Allocation of Harvest Opportunity Between Sectors of the Pacific Coast Groundfish Fishery of Blackgill Rockfish and Other Species Managed in the Slope Rockfish Complex South of 40°10' N Latitude

Preliminary Draft Analytical Document

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Allocation of Harvest Opportunity Between Sectors of the Pacific Coast Groundfish Fishery of Blackgill Rockfish and Other Species Managed in the Slope Rockfish Complex South of 40°10' N Latitude

Proposed Action:

1. Remove blackgill rockfish (*Sebastes melanostomus*) from the Slope Rockfish complex south of 40°10' N lat. to allow more refined and conservative management of this stock.

2. If blackgill rockfish are removed from the Slope Rockfish complex, make sector allocations of southern blackgill rockfish and potentially reallocate the remaining Slope Rockfish complex south of 40°10' N lat. between sectors.

3. If blackgill rockfish are removed from the Slope Rockfish complex, allocate quota share (QS) of blackgill rockfish and potentially reallocate quota share of the remaining Slope Rockfish complex south of 40°10' N lat. to permittees in the limited entry (LE) trawl individual fishing quota fishery for those permits with Slope Rockfish South quota.

Type of Statement: Preliminary Draft Analytical Document

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Executive Summary

To be completed once the Council decides a final preferred alternative for this action.

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ACRONYMS AND GLOSSARY

Acronym	Definition
ACL	annual catch limit
CFR	Code of Federal Regulations
Council	Pacific Fishery Management Council
CPS	coastal pelagic species
CZMA	Federal Coastal Zone Management Act
DEIS	draft environmental impact statement
EEZ	Exclusive Economic Zone
EFH	essential fish habitat
EFP	exempted fishing permit
EIS	environmental impact statement
EO	Executive Order
ESU	evolutionarily significant units
fm	fathom or fathoms
FMP	fishery management plan
F_{MSY}	the fishing mortality rate that maximizes catch biomass in the long term
GAP	Groundfish Advisory Subpanel
GMT	Groundfish Management Team
HAPC	habitat areas of particular concern
IFQ	individual fishing quota

Acronym	Definition
IRFA	initial regulatory flexibility analysis
LE	limited entry
m	meter or meters
MRFSS	Marine Recreational Fisheries Statistical Survey
MSA	Magnuson-Stevens Fishery Conservation and Management Act
mt	metric ton
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration – the parent agency of National Marine Fisheries Service
NS1	National Standard 1
OA	open access
OFL	overfishing level
OMZ	oxygen minimum zone
OY	optimum yield
PacFIN	Pacific Coast Fisheries Information Network. Provides commercial fishery information for Washington, Oregon, and California. Maintained by the Pacific States Marine Fisheries Commission.
POP	Pacific ocean perch – a rockfish species that was declared overfished in 1999
QP	quota pound
QS	quota share
RCA	Rockfish Conservation Area

Acronym	Definition
RecFIN	Recreational Fishery Information Network. Provides recreational fishery information for Washington, Oregon, and California. Maintained by the Pacific States Marine Fisheries Commission.
RFA	Regulatory Flexibility Analysis, or Regulatory Flexibility Act
RIR	Regulatory Impact Review
SAFE	stock assessment and fishery evaluation
SSC	Science and Statistical Committee
USFWS	U.S. Fish and Wildlife Service – a representative of USFWS is a nonvoting member of the Council

1 Purpose and Need for the Proposed Action

1.1 Introduction

This document provides background information about, and analyses informing the impacts associated with removing blackgill rockfish (*Sebastes melanostomus*) from the Slope Rockfish complex south of 40°10' N lat. and for exploring alternative sector and trawl permit quota share allocations of blackgill and other rockfish species (*Sebastes* spp.) currently managed in the Slope Rockfish complex south of 40°10' N lat. to west coast fishing sectors that target federally-managed groundfish species. These actions would require an amendment to the Pacific Coast Groundfish Fishery Management Plan (FMP), which contains the policies and framework for allocating the harvestable surplus of groundfish. This action must conform to the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the principal legal basis for fishery management within the Exclusive Economic Zone (EEZ), which extends from the outer boundary of the territorial sea to a distance of 200 nautical miles from shore.

1.2 Description of the Proposed Actions

The Council/NMFS *proposed actions*, evaluated in this document, are:

1. Remove blackgill rockfish (*Sebastes melanostomus*) from the Slope Rockfish complex south of 40°10' N lat. to allow more refined and conservative management of this stock.

2. If blackgill rockfish are removed from the Slope Rockfish complex, make sector allocations of southern blackgill rockfish and potentially reallocate the remaining Slope Rockfish complex south of 40°10' N lat. between sectors.

3. If blackgill rockfish are removed from the Slope Rockfish complex, allocate quota share (QS) of blackgill rockfish and potentially reallocate quota share of the remaining Slope Rockfish complex south of 40°10' N lat. to permittees in the limited entry (LE) trawl individual fishing quota fishery for those permits with southern Slope Rockfish quota.

1.3 Purpose and Need for the Proposed Actions

The most recent assessment of blackgill rockfish was conducted in 2011 (Field and Pearson 2011). The 2011 assessment indicated the spawning stock biomass south of 40°10' N lat. was at a depletion of 30% of unfished biomass at the start of 2011, or in the precautionary zone below the target biomass of 40% of unfished biomass. The Pacific Fishery Management Council (Council) and the National Marine Fisheries Service (NMFS) implemented conservative cumulative landing limits of blackgill rockfish for the non-trawl sectors of the west coast groundfish fishery in 2013 to reduce the risk of exceeding annual catch limits (ACLs) projected using the precautionary 40-10 ACL harvest control rule (these 40-10 ACLs are projected in the 2011 blackgill rockfish assessment).

A reduction in the cumulative landing limits of blackgill rockfish for non-trawl sectors was designed to remove any incentive to target blackgill rockfish and, based on 2013 total catch of blackgill by these sectors, appears to have been successful. However, a similar strategy designed to restrict trawl catches of blackgill cannot work efficiently under status quo management measures. Annual trawl catches of southern slope rockfish species are controlled by the formal trawl allocation of the harvestable surplus of the Slope Rockfish complex south of 40°10' N lat. Under trawl rationalization, any stock managed in the non-whiting trawl fishery with individual fishing quotas (IFQs) are effectively managed at the management unit which is the level at which harvest limits are specified, whether the management unit is a single stock or an aggregate of stocks managed within a complex. Given that blackgill are currently

managed within the southern Slope Rockfish complex and quota is allocated for the entire complex in aggregate, there are few management measures that would effectively reduce trawl targeting in the IFQ fishery without a significant disruption in other target strategies. For example, with status quo management at the complex level, non-voluntary measures such as significant area/depth or season closures may be needed to reduce trawl impacts on blackgill. And since blackgill rockfish have one of the deepest distributions of west coast groundfish (they occur out to the edge of the oxygen minimum zone (OMZ) (Field and Pearson 2011) and have a reported distribution out to 768 m (Love, *et al.* 2002)), area/depth closures could be extreme and could affect the efficiency of important deep-water trawl target strategies, such as the DTS (Dover sole-thornyheads-sablefish) harvesting strategy. Removing blackgill rockfish from the southern Slope Rockfish complex and managing the stock with stock-specific ACLs and quotas would allow for more refined and less disruptive management measures to control trawl impacts.

While blackgill is caught using trawl and non-trawl gear, the other species in the Slope Rockfish complex south of 40°10' N lat. