes average 0.03 mt of mortality combined per year at the coastwide scale and even less at the state scale. These amounts could be considered *de minimis* mortality in the context of the groundfish fishery. Similarly, mortality of bronzespotted rockfish had an average 0.1 mt of mortality per year within the analyzed time periods.

In March 2025, the SSC noted that *de minimis* mortality for some species may be a consequence of historical fishing pressure and low population size, rather than low presence of the species in the fishery ([Agenda Item H.6.a, Supplemental SSC Report 1, March 2025](#)). However, there are two points to consider in relation to this theory. First, many of these species have either never been assessed (e.g., chameleon, harelequin, etc.) or were last assessed via data-poor methods in 2011 (PFMC, 2011), which is considered a Category 3 assessment. As discussed elsewhere, Category 3 assessments cannot be used to gauge biological status. Second, the area of abundance for these species is the deep continental shelf, as indicated by the SAFE (PFMC, 2024b) and Love et al, (2002). That area has largely been closed to fishing since the early 2000s, which, subjectively, may have been of benefit to these species in terms of allowing their biomass to increase in the absence of fishing pressure. Accordingly, the SSC statement is difficult to factually confirm without

evaluation of biological reference points, and it is difficult to know which species, if any, have *de minimus* mortality as a consequence of historical fishing pressure. Regardless of the absence or presence of biological information for these species, however, the mortality of these species will be tracked via the current fishery monitoring programs. Thus, the Council will be informed by the GMT if mortality begins to increase in the EEZ and could act appropriately to address the issue.

Several species have no recent recorded mortality in the fishery. Catch of dwarf-red rockfish cannot be attributed to either state waters or to the EEZ, as there has been no mortality of this species recorded in the groundfish fishery in at least the last 21 years (Somers et al, 2024). Light dusky rockfish last had mortality recorded in the groundfish fishery in 2004 (Somers et al, 20224). As these species have no recorded mortality in the groundfish fishery in at least 21 years, the conclusion is that these species are not caught by the fishery.

The mortality for all the flatfish species, except for rock and sand soles off of Washington, is principally attributed to EEZ based on the 25 percent threshold and these species can therefore be considered as caught by the fishery. Rock and sand soles have *de minimis* mortality off of Washington, with 0.004 mt and 0.002 mt average annual mortality, respectively. A key aspect of this bin regarding mortality is that while the mortality for species, except rock and sand soles, is principally attributed to the EEZ, the average annual mortality is minimal. With the exception of sand sole and starry flounder off of Oregon, the average annual mortality for every species in the bin does not exceed 0.8 mt. This finding indicates that, overall, the species in the flatfish bin have minimal presence in the fishery.

Leopard shark mortality is principally attributable to state waters based on the 25 percent threshold and is therefore not considered caught by the fishery.

3.3 Factor (iii) - Whether an FMP can improve the condition of the stock

Factor (iii) at §600.305(c) is: “Whether an FMP can improve or maintain the condition of the stock.” All of the species included in this analysis are, at present, managed under the Groundfish FMP. The FMP and the 50 CFR part 660 regulations are limited in application to fishing activity that occurs in the EEZ. This factor ties directly into the first goal of the Groundfish FMP, which is to “*Prevent overfishing and rebuild overfished stocks by managing for appropriate harvest levels and prevent, to the extent practicable, any net loss of the habitat of living marine resources.*”²

The FMP indicates that it is the responsibility of management to maintain a stock’s condition close to sustainable yield. If a stock is overfished, experiencing overfishing, or in a precautionary status, the FMP guides management to return the fishery to a healthy state. Consistent with the MSA, Goal 1 and Objectives 2 and 3 of the FMP indicate that the Council should strive for optimum yield (OY) and that management of the fishery should prevent overfishing and rebuild overfished species in as short a timeframe as possible (Section 2.1 Groundfish FMP, PFMC 2024a). However, the MSA is clear that Federal management is specific to Federal waters, and thus there is a question of whether species with mortality principally in state waters could be effectively managed by the Council. To understand whether the Groundfish FMP can improve the condition of the species included in this analysis, the results of the Factor (ii) analysis (is the species caught by the fishery) should therefore be integrated with the Factor (iii) evaluation, and the area of a species’ or stock’s principal mortality should first be identified before determining whether the FMP can improve the condition of the species. If a species’ mortality in the EEZ is minimal, it can be assumed that the FMP could not reasonably be expected to improve the condition of the species given the jurisdictional boundaries of the FMP. For example, if the Council and NMFS only have jurisdiction over a small portion of the fishing activity for a stock, even the most significant management measure, like a full closure, would be unlikely to impact the trajectory of that stock and the FMP would thereby fail the test of whether it could improve the condition of the stock.

As a general note, most groundfish species are longer-lived and have relatively stable populations, as differentiated from coastal pelagic species or salmon, for example. Because of these life history traits and general population stability, groundfish can be well managed under the FMP, where there is principal mortality in the EEZ and the FMP is in effect. The FMP sets a harvest specification framework, which requires biomass targets for groundfish, in an effort to prevent overfishing and achieve OY (National Standard 1). The management target for rockfish under the Groundfish FMP is a depletion level of 40 percent (i.e., B40%), unless specified otherwise, and for flatfish it is a depletion level of 25 percent (i.e., B25%), unless specified otherwise. For species where the biomass for maximum sustainable yield (B_{MSY}) cannot be calculated, default proxy values are used for B_{MSY} target: B30% for flatfish and B50% for rockfish and elasmobranchs (Section 4.6.1 Groundfish FMP, PFMC 2024a). Stock status is a useful metric in understanding the depletion of a species and to determine whether accountability measures are necessary to meet conservation goals of the FMP. This metric is not useful for most of the species included in this analysis, however. With few exceptions (e.g., black rockfish), the majority of the species in this analysis are either assessed via Category 3 stock assessments, which do not provide for

² [FMP, Chapter 2.](#)

determinations of stock status, or have never been assessed. When species-specific monitoring and data collection is available, the FMP provides for a variety of management measure tools that can effectively reduce mortality of individual groundfish species. Additionally, though not without detrimental impacts to fishing businesses and communities, the FMP has been successful historically in rebuilding overfished groundfish stocks. Limited administrative resources, however, affect the ability of the Council and NMFS to collect the necessary data to assess and manage many Pacific coast groundfish species.

The revised National Standard 1 (NS1) Guidelines incorporated a framework for managing stock complexes. However, the current structure of the Council's groundfish stock complexes was developed before the revisions to NS1, meaning that many of the updated Guidelines were not considered during the creation of the groundfish stock complexes. Reorganization of the FMP's current stock complexes is not a part of this action. Rather, it will be considered during a subsequent step of the Phase 2 stock definition process. Accordingly, this analysis does not intend to evaluate the efficacy of the FMP's management of current stock complexes.

3.3.1 Mortality

3.3.1.1 Shallow and Deeper Nearshore Species

As described in the Factor (ii) analysis above, at the coastwide scale the mortality for all species in the Shallow and Deeper Nearshore Bins is principally attributed to state waters, including the California stock of quillback rockfish. However, at the state scale, black, copper, and quillback rockfishes off of Washington have principal mortality in the EEZ, which is dissimilar to the results off of California and Oregon, which indicate their principal mortality is in state waters. The FMP is unlikely to improve or maintain the condition of the species in these bins with principal mortality in state waters. The FMP could maintain or improve the condition of black, copper, and quillback rockfishes off of Washington as they are principally caught in the EEZ.

3.3.1.2 Shallow and Deep Shelf Bins

As described in the Factor (ii) analysis above, the mortality of the species in the Shallow and Deep Shelf Bins are principally attributed to the EEZ, except for calico, rosy, and tiger rockfishes in the Shallow and Deep Shelf Bins, respectively. The principal mortality for calico and rosy rockfish is in state waters off of California; whereas, off of Oregon, rosy rockfish mortality is principally in the EEZ. Calico range is limited to California. Tiger rockfish mortality off of California and Oregon is principally in state waters; whereas off Washington it is in the EEZ. All of these species are managed in the Shelf Rockfish Complexes north and south of 40°10' N. lat. Calico, chameleon, freckled, harlequin, halfbanded, pinkrose, and pygmy rockfishes have not been assessed and contribute no harvest specifications to the Shelf Rockfish Complexes. The remaining species have Category 3 assessments and there is uncertainty regarding the reference points for these species. Based strictly on the area of mortality, except for the species noted, it is reasonable to conclude that the FMP could improve the condition of these species. Nevertheless, the paucity of information regarding these species, and the lack of assessments and harvest specifications for the seven species, does draw into question how effective the FMP is at maintaining and/or improving their condition.

3.3.1.3 No Mortality Bin

Dwarf-red and light dusky rockfishes have no recent fishery mortality (see Factor (ii)); however, the life history for these species strongly suggests that they could be principally caught in the EEZ (Love et al, 2002) and thus, correspondingly, could be likely to have principal mortality in the EEZ. While there is a strong likelihood these species would have principally mortality in the EEZ, the fact that they are not caught in the fishery means it is unlikely that their condition could be improved or maintained by the FMP.

3.3.1.4 Flatfish Bin

The majority of species in the Flatfish Bin have principal mortality in the EEZ, with the exceptions of rock and sand soles off of Washington, whose principal mortality is attributed to state waters. The FMP could maintain or improve the condition of these species with principal mortality in the EEZ, though it is unlikely to do so for the Washington portion of rock and sand soles in this bin.

3.3.1.5 Leopard Shark

The mortality of leopard shark is principally attributed to state waters, with 3.3 percent of its mortality linked to the EEZ (see section 3.2.5). The FMP is not expected to improve or maintain the condition of this stock, as the effects of any management measure in the FMP is limited to the species range of the EEZ.

3.3.1.6 Conclusions

Three categories were developed as a result of analyzing the species under Factor (iii). The FMP is unlikely, likely, and uncertain to improve or maintain the condition of the species. Those results are shown in Table 3-1 and described below.

Table 3-1. The effect of the FMP on improving or maintaining the condition of the species considered in this analysis

Not likely	Likely	Uncertain
<ul style="list-style-type: none"> · Black rockfish (CA/OR) · Black and yellow rockfish · Blue/Deacon rockfish · Brown rockfish · Cabezon · Calico rockfish · China rockfish · Copper rockfish (CA/OR) · Gopher rockfish · Grass rockfish · Kelp greenling · Kelp rockfish · Leopard shark · Olive rockfish · Quillback rockfish (CA/OR) · Rock sole (WA) · Rosy rockfish (CA) · Sand sole (WA) · Tiger Rockfish (CA/OR) · Treefish 	<ul style="list-style-type: none"> · Bronzespotted rockfish · Butter sole · Chameleon rockfish · Copper rockfish (WA) · Curlfin sole · Flag rockfish · Freckled rockfish · Greenblotched rockfish · Halfbanded rockfish · Harlequin rockfish a/ · Honeycomb rockfish · Mexican rockfish · Pink rockfish · Pinkrose rockfish · Pygmy rockfish · Quillback rockfish (WA) · Rock sole (CA/OR) · Rosy rockfish (OR) · Sand sole · Sand sole · Speckled rockfish · Starry flounder · Swordspine rockfish · Tiger Rockfish (WA) 	<ul style="list-style-type: none"> · Dwarf-Red rockfish · Light dusky rockfish

The FMP is unlikely to improve or maintain the condition of all species in the Shallow Nearshore Bin as their principal mortality, as indicated in the Factor (ii) analysis, is in state waters.

The FMP is unlikely to improve or maintain the condition of most species in the Deeper Nearshore Bin as their principal mortality, as indicated in the Factor (ii) analysis, is in state waters. The exceptions to this finding are black, copper, and quillback rockfishes off Washington, where principal mortality is in the EEZ. The FMP is unlikely to improve the condition of California stock of quillback rockfish as its mortality is principally attributed to state waters. As noted in the analysis supporting Amendment 33 to the FMP, which established the rebuilding plan for California quillback rockfish, the rebuilding plan is unlikely to be successful unless the State of California independently implements similar restrictions as those included in federal regulation.

The FMP is likely to improve or maintain the condition of most species in the Shallow Shelf Bin as their principal mortality is in the EEZ. The exceptions are calico and rosy rockfishes. The condition of calico is unlikely to be affected by the FMP as its mortality is principally in state

waters. Rosy rockfish has 24.2 percent of its mortality attributed to the EEZ, thus, given the uncertainty surrounding mortality data, it is reasonable to assume the FMP could improve the condition of this species. Further, the SSC indicated that it is possible that the mortality of rosy rockfish in the EEZ will increase in the near future. Calico, freckled, harlequin, halfbanded, and pygmy rockfishes have not been assessed, and therefore lack harvest specifications. Without reference points, the ability of the FMP to improve the condition of these species is unknown.

There is considerable uncertainty regarding the two species in the No Mortality Bin. As they have no mortality in the study period and no harvest specifications, it is unknown whether the FMP could improve or maintain the condition of these species. Given their life history and depth distribution, it is likely they are principally found in the EEZ, which suggests the FMP could theoretically address their condition. However, given there is no recent recorded mortality of these species tied to the groundfish fishery, it is unlikely that the FMP could address their condition.

The FMP is likely to improve or maintain the condition of most species in the Deep Shelf Bin, as their principal mortality is in the EEZ. The exception is tiger rockfish off of California and Oregon, as its principal mortality is in state waters for these two states, which indicates that the FMP would not be able to maintain or improve the condition of the species. Chameleon rockfish has not been assessed and therefore lacks harvest specifications. Without reference points, the ability of the FMP to improve or maintain the condition of this species is unknown.

The FMP is likely to improve or maintain the condition of the species in the Flatfish Bin, except for rock and sand soles off of Washington. Those two species have principal mortality, albeit low, in state waters and it is unlikely that the FMP would improve or maintain the condition of these species off Washington. Additionally, butter and curlfin soles have not been assessed. Without reference points, the ability of the FMP to improve or maintain the condition of these species is unknown.

The FMP is unlikely to improve or maintain the condition of leopard sharks, as its mortality is principally attributed to state waters.

3.4 Factor (iv) - The stock is a target of a fishery

Factor (iv) seeks to determine whether a stock is a target of a Federal fishery. Target stocks are stocks or stock complexes that fishery participants “...seek to catch for sale or personal use, including such fish that are discarded for economic or regulatory reasons as defined under MSA sections 3(9) and 3(38)” (50 CFR [§600.305\(d\)\(11\)](#)). Target stocks, when considered as defined, can be indicated by the presence of the species either as landings or discard. Non-target stocks, as defined at [§600.305\(d\)\(12\)](#), are “...fish caught incidentally during the pursuit of target stocks in a fishery. Non-target stocks may require conservation and management and, if so, must be included in a FMP and be identified at the stock or stock complex level”. Currently, there is considerable fluidity between groundfish fishing off the U.S. West Coast that occurs in state waters and in Federal waters; with many management measures such as trip limits and bag limits accounting for fishing across both areas. Therefore, the evaluation of this factor considers groundfish fishing in both state and Federal waters.

Landings data is evaluated under this factor to calculate the relative catch of each species on a per trip basis. The species comprising the largest portion of single trips from 2015 through 2024 (excluding at sea whiting trips) was categorized as the ‘target’ species for that trip. The targets of each trip from 2015 through 2024 were analyzed to determine whether a portion of the groundfish fleet has targeted particular species over this time period.

The rationale for targeting and even retaining non-target species may differ across sectors. Species may be targeted due to price, processor needs, or even personal preference. Quantitative data may be able to indicate what a target is in portions of the sector, but the target could also be masked by retention of other species or by the retention of multiple, interchangeable targets. As a hypothetical example, Species 1 could be the target of a trip as it fetches a high price in the live market, but the fishermen may retain Species 2 at higher numbers than Species 1 during that trip, due to high prevalence of that species in the area fished. The data would indicate Species 2 was the target in this example. Therefore, to understand what species are targeted, analysts also consulted with industry members from the GAP and the GMT, and with Treaty Tribal representatives.

3.4.1 Qualitative Consultation

The GMT, GAP, and the Tribal representatives on each body were asked to identify key target groundfish species in commercial, recreational, and Tribal fisheries along the West Coast. Public comments in the Council’s E-portal were also reviewed for qualitative information on target species.

Table 4-1 below summarizes the outcomes of consultations with the GMT. Note that off Washington opportunity for nearshore species is limited to a recreational fishery; therefore, none of the species included in this analysis are considered targets of a commercial fishery off Washington State.

Table 4-1. Identification of target species among those included in this document's analysis by state and sector (identification of target species completed through consultation with members of the GMT). 'X' indicates that a species has been identified as a target species in that state and sector. 'X*' indicates that a species has been identified as not directly targeted, but still often captured and retained with other, targeted species. No species included in this analysis are available for the WA commercial sector.

Species	CA Rec	CA Comm	OR Rec	OR Comm	WA Rec	WA Comm (N/A)
Shallow Nearshore						
Black and Yellow Rockfish	X*	X	X*	X		
Gopher Rockfish	X		X*	X		
Cabazon	X	X	X	X	X	
Kelp greenling	X*	X	X*	X	X	
China Rockfish	X*		X*	X	X	
Kelp Rockfish	X*	X*	X*	X		
Grass Rockfish	X*	X	X*	X		
Deeper Nearshore						
Black Rockfish	X	X	X	X	X*	
Blue/Deacon Rockfish	X	X	X	X	X*	
Brown Rockfish	X	X	X*	X		
Copper Rockfish	X	X	X*	X	X	
Olive Rockfish	X*	X*		X		
Quillback Rockfish			X*	X	X*	
Treefish	X*					
Shallow Shelf						
Calico Rockfish						
Flag Rockfish	X*		X*			
Freckled Rockfish		X*				
Halfbanded Rockfish		X*				
Honeycomb Rockfish	X*					
Pygmy Rockfish						
Rosy Rockfish	X*		X*			
Speckled Rockfish	X*	X*	X*			
Swordspine Rockfish		X*				
Deep Shelf						
Bronzespotted Rockfish						
Chameleon Rockfish						
Greenblotched Rockfish	X*	X				
Mexican Rockfish	X*					
Pink Rockfish		X				
Pinkrose Rockfish						
Dwarf-Red Rockfish		X				
Tiger Rockfish			X*	X	X	
No Mortality						

Light Dusky Rockfish		X*				
Dwarf-Red rockfish						
Flatfish						
Butter sole		X	X*			
Curlfin sole			X*			
Rock sole			X*			
Sand sole		X*	X*			
Starry flounder		X	X*			
Leopard shark	X	X				

Based on consultation with the GMT, the Shallow Nearshore Species Bin is targeted in the California and Oregon non-Tribal commercial fishery³ and certain species are sought after more so than others. Cabezon and kelp greenling are also targeted by Tribal fisheries. The recreational fishery, coastwide, does not, in general, target specific species in this bin, but retains them. Black and yellow, gopher, grass, and kelp rockfishes, and kelp greenling are not targeted in the California and Oregon recreational fisheries, but are retained when caught to fill out bag limits. Of these five species, only kelp greenling is present in Washington, where it is not targeted by the recreational fishery, but can be retained. Black and yellow, gopher, grass, and kelp rockfishes, cabezon, and kelp greenling are targeted in the California and Oregon commercial fisheries, but are not targeted in Washington commercial fisheries.⁴

Species in the Deeper Nearshore Bin are targeted in both commercial and recreational sectors. Black, blue, copper, and deacon rockfishes are considered targets in all states and in non-Tribal commercial, recreational, and Tribal (excluding copper) fisheries, where allowed by regulations. Quillback rockfish was also identified as increasingly caught in the Washington Treaty Tribal commercial fishery, though not directly targeted by these vessels. The species in this bin are considered the primary targets of the recreational sector on the West Coast, depending on the location of the trip. Black, blue, and deacon rockfishes are schooling species and are often targeted on recreational trips in all three states to fill bag limits. Olive rockfish are retained, but not highly targeted in the California recreational fishery. Based on qualitative information, the species may be an important live market species targeted in the California and Oregon commercial sectors. Landings data reveals, however, that olive rockfish sees an average mortality of about 0.02 mt annually in Oregon. Therefore, qualitative information on which species *could* be targets in each state and sector should also be balanced with evidence of which species are actually landed. Retention of the California stock of quillback rockfish is prohibited in California to achieve the rebuilding plan's goals and objectives, and therefore California quillback rockfish is not targeted in either sector off California. Oregon and Washington allow limited recreational and commercial fishery harvest of quillback rockfish, though it is not typically considered a directed target. Treefish are caught and retained to fill bag limits in the recreational fishery in California, but not typically directly targeted.

³ Washington regulations prohibits a state water commercial, i.e., groundfish fishery.

⁴ Id.

Species in the Shallow Shelf Bin are not typically targeted in commercial and recreational fisheries. The catch of these species is dependent on the context of the mixed-stock fishery. Flag, freckled, halfbanded, honeycomb, rosy, speckled, and swordspine rockfishes are occasionally caught and retained with other rockfish species. The retention of these species in the fishery varies and appears to be highly dependent on their geographic distribution along the coast, creating high variation in which species are considered potential ‘targets’ by state. However, none of these species are considered directed targets. Rather, they are retained when caught with other, targeted rockfish. Pygmy rockfish are not considered a target species or to be caught with other target species in any state or sector.

A few species in the Deep Shelf Bin are considered targets depending on their geographic distribution by state, though several species are not considered targets at all. Bronzespotted, chameleon, pink, and pinkrose rockfishes are not considered target species in any state or sector. These species may be retained, where allowed or encountered, but as established under Factor (ii), they have *de minimis* mortality and retention is very irregular. Greenblotched and Mexican rockfishes are retained, but not directly targeted in the California recreational sector. Greenblotched rockfish are, however, targeted in the California commercial sector. Tiger rockfish are targeted in Oregon commercial and Washington recreation sectors, and retained in the Oregon recreational sector. Tiger rockfish also have *de minimis* mortality in the fishery, per analysis under Factor (ii).

Most species in the Flatfish Bin are not considered directed target species in any state or non-Tribal sector. The exceptions are butter sole and starry flounder, which were identified as targeted in the California commercial sector and retained in the Oregon non-Tribal commercial sector. All flatfish species are retained when encountered in the Oregon recreational fishery, though not considered directed targets. Sand sole is also caught with other, target species in the California commercial fishery. Fishery data (Somers et al, 2024) indicates there was a target fishery for butter sole, sand sole, and starry flounder in the early part of the 2000s, but that this target fishery has since disappeared. Rock sole was also identified as a target species in Washington Treaty Tribal fisheries, though, as with non-Tribal commercial fisheries, have not seen high landings in recent years.

The GMT was also consulted on the unique, non-binned species. Leopard shark is only targeted in California, in both commercial and recreational sectors. Light dusky rockfish and dwarf-red rockfish have seen no recent mortality (see Factor (ii)) in any state or fishery and are therefore not considered targets in any West Coast groundfish fisheries.

Members of the GAP were also consulted on which species included in this document’s analysis are considered targets in commercial and recreational fisheries. Tables 4-2 and 4-3, below, summarize the outcomes of this consultation.

Table 4-2. Categorization of evaluated species by GAP members in terms of presence in the commercial sector

Frequently Identified as Targets	Occasionally Identified as Targets	Not Targeted but Identified as Caught by the Commercial Sector	Not Identified in the Commercial Sector
<ul style="list-style-type: none"> • black rockfish • blue rockfish • brown rockfish • cabezon • copper rockfish 	<ul style="list-style-type: none"> • grass rockfish • greenblotched rockfish • kelp rockfish • leopard shark • olive rockfish • deacon rockfish 	<ul style="list-style-type: none"> • black and yellow rockfish • bronzespotted rockfish • butter sole • calico rockfish • china rockfish • gopher rockfish • honeycomb rockfish • kelp greenling • pink rockfish, • pinkrose rockfish • curlfin sole • light dusky rockfish • tiger rockfish • treefish • mexican rockfish 	<ul style="list-style-type: none"> • chameleon rockfish • freckled rockfish • halfbanded rockfish • pygmy rockfish

GAP members consulted were able to provide a relative categorization of the species included in this document's analysis (Table 4-2). Certain species were frequently identified by those consulted as targets. However, other species were identified as targets by some, but not all, members consulted. This highlights that there may be differences, by region, sector, or otherwise, in which species are considered targets. Other species were described as caught by the commercial sector, but not targeted (Table 4-2). Lastly, a subset of species was identified that is neither targeted, nor present in the commercial sector. Note that while GAP members described dwarf-red and light dusky rockfish as present in the fishery, there is no recorded catch of dwarf-red or light dusky rockfish in recent years. Therefore, this qualitative information should be interpreted in the context of all available data presented in this analysis.

Table 4-3. Categorization of evaluated species by GAP members in terms of presence in the recreational sector

Frequently Identified as Targets	Occasionally Identified as Targets	Not Targeted but Identified as Caught by the Recreational Sector	Not Identified in the Recreational Sector
<ul style="list-style-type: none"> ● black rockfish ● blue rockfish ● brown rockfish ● olive rockfish 	<ul style="list-style-type: none"> ● cabezon ● calico rockfish ● copper rockfish ● deacon rockfish ● grass rockfish ● greenblotched rockfish ● leopard shark ● starry flounder ● mexican rockfish 	<ul style="list-style-type: none"> ● black and yellow rockfish ● bronzespotted rockfish ● butter sole ● china rockfish ● dwarf-red rockfish ● flag rockfish ● freckled rockfish ● gopher rockfish ● halfbanded rockfish ● honeycomb rockfish ● kelp greenling ● kelp rockfish ● pink rockfish ● pinkrose rockfish ● quillback rockfish ● rock sole ● rosy rockfish ● sand sole ● speckled rockfish ● swordspine rockfish ● tiger rockfish ● treefish 	<ul style="list-style-type: none"> ● curlfin sole ● pygmy rockfish

Several species were identified by GAP members as targets in the recreational sector (Table 4-3). Black rockfish were identified as the primary target species for recreational anglers and charter boats, especially off Oregon and Washington. Blue and copper rockfish, as well as colorful, ‘unique,’ or ‘unusual’ species like tiger rockfish were also identified as targeted or frequently caught in the recreational sector. Overall, the recreational sector relies on the experience value for the recreational angler or guest, which can allow for interchangeable targets and variation in targets based on locality. Targeting of particular species is highly localized and dependent on the geographic distributions of the species; for instance, black rockfish are predominant in northern California, Oregon, and Washington, while copper rockfish are a frequent target in southern California.

Lastly, public comments in the Council’s E-portal were reviewed for qualitative information on target species. Comments identified black, blue, brown, and olive rockfish as target species, particularly in the recreational sector. In the commercial sector, these same species were noted to not as frequently be retained. Cabezon was also identified as a recreational target. On the other

hand, comments related to management measures intended to conserve and rebuild quillback rockfish helped identify this species as a non-target species. A review for the shallow shelf, deep shelf and flatfish species, as well as light dusky rockfish, dwarf-red rockfish, and leopard shark, returned no comments speaking to whether these species are targeted.

3.4.2 Quantitative Analysis of Non-Tribal Landings

To understand whether a portion of the non-Tribal groundfish fleet is targeting particular species, landings data was analyzed on a per-trip basis. Tribal landings were not analyzed due to data availability. For 2015 through 2024, about 140,000 total individual vessel trips were characterized by the top species by landed weight. The species comprising the largest portion of the trip's landings is considered the target species for the trip. While there may be multiple species targeted on a single trip, it is assumed that interchangeable targets will average out over the ten year time frame. At-sea whiting trips were excluded as they are known not to target the species included in this analysis.

3.4.2.1 Commercial Sector

Figures 4-2 through 4-7 show the number of non-Tribal commercial groundfish trips targeting each species by this definition, excluding at-sea whiting trips.

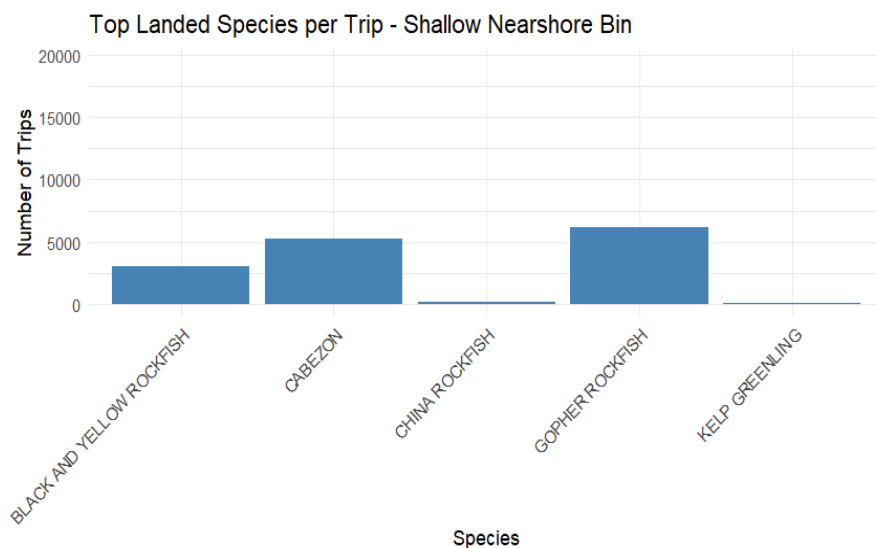


Figure 4-1. Number of non-Tribal commercial trips where shallow nearshore species were landed as the highest landing volume per trip from 2015 through 2024. Scaled to maximum count in this analysis, relative to about 140,000 total non-Tribal commercial groundfish trips in the same time period, excluding the at-sea whiting sector.

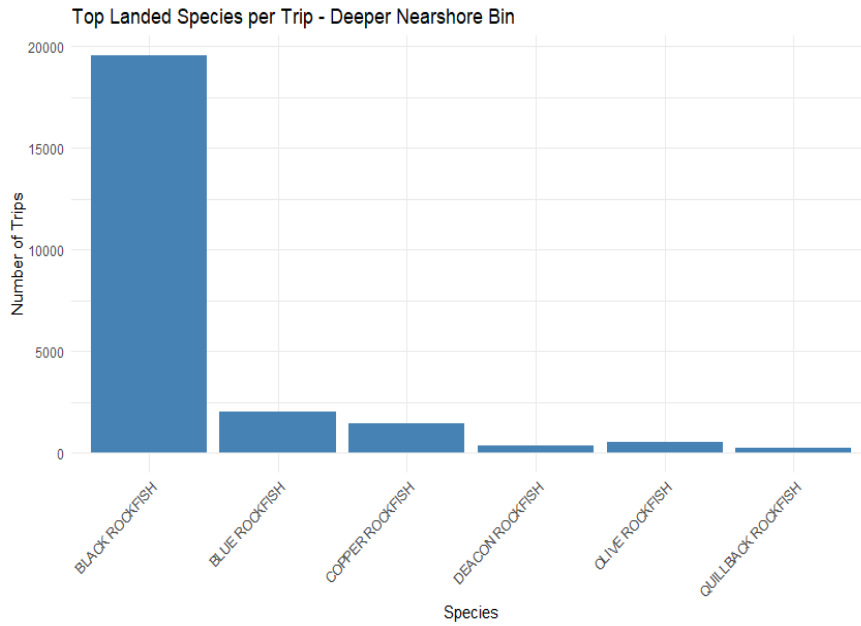


Figure 4-2. Number of non-Tribal commercial trips where deeper nearshore species were landed as the highest landing volume per trip from 2015 through 2024. Scaled to maximum count in this analysis.

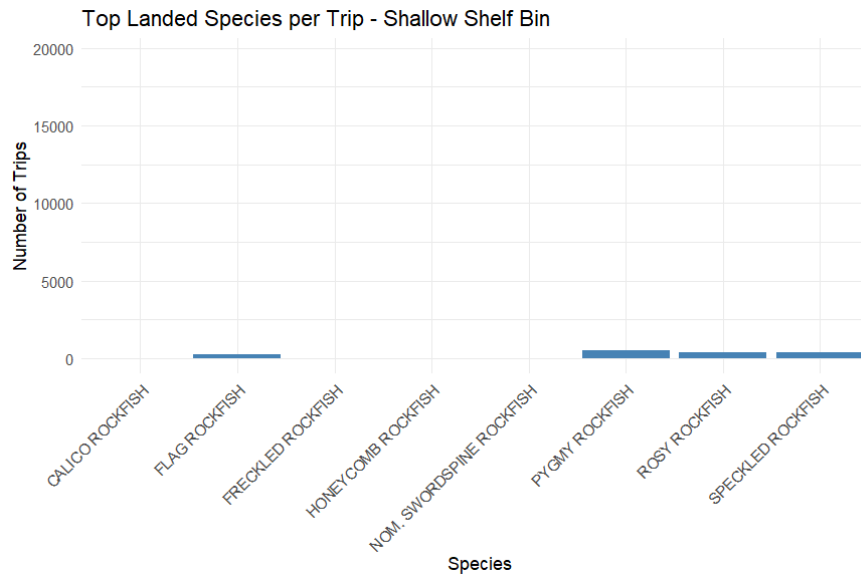


Figure 4-3. Number of non-Tribal commercial trips where shallow shelf species were landed as the highest landing volume per trip from 2015 through 2024. Scaled to maximum count in this analysis.

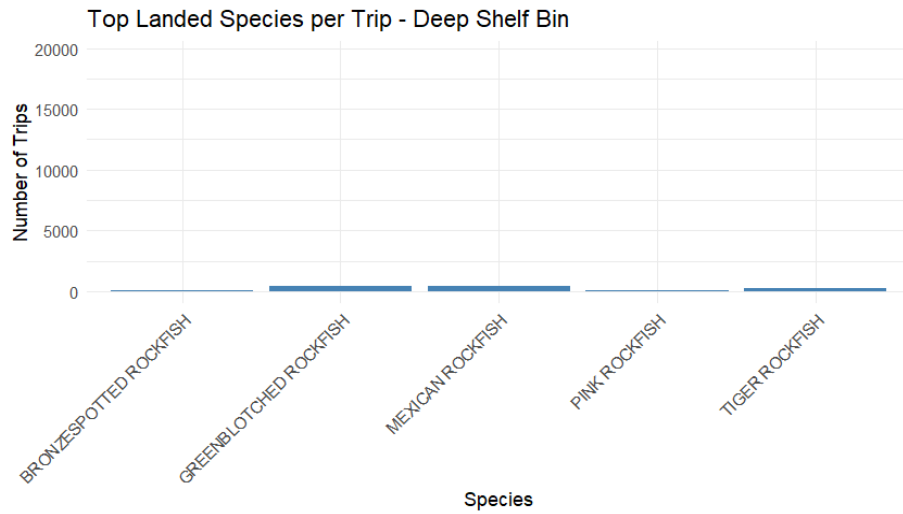


Figure 4-4. Number of non-Tribal commercial trips where deep shelf species were landed as the highest landing volume per trip from 2015 through 2024. Scaled to maximum count in this analysis.

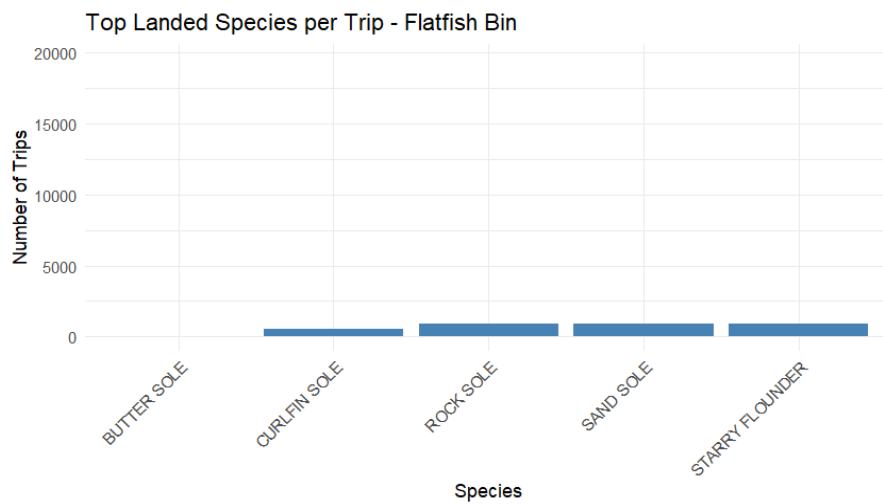


Figure 4-5. Number of non-Tribal commercial trips where flatfish species were landed as the highest landing volume per trip from 2015 through 2024. Scaled to maximum count in this analysis.

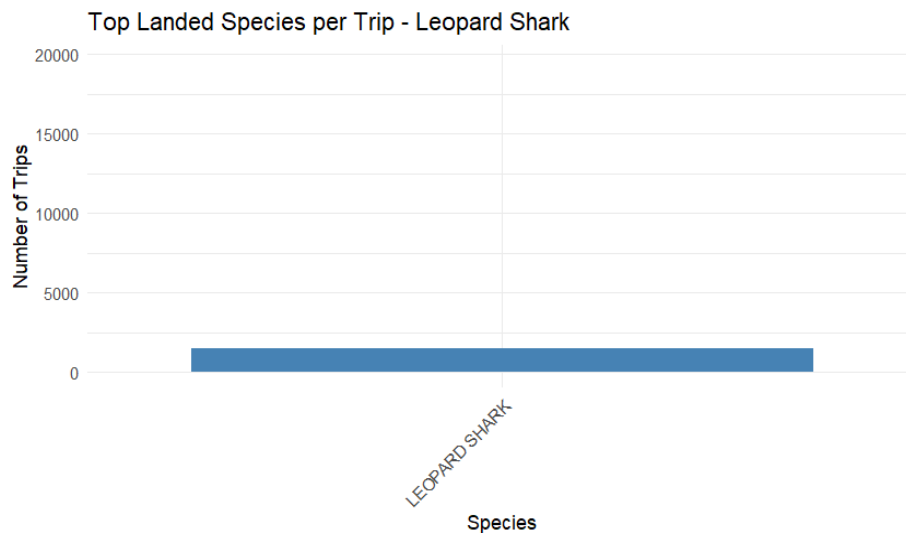


Figure 4-6. Number of non-Tribal commercial trips where leopard shark were landed as the highest landing volume per trip from 2015 through 2024. Scaled to maximum count in this analysis.

Of the species included in this analysis, black rockfish were the most highly targeted in the commercial groundfish sector on a per-trip basis. Gopher rockfish, cabezon, blue rockfish, and black and yellow rockfish were also targeted more frequently, comprising the highest landing weight on at least 2,000 trips each. For these species, effort was also distributed among many vessels, rather than attributable to only a very small portion of the fleet. Every other species evaluated was very infrequently the top species landed on individual trips.

3.4.2.2 Recreational Sector

Due to the structure of recreational data, a poisson distribution was created to understand the relative probability of a species being one of the top 5 species retained in a recreational bottomfish trip in any random year between 2015 and 2024. Scaled to all species caught in bottomfish trips, only black rockfish and blue rockfish had a significant probability of being in the 5 highest retained species in a given year, at 20, and 16 percent, respectively.

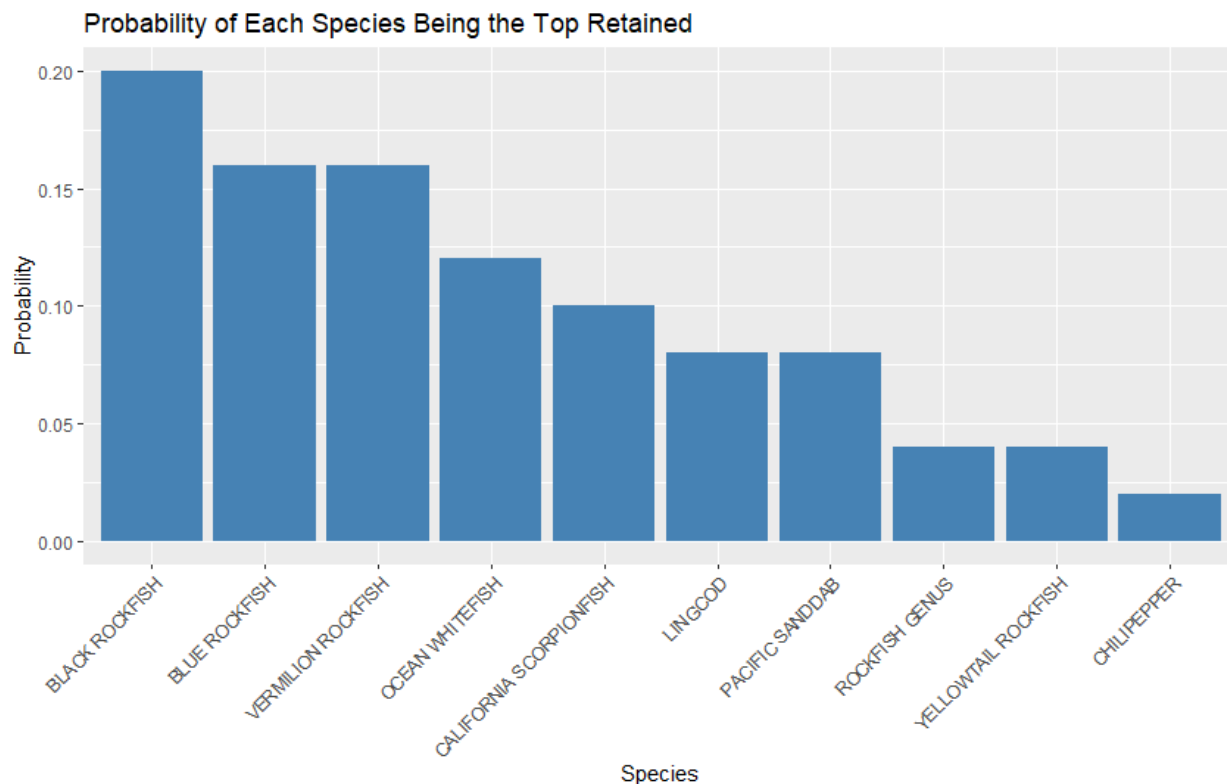


Figure 4-7. Probability of species being the top retained in any particular year, between 2015 and 2024, in the bottomfish recreational sector.

3.4.3 Conclusions

Overall, the species considered in this document’s analysis may be caught in both commercial and recreational sectors, but vary in whether they are directly targeted, targeted in terms of being caught in the mixed stock fishery, or not targeted at all. In the Shallow Nearshore Species Bin, black and yellow, gopher, grass, and kelp rockfishes, and cabezon may be considered targets of a fishery in the sense that they are caught in a targeted mixed stock fishery, but they are not often specifically targeted in the sense that they are the only or primary species retained. Cabezon and grass rockfish may fetch relatively higher market prices as live market targets. The deeper Nearshore Bin is the most highly targeted group overall, with black rockfish standing out as a predominant commercial and recreational target species. Copper rockfish, blue rockfish, deacon rockfish, and brown rockfish may also be considered target species in this bin, particularly in geographically localized recreational fisheries. On the other hand, little to no targeting of most shallow shelf species occurs in either commercial or recreational fisheries. Many diminutive species in this bin (e.g., honeycomb, rosy, swordspine rockfishes, etc.) are discarded and, for those that are retained, it is often because they co-occur with other, target species. Similarly, deep shelf and flatfish species similarly see little to no direct targeting in the commercial sector, though particular species, like the tiger rockfish, may be desirable for recreational anglers and many species co-occur with target species. Leopard shark, analyzed on its own, may be considered a target species for commercial and recreational sectors, but solely in California. Lastly, light dusky

rockfish and dwarf-red rockfish, as they have seen no recent recorded catch, cannot be considered target species in any West Coast groundfish sectors.

3.5 Factor (v) - The stock is important to commercial, recreational, and subsistence users.

An analysis of whether conservation and management in the EEZ is necessary for a species or stock must take into account the importance of fishery resources to fishery participants and fishing communities. Factor (v) focuses on whether species are important to commercial, recreational, and subsistence users.

A combination of qualitative and quantitative methods were used to evaluate the relative importance of the species included in this analysis. Quantitative data from the SAP tool and landings data create relative indices by which to compare the species in this analysis. However, ‘importance’ is also highly subjective, and qualitative information collected from the GAP, the GMT, Tribal representatives, and the Council’s public comment E-portal provide additional context as to why some species may be important in certain sectors while others are not considered important. This evaluation, though using multiple forms of information, must also be caveated with the fact that it is difficult to capture the full subjective ‘value’ of each species in terms of their unique importance to a wide range of fishery participants on the West Coast.

3.5.1 GAP and GMT Consultation

Upon consultation of GAP members, none of the species in this document’s analysis were identified as significant contributors to commercial groundfish landings or to fishermen’s and processors’ incomes. The diminutive rockfish species are generally considered too small or undesirable to retain and the species in the Flatfish Bin have seen little market demand in recent years. For these reasons, the species included in this document’s analysis are not important to or desired by processors. However, the GAP members consulted were able to make relative distinctions of importance among the species, highlighting some species as targeted to some extent, others as present in catch based on the mixed-stock nature of the fishery, and still others as not present in the catch at all (see Table 4-2 in the previous section). Certain species were frequently identified by those consulted as targets. Still, other species were identified as targets by some, but not all, GAP members, highlighting that there may be differences by region, sector, or otherwise, in the relative valuation of species. Some species were universally considered unimportant in the commercial sector; bronzespotted, pink, tiger, chameleon, light dusky, calico, freckled, halfbanded, honeycomb, pinkrose, pygmy, and swordspine rockfishes were identified as species of little to no importance in the fishery, as they are often discarded (see Table 4-2 and 4-3 under Factor (iv)). Note, while GAP members described dwarf-red and light dusky rockfish as present in the catch, there is no recorded catch of dwarf-red or light dusky rockfish in recent years.

Several species were identified by GAP members as important to the recreational sector. Relative categorizations of targets and non-targets are provided in Table 4-3 (see previous section). Black rockfish were identified as highly important for recreational anglers and charter boats. Blue and copper rockfishes, as well as colorful, ‘unique,’ or ‘unusual’ species, like tiger and China rockfish, were also identified as important to the recreational sector. However, the importance of particular

species is highly localized and dependent on the geographic distributions of the species that may be retained to fill out a bag limit.. Hence, species may be of relatively equal importance due to their aesthetic characteristics, but their value will vary by where they are typically found.

From discussions with the Tribal representatives on the GMT and GAP, it was established that the Washington Treaty Tribes have identified several species included in this analysis as important to Tribal fisheries. These species include black rockfish, blue rockfish, deacon rockfish, quillback rockfish, rock sole, sand sole, cabezon, and kelp greenling. These species are important to both commercial and subsistence fisheries for Tribal users. In particular, black rockfish, blue rockfish, deacon rockfish, cabezon, and kelp greenling have been identified as potential species that may be undergoing increased, directed harvest in the Tribal commercial sector. Qualitative information provided by the representatives suggests that Tribal fishermen are currently making investments to increase access to the nearshore fishery, particularly for these species. The flatfish species identified as important - rock sole and sand sole - have a history of importance in Tribal commercial fisheries; with targeted harvest in the case of rock sole, and non-targeted high bycatch events in the case of sand sole. While landings are currently low, there is potential for them to increase again in the future with only minor changes in fishery behavior. Lastly, quillback rockfish, though not directly targeted in Tribal fisheries, have been landed with increasing regularity by Tribal longline and halibut fisheries occurring in Federal waters.

3.5.2 Public comment

Public comments on groundfish actions were also reviewed for information on the importance of specific species and analyzed qualitatively. The Council's E-portal public comment database was searched for species names (e.g., "blue rockfish"). Some species did not return comments based on the search criteria, and were therefore excluded from this portion of the analysis. Information from public comments were included if the focus of the comment or a section of the comment pertained to the species of concern and the statement was referring to the fishery and the use of the resource. Statements were excluded when focused on modelling or other theoretical approaches to understanding the species, stock assessments, or scientific research more broadly. Comments were also excluded if a species was referenced, but was not a major topic of the comment. Comments were analyzed by key themes relevant to the 10-factor analysis, including significant impacts on and the importance to fishing communities and entities, specific targeting of analyzed species, and common capture or association with target species. The same pool of comments were also analyzed for relevance to other factors and coded for themes such as disparity of impacts between sectors (Factor vii).

For the majority of species included in this analysis, public comment did not reveal additional information on importance. Many comments, however, reaffirmed the importance of retaining access to deeper nearshore species like black, blue, brown, and olive rockfishes, particularly for recreational, charter boat, and small-scale commercial users.

3.5.3 Index Scoring

The qualitative information presented above is also congruent with the SAP index scoring of the importance of species in commercial, recreational, and Tribal fisheries.

Similar to the ecosystem importance index scoring (see Factor (i)), the SAP has developed index scores for the commercial (non-Tribal), recreational, and Tribal importance of species (Wetzel et al. 2025). Thresholds can be similarly used to categorize species by low, medium, or high importance for each fishery type. The commercial importance score is based on coastwide ex-vessel revenue, transformed logarithmically to compress the distribution into a 0-10 index score. The recreational importance score is based on a pseudo-revenue, calculated by multiplying recreational-catches with state- and species- specific weights. The catch data are pulled from the West Coast Groundfish Observer Program Groundfish Expanded Mortality Multi-Year (Somers et al, 2024) report with catches summed between 2018-2022. The Tribal importance score includes the value of subsistence fishing, as well as fishing for commercial sale and ceremonial uses. These species scores were refined through consultation with Tribal representatives with the values initially developed in 2016 and updated in 2024. It is important to note that these scores reflect which species are prioritized for stock assessments by Tribal representatives, but do not capture the cultural importance or other aspects of a holistic definition of Tribal ‘importance’.

For each species, the commercial, recreational, and Tribal importance score is defined, then binned into quantiles of low, medium, and high importance.

As commercial importance is normally distributed (Figure 5-1), a standard deviation from the mean (z-score) was used to generate categories of low, medium, and high importance (Table 5-1).

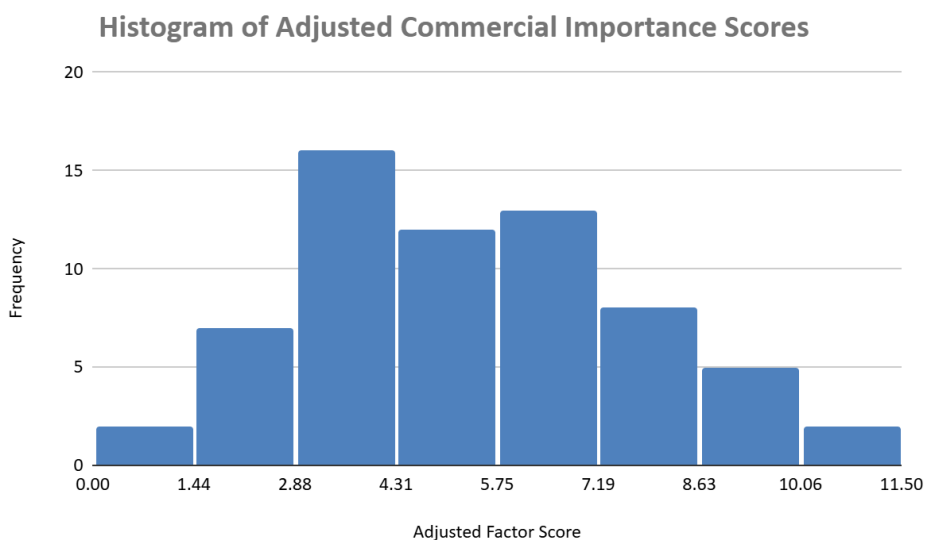


Figure 5-1. Histogram of commercial importance index scores for all groundfish species, adjusted for recently assessed penalty.

Table 5-1. Threshold categorization of index scores for commercial importance, by deviation from mean (Z-score).

Z-Score	Relative Importance
< 0	Low
0 - 0.5	Medium
> 0.5	High

As the distribution of recreational importance scores was heavily skewed towards 0 (Figure 5-2), quantiles were used to create thresholds rather than standard deviations from the mean (Table 5-2).

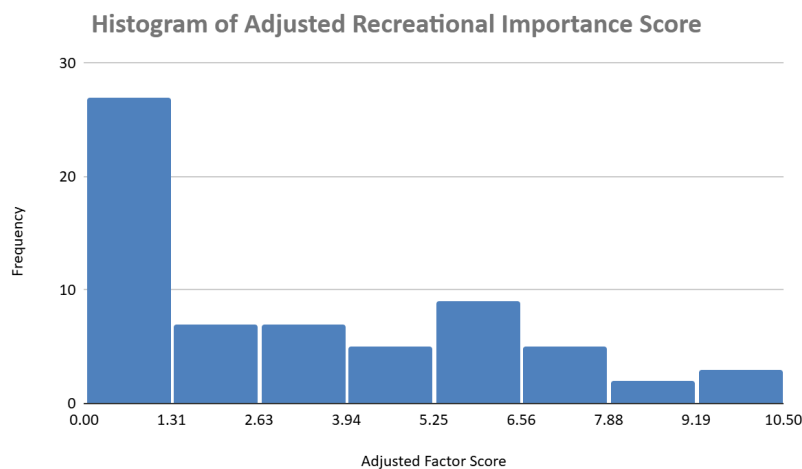


Figure 5-2. Histogram of recreational importance index scores for all groundfish species, adjusted for recently assessed penalty.

Table 5-2. Threshold categorization of index scores for Recreational importance.

Adjusted Index Score	Percentile	Relative Importance
Score = 0	< 25 percentile	Low
5.45 > Score > 0	25 - 75 percentile	Medium
Score > 5.45	> 75 percentile	High

As Tribal importance scoring is distributed from 0-3, thresholds for low, medium, and high importance were generated based on the meaning attributed to each value (Table 5-3).

Table 5-3. Threshold categorization of Tribal scores for relative importance of assessing species for Tribal fisheries

Tribal Score	Relative Importance
0	Low
1	Medium
> 1	High

Tables 5-4, 5-5, and 5-6 below summarize the adjusted index scores and relative importance of each species included in the SAP tool across commercial, recreational, and Tribal groundfish fisheries, respectively. Note that the species not included in index scoring (indicated by NA in the tables) are not currently assessed and are therefore not assigned a score within this dataset. However, this lack of data may not just be a data gap, but could indicate that unassessed species are likely of low importance to commercial, recreational, and Tribal fisheries.

Table 5-4. Summary of adjusted commercial importance index scores and related thresholds for species included in this analysis available in the SAP tool. Z-score indicates the variation of the value from the mean.

Species	Adjusted Index Score	Z-Score	Relative Importance
Shallow Nearshore			
Gopher/Black and Yellow rockfish	7.85	1.00450326	High
Cabazon	7.76	0.96697871	High
Grass rockfish	6.82	0.57505566	High
Kelp greenling	6.71	0.52919233	High
China rockfish	6.3	0.35824717	Medium
Kelp rockfish	3.74	-0.70911772	Low
Deeper Nearshore			
Black rockfish	8.14	1.12541568	High
Blue rockfish	6.32	0.36658596	Medium
Brown rockfish	7.03	0.66261294	High
Copper rockfish	6.59	0.47915960	Medium
Deacon rockfish	6.32	0.36658596	Medium
Olive rockfish	4.07	-0.57152771	Low
Quillback rockfish	5.50	0.02469564	Medium
Treefish	5.35	-0.03784527	Low
Shallow Shelf			
Calico rockfish	NA	NA	NA
Flag rockfish	2.02	-1.42625351	Low
Freckled rockfish	NA	NA	NA
Halfbanded rockfish	NA	NA	NA
Honeycomb rockfish	1.00	-1.85153170	Low
Pygmy rockfish	NA	NA	NA
Rosy rockfish	3.12	-0.96762015	Low
Speckled rockfish	3.55	-0.78833621	Low
Swordspine rockfish	NA	NA	NA
Deep Shelf			
Bronzespotted rockfish	NA	NA	NA
Chameleon rockfish	NA	NA	NA
Greenblotched rockfish	NA	NA	NA

Mexican rockfish	NA	NA	NA
Pink rockfish	NA	NA	NA
Pinkrose rockfish	NA	NA	NA
Tiger rockfish	NA	NA	NA
No Mortality			
Light dusky rockfish	NA	NA	NA
Dwarf-red rockfish	NA	NA	NA
Flatfish			
Butter sole	NA	NA	NA
Curlfin sole	2.04	-1.41791472	Low
Rock sole	2.42	-1.25947774	Low
Sand sole	4.33	-0.46312347	Low
Starry flounder	4.22	-0.50898680	Low
Leopard shark	3.69	-0.72996469	Low

Table 5-5. Summary of adjusted recreational importance index scores and related thresholds for species included in this analysis available in the SAP tool

Species	Adjusted Index Score	Relative Importance
Shallow Nearshore		
Gopher/Black and Yellow rockfish	6.46	High
Cabazon	6.46	High
Kelp greenling	5.45	Medium
China rockfish	5.2	Medium
Kelp rockfish	3.6	Medium
Grass rockfish	2.87	Medium
Deeper Nearshore		
Black rockfish	9.79	High
Blue rockfish	9.19	High
Brown rockfish	7.35	High
Copper rockfish	7.69	High
Deacon rockfish	9.19	High
Olive rockfish	6.32	High
Quillback rockfish	5.78	High
Treefish	3.82	Medium
Shallow Shelf		
Calico rockfish	NA	N
Flag rockfish	4.54	Medium
Freckled rockfish	NA	NA
Halfbanded rockfish	NA	NA
Honeycomb rockfish	3.35	Medium
Pygmy rockfish	NA	NA
Rosy rockfish	0	Low
Speckled rockfish	3.83	Medium
Swordspine rockfish	NA	NA
Deep Shelf		
Bronzespotted rockfish	NA	NA
Chameleon rockfish	NA	NA
Greenblotched rockfish	NA	NA
Mexican rockfish	NA	NA
Pink rockfish	NA	NA
Pinkrose rockfish	NA	NA

Tiger rockfish	NA	NA
No Mortality		
Light dusky rockfish	NA	NA
Dwarf-red rockfish	NA	NA
Flatfish		
Butter sole	NA	NA
Curlfin sole	0	Low
Rock sole	2.03	Medium
Sand sole	0.74	Medium
Starry flounder	1.12	Medium
Leopard Shark	0	Low

Table 5-6. Summary of Tribal importance scores and relative importance for species included in this analysis available in the SAP tools. Represents importance of stock assessments for each species, but does not reflect cultural or other holistic aspects of 'importance.'

Species	Tribal Score	Relative Importance
Shallow Nearshore		
Gopher/Black and Yellow rockfish	0	Low
Cabezon	2	High
Kelp greenling	2	High
China rockfish	2	Low
Kelp rockfish	0	Low
Grass rockfish	0	Low
Deeper Nearshore		
Black rockfish	2	High
Blue rockfish	2	High
Brown rockfish	2.5	High
Copper rockfish	2	High
Deacon rockfish	2	High
Olive rockfish	0	Low
Quillback rockfish	2	High
Treefish	0	Low
Shallow Shelf		
Calico rockfish	0	Low
Flag rockfish	0	Low
Freckled rockfish	NA	NA
Halfbanded rockfish	NA	NA
Honeycomb rockfish	0	Low
Pygmy rockfish	NA	NA
Rosy rockfish	0	Low
Speckled rockfish	0	Low
Swordspine rockfish	NA	NA
Deep Shelf		
Bronzespotted rockfish	NA	NA
Chameleon rockfish	NA	NA
Greenblotched rockfish	NA	NA
Mexican rockfish	NA	NA
Pink rockfish	NA	NA
Pinkrose rockfish	NA	NA
Tiger rockfish	NA	NA
No Mortality		

Light dusky rockfish	NA	NA
Dwarf-red rockfish	NA	NA
Flatfish		
Butter sole	NA	
Curlfin sole	0	Low
Rock sole	0	Low
Sand sole	1.5	High
Starry flounder	1.5	High
Leopard Shark	0	Low

Based on the categorization of index scoring, some shallow nearshore, deeper nearshore, and flatfish species may be considered important in commercial, recreational, and Tribal fisheries.

In the commercial sector (Table 5-4), only shallow nearshore and deeper nearshore species were categorized as at least of “medium” importance. Gopher rockfish, black and yellow rockfish, grass rockfish, kelp greenling, black rockfish, and brown rockfish were all categorized as of “high” importance. China rockfish, blue rockfish, copper rockfish, deacon rockfish, and quillback rockfish were categorized as of “medium” importance. Leopard shark, as well as the shallow shelf, deep shelf, and flatfish species, were all categorized as “low” importance or not assessed. In the recreational sector (Table 5-5), the deeper nearshore species were of the highest importance in this index score categorization, with black rockfish, blue rockfish, brown rockfish, copper rockfish, deacon rockfish, and quillback rockfish all categorized as “high” importance. In the Shallow Nearshore bin, cabezon and kelp greenling also scored as “high” importance and in the Flatfish bin sand sole and starry flounder scored as “high” importance. The Tribal scores (Table 5-6) mirror a similar categorization, with cabezon, kelp greenling, black rockfish, blue rockfish, brown rockfish, copper rockfish, deacon rockfish, quillback rockfish, sand sole, and starry flounder identified as species important to prioritize for assessment. For each of these categorizations, it is important to consider that the SAP tool was created for the specific purpose of prioritizing which stocks to assess in a given year. While the data, combined with the thresholds created in this analysis, provide a relative scaling of species, these scores should not be considered absolute and are not intended to reflect all aspects of why a species may be important to various fishery participants. These scores should be considered in the context of all information provided in this section. Most of the shallow shelf and deep nearshore species, as well as light dusky rockfish and dwarf-red rockfish, which have seen no recent catch in any sector, are also not assessed and therefore not included in this scoring. The lack of data in the SAP for these species is a data gap, but may also be interpreted as a lack of need to assess the species for fisheries management and therefore a low importance in all sectors.

This list of species identified as important to Tribal fisheries is relatively consistent with those identified as ‘high importance’ by the SAP Tribal scores and related thresholds (Table 5-6). Note, the species identified as ‘important’ via the SAP scoring reflect those that have previously been identified as a priority for stock assessment by the Washington Treaty Tribes. The species list provided by Tribal representatives in this document may be considered more up-to-date information, and an identification of those species selected for additional analysis that may be in need of conservation and management in the EEZ and may therefore be retained in the FMP. The differences between the SAP scoring and the species list provided by the Tribes include: 1)

omission of brown, China, and copper rockfishes in the list provided by Tribes, and 2) inclusion of rock sole, but not starry flounder, in the list provided by Tribes.

3.5.4 Calculation of Local Quotients

Considering some species may be important to fisheries on a local or regional level, if not the whole West Coast, a Local Quotient (LQ) was used to understand locally-important species. The Local Quotient is a measure of the importance of a particular species or species group, relative to all species in a particular area. It is calculated by dividing the local value of the species by the total community or port fishery value. For commercial fisheries, this value was calculated via ex-vessel revenue. For recreational fisheries, this value was calculated by counts, which may also be considered a proxy to the amount of access a particular species provides to the recreational fishery experience. This information was overlaid with data on commercial and recreational fishery engagement and dependence to understand whether regions where species have high local landings are also particularly reliant on the fishery.

LQ were calculated for each species, representing the species' relative contribution to local ports' revenues. This metric is calculated by dividing the total species revenue (commercial) or catch (recreational) contribution to a port's total sum of revenue or catch in each respective sector. This metric helps identify patterns of local importance of particular species or fisheries that may not be visible on the regional scale.

Figures 5-3 through 5-6 below summarize the commercial and recreational LQs calculated for all species included in this analysis.

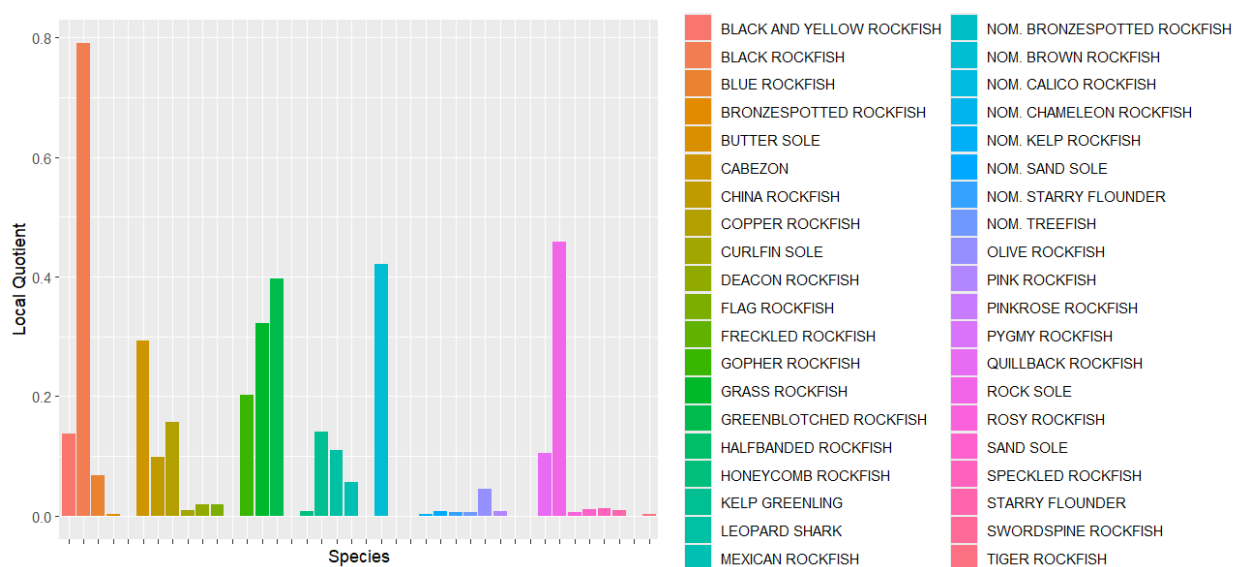


Figure 5-3. Maximum commercial LQ at any given West Coast port, on average from 2015 through 2024, for analyzed species. 'Nom.' indicates those species with only nominal landings recorded. For species with both identified and nominal landings, these values are sum

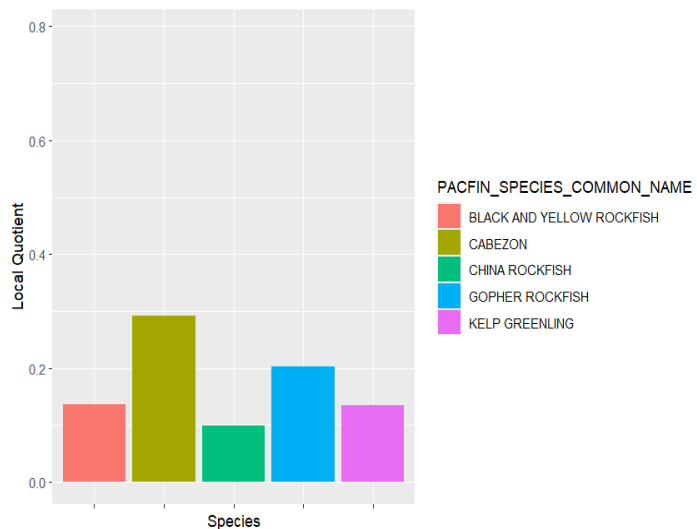


Figure 5-3a. Maximum commercial LQ for the Shallow Nearshore Species Bin at any given West Coast port, on average from 2015 through 2024, for analyzed species.

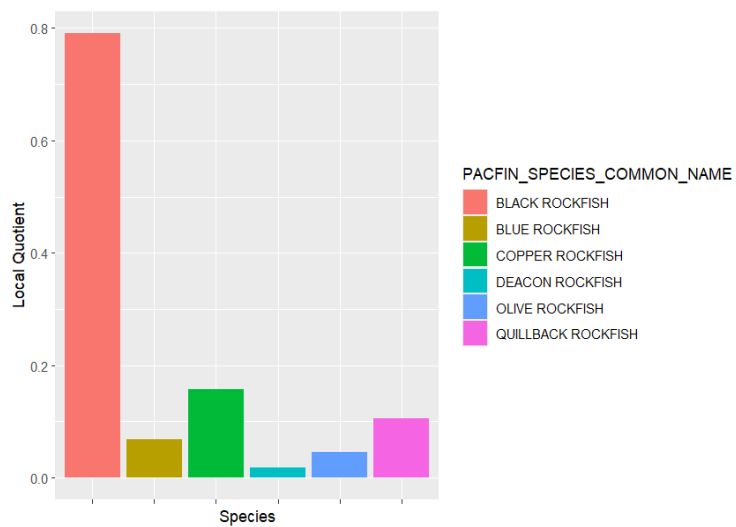


Figure 5-3b. Maximum commercial LQ for the Deeper Nearshore Species Bin at any given West Coast port, on average from 2015 through 2024, for analyzed species.

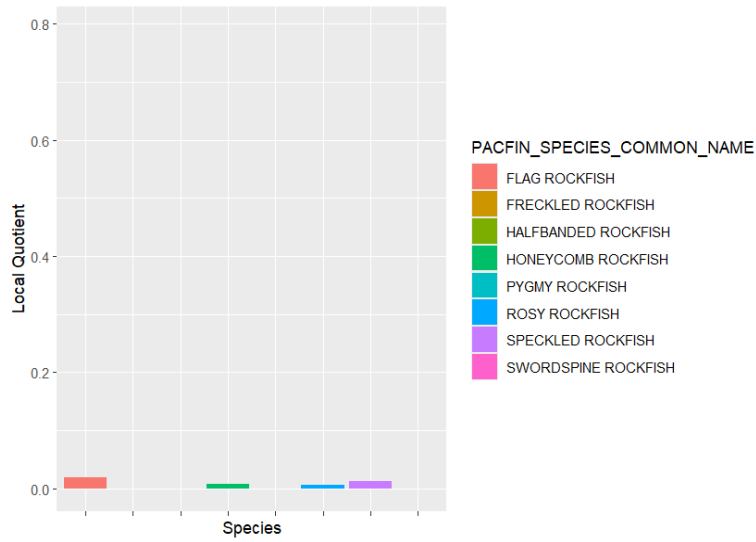


Figure 5-3c. Maximum commercial LQ for the Shallow Shelf Species Bin at any given West Coast port, on average from 2015 through 2024, for analyzed species.

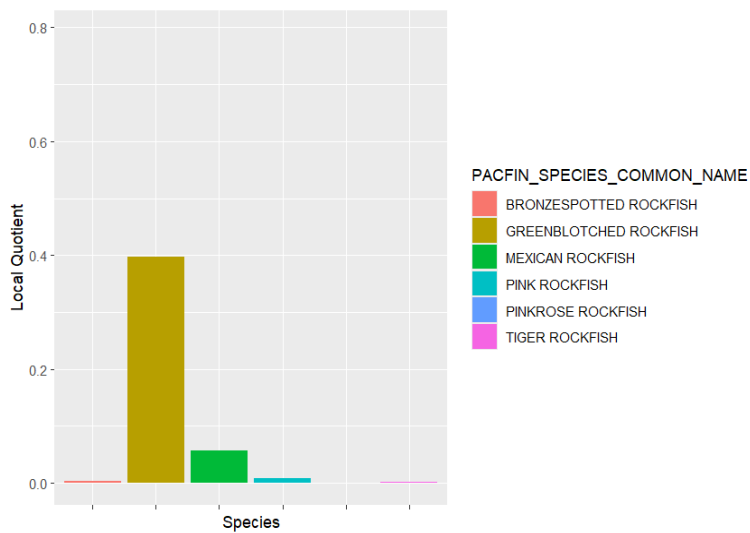


Figure 5-3d. Maximum commercial LQ for the Deep Shelf Species Bin at any given West Coast port, on average from 2015 through 2024, for analyzed species.

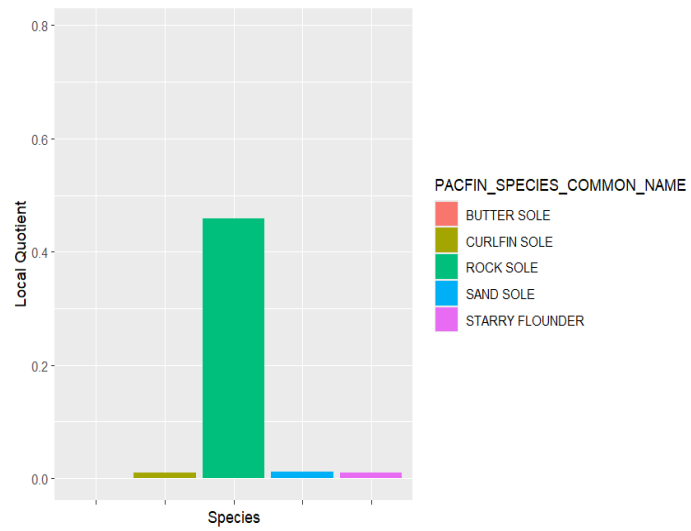


Figure 5-3e Maximum commercial LQ for the Flatfish Bin at any given West Coast port, on average from 2015 through 2024, for analyzed species.

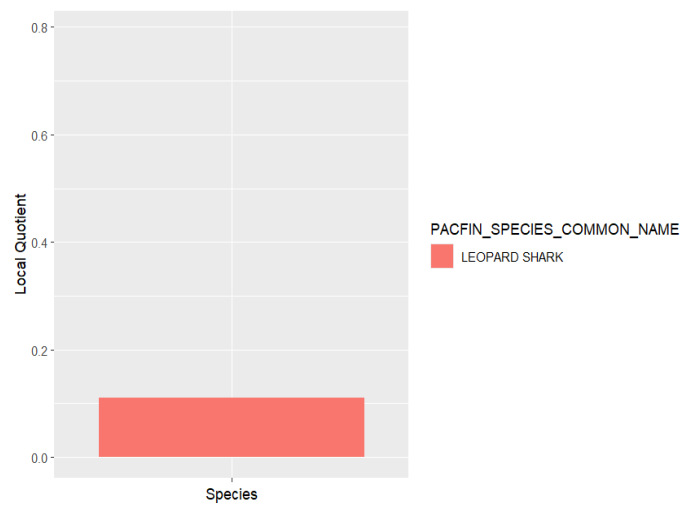


Figure 5-3f. Maximum commercial LQ for leopard shark at any given West Coast port, on average from 2015 through 2024, for analyzed species.

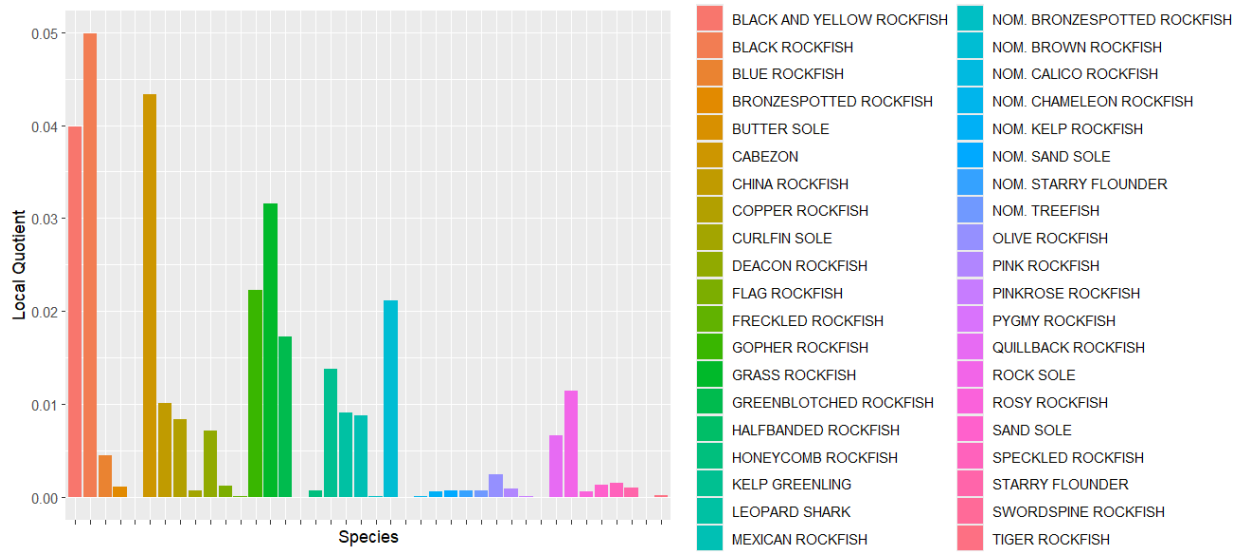


Figure 5-4. Mean commercial LQ across all West Coast ports, on average from 2015 through 2024, for analyzed species.

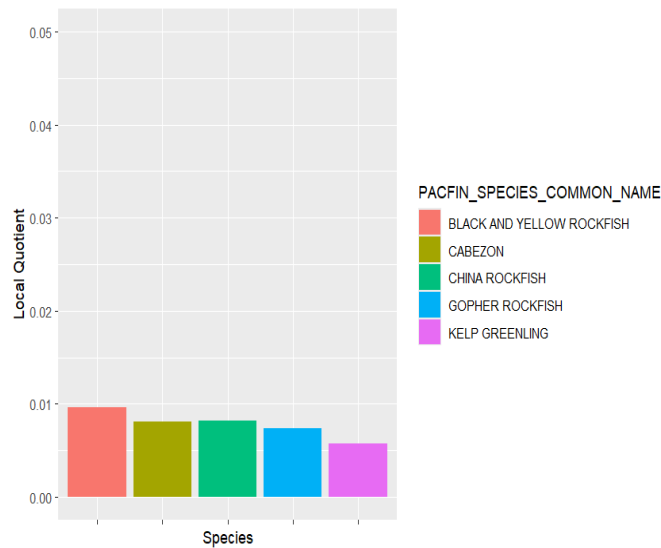


Figure 5-4a. Mean commercial LQ for the Shallow Nearshore Species Bin across all West Coast ports, on average from 2015 through 2024, for analyzed species.

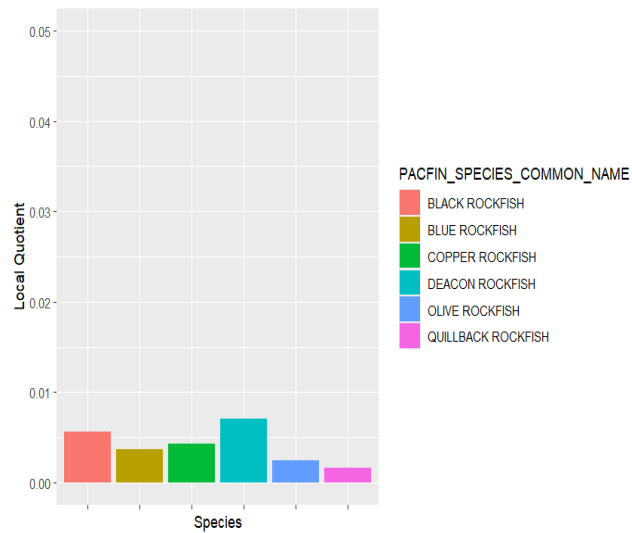


Figure 5-4b. Mean commercial LQ for the Deeper Nearshore Species Bin across all West Coast ports, on average from 2015 through 2024, for analyzed species.

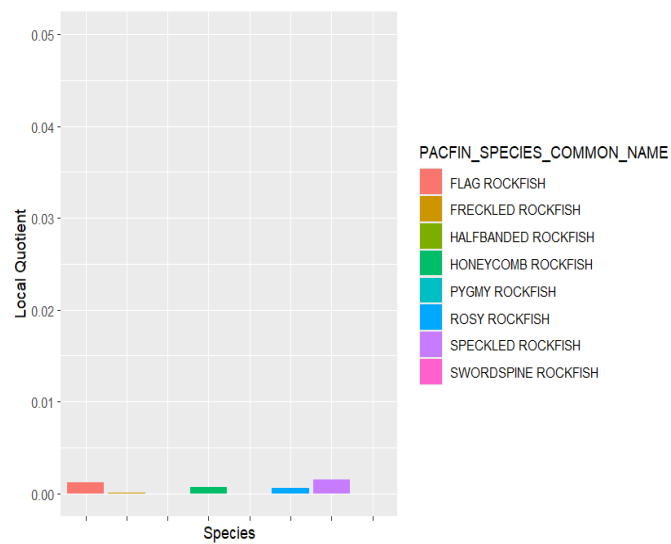


Figure 5-4c. Mean commercial LQ for the Shallow Shelf Species Bin across all West Coast ports, on average from 2015 through 2024, for analyzed species.

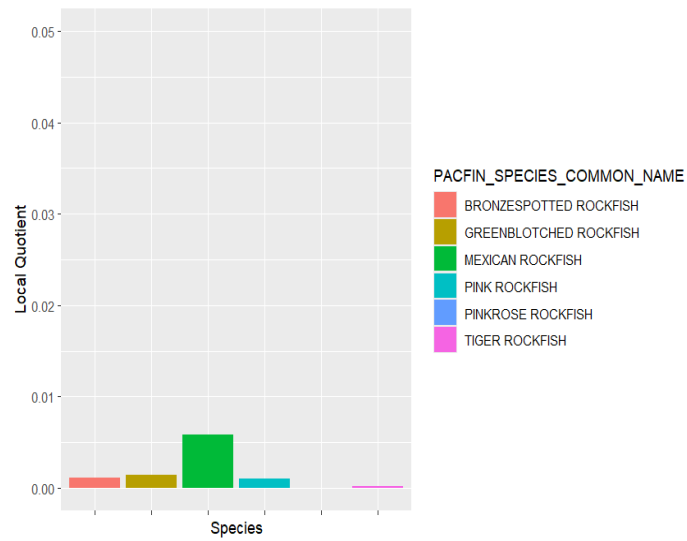


Figure 5-4d. Mean commercial LQ for the Deep Shelf Species Bin across all West Coast ports, on average from 2015 through 2024, for analyzed species.

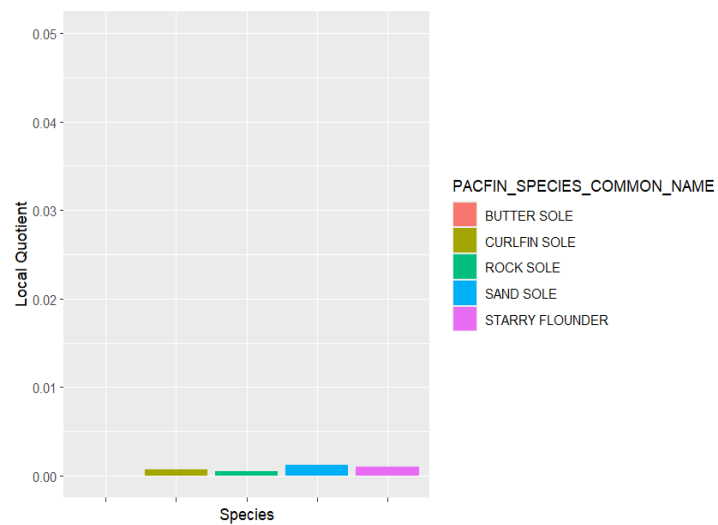


Figure 5-4e. Mean commercial LQ for the Flatfish Species Bin across all West Coast ports, on average from 2015 through 2024, for analyzed species.

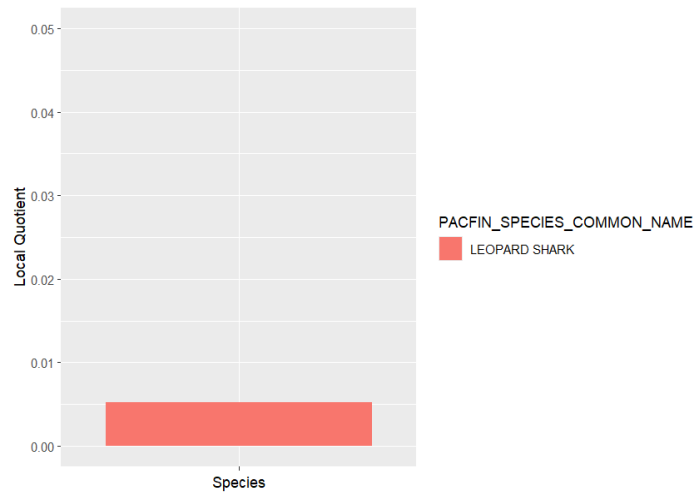


Figure 5-4f. Mean commercial LQ for leopard shark across all West Coast ports, on average from 2015 through 2024, for analyzed species.

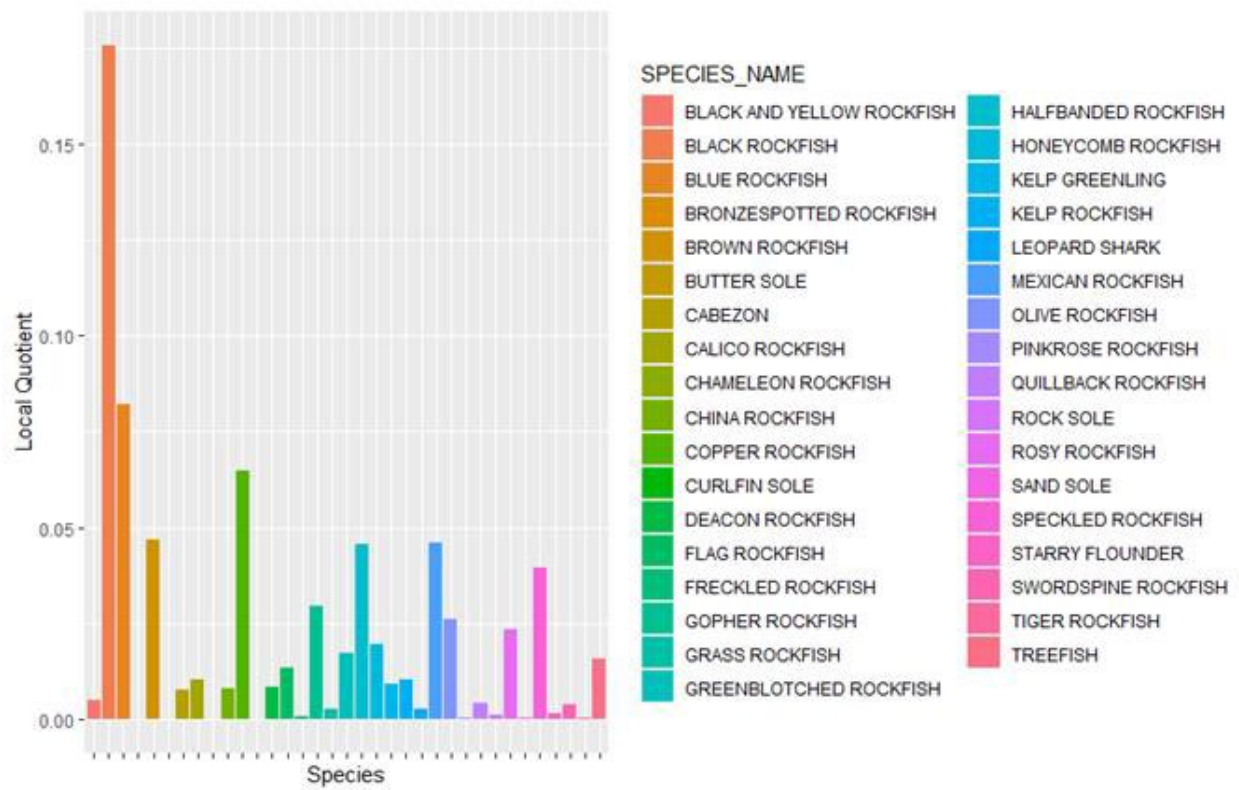


Figure 5-5. Maximum recreational LQ in any given West Coast district, on average from 2015 through 2024 for analyzed species.

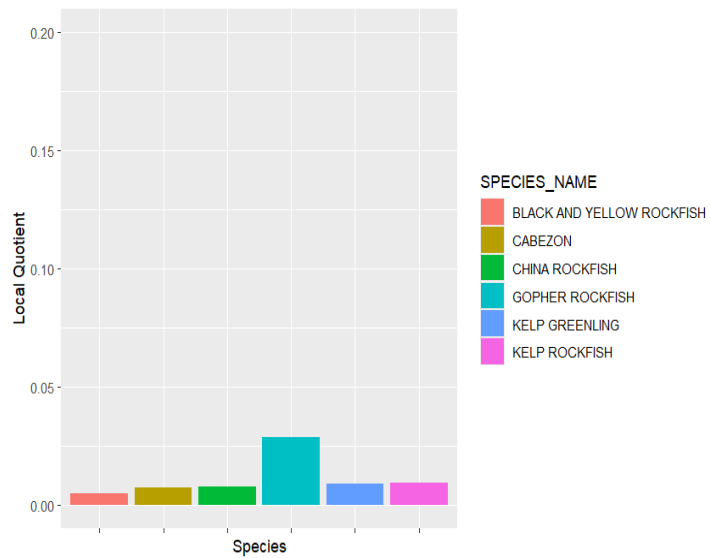


Figure 5-5a. Maximum recreational LQ of the Shallow Nearshore Species Bin in any given West Coast district, on average from 2015 through 2024 for analyzed species.

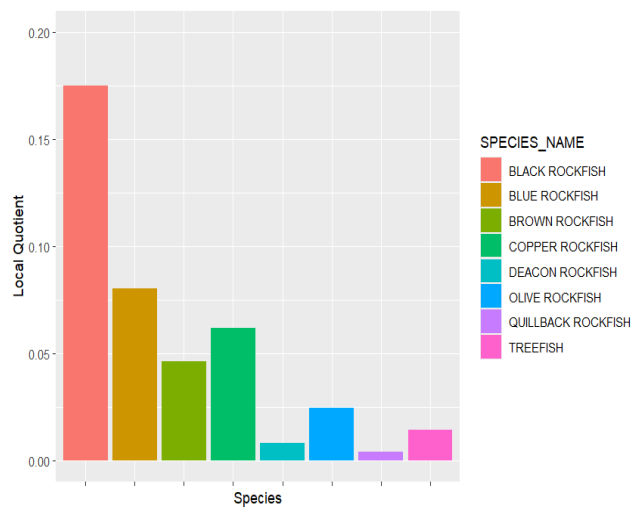


Figure 5-5b. Maximum recreational LQ of the Deeper Nearshore Species Bin in any given West Coast district, on average from 2015 through 2024 for analyzed species.

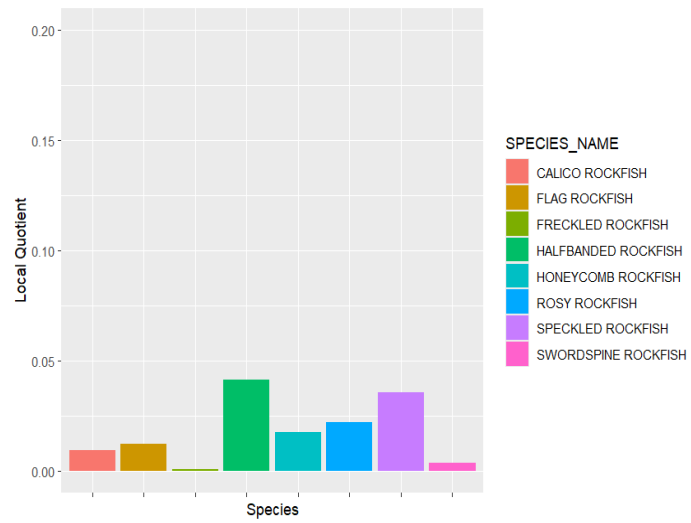


Figure 5-5c. Maximum recreational LQ of the Shallow Shelf Species Bin in any given West Coast district, on average from 2015 through 2024 for analyzed species.

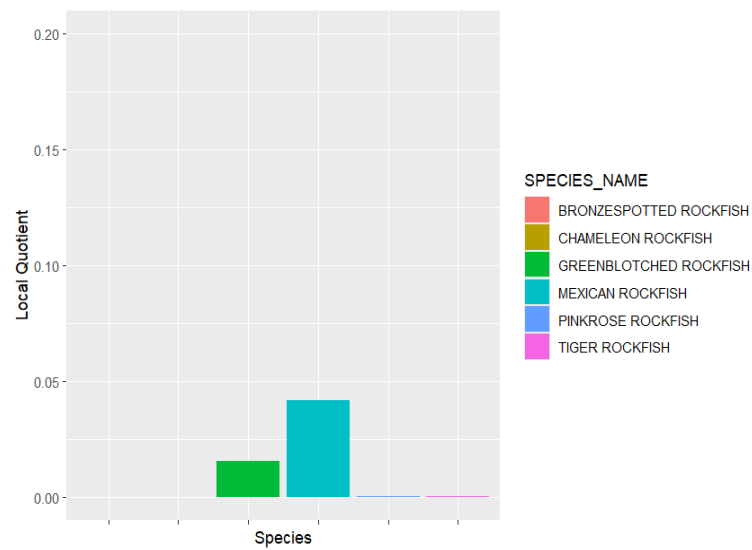


Figure 5-5d. Maximum recreational LQ of the Deep Shelf Species Bin in any given West Coast district, on average from 2015 through 2024 for analyzed species.

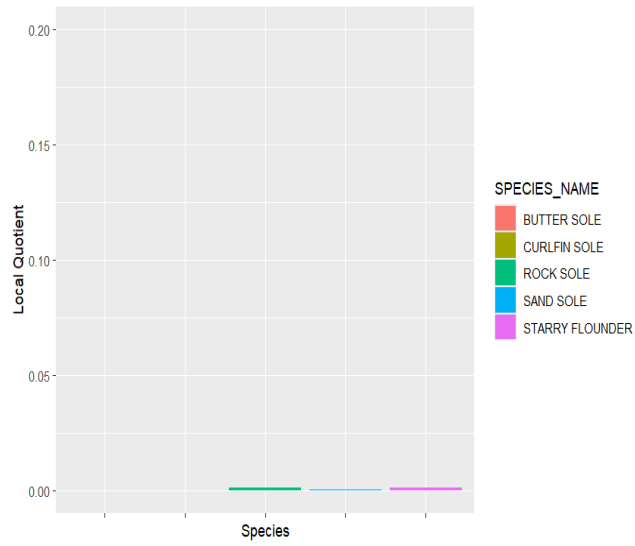


Figure 5-5e. Maximum recreational LQ of the Flatfish Species Bin in any given West Coast district, on average from 2015 through 2024 for analyzed species.

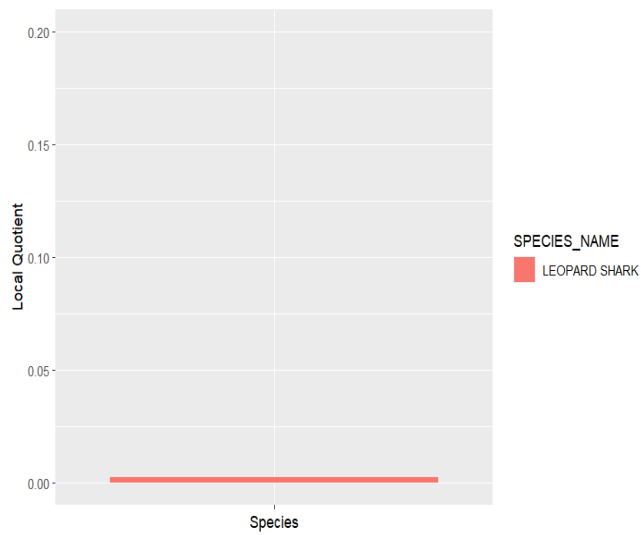


Figure 5-5f. Maximum recreational LQ of leopard shark in any given West Coast district, on average from 2015 through 2024 for analyzed species.

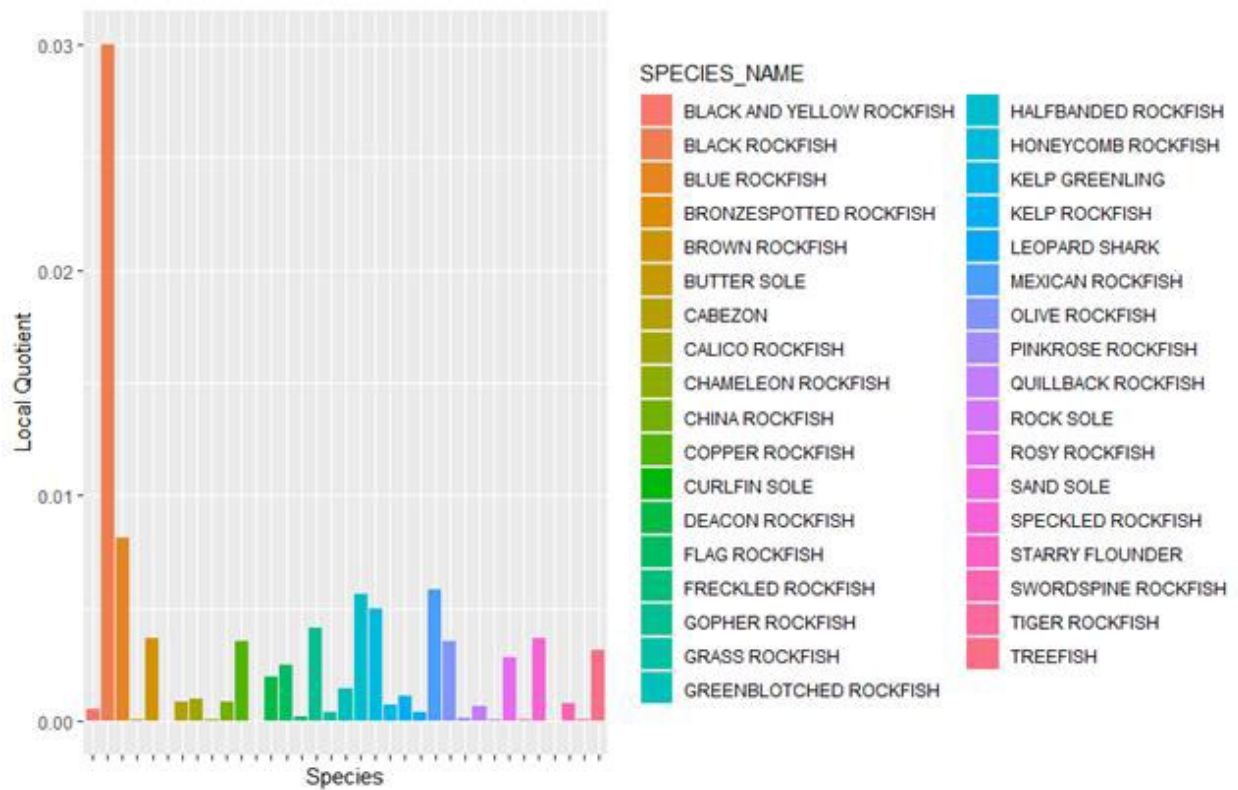


Figure 5-6. Mean recreational LQ across all West Coast ports, on average from 2015 through 2024, for analyzed species.

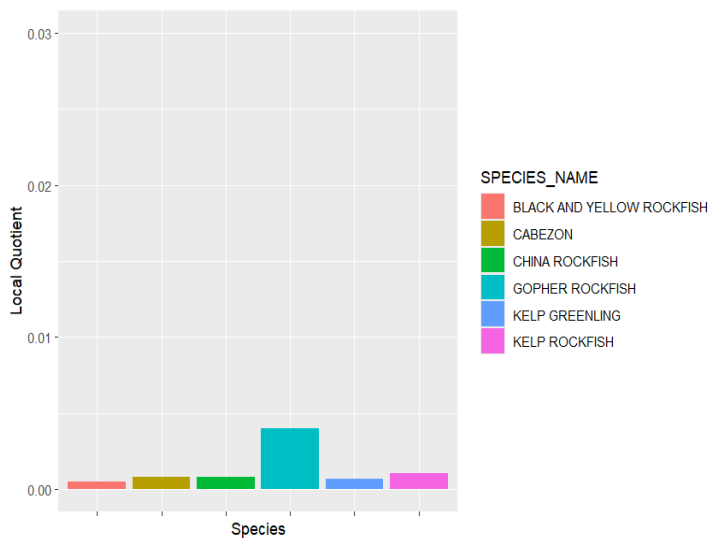


Figure 5-6a. Mean recreational LQ of the Shallow Nearshore Species Bin across all West Coast ports, on average from 2015 through 2024, for analyzed species.

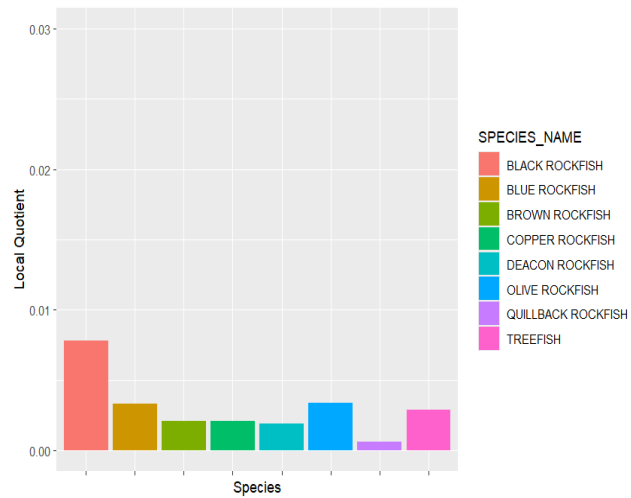


Figure 5-6b. Mean recreational LQ of the Deeper Nearshore Species Bin across all West Coast ports, on average from 2015 through 2024, for analyzed species.

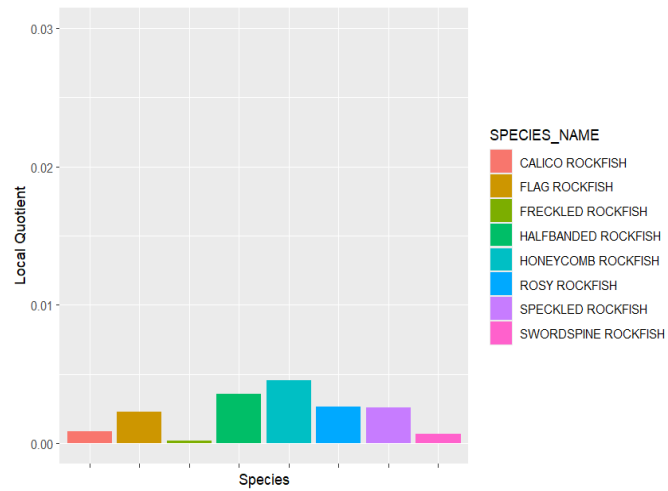


Figure 5-6c. Mean recreational LQ of the Shallow Shelf Species Bin across all West Coast ports, on average from 2015 through 2024, for analyzed species.

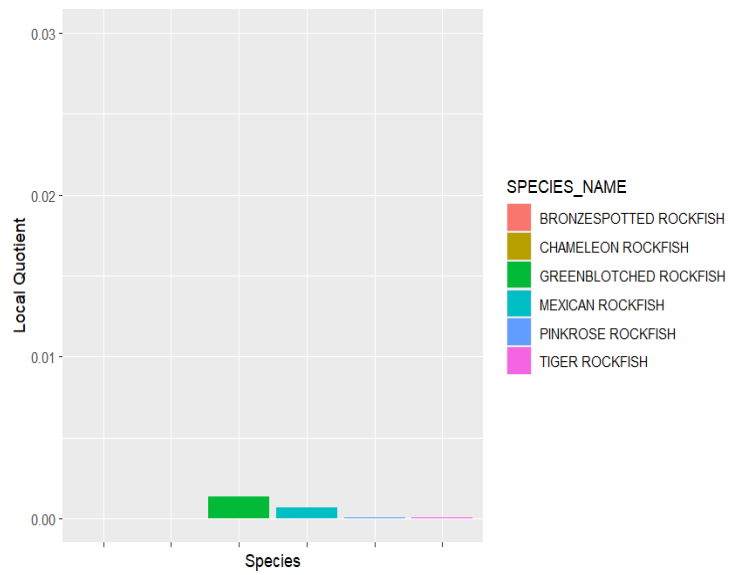


Figure 5-6d. Mean recreational LQ of the Deep Shelf Species Bin across all West Coast ports, on average from 2015 through 2024, for analyzed species.

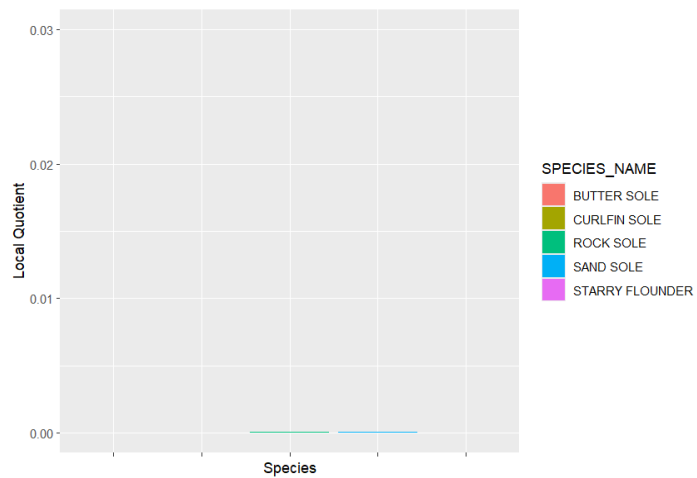


Figure 5-6e. Mean recreational LQ of the Flatfish Species Bin across all West Coast ports, on average from 2015 through 2024, for analyzed species.

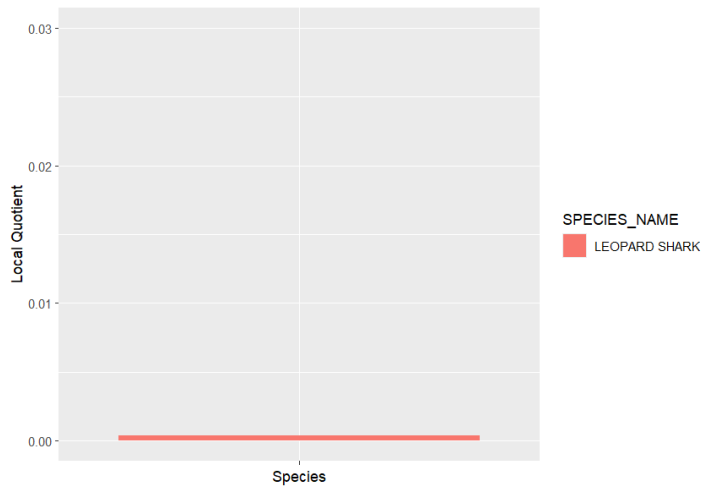


Figure 5-6f. Mean recreational LQ of leopard shark across all West Coast ports, on average from 2015 through 2024, for analyzed species.

Tables 5-7 and 5-8 below show the average and maximum LQ values across West Coast ports from 2015 to 2024, by species, indicating how important a species typically is locally, on average on the West Coast and whether particular species are highly important on a very localized scale, respectively.

Table 5-7. Mean and maximum commercial LQ across West Coast ports from 2015-2024. LQ represents the relative value each species contributes to total port revenue, as a proportion, converted to a percentage in this table. Values rounded to 3 percentage decimal places.

Species	Mean LQ	Max LQ
Shallow Nearshore		
Gopher rockfish	2.223%	20.233%
Black and Yellow rockfish	3.985%	13.696%
Cabezon	4.252%	29.252%
Kelp greenling	1.358%	13.433%
China rockfish	1.005%	9.859%
Kelp rockfish	0.059%	0.291%
Deeper Nearshore		
Black rockfish	4.965%	79.096%
Blue rockfish	0.452%	6.798%
Brown rockfish	2.105%	42.113%
Copper rockfish	0.837%	15.701%
Deacon rockfish	0.705%	1.823%
Olive rockfish	0.248%	4.584%
Quillback rockfish	0.660%	10.563%
Treefish	0.066%	0.652%
Shallow Shelf		
Calico rockfish	0.002%	0.009%
Flag rockfish	0.116%	1.936%
Freckled rockfish	0.006%	0.015%
Halfbanded rockfish	0%	0%
Honeycomb rockfish	0.074%	0.724%
Pygmy rockfish	0%	0%
Rosy rockfish	0.057%	0.617%

Speckled rockfish	0.150%	1.246%
Swordspine rockfish	0%	0%
Deep Shelf		
Bronzespotted rockfish	0.114%	0.372%
Chameleon rockfish	0.009%	0.009%
Greenblotched rockfish	1.696%	39.743%
Mexican rockfish	0.858%	05.719%
Pink rockfish	0.100%	0.836%
Pinkrose rockfish	0.004%	0.028%
Tiger rockfish	0.022%	0.228%
No Mortality		
Light dusky rockfish	0%	0%
Dwarf-red rockfish	0%	0%
Flatfish		
Butter sole	0%	0%
Curlfin sole	0.068%	0.992%
Rock sole	1.123%	45.940%
Sand sole	0.128%	1.136%
Starry flounder	0.103%	0.953%
Leopard Shark	0.910%	11.042%

Table 5-8. Mean and maximum recreational LQ across West Coast ports from 2015-2024. LQ represents the relative numbers each species contributes to total port landings, as a proportion, converted to a percentage in this table. Values rounded to 3 percentage decima

Species	Mean LQ	Max LQ
Shallow Nearshore		
Gopher rockfish	0.465%	3.205%
Black and Yellow rockfish	0.055%	0.547%
Cabezon	0.087%	0.800%
Kelp greenling	0.072%	0.991%
China rockfish	0.089%	0.858%
Kelp rockfish	0.111%	1.040%
Deeper Nearshore		
Black rockfish	3.049%	17.598%
Blue rockfish	0.931%	9.517%
Brown rockfish	0.408%	5.099%
Copper rockfish	0.354%	6.468%
Deacon rockfish	0.195%	0.857%
Olive rockfish	0.414%	3.846%
Quillback rockfish	0.064%	0.413%
Treefish	0.314%	0.01566%
Shallow Shelf		
Calico rockfish	0.110%	1.164%
Flag rockfish	0.303%	1.489%
Freckled rockfish	0.024%	0.082%
Halfbanded rockfish	0.631%	5.059%
Honeycomb rockfish	0.561%	2.178%
Pygmy rockfish	0%	0%
Rosy rockfish	0.349%	3.454%
Speckled rockfish	0.432%	4.355%
Swordspine rockfish	0.086%	0.440%
Deep Shelf		

Bronzespotted rockfish	0.004%	0.011%
Chameleon rockfish	0.004%	0.004%
Greenblotched rockfish	0.184%	2.344%
Mexican rockfish	0.658%	5.097%
Pink rockfish	0%	0%
Pinkrose rockfish	0.011%	0.038%
Tiger rockfish	0.009%	0.052%
No Mortality		
Light dusky rockfish	0%	0%
Dwarf-red rockfish	0%	0%
Flatfish		
Butter sole	0.001%	0.005%
Curlfin sole	0.003%	0.014%
Rock sole	0.011%	0.180%
Sand sole	0.005%	0.043%
Starry flounder	0.003%	0.143%
Leopard Shark	0.046%	0.290%

3.5.4.1 Shallow Nearshore Bin and Deeper Nearshore Bin

Based on the mean LQ across ports, each of the shallow nearshore and deeper nearshore species contributes less than 5 percent of revenue in West Coast ports in shoreside commercial fisheries, on average, across ports from 2015 to 2024.

In the Shallow Nearshore Species Bin, cabezon, gopher rockfish, and grass rockfish each had high commercial LQ maximums, demonstrating that they may be important in particular localized areas. These species contributed a maximum of 29, 20, and 32 percent to commercial port revenue, respectively, on average from 2015 to 2024. Cabezon brought in relatively high revenue in Port Orford, Avila, Morro Bay, and Depoe Bay. Gopher rockfish brought in relatively high revenue in Avila and Morro Bay. Grass rockfish brought in relatively higher revenue in Santa Barbara, Morro Bay, and Avila ports. Therefore, these species are important on a localized scale of the West Coast, particularly off Central California. Black and yellow rockfish, kelp greenling, and China rockfish also had maximum commercial LQs of at least 10 percent.

In the Deeper Nearshore Species Bin, black rockfish and brown rockfish each had high commercial LQ maximums, demonstrating that they could also be important localized areas. These species contributed a maximum of 79 and 42 percent to commercial port revenue, respectively, on average from 2015 to 2024. Deeper nearshore species, particularly black rockfish, brought in relatively higher revenue in Crescent City, Port Orford, and Depoe Bay. Therefore, this species bin may have higher localized importance in areas of southern Oregon and Northern California. Copper and quillback rockfishes also had maximum commercial LQs of at least 10 percent.

The mean and maximum recreational LQ were close to zero for all shallow nearshore species, reiterating that these species are not as important recreationally, even at a local scale. The recreational LQs for deeper nearshore species indicated higher localized importance in the recreational sector, particularly for black rockfish (max = 17 percent), blue rockfish (max = 9

percent), and brown rockfish (max = 5 percent). These lower LQs in the recreational sector highlight that many of the diminutive rockfish species are interchangeable when contributing to the value of a recreational trip.

3.5.4.2 Other Species Bins

Across the board, shallow shelf, deep shelf, and flatfish species as well as leopard shark did not show indications of localized importance through calculation of the LQ. Halfbanded, honeycomb, speckled, and Mexican rockfishes each contributed a maximum, on average from 2015 through 2024, of at least 2 percent of localized catch in the recreational sector, though no species exceeded 6 percent. Species with no mortality off the West Coast were not included in these calculations and cannot be considered important, locally, without any recent recorded catch in any fishery sector.

3.5.5 Conclusion

In summary, the qualitative and quantitative information presented in this section converges towards identifying a select group among the species analyzed that may be important to commercial, recreational, Tribal, and subsistence users. In both the commercial and recreational sectors, shallow nearshore and deeper nearshore species were identified as the highest importance in the fishery. For the non-Tribal commercial sector, black rockfish, brown rockfish, gopher rockfish, black and yellow rockfish, cabezon, and kelp greenling were primarily identified as the species of highest importance. In the recreational sector, black rockfish, blue rockfish, brown rockfish, copper rockfish, deacon rockfish, cabezon and quillback rockfish were identified as the species of the highest importance. Black rockfish stand out as the species of highest importance across sectors, but brown rockfish, cabezon, and copper rockfish follow close behind. For Tribal sectors, black rockfish, blue rockfish, deacon rockfish, quillback rockfish, cabezon, and kelp greenling were identified as species of importance. From public comments and consultation with the GAP, it is clear that maintaining access to nearshore species is important across sectors, but particularly for recreational anglers, charter boat businesses, and small-scale commercial participants. The shallow nearshore and deeper nearshore bins did demonstrate highly localized variations in importance, demonstrating that the species may not be universally important across the West Coast. In contrast, the analysis demonstrates that shallow shelf, deep shelf, and flatfish species, as well as leopard shark and species with little to no recorded catch, are largely considered unimportant across sectors. Most diminutive rockfish species in the shallow shelf and deep shelf bins are too small to retain and often discarded, contributing little to local or regional revenue. A decline in market demand for flatfish has also consigned these species to be considered relatively unimportant across sectors, though Tribal representatives see potential for landings of rocks sole and sand sole to increase again in the future. Those species with no mortality (light dusky and dwarf-red rockfish), as well as those with very minimal catch and resulting revenue (i.e., bronzed-spotted rockfish, pygmy rockfish, swordspine rockfish, pink rockfish, and chameleon rockfish), are in no way considered important in any fishery sector along the West Coast. Overall, the sum of this information provides insight into the relative importance of each species analyzed, which can be utilized to determine which species may be in need of conservation and management in the EEZ. However, the Council should also rely on the input of advisory bodies and the public to determine which species are important to fishery participants throughout the West Coast.

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

Per the NS1 Guidelines, conservation and management of a fishery in the EEZ may be necessary when a fishery supports provision of a net benefit to the Nation, by ensuring long-term sustainability of fishery stocks and providing significant net economic benefits. Factor (vi) and this analysis considers how substantial the contributions of a particular fishery are, relative to the regional and national economy. The “region” in this analysis can be defined broadly as the West Coast region.

Information solicited from the Council’s GAP and qualitative analysis of public comments are utilized to support an understanding of the relative importance of species to the West Coast region. A Regional Quotient (RQ), representing each species’ relative contributions to the West Coast region’s economic benefit derived from the groundfish fishery, was also utilized to evaluate the relative importance of species’ contributions to local and regional landings. The RQ was calculated by dividing the regional revenue or landings of a species by the total regional groundfish ex-vessel revenue or landings, excluding whiting and sablefish, as well as the at-sea whiting sector.

3.6.1 Qualitative Consultation

The GAP was once again consulted to provide qualitative information on the importance of species included in this analysis to the Nation and to the region. Besides the blanket statements on relative importance of species, described under Factor (v), members of the GAP also spoke to whether a species included in this analysis entered local, regional, or national markets. No species in this analysis were identified as sold into national markets. Processors specifically pointed out that there is no profitable market for diminutive rockfish species and that market demand for flatfish has declined. Several species were noted to have regional markets, i.e., to be bought by West Coast processors and consumers. These included:

- Black rockfish
- Blue rockfish
- Brown rockfish
- Cabezon
- China rockfish
- Copper rockfish
- Deacon rockfish
- Flag rockfish
- Gopher rockfish
- Grass rockfish
- Greenblotched rockfish
- Kelp rockfish
- Mexican rockfish
- Olive rockfish
- Quillback rockfish
- Rock sole
- Sand sole
- Starry flounder
- Tiger rockfish
- Treefish

3.6.2 Calculation of Regional Quotient

An RQ was calculated for each species included in the analysis. RQ represents the species' relative contribution to the West Coast region's economic benefit derived from groundfish fisheries. The RQ was calculated for both the commercial sector (excluding the at-sea whiting fleet) and the recreational sector, by dividing the regional revenue or landings count of a species by the total regional groundfish revenue or landings, respectively. Revenue from sablefish and Pacific whiting landings were excluded from these calculations, as they make up the majority of total West Coast groundfish revenue and would skew the data. At-sea whiting trips were also excluded for relevance. The calculation includes landings from 2015 through 2025. These RQ values are summarized in Table 6-1 below.

Table 6-1. Relative species contributions to regional commercial ex-vessel revenue (excluding sablefish and Pacific whiting), and recreational landings, measured via RQ from 2015 through 2024. Values range from 0-1, representing a proportion of total revenue and landings. Values less than 0.0001 rounded to zero.

Species	Comm RQ (revenue)	Rec RQ (landings)
Shallow Nearshore		
Black and Yellow rockfish	0.004958637	0.001579168
Gopher Rockfish	0.014691661	0.015471435
Cabazon	0.017813	0.003380928
Kelp greenling	0.005944	0.00247817
China rockfish	0.003767	0.003626
Kelp rockfish	0.000164	0.002036
Deeper Nearshore		
Black rockfish	0.025264	0.097368
Blue rockfish	0.003139	0.046526
Brown rockfish	0.00194	0.018728
Copper rockfish	0.003979	0.018148
Deacon rockfish	0.000589	0.003167
Olive rockfish	0.000388	0.009046
Quillback rockfish	0.000397	0.002081
Treefish	0.000223	0.002674
Shallow Shelf		
Calico rockfish	0	0.000855
Flag rockfish	0	0.003054
Freckled rockfish	0	0
Halfbanded rockfish	0	0.003271
Honeycomb rockfish	0	0.002911
Pygmy rockfish	0	0
Rosy rockfish	0	0.007855
Speckled rockfish	0.000193	0.003647
Swordspine rockfish	0	0.000254
Deep Shelf		
Bronzespotted rockfish	0	0
Chameleon rockfish	0	0
Greenblotched rockfish	0.000183	0.001119
Mexican rockfish	0.000414	0.002175
Pink rockfish	0	0
Pinkrose rockfish	0	0
Tiger rockfish	0	0.000194

No Mortality		
Light dusky rockfish	0	0
Dwarf-red rockfish	0	0
Flatfish		
Butter sole	0	0
Curlfin sole	0	0
Rock sole	0	0.000213
Sand sole	0.000574	0.000101
Starry flounder	0.000344	0
Leopard Shark	0	0.000766

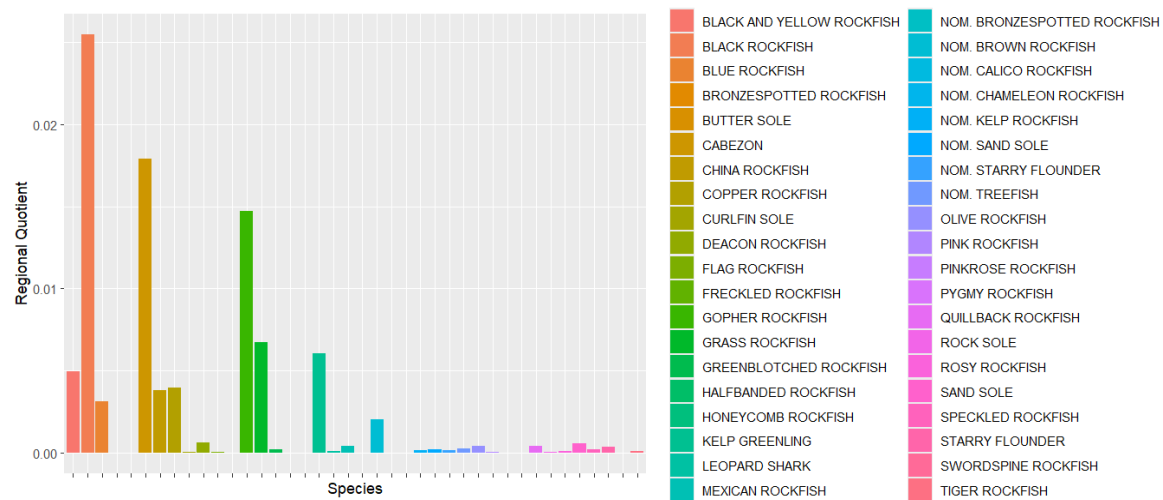


Figure 6-1. Relative species (denoted by species name in PacFIN) contributions to regional commercial ex-vessel revenue, measured as a proportion of total regional revenue, excluding sablefish and Pacific whiting. "Nom." indicates only nominal catch recorded of that species. Nominal catch summed with identified catch for species for which both are recorded. Shallow nearshore and deeper nearshore species presented in figures (6-1a and 6-1b) below. RQ for species in all other bins was too small to present on the same scale (< 0.01).

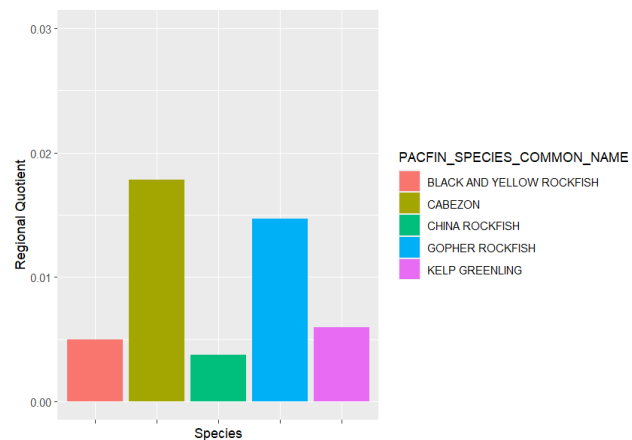


Figure 6-1a. Relative shallow nearshore species (denoted by species name in PacFIN) contributions to regional commercial ex-vessel revenue, measured as a proportion of total regional revenue, excluding sablefish and Pacific whiting. Scaled to the maximum of all species included in this analysis.

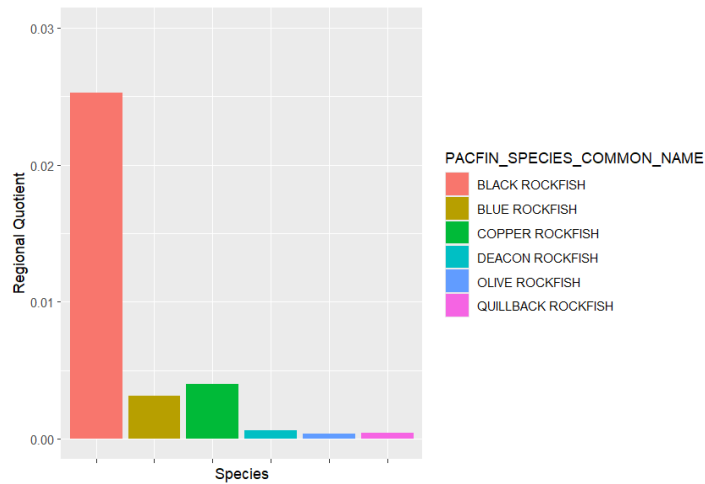


Figure 6-1b. Relative deeper nearshore species (denoted by species name in PacFIN) contributions to regional commercial ex-vessel revenue, measured as a proportion of total regional revenue, excluding sablefish and Pacific whiting. Scaled to the maximum of all species included in this analysis.

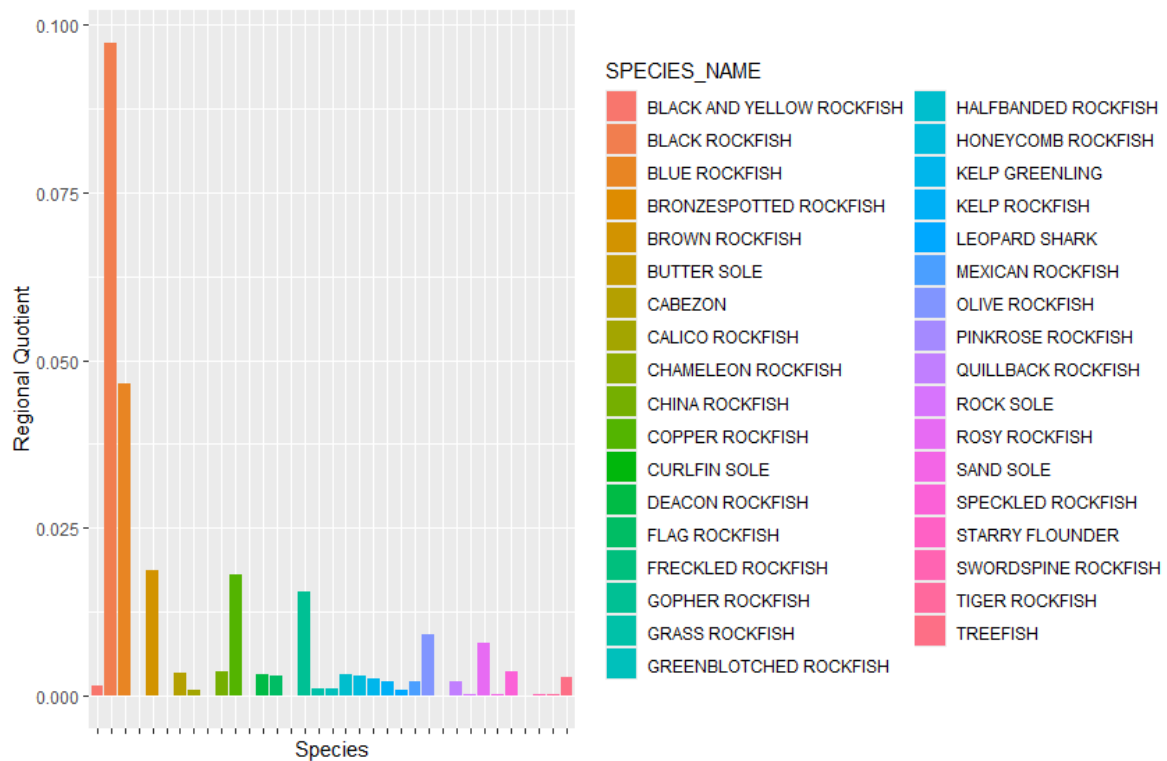


Figure 6-2. Relative species contributions to regional recreational landings from 2015 through 2024, measured as a proportion of total regional landings (count). Shallow Nearshore, Deeper Nearshore, and Shallow Shelf Species Bins presented in figures (6-2a - 6-2c) below. RQ for species in all other bins was too small to present on the same scale (< 0.01).

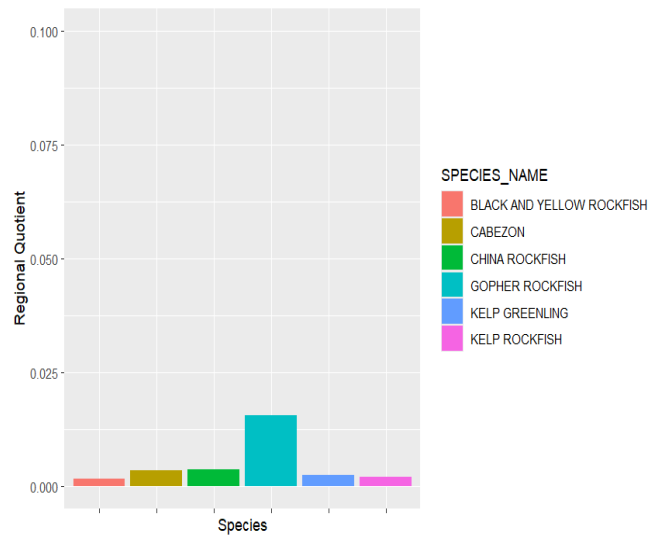


Figure 6-2a. Relative shallow nearshore species contributions to regional recreational landings from 2015 through 2024, measured as a proportion of total regional landings (count). Scaled to maximum RQ of all species included in the analysis.

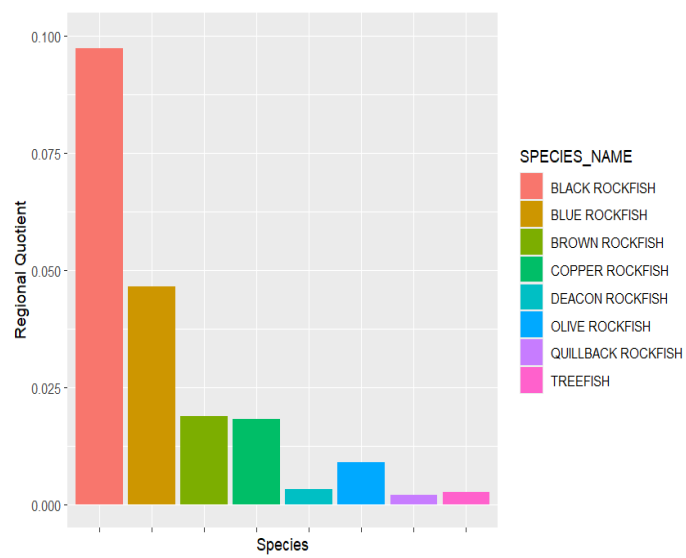


Figure 6-2b. Relative deeper nearshore species contributions to regional recreational landings from 2015 through 2024, measured as a proportion of total regional landings (count). Scaled to maximum RQ of all species included in the analysis.

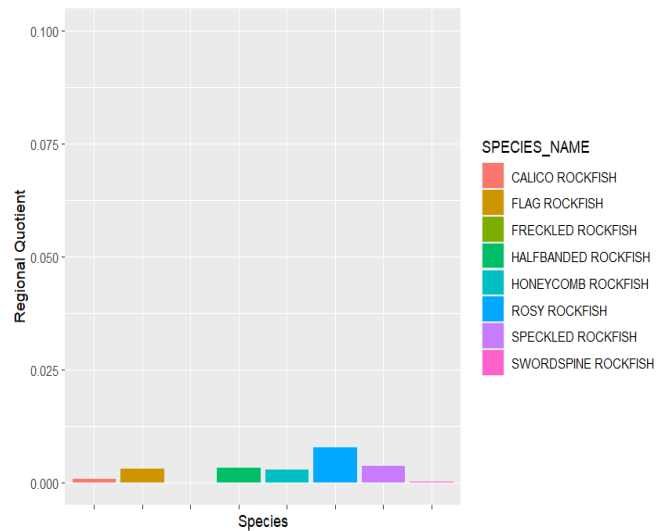


Figure 6-2c. Relative shallow shelf species contributions to regional recreational landings from 2015 through 2024, measured as a proportion of total regional landings (count). Scaled to maximum RQ of all species included in the analysis.

Black rockfish, cabezon, and gopher rockfish each contributed at least 1 percent of regional commercial revenue from 2015 through 2024, excluding sablefish and Pacific whiting revenue (2.5, 1.8, and 1.5 percent, respectively, see Table 6-1 and Figure 6-1). Several species contributed less than 1 percent, but more than 0.1 percent, of revenue from 2015 through 2024, including kelp greenling and grass, black and yellow, copper, China, blue, and brown rockfishes. The majority of species analyzed comprise less than 0.1 percent of commercial regional revenue, excluding sablefish and Pacific whiting revenue. Therefore, while some of these species may be described as ‘targets,’ in portions of the fleet, in the reality of a mixed stock fishery, they make up a very small proportion of total landings and revenue on a regional scale. Those species with very minimal landings, particularly the diminutive rockfish species, logically contribute close to zero revenue to the region. It should be noted that while many species included in this analysis contributed a very low proportion of revenue to the regional economy, this may not reflect their importance in a regionally important stock complex. As many species included in this analysis are managed within a stock complex, rather than on an individual basis, a species may be important to the region in that it is caught alongside economically valuable species within the complex.

The RQ of recreational landings by species also highlighted certain species that contribute a significant proportion of total regional recreational landings (Table 6-1 and Figure 6-2). Black, blue, brown, copper, and gopher rockfishes contributed about 20 percent of total regional recreational landings, combined, with black rockfish comprising about 10 percent of total regional recreational landings alone. On the other end of the spectrum, species like starry flounder, freckled rockfish, pinkrose rockfish, butter sole, bronzespotted rockfish, curlfin sole, and chameleon rockfish contributed close to zero percent of total recreational landings. Note, landings of bronzespotted rockfish are prohibited. Nearshore species that contributed less than 1 percent, but at least 0.1 percent, of regional landings further reflect their inclusion, but interchangeability, in a mixed-stock recreational fishery. For the recreational fishery, it is hard to piece out exactly how much value any particular species brings economically to the region by driving more recreational anglers to take trips and book charters. Some species, though not a significant portion of the

landings, like tiger rockfish or cabezon, are aesthetically valued, may increase the overall value of the recreational trip, and may help drive the number of trips taken in the region, yet the value of those species is not captured as highly landed regionally in the data. Further, the same caveat provided for the commercial sector above, regarding stock complexes, also applies to the recreational sector. Therefore, the importance of individual species, as identified under the analysis for Factor (v), may help identify those species that help drive regional economic benefit in the recreational sector.

Overall, several species, namely nearshore species like black, blue, brown, copper, gopher rockfishes, and cabezon, may be considered important to the regional economy. However, the majority of the species considered in this analysis have a negligible impact on the regional economy.

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

Competing interests and conflicts in a fishery may include competing needs between states, competition between sectors, and competition between resource user types. The analysis of Factor (vii) considers whether an FMP has been useful in moderating these issues or is anticipated to be useful in moderating these issues in the future. This analysis is primarily qualitative, combining insights from the GAP and GMT discussions, and review of the public comment E-portal identifying themes such as disparity of impacts between sectors and states.

Broadly, an FMP may be useful to facilitate resolution of potential conflicts or competing interests in a fishery. However, for the majority of species analyzed, no particular competing interests or conflicts among user groups were identified that would require an FMP to resolve or manage those conflicts. This conclusion was determined through consultation with the GMT, the GAP, and NMFS and state agency staff, as well as through a review of public comments in the Council's E-portal.

Exceptions to this general rule were revealed for some shallow nearshore and deeper nearshore species. From both the review of public comments and consultation with state representatives on the GMT, it is clear that the FMP has been used as a tool to coordinate and facilitate collaborative management of nearshore species between states; mitigating potential conflict before it starts, and assisting in resolving conflict when it arises. While the states manage individual bag limits and opportunities for sectors within their state waters, the FMP provides the harvest guidelines, which are tools with a high level of accountability from which these smaller limits are derived. Inclusion of these species in the FMP also provides management benefits derived from regional science resources, and a transparent public Council process. These resources help preempt doubt from fishery participants in the validity of management decisions. While some conflicts do still occur between fishery participants in different states - for instance, perceptions of one state's fishermen 'taking' another state's fish or of the inequitable geographic distribution of the impacts of management measures, which have been identified in public comments - the inclusion of certain groundfish species in the FMP may allow for the burden of the conservation and management of these species in the EEZ to be shared among states, and for different fishery users' perspectives to be shared publicly during the decision making process in order to help resolve potential conflicts

and tensions. On the other hand, the FMP could also be a tool that occasionally generates, rather than resolves, conflict between user groups. For instance, a review of public comments revealed that management measures set to rebuild California quillback rockfish, through a rebuilding plan guided by the requirements of the MSA, may have led to conflicts between user groups due to the perception that the rebuilding plan would lead to undue and inequitable impacts. Overall, with respect to this Factor, the benefits of inclusion in the FMP are most pertinent to those stocks that are defined as crossing state lines, such as copper rockfish. Stocks of black rockfish and quillback rockfish, for example, though potentially relevant under this factor based on conflicts identified in public comments, are currently defined in stocks by state, which reduces the FMP's ability to resolve any potential conflicts on a coastwide basis. Finally, it is not possible to discern, in this analysis, whether the benefits under this factor that are assumed to be achieved by inclusion in the FMP could be achieved through other means were certain species removed from the FMP. Moreover, there may be additional drawbacks under this Factor incurred through federal management.

It is important to note that the states already take on a significant amount of work resolving conflicts and competing interests between user groups within the West Coast groundfish fisheries, in terms of mediating between the interests of the recreational versus commercial sectors, and between user groups within those sectors (i.e., small-scale vs. corporate), as many of these fisheries occur in state waters. For instance, the differential impacts of closed areas on large-scale commercial, small-scale commercial, and recreational sectors was identified as an issue in public comments to the Council; however, it is an issue that is taken up at the state level due to the prominence of area management within state waters and the principal mortality of nearshore species within state waters. Another example is the use of [Black Rockfish Management Areas](#) (BRMAs), which have historically been used by Oregon to reduce potential conflicts between commercial and recreational users. Lastly, as many of the species included in this analysis are principally caught in state waters, the burden would be on the states to resolve any potential conflicts or competing interests between the sectors participating in those areas.

3.8 Factor (viii) - The economic condition of a fishery and whether an FMP can provide more efficient utilization & Factor (ix) - The needs of a developing fishery, and whether an FMP can foster orderly growth.

Factors (viii) and (ix) concern trends in utilization and development, respectively, of a fishery for each species evaluated in this analysis. Factor (viii) characterizes trends in utilization of a species within the fishery to determine whether there is potential for more efficient utilization via implementation of an FMP. Factor (ix) identifies fisheries (if any) for a species that are under development and the growth of these developing fisheries, including whether that growth has been or could be guided by an FMP. Analysis considers whether trends in landings reflect market replaceability and interchangeability of groundfish species, versus true development of a unique fishery for a particular species. All landings for a species were analyzed and no differentiation was made between catch in state waters and the EEZ. However, overall trends in landings should also take into account where those landings are principally caught, via the threshold analysis in Factor (ii).

Generally speaking, the West Coast groundfish fishery has been efficiently utilized and has not seen recent efforts to develop the fishery further. Chapter 1 of the Groundfish FMP provides the history of the groundfish fishery and is incorporated by reference. The FMP was implemented in 1982. Prior to that, management of the domestic groundfish fishery was under the jurisdiction of California, Oregon, and Washington. The MSA established the Council and the FMP. Since 1982, the FMP has been amended many times to meet the Council's goals and objectives for the groundfish fishery in the EEZ. While the needs of the fishery have changed, and are likely to keep changing, the needs of the fishery have been largely accommodated. The species targeted in the groundfish fishery, to varying degrees, have been heavily utilized. There is little room for growth in the fishery at present. While some species have seen specific demand and therefore fisheries for those species have been specifically developed (i.e., the Pacific whiting sectors or live lingcod fisheries), most of the species under evaluation in this analysis do not elicit specific demand, and therefore would not warrant the specific development of a unique fishery. Most diminutive rockfish species are interchangeable in the commercial market or equally contribute to a positive recreational "experience." Further, many of these species are managed within stock complexes; meaning specific utilization of individual species is not necessarily within the goals of the current management framework.

From qualitative information provided by Tribal representatives on the GMT and GAP, it is possible that several species included in this analysis are subject to a developing commercial Tribal fishery. Tribal representatives reported that there are currently investments being made by Washington Treaty Tribal fishermen to increase their capacity to fish nearshore species, particularly black, blue, and deacon rockfishes, and cabezon and kelp greenling. Trends in landings reflect this qualitative information and will be available in a forthcoming Tribal report.

3.8.1 Analysis of Landings

Trends in the landings of the species analyzed in this document were plotted over time (from 2015 through 2024, see Figures 8-1 through 8-12) to evaluate whether significant changes may indicate the development of a fishery for, or changes in the utilization of, any particular species. Light dusky rockfish and dwarf-red rockfish have seen no recent catch off the West Coast and are therefore not included in the plots below. It can be assumed that there is currently no utilization or development of a fishery for these species. Chameleon rockfish has also seen no commercial catch over the plotted timeframe, though it was present in recreational landings. Similarly, pink rockfish were not present in recreational landings in the plotted timeframe, though they did show up in the commercial data. From these data gaps, it can be assumed that there is no utilization or development of a fishery in the EEZ for chameleon rockfish in the commercial sector and no utilization or development of a fishery for pink rockfish in the recreational sector. Commercial landings of pink rockfish, calico rockfish, butter sole, swordspine rockfish, pygmy rockfish, and halfbanded rockfish cannot be disclosed in the plots below due to confidentiality requirements. However, as indicated in the Factor (ii) analysis, catch of each of these species in the EEZ is minimal in both the commercial and recreational sectors and no species showed significant changes in utilization over this time period.

Commercial landings (mt), excluding landings in the at-sea whiting sector, were analyzed over time by species bin to determine whether there are clear patterns of growth or other trends in utilization over the last 10 years. These trends are graphed in Figures 8-1 through 8-6 below.

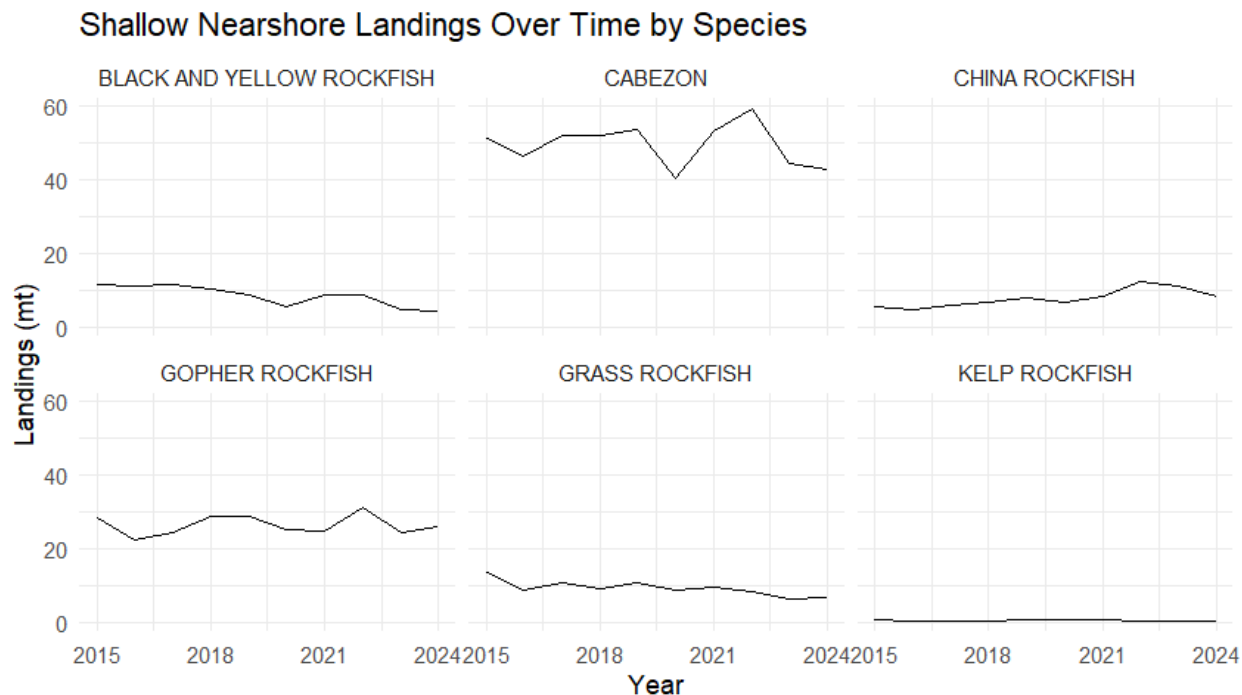


Figure 8-1.a. Trends in non-Tribal commercial landings of shallow nearshore species from 2015 to 2024. See kelp greenling plotted separately below.

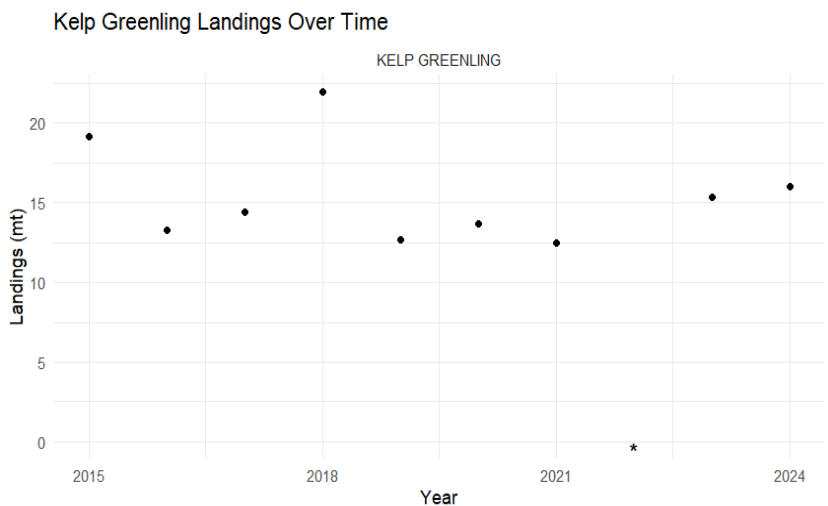


Figure 8-1b. Trends in non-Tribal commercial landings of shallow nearshore species from 2015 to 2024. See kelp greenling plotted separately below.

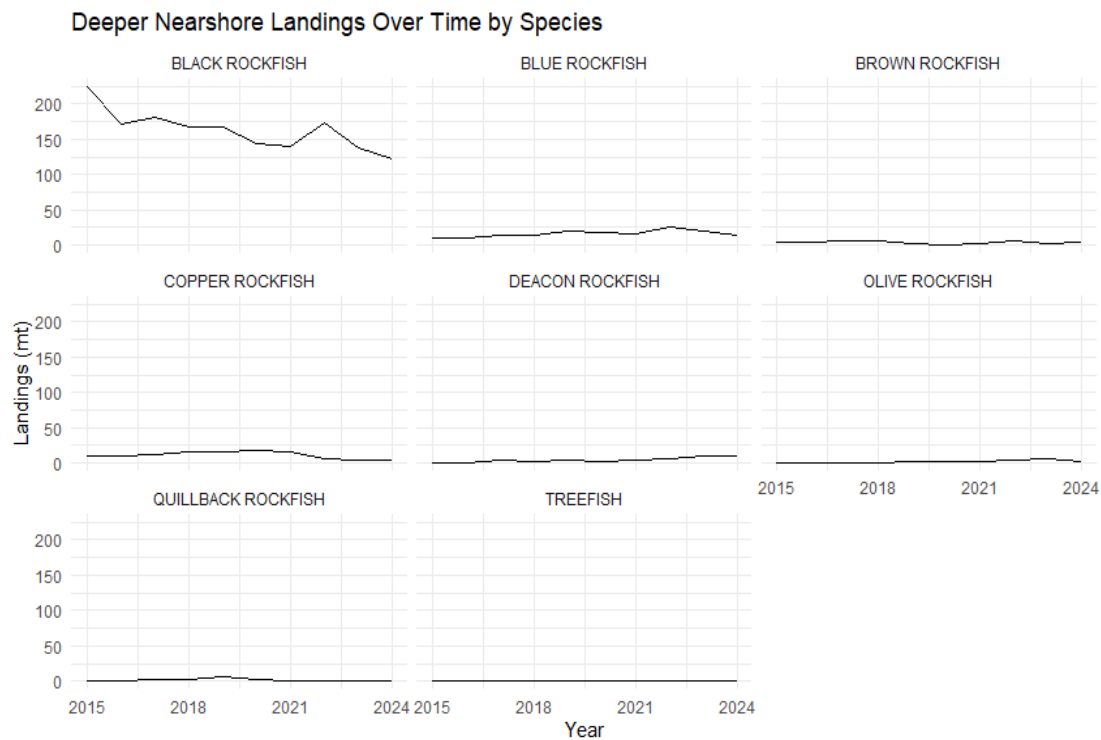


Figure 8-2. Trends in non-Tribal commercial landings of deeper nearshore species from 2015-2024. Note, calico rockfish are not shown due to confidentiality requirements.

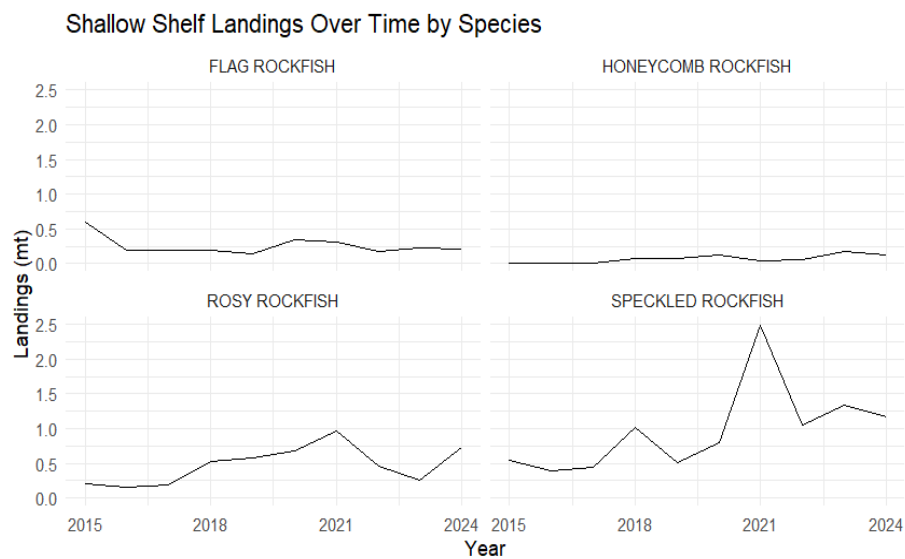


Figure 8-3. Trends in non-Tribal commercial landings of shallow shelf species from 2015-2024. Note, freckled, halfbanded, pygmy and swordspine rockfish are not shown due to confidentiality requirements.

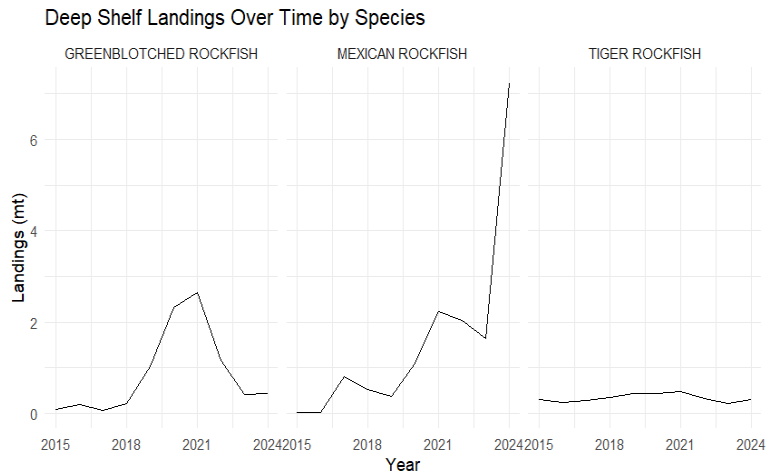


Figure 8-4.a. Trends in non-Tribal commercial landings of deep shelf species from 2015-2024. See pinkrose and bronzespotted rockfish plotted below. Note, pink rockfish are not shown due to confidentiality requirements.

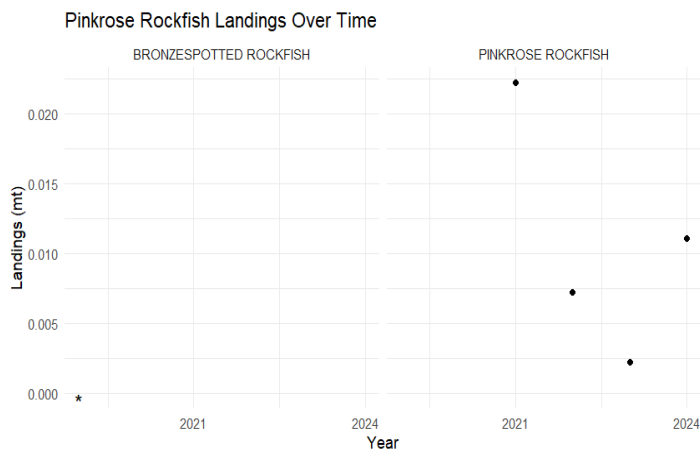


Figure 8-4b. Trends in non-Tribal commercial landings of pinkrose rockfish from 2015-2024. *2019 landings not shown due to confidentiality requirements.

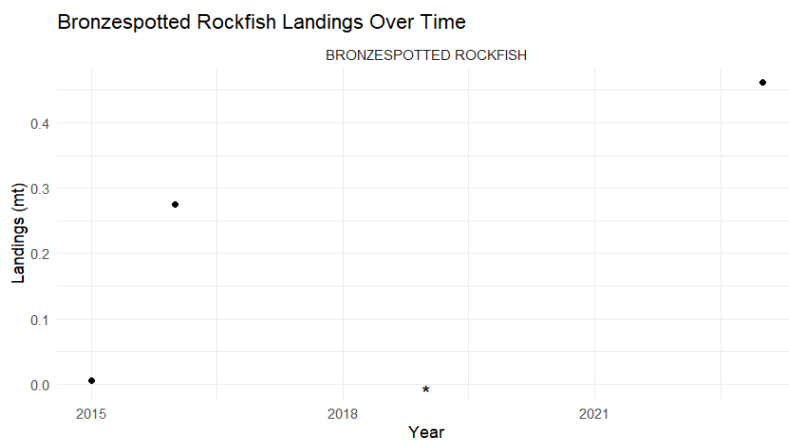


Figure 8-4c. Trends in non-Tribal commercial landings of bronzespotted rockfish from 2015-2024. *2015 landings are not shown due to confidentiality requirements.

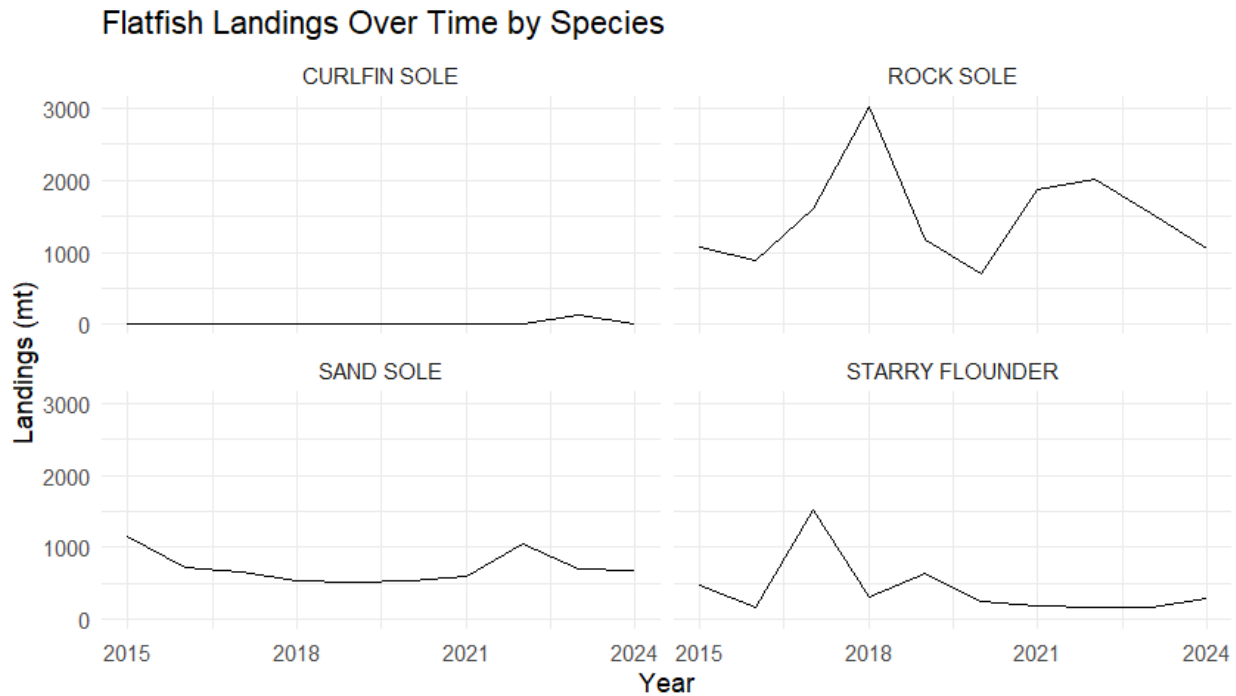


Figure 8-5. Trends in non-Tribal commercial landings of flatfish species from 2015-2024. Note, butter sole is not shown due to confidentiality requirements.

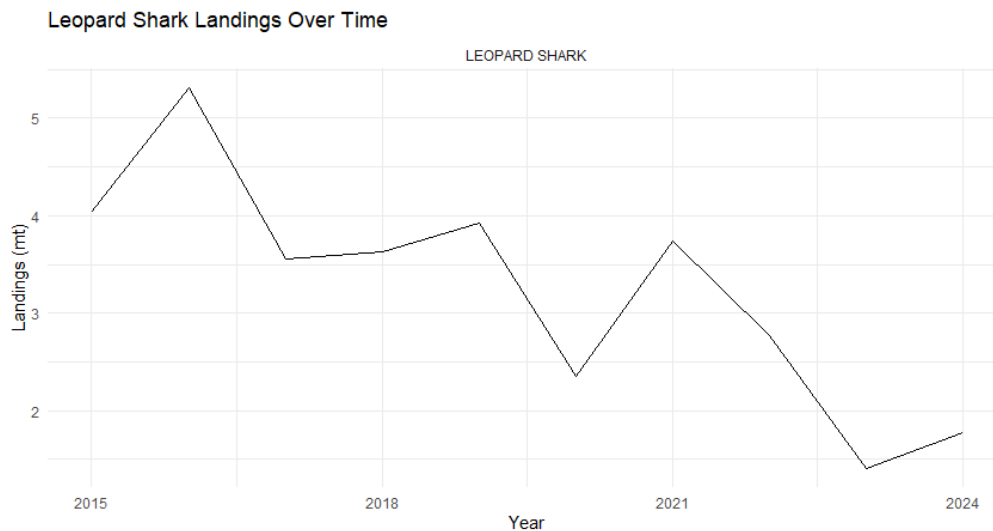


Figure 8-6. Trends in commercial landings of leopard sharks from 2015-2024.

Overall, the shallow nearshore, deeper nearshore, and flatfish species have seen patterns of steady, though oscillating, levels of commercial landings (China, gopher, grass, blue, brown, deacon, olive rockfishes, and cabezon, treefish, and butter sole); slightly declining commercial landings (black and yellow rockfish, kelp greenling, and curlfin sole); or sharply declining commercial landings (black rockfish, rock sole, sand sole, starry flounder), from 2015 through 2024. Oscillations in commercial landings indicate that there is no particularly developed market for any

of the species alone, but rather the species are interchangeable within a mixed-stock fishery and/or a generalized market. Declines in flatfish landings (Figure 8-5) reflect anecdotal evidence from regional processors that the market no longer facilitates a more highly utilized flatfish fishery (GAP members, pers. comm) and that historical exploitation of sand sole and starry flounder are not likely to increase in the near future. Landings of leopard shark have also largely declined in recent years (Figure 8-6). Landings of shallow shelf species have remained minimal over the last ten years, and while the plots may show spikes in landings in particular years (Figure 8-3), the scale of overall landings does not indicate a particular trend in utilization or fishery development. Commercial landings of deep shelf species have been minimal over the last ten years (Figure 8-3), with bronzespotted, pinkrose and tiger rockfishes seeing almost no landings (note, retention of bronzespotted rockfish is prohibited). Landings of greenblotched and Mexican rockfish saw an uptick starting in 2019, though this trend has already subsided for greenblotched rockfish, so it is unclear whether the pattern will persist for Mexican rockfish. The spike does coincide with increased access to deeper shelf areas for the mixed stock fishery. In the end, the trends (increasing and decreasing) in the commercial landings of the species evaluated in this document may be a factor of changing regulations, rather than the result of a market or other desire for utilization of a particular species.

Recreational landings (counts) were also analyzed over time, by species bin, to determine whether there are clear patterns of growth or other trends in utilization over the last 10 years. These trends are graphed in Figures 8-7 through 8-11 below.

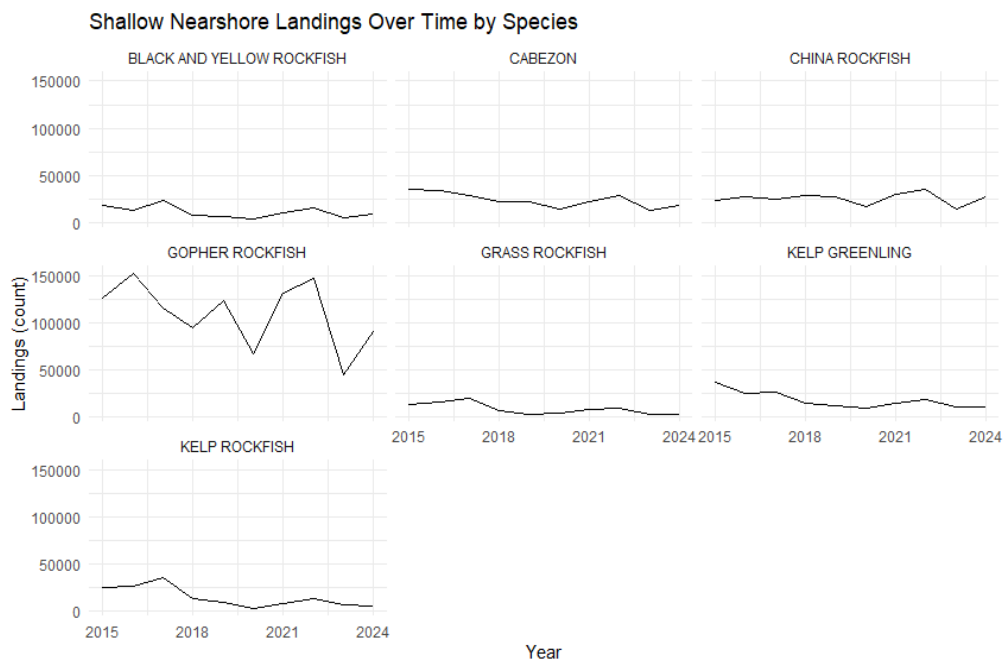


Figure 8-7. Trends in recreational landings of shallow nearshore species from 2015 to 2024.

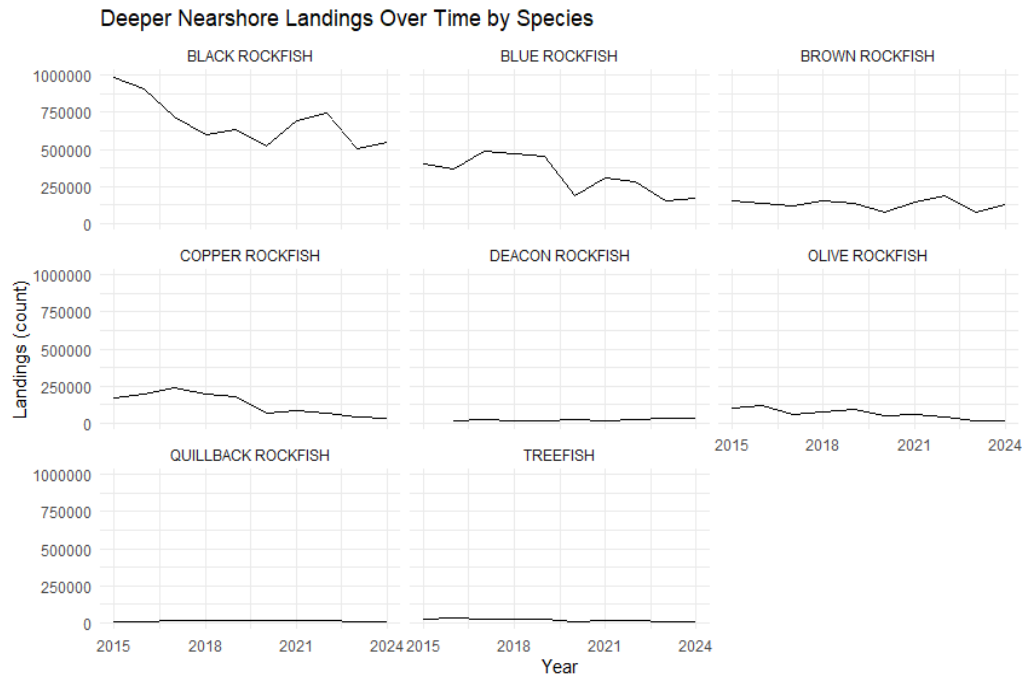


Figure 8-8. Trends in recreational landings of deeper nearshore species from 2015 to 2024.

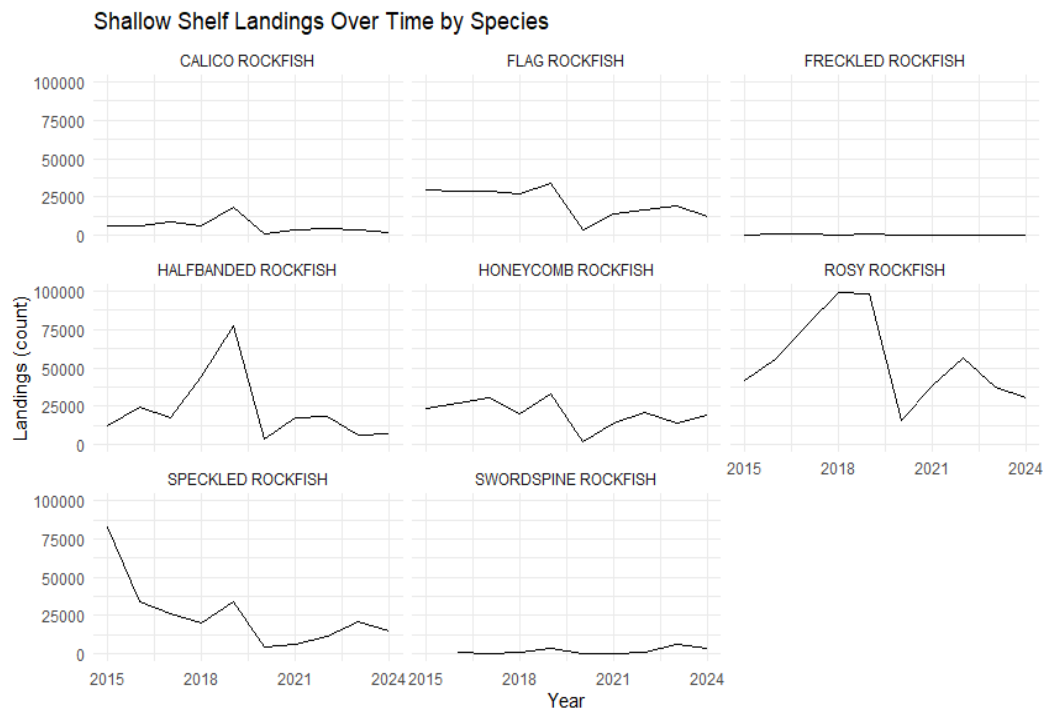


Figure 8-9. Trends in recreational landings of shallow shelf species from 2015 to 2024.

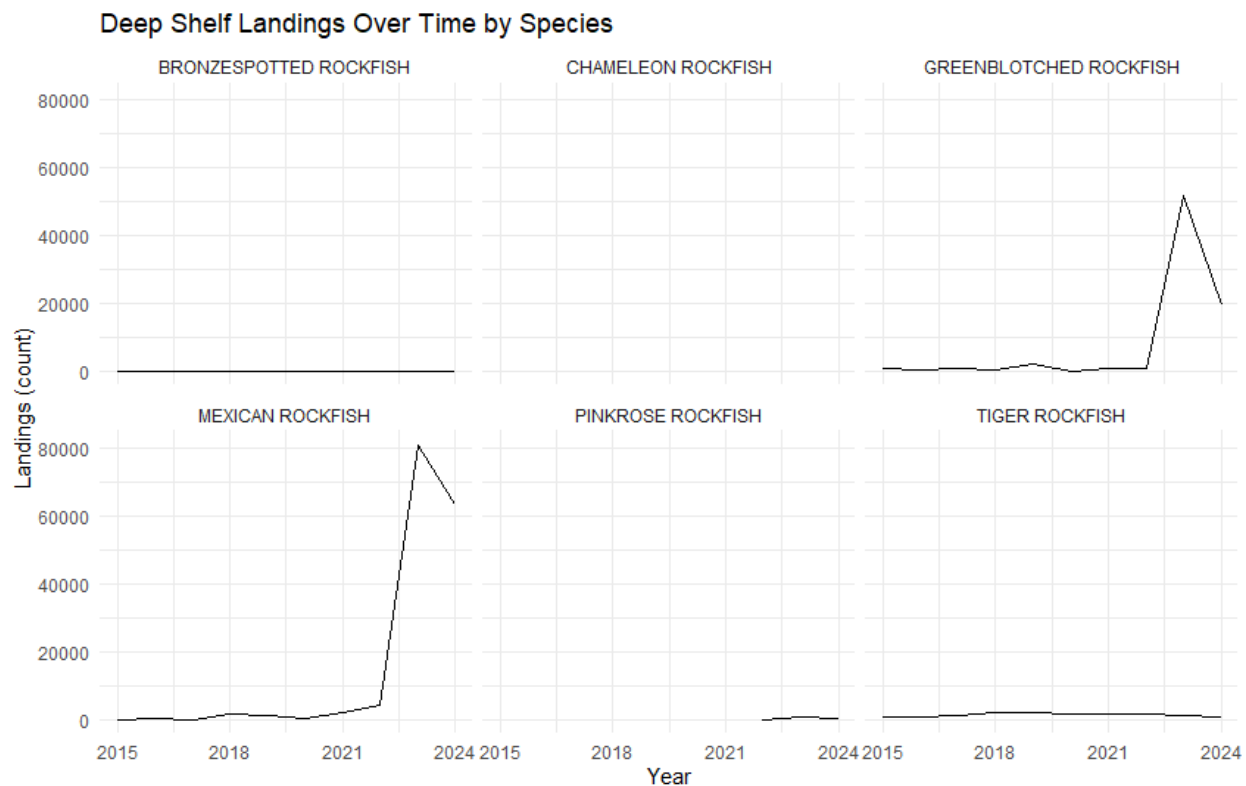


Figure 8-10. Trends in recreational landings of deep shelf species from 2015 to 2024. Note, pink rockfish is not included in figure, as no recreational landings available over time period.

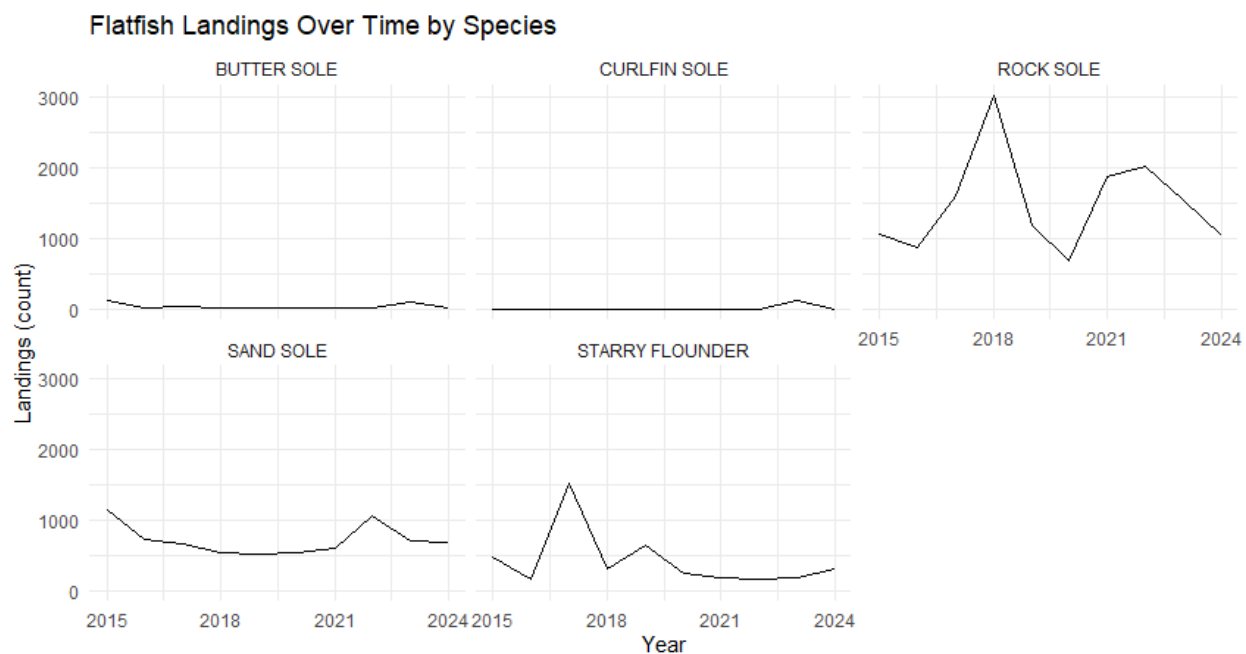


Figure 8-11. Trends in recreational landings of flatfish species from 2015 to 2024.

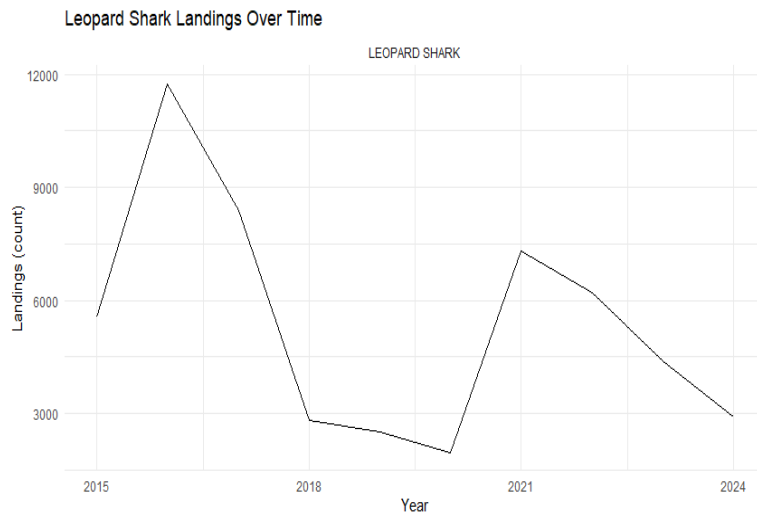


Figure 8-12. Trends in recreational landings of leopard shark from 2015 to 2024.

Recreational landings of many of the groundfish species evaluated herein remained relatively steady (brown, deacon, freckled, honeycomb, swordspine, bronzespotted, tiger rockfishes, and curlfin sole); showed oscillations, but no clear trend of increased or decreased utilization (black and yellow rockfish, China rockfish, gopher rockfish, sand sole, and leopard shark); or showed trends of decline (kelp greenling, black rockfish, blue rockfish, olive rockfish, and speckled rockfish), during the 2015 to 2024 period. Thus, an evaluation of recreational landings is not showing any clear patterns of growth, development, or other changes in utilization within the fishery in the recreational sector. Pinkrose rockfish saw almost no recreational landings over the time series. Landings of greenblotched and Mexican rockfish sharply increased in 2023, though it is unclear given the short time series whether this reflects a developing fishery or a one-off spike. Halfbanded rockfish, rosy rockfish, rock sole, and starry flounder have also seen spikes in landings, in various years over the time series, though none of these species show a consistent trend in changes in utilization. Therefore, as with the commercial sector, trends and changes year-to-year could be a result of changes in regulations, rather than a reflection of a desire to increase utilization of a particular species in the recreational sector.

3.8.2 3.8.2 Conclusions

Overall, no developing fisheries or areas for increased efficiency in utilization within the fishery were identified for any of the species evaluated in this analysis. While greenblotched and Mexican rockfish show recent spikes in landings, it is unclear whether this elevated mortality will be sustained and/or whether this short-term trend signifies a larger trend of a developing fishery for either of these species. The mixed-stock groundfish fishery is currently considered fully developed. Further, many diminutive rockfish in the mixed stock fishery are managed within stock complexes. Therefore, current management focuses on weak stocks and utilization of all individual species within the mixed stock fishery is not the overall management goal. Therefore, while some species may be minimally utilized (i.e., freckled rockfish or swordspine rockfish, among others), the FMP would not facilitate an increased net benefit were utilization of these species to increase.

Further, as discussed under Factors (ii) and (iii), for species principally caught in state waters any efforts to further utilize these species, or to develop a unique fishery, would need to occur principally in state waters. As described in the Factors (ii) and (iii) analysis, at the coastwide scale, the mortality for all species in the Shallow and Deeper Nearshore Bins is principally attributed to state waters. The FMP is therefore unlikely to provide more efficient utilization of the species in these bins with principal mortality in state waters, even if there were an opportunity. The mortality of the species in the Shallow and Deep Shelf Bins are principally attributed to the EEZ, except for calico, rosy, and tiger rockfishes. Based strictly on the area of mortality, except for the species noted, it is reasonable to conclude that the FMP could provide more efficient utilization of the species. However, based on the analysis presented here under Factor (viii), there is currently no potential for more efficient utilization. Dwarf-red and light dusky rockfishes have no recent fishery mortality (see Factors (ii) and (iii)). While there is a likelihood these species would have principally mortality in the EEZ, were they to be caught by the fishery and based upon their known range, the fact that they are not caught in the fishery means it is unlikely that continued management under the FMP would provide for more efficient utilization of these species. The majority of species in the Flatfish Bin have principal mortality in the EEZ, with the exceptions of rock and sand soles off of Washington, whose principal mortality is attributed to state waters. Based strictly on the area of mortality, except for the species noted, it is reasonable to conclude that the FMP could provide more efficient utilization of the species. However, based on the analysis presented here under Factor (viii), there is currently no potential for more efficient utilization. The mortality of leopard shark is principally attributed to state waters, with 3.3 percent of its mortality linked to the EEZ (see section 3.2.5). It is therefore not reasonable to conclude that the FMP would provide more efficient utilization of the species, even if there were opportunity, as management measures in the FMP are limited to fishing in the EEZ.

Finally, developments in the groundfish fishery that may facilitate future changes in the fishery in the EEZ, including changes in the utilization of certain species, like novel gear types, fishery innovation, or market changes, could still be monitored for future potential impacts on species, even were those species to be removed from the FMP under the the Phase 2 stock definitions action.

3.9 Factor (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.

Factor (x) applies to species that are already, in the current management landscape, managed under state programs, other Federal programs, or by Federal regulations pursuant to other FMPs or international commissions, or by industry self-regulation. Below, current management outside of the FMP is described, including any aspects of management that are already under state programs, other Federal programs, or by Federal regulations pursuant to other FMPs or international commissions.

3.9.1 Summary of State Programs

Current programs outside the Groundfish FMP that contribute to management of the West Coast groundfish fishery are summarized in Table 10-1, below. Generally, none of the species analyzed in this document are managed comprehensively, coastwide, by another program or institution. Because all species in this analysis are currently managed in the FMP, this analysis does not evaluate the efficacy of state or other programs.

Table 10-1. Summary of State management of commercial and recreational fisheries.

	California	Oregon	Washington
Recreational	<p>Ocean Sport Fishing License, bag limits, time and area closures, depth restrictions.</p> <p>Summary of Recreational Groundfish Fishing Regulations.</p>	<p>Oregon Angling License, bag limits, time and area closures.</p> <p>Sport bottomfish seasons Oregon Department of Fish & Wildlife</p>	<p>WDFW saltwater fishing license, bag limits, time and area closures, depth restrictions.</p> <p>Recreational bottomfish and halibut - Washington Department of Fish & Wildlife</p>
Commercial	<p>Area limits, trip limits by species, length requirements, Limited Entry Nearshore permits (shallow and deeper)</p> <p>Commercial Take of Nearshore Fishes.</p>	<p>Area limits, trip limits by species, Black and Blue Rockfish Permits WITH a Nearshore Endorsement and WITHOUT a Nearshore Endorsement</p> <p>Commercial Fishing Rules and Regulations - Nearshore Fisheries</p>	None

3.9.2 Nearshore Fishery Permits

California is the only West Coast state with a Nearshore Fishery Management Plan, which includes species in the Shallow and Deeper Nearshore Species Bins. For the recreational fishery, each state has state specific sport fishing licences, bag limits or sub-bag limits by species, and time and area closures. California and Oregon are the only states that have a nearshore commercial fishery, and both offer commercial limited entry nearshore permits (see Table 10-2 for details). Nearshore rockfish opportunity in Washington is limited to recreational fishing.

Species included in California's and Oregon's nearshore permit programs include those listed in Table 10-2 below. Species in this document's analysis included under California's two nearshore fishery permits include the species identified below, per the California Fish and Game Code §8586 (T14 CCR §1.90). These California permits comprise a limited entry program, with around 180 permits, not all of which are actively fished in a given year. The Oregon "Nearshore"

Permit covers the species included in this document's analysis that are identified below (OAR 635-004-0200, ORS 506.011). Without a nearshore permit, a vessel in Oregon waters is not able to 'target' nearshore species. Non-target catch is defined as allowing up to 15 pounds of incidental catch per landing, which can only be up to 25 percent of an overall landing.

Table 10-2. Summary of species in this document's analysis that are covered by nearshore permit programs in California and Oregon.

California Nearshore Permit Species	Oregon Nearshore Permit Species
<ul style="list-style-type: none"> • Black rockfish • Black and yellow rockfish • Blue rockfish • Brown rockfish • Cabezon • Calico rockfish • China rockfish • Copper rockfish • Gopher rockfish • Grass rockfish • Greenlings of the genus Hexagrammos, including kelp greenling • Kelp rockfish • Olive rockfish • Quillback rockfish • Treefish 	<ul style="list-style-type: none"> • Black and yellow rockfish • Brown rockfish • Cabezon • Calico rockfish • China rockfish • Copper rockfish • Gopher rockfish • Grass rockfish • Kelp greenling • Kelp rockfish • Olive rockfish • Quillback rockfish • Tiger rockfish • Treefish

3.9.3 Notable State Management Measures

Oregon and California have several closures and management measures in place that apply to species included in this analysis. The Oregon commercial nearshore fishery has utilized Black Rockfish Management Areas (BRMAs), as recently as 2021, to reduce potential conflicts between commercial and recreational sectors. While the BRMAs are currently suspended (2022-2025), they could be used again in the future. California also uses an area closure for commercial groundfish, from 42° N. Lat. to 37°07' N. Lat., from the 20fm line to the shoreward boundary of the EEZ. Retention of bronzespotted rockfish and quillback rockfish is also prohibited in California.

3.9.4 Conclusions

Overall, states provide complementary management measures to the Groundfish FMP to manage fishing for the species evaluated in this document, particularly through licensing, area closures, and species-specific restrictions. For example, Oregon and California nearshore permits cover the shallow and deeper nearshore species listed in Table 10-2. This analysis does not evaluate the adequacy of these state programs, however. Thus, we do not speculate as to whether species evaluated herein could or would be adequately managed by the states if removed from the FMP.

3.10 Other Considerations Beyond the §600.305(c) Factors

The 10-factor test in 50 CFR §600.305(c) is non-exhaustive. Indeed, the National Standard Guidelines at §600.305(c)(4) specifically provide that: “When considering removing a stock from, or continuing to include a stock in, an FMP, Councils should prepare a thorough analysis of factors in paragraphs (c)(1)(i) through (x) of this section, and any additional considerations that may be relevant to the particular stock.” This section reviews other considerations that may be relevant to those species currently managed in the Groundfish FMP, which are evaluated herein.

3.10.1 Vulnerability

An additional consideration to evaluate species under the action alternatives (i.e., to the question of whether a certain species should be retained in or removed from the FMP, or designated as an EC species) is the productivity, susceptibility, and vulnerability of each species. At their March 2025 meeting, the SSC recommended considering the results of the productivity-susceptibility analysis conducted in 2011 by Cope et al. when evaluating species as candidates for EC designation. In particular, the SSC noted that species with “low vulnerability” characterization were good candidates for EC designation (H.6.a Supplemental SSC Report 1, March 2025). Assessing the productivity, susceptibility, and vulnerability of the species evaluated in this analysis may therefore help to determine whether species are in need of conservation and management in the EEZ, based on their vulnerability characterization.

The terms productivity, susceptibility, and vulnerability 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), productivity 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 a 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.

It is important to state at the outset that the productivity and susceptibility analysis (PSA) used in this section is from the Cope et al. (2011) paper, which is more than a decade old. Cope et al (2011) conducted a PSA on all the managed groundfish species (as of 2011) at the coastwide scale and estimated vulnerability of these managed species. While this analysis is dated, the information is useful as adjunct information for Council consideration. The SSC suggested that in the absence of more updated information, the 2011 PSA analysis could be useful in the evaluation of species for designation as EC species (H.6.a Supplemental SSC Report 1, March 2025). There are key caveats to understand when considering these data, however. For example, some advances in the understanding of the productivity of each species may have occurred in the intervening time. Additionally, the susceptibility of each species to fishing may have changed since the paper was written. This information is brought forward in this analysis, however, as it has been noted multiple

times in Council, GMT, and SSC discussions, as data of interest in the decision making process for the larger Phase 2 stock definitions action.

In Table 11-1, vulnerability scores are used, by species bins, to indicate a species' level of concern.

Table 11-1. 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/Bin	P	S	V	Species/Bin	P	S	V
Shallow Nearshore				Deeper Shelf			
Black and yellow rockfish	1.89	2.29	1.70	Bronzespotted rockfish	1.22	2.16	2.12
Cabazon	1.72	2.08	1.68	Chameleon rockfish	1.39	2.24	2.03
China rockfish	1.33	2.48	2.23	Greenblotched rockfish	1.28	2.24	2.12
Gopher rockfish	1.56	2.00	1.76	Harlequin rockfish a/	1.31	1.95	1.94
Grass rockfish	1.61	2.29	1.89	Mexican rockfish	1.50	2.00	1.80
Kelp rockfish	1.83	2.12	1.62	Pink rockfish	1.33	2.14	2.02
Kelp greenling	1.83	2.04	1.56	Pinkrose rockfish	1.31	1.67	1.82
Treefish	1.67	2.02	2.05	Tiger Rockfish	1.25	2.10	2.06
Deeper Nearshore				No Mortality			
Black rockfish	1.33	2.00	1.94	Light dusky rockfish	1.28	0.00	1.99
Blue/Deacon rockfish	1.39	2.20	2.01	Dwarf-red rockfish	1.83	0.00	1.54
Brown rockfish	1.61	2.43	1.99	Flatfish			
Calico rockfish	1.75	1.76	1.46	Butter sole	2.45	2.05	1.18
Copper rockfish	1.36	2.57	2.27	Curlfin sole	2.45	2.10	1.23
Olive rockfish	1.69	2.33	1.87	Rock sole	1.95	1.95	1.42
Quillback rockfish	1.31	2.43	2.22	Sand sole	2.35	2.05	1.23
Shallow Shelf				Starry flounder	1.25	2.14	2.09
Flag rockfish	1.33	2.05	1.97	Leopard Shark			
Freckled rockfish	1.78	1.76	1.44	Leopard shark	1.26	2.00	2.00
Halfbanded rockfish	2.00	1.76	1.26	-	-	-	-
Honeycomb rockfish	1.36	2.10	1.97	-	-	-	-
Pygmy rockfish	1.78	1.71	1.42	-	-	-	-
Rosy rockfish	1.61	2.29	1.89	-	-	-	-
Speckled rockfish	1.33	2.29	2.10	-	-	-	-
Swordspine rockfish	1.33	2.00	1.94	-	-	-	-

Of the species evaluated in this document, 3 species were identified as of major concern, 11 are identified as of high concern, 12 are identified as of medium concern, and 14 are identified as of

low concern. These PSA scores, on their own, and when integrated with the findings of Factor (ii), may help to inform the analysis of whether a species is vulnerable to the fishery.

The 3 species in the major concern category (China, copper, and quillback rockfishes) have principal mortality in state waters off of California and Oregon, therefore, based on the area of principal mortality, the FMP is unlikely to change the potential for overfishing and/or for these species to become overfished. However, off of Washington, principal mortality of these species is attributed to the EEZ and it is therefore reasonable to conclude that these species are highly vulnerable to the fishery, particularly off Washington. The SSC has recommended that species with high vulnerability not be considered for EC designation. However, the PSA did not account for the principal area of mortality, which should also be taken into account in determining whether a species is vulnerable to the fishery in Federal waters and in need of conservation and management in the EEZ.

There are 11 species in the high concern category: treefish, blue/deacon rockfish, speckled rockfish, bronzespotted rockfish, chameleon rockfish, greenblotched rockfish, pink rockfish, tiger rockfish, starry flounder, and leopard shark. Of these, 6 species have principal mortality in the EEZ - bronzespotted, chameleon, greenblotched, pink, speckled and tiger rockfish.⁵ Based on the area of catch, it is reasonable to conclude that these species may have high vulnerability to the fishery in Federal waters. The other four species in this category (blue/deacon rockfish, leopard shark, starry flounder, and treefish) do not have principal mortality in the EEZ and thus, while they may be vulnerable to a fishery, this fishery is principally located in state waters. As described above, the SSC has recommended that species with high vulnerability not be considered for EC designation. However, the PSA did not account for the principal area of mortality, which should also be taken into account in determining whether a species is vulnerable to the fishery in Federal waters and in need of conservation and management in the EEZ.

There are 12 species in the medium concern category: grass, black, brown, olive, flag, honeycomb, rosy, swordspine, harlequin, Mexican, pinkrose, and light dusky rockfishes. Of these 12 species, 8 species - flag, harlequin, honeycomb, light dusky, Mexican, pinkrose, rosy, swordspine rockfishes - have principal mortality attributed to the EEZ coastwide. Black rockfish off of Washington also have principal mortality attributed to the EEZ. Based on the area of catch, it is therefore reasonable to conclude that these species may be somewhat vulnerable to the fishery.

There are 14 species in the lowest concern category: black and yellow rockfish, cabezon, gopher rockfish, kelp rockfish, kelp greenling, calico rockfish, freckled rockfish, halfbanded rockfish, pygmy rockfish, dwarf-red rockfish, butter sole, curlfin sole, rock sole, and sand sole. Further, only 4 of the 14 species in the lowest concern category have principal mortality in the EEZ: dwarf-red, freckled, halfbanded, and pygmy rockfishes. As the SSC has suggested, species with low vulnerability may not be in need of conservation and management, and depending on their context in the rest of the §600.305(c) 10 Factor analysis, may therefore be better candidates for EC designation or removal from the FMP.

⁵ At the coastwide scale, only for Oregon and Washington at the state scale for Tiger rockfish

As a note, neither dwarf-red nor light dusky rockfish have mortality in the fishery in at least the past 21 years (NMFS, 2023). While these species have medium and low vulnerabilities per the PSA, and are principally linked to the EEZ by the science on their ecological ranges, there are no reference points to understand their status or inform management.

4 Synthesis of Factor Analysis

In this section, the overall conclusions for Factors (i) through (x) are synthesized to assist the Council in their decision on a preferred alternative for each species. As stated in the introductory materials, the National Standard Guidelines provide, at 50 CFR §600.305(c)(3), that “no single factor is dispositive or required. 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.” Further, as described in the analytical framework, for any conclusions made under each species, it is important to consider what the Council and the FMP could actually achieve within the boundaries of its jurisdiction. The FMP is a tool that may be used to manage groundfish species in need of conservation and management; however, such management is limited – concurrent with the limitations on Federal jurisdiction – to Federal waters (i.e., within the EEZ).

The National Standard Guidelines at §600.305(c)(4) state that Factors (i) – (iii) should be considered first when councils consider whether species are in need of conservation and management in the EEZ. The Guidelines next direct councils to consider Factors (iv) – (ix), which set forth key economic, social, or other reasons which, if answered positively, would argue for maintaining a stock within a FMP. Following this stepwise process, and based on the analysis provided in sections 3.1 through 3.9, this synthesis is presented for the Council to consider recommending a PPA for each species.

The synthesis below evaluates the §600.305(c) factors on a species-bin basis, discussing specific species where appropriate. The species-bin analysis focuses on the application of Factors (ii) and (iii) and Factors (iv) through (vi) to the species in each species bin. Before tackling the species-bin analysis, we discuss Factors (i), (vii), (viii), (ix) and (x) as applied to all 40 of the groundfish species currently managed in the FMP that are evaluated in this document. For these Factors (i), (vii), (viii), (ix) and (x), we have concluded that the analysis and conclusions are generally equivalent across all 40 species, as described below.

Regarding Factor (i), the species in this analysis occupy a diverse range of habitats, depths, and a multitude of benthic habitats and serve both as predator and prey to several fishes, including rockfishes themselves, marine mammals, and seabirds. Overall, the species are all considered important components of the marine environment. As mentioned in the above analysis, however, some species of groundfish 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 the overall importance of groundfish as a whole. In sum, Factor (i) may support finding species evaluated in this document to be in need of conservation and management.

Regarding Factor (vii), inclusion of the species in this analysis for management through the FMP, taken broadly, may provide benefits in the form of the mitigation and resolution of conflicts between user groups. The FMP and the Council process provide an avenue for communication, stakeholder input, and inclusion of the best scientific information available in the conservation and management of these species. However, this benefit of the FMP may be limited (or even unnecessary) for the species in this analysis, as conflicts between user groups more often than not

occur (and are resolved) in state waters, and Factor (vii) may therefore support the removal of most of the species from the FMP. Overall, analysis of Factor (vii) does provide support either in favor or against finding the species evaluated in this document to be in need of conservation and management.

Regarding Factors (viii) and (ix), no developing fisheries or areas for increased efficiency were identified for the groundfish species in this analysis. The West Coast groundfish fishery is considered fully developed, and focuses on management of weak stocks rather than individual utilization of every species. Therefore, Factors (viii) and (ix) do not support finding any of the species included in this analysis to be in need of conservation and management. The Council may, however, wish to monitor any future development of new gear types or other fishery innovation (consistent with the prohibitions at 50 CFR §600.725(v)), which could alter species utilization within the EEZ in the future. Mexican and greenblotched rockfish may be particular species to monitor, given recent spikes in mortality.

Regarding Factor (x), several state programs currently contribute to the overall management of species included in the West Coast groundfish fishery, particularly nearshore species. Given that all of the species included in this analysis are currently managed within the FMP, however, this analysis does not evaluate the adequacy of these programs. Our analysis of Factor (x), and the existence of state nearshore programs, therefore, neither weighs in favor or against finding the species evaluated in this document to be in need of conservation and management. Further, the analysis does not intend to speak to the states' ability to adequately manage the species evaluated in this document were they removed from the FMP.

4.1 Shallow Nearshore Bin

Following the Guidelines at §600.305(c)(4), Factors (ii) and (iii) weigh against finding the species in the Shallow Nearshore Bin to be in need of conservation and management in the EEZ. Analysis of Factor (ii) indicates that the species in this bin are not caught by the fishery, as their mortality in the EEZ is significantly less than the 25 percent threshold. At the state scale, all species, except China rockfish off of California, have less than 10 percent of their mortality attributed to the EEZ. China rockfish has 12 percent of its mortality attributed to the EEZ off of California. The Factor (iii) analysis further indicates that management under the FMP cannot maintain or improve the condition of the species in this bin, as the effects of any management processes contained in the FMP would be limited to a minor portion of the species' range and mortality. As these species' principal mortality occurs in state waters, Federal management would do little to change the condition of these species.

Next, Factors (iv), (v), and (vi) weigh against finding that the species of the Shallow Nearshore Bin require conservation and management in the EEZ. In terms of Factor (iv), while shallow nearshore species are targeted within the context of the mixed-stock fishery, these species are not individually targeted or exclusively retained. Further, under Factor (v), the species within the Shallow Nearshore Bin that are identified as important to the fishery include only black and yellow rockfish, gopher rockfish, cabezon, and kelp greenling. Meanwhile, the analysis for Factor (vi) indicated that only gopher rockfish contributed significantly to the regional economic benefit derived from the groundfish fishery through revenue and landings. The Tribes did, however,

identify cabezon and kelp greenling as important species to Tribal commercial and subsistence fisheries. Next, given that the outcomes of the analysis of Factors (iv) through (vi) should be weighed in the context of Factors (i) through (iii), the analysis of Factors (iv) through (vi) should also consider whether Federal management would support increased access to the species under evaluation. And, since all of the species in the Shallow Nearshore Species Bin that are identified as ‘important’ or ‘targets’ are also principally caught in state waters (not in the EEZ), we conclude that there is little the FMP could do to effectively constrain landings and prevent overfishing.

4.2 Deeper Nearshore Bin

Based on the analysis contained herein, Factors (ii) and (iii) weigh against finding the species in the Deeper Nearshore Species Bin to be in need of conservation and management in the EEZ. Except for black, copper, and quillback rockfishes off of Washington, mortality for the species in the Deeper Nearshore Species Bin is principally in state waters based on the 25 percent threshold. Thus, with the exceptions noted, these species are not considered caught by the fishery (Factor (ii)). Washington black, copper, and quillback rockfishes have mortality principally attributable to the EEZ and could be considered caught by the fishery. Off California and Oregon, principal mortality of black, copper, and quillback rockfishes and other deeper nearshore species is in state waters; thus, as summarized under Factor (x), Oregon and Washington have historically managed these and other nearshore rockfish species. This suggests that Federal management may be appropriate for black, copper, and quillback rockfishes off of Washington, but not off California and Oregon. While the analytical results in Washington may seem inconsistent with the Oregon and California findings, it is likely the biogeography off of coastal Washington that drives the differences, rather than differences in fishing strategies, as described in the analysis under Factor (ii).

Based on the analysis of Factor (iii), the FMP cannot maintain or improve the condition of the majority of the species in this bin, as they are principally caught in state waters and any management measures within the FMP are limited to the EEZ. The exceptions to this are black, copper, and quillback rockfishes off of Washington. As they are principally caught in the EEZ, it is reasonable to conclude that the FMP could maintain or improve their condition.

Of special note, California quillback rockfish has just slightly above 20 percent of its total combined fishery sector mortality attributed to the EEZ, which is below the 25 percent threshold used to determine area of principal mortality. Therefore, under the threshold it is not considered caught by the fishery. This finding gives rise to the question of whether continued Federal management would be appropriate to maintaining or improving the California stock of quillback rockfish as management measures in the FMP are limited to fishing activity in the EEZ (Factor (iii)). While the status of California stock of quillback rockfish is of the major concern category, in regards to the species’ vulnerability to being overfished or undergoing overfishing (see Section 3.10, other considerations), the majority of the species’ mortality is attributed to state waters. Management measures in the FMP and the rebuilding plan for California quillback rockfish are limited to the portion of its range found in the EEZ. Therefore, as noted in the Environmental Assessment and MSA Analysis for the 2025-2026 Harvest Specifications and Management

Measures (Amendment 33 to the Groundfish FMP)⁶, which implemented the California quillback rockfish rebuilding plan, whether the rebuilding plan could be achieved would depend on the State of California implementing management in its waters to complement that federal action. The Council and NMFS only have the authority to implement fishery management regulations in federal waters, and the State of California has discretion to implement management complementary to federal action, or other management actions, in its state waters. Therefore, the California quillback rockfish rebuilding plan is only in effect in the EEZ, and, because this is a trans-boundary stock with principal mortality in state waters, whether or not rebuilding can be achieved depends on the State of California implementing management in its waters.

Analysis of Factors (iv) through (vi), as applied to species in the Deeper Nearshore Bin, weigh in favor of the finding that the species in this bin are in need of conservation and management in the EEZ. In the analysis of Factor (iv), black rockfish, copper rockfish, blue rockfish, deacon rockfish, brown rockfish, and treefish were each identified as target species. Further, the analysis of Factor (vi) emphasized the contributions these species make to the regional recreational sector. The Tribes have also identified black, blue, deacon, and brown rockfish as important to Tribal commercial and subsistence fisheries. Therefore, as these species are considered important to both individual fishery participants (Factor (v)) as well as to the West Coast region as a whole, under these factors, there may be rationale to retain these species in the Groundfish FMP. Treefish, though not identified as individually targeted or important through the analysis of Factors (iv) through (vi), may be considered for retention in the FMP due to their presence in a mixed-stock fishery that values the important, target species above. The relative importance of deeper nearshore species as identified under Factors (iv) through (vi) must, however, be weighed with the findings of the analyses of Factors (ii) and (iii), which identified all but a few of these species as not caught in the fishery nor capable of being maintained or improved through management under the FMP. In the end, given that black, copper, and quillback rockfish do show principal mortality in the EEZ off Washington, the FMP may be an appropriate tool to manage these species and the economic benefits they contribute to the commercial and recreational sectors. However, for blue rockfish, deacon rockfish, and brown rockfish, the FMP would have less influence on these species since commercial and recreational fishery participants are principally accessing these species in state waters.

Overall, all ten factors should be considered when determining whether the species in the Deeper Nearshore Bin are in need of conservation and management in the EEZ, and these factors should be weighted in accordance with the recommendations outlined in §600.305(c). Taken together, while Factors (ii) and (iii) do not support a finding that the majority of the deeper nearshore species are in need of conservation and management in the EEZ (with the exception of black, copper, and quillback rockfishes off of Washington), other social and economic considerations highlighted in Factors (iv) through (vi) provide compelling rationale that supports continued management in the FMP. Consistent with the guidance at §600.305(c), however, Factors (i) - (iii) “weigh heavily” in this analysis and “should be considered first”. See 50 C.F.R. §600.305(c)(3) and (c)(4).

⁶ [Amendment 33](#) to the Pacific Coast Groundfish Fishery Management Plan, 2025-26 Harvest Specifications, and Management Measures.

4.3 Shallow Shelf Bin

Consideration of Factors (ii) and (iii) weigh in favor of finding all of the species in the Shallow Shelf Species Bin to be in need of conservation and management in the EEZ, except for calico and rosy rockfishes. For calico and rosy rockfish, these factors weigh against requiring conservation and management in the EEZ because those species do not have principal mortality in the EEZ. To be specific, the Factor (ii) analysis indicates that eight of the ten shallow shelf bin species are caught by the fishery as they have principal mortality in the EEZ. Calico and rosy rockfishes (off of California only) however have 17 and 23 percent, respectively, of their total sector mortality attributed to the EEZ. Calico rockfish is therefore considered not caught by the fishery, when applying the 25 percent threshold, as its principal mortality is in state waters. Rosy rockfish is on the cusp of the 25 percent mortality threshold in Federal waters off California. It has *de minimis* catch, however, in the EEZ off Oregon. Based on the area of mortality analysis of Factor (ii), the Factor (iii) evaluation indicates that, with the exception of calico rockfish and possibly rosy rockfish, the FMP could maintain or improve the condition of the species in this bin through its harvest specification framework. The 25 percent threshold captures only the relative amount of catch in Federal and state waters, however, and does not account for the total amount of catch for a species, which, for many of the species in the Shallow Shelf Bin, is minimal. There is also a paucity of information available regarding the species in this bin, which draws into question how effective the FMP could be at maintaining and/or improving their condition. Accordingly, the Council should consider the *de minimis* mortality of calico, pygmy, freckled, and swordspine rockfishes in the EEZ, and the extent of information available on a species, as important factors in determining whether these species could be effectively, and thus should be actively, managed in the FMP.

Regarding Factors (iv) - (vi), there is support for the finding that none of the species in this bin require conservation and management in the EEZ. These shallow shelf species are not considered targets in the nearshore or recreational sectors, though some may co-occur with target species in the fishery. Most, however, are too small to be retained and are therefore discarded; resulting in the *de minimis* mortality of calico, pygmy, freckled, and swordspine rockfishes, as described above. With *de minimis* catch of these species, there is little importance to commercial, recreational or subsistence users, and little economic contribution to the commercial or recreational sectors on a regional scale.

4.4 Deep Shelf Bin

The Factor (ii) analysis indicates that the species in the Deep Shelf Species Bin, have principal mortality in the EEZ based on the 25 percent threshold and are therefore considered caught by the fishery. One exception to this generalization is that tiger rockfish off of California and Oregon have 24.2 percent and 15.4 percent of its mortality attributed to the EEZ, respectively, and are therefore considered not caught by the fishery based on the 25 percent threshold. Off of Washington, however, 67 percent of tiger rockfish's mortality is attributed to the EEZ and it is therefore considered caught by the fishery and on a coastwide scale tiger rockfish does have principal mortality in the EEZ. An important note about the species in this bin is that only greenblotched and Mexican rockfish have mortality in the EEZ exceeding 0.1 mt. Because the Factor (ii) question of whether a species is caught by the fishery should account for not only the

relative catch between Federal and state waters, but also the total amount of a species caught in the EEZ, the *de minimis* mortality of chameleon, harlequin, pink, pinkrose, and bronzespotted rockfishes in the EEZ is an important consideration, with respect to whether these species require conservation and management in Federal waters, and could weigh heavily in the Council's consideration of whether the species should be actively managed in the FMP. Based on the goals and objectives of the FMP, its jurisdictional boundaries, and the fact that the principal area of mortality for many of the species in this bin is in the EEZ (Factor (ii)), the FMP would be expected to improve or maintain the condition of many of the deep shelf species (Factor (iii)), with the exception of tiger rockfish off California and Oregon. The *de minimis* mortality of chameleon, harlequin, pink, pinkrose, and bronzespotted rockfishes in the EEZ is also an important consideration for this factor, however.

Analysis of Factors (iv) - (vi) weigh against all of the species in this bin being found to require conservation and management in the EEZ, with particular caveats for tiger, greenblotched, and Mexican rockfishes to consider. Like the shallow shelf species, most of the deep shelf species are not considered targets or important in the nearshore or recreational sectors, though some may co-occur with target species in the fishery. Tiger rockfish was the one deep shelf species identified as an aesthetically valued recreational target. Except for greenblotched and Mexican rockfish, however, the deep shelf species have *de minimis* mortality in the EEZ; a result of these species being too small to be valued or retained in the commercial sector, and too rare to be consistently encountered in the recreational sectors. This *de minimis* mortality applies to tiger rockfish, despite its aesthetic value. With such low landings, the deep shelf species cannot be considered important to commercial, recreational or subsistence users, or to the region or the Nation, as these species amount to close to zero contributions to regional revenue and/or landings.

4.5 Flatfish Bin

Analysis of Factors (ii) and (iii) weigh in favor of finding butter sole, curlfin sole, and starry flounder to be in need of conservation and management in the EEZ. The Factor (ii) analysis indicates that the mortality for all the flatfish species, except for rock and sand soles off of Washington, is principally attributed to EEZ, based on the 25 percent threshold. These species are therefore considered caught by the fishery. Rock and sand soles off of Washington have *de minimis* mortality and have principal mortality in state waters. These species are therefore not considered caught by the fishery. The Factor (iii) analysis indicates that the FMP is likely to improve or maintain the condition of the species in the flatfish bin, except for rock and sand soles off of Washington. Those two species have principal mortality, albeit low, in state waters.

Factors (iv) through (vi), weigh in favor of finding that the flatfish species do not require conservation and management in the EEZ. Flatfish are not considered directed target species in either commercial or recreational sectors on the West Coast. While there may have been a target fishery for butter sole, sand sole, and starry flounder in the early 2000s, a decline in market demand explains the low and non-target catch of these species in the present. Without a present demand, these species are not deemed important to commercial, recreational or subsistence users, and do not make significant contributions to the regional economy or to fishery participants or fish processors. The Tribes did, however, identify rock sole and sand sole as species important to Tribal fisheries, which should be considered.

4.6 No Mortality Bin

Overall, the §600.305(c) analysis weighs against finding the species in the No Mortality Bin to be in need of conservation and management in the EEZ.

The Factor (ii) analysis could not be completed with certainty for these species, as dwarf-red rockfish have never had recorded mortality in the fishery and the last time light dusky rockfish had recorded mortality was in 2003 (Sommers et al, 2024), when its catch was less than 0.01 mt. The PSA analysis in the other considerations section (see Section 3.10) indicates that dwarf-red and light dusky rockfishes have medium and low vulnerability to overfishing, respectively. However, that finding is based on a paucity of data regarding their susceptibility to fishing and is therefore highly uncertain. Overall, it is reasonable to conclude that the FMP cannot improve or maintain the condition of these species, as there are no reference points to understand their biological status.

With no recent recorded catch, dwarf-red and light dusky rockfish cannot be considered targets of the fishery, or as important to fishery users or the regional economy. However, it should be noted that the same analysis under Factors (iv) through (vi) could not be applied to dwarf-red or light dusky rockfish as applied for the rest of the species included in this document, due to the lack of available data. Still, it is clear that with no recorded mortality in the fishery within the last 21 years, and thus no recorded revenue resulting from dwarf-red or light dusky rockfish catch during this time period, Factors (iv) through (vi) indicate that these species do not require conservation and management in the EEZ.

4.7 Leopard Shark

Factors (ii) and (iii) weigh against finding leopard shark to require conservation and management in the EEZ. Under the Factor (ii) analysis, leopard shark mortality was determined to occur principally in state waters, and therefore it is found to not be caught by the fishery. Under the Factor (iii) analysis, the ability of the FMP to improve or maintain the condition of this species is limited, as the principal mortality occurs in state waters.

Factors (iv) through (vi) provide further support to find that leopard shark does not require conservation and management in the EEZ. While the analysis of Factor (iv) shows that leopard shark is a target species in California, it is not targeted in either Oregon or Washington. Further, while this species is targeted off California, analysis under Factor (ii) demonstrates that this occurs principally in California state waters. In addition, under the analysis of Factors (v) and (vi), leopard shark was not identified as important to commercial or recreational fishery participants, or to the regional economy on the West Coast.

5 Stock Definitions

After completing the 10-factor analysis for the species evaluated in this document, some species may be determined to be in need of conservation and management in the EEZ, and as such would be identified for the PPA under Alternative 1. As described in Section 1.5 of this document, Alternative 1 comprises two parts and therefore adopting Alternative 1 as the PPA for any species contains two decision points. First, those species currently managed under the FMP (and their stocks) that are identified as PPA under Alternative 1 would be evaluated to determine whether they are in need of conservation and management in the EEZ. This need would be evaluated via the 10-factor analysis described above, and those species in need of conservation and management in the EEZ will remain in the FMP and continue to be actively managed by the Council. For those species, three stock definition Options would be considered under Alternative 1, for those stocks of species which have not previously been defined. 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.

Development of the draft stock definition options for the species evaluated in this document was informed using the literature review ([Agenda Item I.8, Attachment 3, September 2024](#)) and previous actions related to stock definitions. The options shown are reflective of stock structure. There are two overarching themes for the stock definition options: 1) an aggregated alternative (i.e., coastwide) and 2) disaggregated alternatives (e.g., state by state, north & south of 40°10' N. lat., etc.). Those species with stock structure are more likely to have multiple options; whereas, those species without structure or have unknown structure are likely to have fewer alternatives. As indicated by the literature review, stock structure for many groundfish is largely unknown. For these species, a default definition of Option 1, single area, single stock, is proposed. The area is based on the range of the species

The Council may consider additional stock definition options for these species, as appropriate. Each Option is designed to define the stock and allow NMFS to determine stock status, i.e., overfished/not-overfished and depletion relative to the management target (B_{MSY}) and the minimum stock size threshold (MSST), as described in Sections 4.3 through 4.5 of the FMP. For the purpose of status determination, the stock definition is the scale at which NMFS will determine stock status (i.e., “overfished”/“not overfished” and depletion relative to biomass reference points). Assessment results and harvest specifications OFL/ABC/ACL would be reported at the geographic scale of the stock

Table S-1 provides the draft stock definition Options for Council consideration, based on the information on the 40 species found in Table S-2, which provides additional information for considerations related to stock delineations. All species shown are categorized under Option 1 or Option 1 and 2. The Council could choose to consider other delineations based on their management policy.

Stocks of species defined through either Amendment 31 or 35 are omitted from the tables. The species shown are those that were not part of A31 or A35.

Option 1: A single stock, single area within the Fishery Management Unit (FMU). A single stock means there is no evidence of or unknown stock structure. The stock unit could be coastwide or limited to a single state based on its known range.

Option 2: Two Stocks within the FMU, delineated by specific latitude (e.g., north/south of 42° N. lat., north/south of 40°10' N. lat., etc.

Option 3: Three Stocks within the FMU, delineated at state boundaries (e.g., a California stock, an Oregon stock, and a Washington stock) and/or latitudes. Each species is defined as a state-specific stock, i.e., a California stock, an Oregon stock, and a Washington stock.

Table S-1. Potential stock definitions options (Opt) for species included in this document. Species previously defined are not shown. Population structure (Pop. Struct.) is denoted by U = unknown, Y = yes, or N = no. Options relevant to species are noted by an “*”. Source: Agenda Item I.8, Attachment 1, September 2024. Stocks of black rockfish, copper rockfish, and quillback rockfish have already been defined, through Amendment 31, and are therefore not considered for definition in this action and are not included in the table below.

Species	Pop. Struct	Opt 1	Opt 2	Opt 3	Proposed Stock Delineations	Notes
Black and yellow rockfish a/	Y	*	*		Opt 1 Coastwide or California/Oregon or Opt 2 California and Oregon	Range = CA & OR
Blue rockfish a/	Y	*	*	*	Opt 1 Coastwide, Opt 2 N/S of 42° N. lat. Opt 3 state-specific,	
Bronzespotted rockfish	U	*			Opt 1 Coastwide or California-only	Range = CA
Brown Rockfish a/	Y	*	*	*	Opt 1 Coastwide, Opt 2 N/S of 42° N. lat. Opt 3 state-specific,	
Butter sole	U	*			Opt 1 Coastwide	
Cabazon	Y	*	*	*	Opt 1 Coastwide, Opt 2 N/S of 42° N. lat. Opt 3 state-specific,	
Calico rockfish a/	Y	*			Opt 1 Coastwide or California-only	Range = CA
Chameleon rockfish	Y	*			Opt 1 Coastwide or California-only	Range = CA
China rockfish a/	Y	*	*	*	Opt 1 Coastwide, Opt 2 N/S of 42° N. lat. Opt 3 state-specific,	
Curlfin sole	U	*			Opt 1 Coastwide	
Deacon rockfish a/	Y	*	*	*	Opt 1 Coastwide, Opt 2 N/S of 42° N. lat. Opt 3 state-specific,	
Dwarf-red rockfish	U	*			Opt 1 Coastwide or California-only	Range = CA
Flag rockfish	U	*			Opt 1 Coastwide or California/Oregon or Opt 2 California and Oregon	Range = CA & OR
Freckled rockfish	U	*			Opt 1 Coastwide or California-only	Range = CA
Gopher rockfish a/	Y	*	*		Opt 1 Coastwide or California/Oregon or Opt 2 California and Oregon	Range = CA & OR
Grass rockfish a/	Y	*	*		Opt 1 Coastwide or California/Oregon or Opt 2 California and Oregon	Range = CA & OR
Greenblotched rockfish	U	*			Opt 1 Coastwide	
Halfbanded rockfish	U	*			Opt 1 Coastwide	
Harlequin rockfish	U	*	*		Opt 1 Coastwide or Oregon/Washington. Opt 2 Oregon, and Washington	range = OR & WA
Honeycomb rockfish	U	*			Opt 1 Coastwide or California-only	Range = CA
Kelp greenling	Y	*	*	*	Opt 1 Coastwide, Opt 2 N/S of 42° N. lat. Opt 3 state-specific,	
Kelp rockfish a/	Y	*	*		Opt 1 Coastwide or California/Oregon or Opt 2 California and Oregon	Range = CA & OR
Light dusky rockfish	U	*			Opt 1 Coastwide or Oregon/Washington. Opt 2 Oregon, and Washington	range = OR & WA
Leopard shark	U	*	*		Opt 1 Coastwide or California/Oregon or Opt 2 California and Oregon	Range = CA & OR
Mexican rockfish	Y	*			Opt 1 Coastwide or California-only	Range = CA

Species	Pop. Struct	Opt 1	Opt 2	Opt 3	Proposed Stock Delineations	Notes
Olive rockfish a/	Y	*	*		Opt 1 Coastwide or California/Oregon or Opt 2 California and Oregon	Range = CA & OR
Pink rockfish	U	*			Opt 1 Coastwide or California/Oregon or Opt 2 California and Oregon	Range = CA & OR
Pinkrose rockfish	U	*			Opt 1 Coastwide or California-only	Range = CA
Pygmy rockfish	U	*			Opt 1 Coastwide	
Rock sole	U	*			Opt 1 Coastwide	
Rosy rockfish	U	*			Opt 1 Coastwide	
Sand sole	U	*			Opt 1 Coastwide	
Speckled rockfish	U	*			Opt 1 Coastwide	
Starry flounder	U	*			Opt 1 Coastwide	
Swordspine rockfish	U	*			Opt 1 Coastwide or California-only	Range = CA
Tiger rockfish	U	*			Opt 1 Coastwide	
Treefish a/	U	*			Opt 1 Coastwide or California-only	Range = CA

a/based on SSC recommendations, all nearshore rockfish are presumed to have stock structure, based on their published range, and are therefore considered under three Options: Opt 1 Single Area, Opt 2 Two Areas, and Opt 3 Three area

Table S-2. Potential range of alternatives for stock definitions of Group A species not already defined. Adjunct information related to the population structure (U=unknown, N = None, Y = yes), current annual catch limit (ACL) scale, current NMFS status area, assessment year, category assigned to assessment, and notes also provided. A “-” indicates species is unassessed.

Species	Pop. Struct	Opt 1	Opt 2	Opt 3	Current Management Scale	NMFS Status Area	Assess Yr	Category	Notes
Black and Yellow Rockfish c/	Y	*	*		N/S of 40° 10' N. lat.	Northern CA	2019	2	range = CA & OR
Blue Rockfish a/ c/	Y	*	*	*	N/S of 40° 10' N. lat.	OR N/S 40 10 Complex	2017	2 CA 2 OR 3 WA	
Bronzespotted Rockfish	U	*			N/S of 40° 10' N. lat.	Shelf N/S 40 10 Complex	2011	3	range = CA
Brown Rockfish a/	Y	*	*	*	N/S of 40° 10' N. lat.	Nearshore N/S 40 10 Complex	2011	3	
Butter Sole	U	*			Coastwide	Other Flatfish complex	-	3	
Cabezon c/	Y	*	*	*	CA, OR, WA	California, Northern Pacific Coast	2019	1 OR/CA 3 WA	
Calico Rockfish a/	Y	*			N/S of 40° 10' N. lat.	N/S 40 10 Complex	-	3	range = CA
Chameleon Rockfish	Y	*			N/S of 40° 10' N. lat.	Nearshore N/S 40 10 Complex	-	3	range = CA
China Rockfish a/ c/	Y	*	*	*	N/S of 40° 10' N. lat.	Central Pacific Coast	2015	2	
Curlfin Sole	U	*			Coastwide	Other Flatfish complex	-	3	
Deacon Rockfish a/ c/	Y	*	*	*	N/S of 40° 10' N. lat.	OR/CA blue-deacon complex	2017	2	
Dwarf-Red Rockfish	U	*			N/S of 40° 10' N. lat.	Shelf N/S 40° 10' N. lat. Complex	-	3	Range = CA

Species	Pop. Struct	Opt 1	Opt 2	Opt 3	Current Management Scale	NMFS Status Area	Assess Yr	Category	Notes
Flag Rockfish	U	*			N/S of 40° 10' N. lat.	Other Flatfish complex	2011	3	
Freckled Rockfish	U	*			N/S of 40° 10' N. lat.	Shelf N/S 40 10 Complex	-	3	range = CA
Gopher Rockfish a/ c/	Y	*	*		N/S of 40° 10' N. lat.	Northern California	2019 (S 4010) 2011 (N 4010)	2 S 4010 3 N 4010	range = CA & OR
Grass Rockfish a/	Y	*	*		N/S of 40° 10' N. lat.	Nearshore N/S 40 10 Complex	2011	3	range = CA & OR
Greenblotched Rockfish	U	*			N/S of 40° 10' N. lat.	Shelf N/S 40 10 Complex	2011	3	
Halfbanded Rockfish	U	*			N/S of 40° 10' N. lat.	Shelf N/S 40 10 Complex	-	3	
Harlequin Rockfish	U	*	*		N/S of 40° 10' N. lat.	Shelf N/S 40 10 Complex	-	3	range = OR & WA
Honeycomb Rockfish	U	*			N/S of 40° 10' N. lat.	Shelf N/S 40 10 Complex	2011	3	range = CA
Kelp Greenling c/	Y	*	*	*	CA, OR, WA	Oregon, Other Fish	2019	1 CA/OR 3 WA	
Kelp Rockfish a/	Y	*	*		N/S of 40° 10' N. lat.	Nearshore N/S 40 10 Complex	2011	3	range = CA b/
Light Dusky Rockfish	U	*	*		N/S of 40° 10' N. lat.	Shelf N/S 40 10 Complex	-	3	range = OR & WA
Leopard Shark	Y	*	*		Coastwide	Pacific Coast	2011	3	range = CA & OR
Mexican Rockfish	U	*			N/S of 40° 10' N. lat.	N/S 40 10 Complex	2011	3	range = CA
Olive Rockfish a/	Y	*	*		N/S of 40° 10' N. lat.	Nearshore N/S 40 10 Complex	2011	3	range = CA & OR

Species	Pop. Struct	Opt 1	Opt 2	Opt 3	Current Management Scale	NMFS Status Area	Assess Yr	Category	Notes
Pink Rockfish	U	*			N/S of 40° 10' N. lat.	Shelf N/S 40 10 Complex	2011	3	range = CA & OR
Pinkrose Rockfish	U	*			N/S of 40° 10' N. lat.	Shelf N/S 40 10 Complex	2011	3	range = CA
Pygmy Rockfish	U	*			N/S of 40° 10' N. lat.	Shelf N/S 40 10 Complex	-	3	
Rock Sole	U	*			Coastwide	Other Flatfish complex	2011	3	
Rosy Rockfish	U	*			N/S of 40° 10' N. lat..	Shelf N/S 40 10 Complex	2011	3	
Sand Sole	U	*			Coastwide	Other Flatfish complex	2011	3	
Starry Flounder c/	U	*			Coastwide	Pacific Coast	2017	3	
Swordspine Rockfish	U	*			N/S of 40° 10' N. lat.	Shelf N/S 40 10 Complex	2011	3	range = CA
Tiger Rockfish	U	*			N/S of 40° 10' N. lat.	Shelf N/S 40 10 Complex	2011	3	
Treefish a/	Y	*			N/S of 40° 10' N. lat.	Nearshore N/S 40 10 Complex	2011	3	range = CA

a/ these species are in the nearshore rockfish complex. The applicable alternatives based on SSC recommendations (e.g., [Agenda Item F.7, Attachment 1, March 2023](#)). All nearshore rockfish are presumed to have stock structure: Options are structured based on range and assessment information. Range could include all four options: Opt 1 – Single Area, Opt 2 – Two Areas, and Opt. 3 – Three areas, Opt. 4 -Four areas

b/ the range of kelp rockfish is, in literature (e.g., Miller and Lea, 2020; Love et al, 2002; etc.) limited to California; however, records of catch in Oregon are not uncommon in the last 5 years

c/ species with dedicated stock assessments

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Appendix to Factor ii

Table 2-9. Average combined non-Tribal commercial and recreational sector mortality at the state and coastwide scale in metric tons (mt) and percentage of mortality in the EEZ for all species, by bins, for years 2018-19 & 2021-23.

	California Mortality EEZ			Oregon Mortality EEZ			Washington Mortality EEZ			Coastwide Mortality EEZ	
Species	mt	%		mt	%		mt	%		mt	%
Shallow Nearshore											
Black and Yellow Rockfish	0.50	2.5%		0.0	0.0%		0.00	0%		0.50	2.5%
China Rockfish	1.73	11.8%		0.32	3.5%		0.04	1.8%		2.09	8.8%
Gopher Rockfish	2.43	3.4%		0.00	1.5%		0.00	0%		2.43	3.4%
Grass Rockfish	0.12	1.0%		0.01	4.2%		0.00	0.0%		0.13	1.1%
Kelp Rockfish	0.32	6.3%		0.00	7.1%		0.00	0%		0.32	6.3%
Treefish Rockfish	0.95	9.2%		0.00	0%		0.00	0%		0.95	9.2%
Cabezon	2.92	6.2%		1.56	3.8%		0.91	9.3%		5.39	6.0%
Kelp Greenling	0.16	2.8%		0.46	3.5%		0.07	3.7%		0.69	3.7%
Deeper Nearshore											
Black Rockfish	14.22	7.7%		11.32	2.6%		89.20	42.0%		114.74	16.2%
Blue Rockfish	12.36	7.4%		0.32	2.7%		0.15	7.3%		12.83	7.2%
Brown Rockfish	16.05	15.8%		0.03	10.6%		0.02	18.6%		16.10	15.8%
Copper Rockfish	19.68	16.1%		0.39	4.3%		0.87	30.7%		20.94	15.8%
Deacon rockfish	0.00	0.0%		0.55	3.5%		0.00	0%		0.55	3.5%
Olive Rockfish	4.03	10.2%		0.00	1.1%		0.00	0%		4.03	10.2%
Quillback Rockfish(CA)	2.51	20.3%		-	-		-	-		2.51	10.7%
Quillback Rockfish (OR)	-	-		0.56	6.4%		-	-		0.56	6.4%
Quillback Rockfish (WA)	-	-		-	-		1.09	45.9%		1.09	46.0%
Shelf Shallow											
Calico Rockfish	0.08	17.3%		0.00	0%		0.00	0%		0.08	17.2%
Flag Rockfish	4.02	44.8%		0.01	73.7%		0.00	0%		4.03	44.8%
Freckled Rockfish	0.01	48.2%		0.00	0%		0.00	0%		0.01	45.8%
Halfbanded Rockfish	1.19	55.0%		0.00	0%		0.00	0%		1.19	55.1%
Harlequin Rockfish	0.00	0.0%		0.003	100.0%		0.00	0%		0.003	100.0%
Honeycomb Rockfish	1.55	47.5%		0.00	0%		0.00	0%		1.55	47.6%
Pygmy Rockfish	0.00	0.0%		0.003	100%		0.00	0%		0.003	100%
Rosy Rockfish	2.70	24.2%		0.02	56.2%		0.00	0%		2.72	24.2%
Speckled Rockfish	5.17	62.8%		0.00	40.0%		0.00	0%		5.17	62.8%
Swordspine Rockfish	0.24	89.7%		0.00	0%		0.00	0%		0.24	88.2%
Deep Shelf											
Bronzespotted Rockfish	a/	84.0%		0.0	0%		0.00	0%		a/	84.0%
Chameleon Rockfish	0.01	100.0%		0.00	0%		0.00	0%		0.01	100.0%
Greenblotched Rockfish	9.15	90.6%		0.03	96.3%		0.00	0%		9.18	90.6%
Mexican Rockfish	9.71	93.7%		0.00	0%		0.00	0%		9.71	93.7%
Pink Rockfish	0.01	100.0%		0.00	0%		0.00	0%		0.01	100.0%
Pinkrose Rockfish	0.004	100.0%		0.00	0%		0.00	0%		0.004	100.0%
Tiger Rockfish	0.17	24.2%		0.20	15.4%		0.30	67.2%		0.67	27.2%

No Mortality Bin											
Dwarf-red Rockfish	0.00	0.0%		0.00	0%		0.00	0%		0.00	0%
Light Dusky Rockfish	0.00	0.0%		0.00	0%		0.00	0%		0.00	0%
Flatfish											
Butter Sole	<0.001	100.0%		0.01	59.4%		0.00	0%		0.01	66.7%
Curlfin Sole	0.46	98.9%		0.09	100.0%		0.00	0%		0.55	98.0%
Rock Sole	0.59	30.4%		0.76	98.5%		0.00	7.5%		1.35	48.7%
Sand Sole	0.11	39.4%		1.15	85.3%		0.00	3.3%		1.26	74.4%
Starry Flounder	0.61	66.3%		1.28	74.6%		0.02	48.6%		1.91	71.3%
Leopard Shark											
Leopard Shark	0.19	3.3%		0.00	0%		0.00	0%		0.19	3.4%

a/ 104 bronzespotted rockfish (estimated) with mortality in EEZ, 20 (estimated) with mortality in state waters. No weights reported in RecFIN; therefore, percentage of mortality in EEZ based on numbers of fish not weight.

Document Appendix

Table A-1. Average non-Tribal commercial and recreational sector mortality in metric tons (mt), percentage of mortality, and principal fishery of mortality (c=commercial, r = recreational) in the EEZ off of California for years 2018-19 & 2021-23. Note: dash “-” indicates no recorded mortality in state.

Species	Comm EEZ mean weight (mt)	% in EEZ Comm	Rec EEZ mean weight (mt)	% in EEZ Rec	EEZ mean weight	% in EEZ
Black and yellow rockfish	0.36	2.2%	0.14	4.0%	0.5	2.5%
Black rockfish	0.38	0.9%	13.84	9.7%	14.22	7.7%
Blue	1.00	5.6%	11.36	7.6%	12.36	7.4%
Bronzespotted rockfish	a/	84.0%	b/	100.0%	a/	84.0%
Brown rockfish	1.01	5.1%	15.04	18.3%	16.05	15.8%
Butter sole	<0.001	100.0%	0.00	0.0%	<0.001	100.0%
Cabezon	1.18	5.1%	1.74	7.3%	2.92	6.2%
Calico rockfish	0.00	15.8%	0.08	17.4%	0.08	17.3%
Chameleon rockfish	0.01	100.0%	0.00	0.0%	0.01	100.0%
China rockfish	0.09	4.4%	1.64	13.0%	1.73	11.8%
Copper rockfish	1.99	14.0%	17.69	16.4%	19.68	16.1%
Curlfin sole	0.46	98.9%	0.00	0.0%	0.46	98.9%
Deacon rockfish	-	-	-	-	-	-
Dwarf-red Rockfish	-	-	-	-	-	-
Flag rockfish	0.15	72.6%	3.87	44.1%	4.02	44.8%
Freckled rockfish	0.03	100.0%	0.01	40.0%	0.01	48.2%
Gopher rockfish	0.64	2.3%	1.79	4.0%	2.43	3.4%
Grass rockfish	0.02	0.2%	0.10	5.3%	0.12	1.0%
Greenblotched rockfish	0.50	68.1%	8.64	92.4%	9.15	90.6%
Halfbanded rockfish	0.00	0.0%	1.19	55.0%	1.19	55.0%
Harlequin rockfish	-	-	-	-	-	-
Honeycomb rockfish	0.01	42.9%	1.54	47.6%	1.55	47.5%
Kelp greenling	0.00	0.0%	0.16	4.8%	0.16	2.8%

Species	Comm EEZ mean weight (mt)	% in EEZ Comm	Rec EEZ mean weight (mt)	% in EEZ Rec	EEZ mean weight	% in EEZ
Kelp rockfish	0.00	0.0%	0.32	7.8%	0.32	6.3%
Leopard shark	0.15	25.0%	0.03	0.7%	0.19	3.3%
Light dusky rockfish	-	-	-	-	-	-
Mexican rockfish	0.41	76.9%	9.31	94.6%	9.71	93.7%
Olive rockfish	0.35	17.8%	3.69	9.8%	4.03	10.2%
Pink rockfish	0.01	100.0%	0.00	100.0%	0.01	100.0%
Pinkrose rockfish	0.004	100.0%	0.00	100.0%	0.004	100.0%
Pygmy rockfish	-	-	-	-	-	-
Quillback rockfish(ca)	0.55	15.1%	1.96	22.5%	2.51	20.3%
Rock sole	0.21	64.5%	0.38	23.6%	0.59	30.4%
Rosy rockfish	0.09	17.1%	2.61	24.5%	2.7	24.2%
Sand sole	0.11	61.3%	0.00	3.6%	0.11	39.4%
Speckled rockfish	0.55	85.9%	4.62	60.9%	5.17	62.8%
Starry flounder	0.52	80.5%	0.09	33.1%	0.61	66.3%
Swordspine rockfish	0.00	0.0%	0.24	89.7%	0.24	89.7%
Tiger rockfish	0.02	33.0%	0.15	23.4%	0.17	24.2%
Treefish	0.11	4.3%	0.84	9.2%	0.95	9.2%

a/ ca/ 104 bronzespotted rockfish estimated, with mortality in EEZ, 20 estimated in state waters. No weights reported in RecFIN. -percentage based on #s

b/ no weights obtained, count only.

Table A-2. Average non-Tribal commercial and recreational sector mortality in metric tons (mt), percentage of mortality, and principal fishery of mortality (c=commercial, r = recreational) in the EEZ off of Oregon for years 2018-19 & 2021-23. Note: dash “-” indicates no recorded mortality in state.

Species	Comm EEZ mean weight (mt)	% in EEZ Comm	Rec EEZ mean weight (mt)	% in EEZ Rec	EEZ mean weight	% in EEZ
Black and yellow rockfish	0.00	0.0%	0.00	0.0%	0.00	0.0%
Black rockfish	2.79	2.4%	8.53	2.7%	11.32	2.6%
Blue	0.17	2.4%	0.15	3.1%	0.32	2.7%
Bronzespotted rockfish	-	-	-	-	-	-
Brown rockfish	0.00	0.0%	0.03	13.1%	0.03	10.6%
Butter sole	0.01	100.0%	0.00	23.9%	0.01	59.4%
Cabezon	1.14	4.2%	0.41	2.9%	1.56	3.8%
Calico rockfish	-	-	-	-	-	-
Chameleon rockfish	-	-	-	-	-	-
China rockfish	0.23	3.5%	0.09	3.5%	0.32	3.5%
Copper rockfish	0.05	2.4%	0.34	4.9%	0.39	4.3%
Curlfin sole	0.09	100.0%	0.00	0.0%	0.09	100.0%
Deacon rockfish	0.00	0.0%	0.55	3.5%	0.55	3.5%
Dwarf-red Rockfish	-	-	-	-	-	-
Flag rockfish	0.00	0.0%	0.01	73.7%	0.01	73.7%
Freckled rockfish	-	-	-	-	-	-

Species	Comm EEZ mean weight (mt)	% in EEZ Comm	Rec EEZ mean weight (mt)	% in EEZ Rec	EEZ mean weight	% in EEZ
Gopher rockfish	0.001	1.2%	0.001	1.9%	0.001	1.5%
Grass rockfish	0.00	0.0%	0.01	10.3%	0.01	4.2%
Greenblotched rockfish	0.00	0.0%	0.03	96.3%	0.03	96.3%
Halfbanded rockfish	-	-	-	-	-	-
Harlequin rockfish	0.01	100.0%	0.01	100.0%	0.01	100.0%
Honeycomb rockfish	-	-	-	-	-	-
Kelp greenling	0.33	3.4%	0.13	3.9%	0.46	3.5%
Kelp rockfish	0.00	0.0%	0.001	7.1%	0.001	7.1%
Leopard shark	-	-	-	-	-	-
Light dusky rockfish	-	-	-	-	-	-
Mexican rockfish	-	-	-	-	-	-
Olive rockfish	0.00	0.0%	0.0002	3.7%	0.00	1.1%
Pink rockfish	-	-	-	-	-	-
Pinkrose rockfish	-	-	-	-	-	-
Pygmy rockfish	-	-	-	-	-	-
Quillback rockfish	0.13	5.2%	0.43	6.8%	0.56	6.4%
Rock sole	0.75	99.8%	0.00	25.9%	0.76	98.5%
Rosy rockfish	0.00	30.4%	0.01	57.2%	0.02	56.2%
Sand sole	1.11	92.9%	0.03	22.9%	1.15	85.3%
Speckled rockfish	0.00	0.0%	0.001	40.0%	0.00	40.0%
Starry flounder	1.28	75.4%	0.01	23.8%	1.28	74.6%
Swordspine rockfish	0.00	0.0%	0.00	0.0%	0.00	0.0%
Tiger rockfish	0.01	3.8%	0.19	18.8%	0.20	15.4%
Treefish rockfish	-	-	-	-	-	-

Table A-3. Average non-Tribal commercial and recreational sector mortality in metric tons (mt), percentage of mortality, and principal fishery of mortality (c=commercial, r = recreational) in the EEZ off of Washington for years 2018-19 & 2021-23. Note: dash “-” indicates no recorded mortality EEZ and/or state.

Species	Comm EEZ mean weight (mt)	% in EEZ Comm	Rec EEZ mean weight (mt)	% in EEZ Rec	EEZ mean weight	% in EEZ
Black and yellow rockfish	-	-	-	-	-	-
Black rockfish	0.00	100.0%	89.20	42.0%	89.20	42.0%
Blue	0.00	0.0%	0.15	7.3%	0.15	7.3%
Bronzespotted rockfish	-	-	-	-	-	-
Brown rockfish	0.00	0.0%	0.02	18.6%	0.02	18.6%
Butter sole	0.00	0.0%	0.00	0.0%	0.00	0.00
Cabezon	0.00	0.0%	0.91	9.3%	0.91	9.3%
Calico rockfish	-	-	-	-	-	-
Chameleon rockfish	-	-	-	-	-	-
China rockfish	0.00	0.0%	0.04	1.8%	0.04	1.8%
Copper rockfish	0.00	0.0%	0.87	30.7%	0.87	30.7%
Curlfin sole	-	-	-	-	-	-
Deacon rockfish	-	-	-	-	-	-

Species	Comm EEZ mean weight (mt)	% in EEZ Comm	Rec EEZ mean weight (mt)	% in EEZ Rec	EEZ mean weight	% in EEZ
Dwarf-red Rockfish	-	-	-	-	-	-
Flag rockfish	-	-	-	-	-	-
Freckled rockfish	-	-	-	-	-	-
Gopher rockfish	-	-	-	-	-	-
Grass rockfish	-	-	-	-	-	-
Greenblotched rockfish	-	-	-	-	-	-
Halfbanded rockfish	-	-	-	-	-	-
Harlequin rockfish	0.01	100.0%	0.01	100.0%	0.01	100.0%
Honeycomb rockfish	-	-	-	-	-	-
Kelp greenling	0.00	0.0%	0.07	3.7%	0.07	3.7%
Kelp rockfish	-	-	-	-	-	-
Leopard shark	-	-	-	-	-	-
Light dusky rockfish	-	-	-	-	-	-
Mexican rockfish	-	-	-	-	-	-
Olive rockfish	-	-	-	-	-	-
Pink rockfish	-	-	-	-	-	-
Pinkrose rockfish	-	-	-	-	-	-
Pygmy rockfish	-	-	-	-	-	-
Quillback rockfish	0.00	0.0%	1.09	45.9%	1.09	45.9%
Rock sole	0.004	100.0%	0.00	0.0%	0.004	7.5%
Rosy rockfish	-	-	-	-	-	-
Sand sole	0.002	100.0%	0.00	0.0%	0.002	3.3%
Speckled rockfish	-	-	-	-	-	-
Starry flounder	0.01	100.0%	0.01	27.0%	0.02	48.6%
Swordspine rockfish	-	-	-	-	-	-
Tiger rockfish	0.00	0.0%	0.30	67.2%	0.30	67.2%
Treefish rockfish	-	-	-	-	-	-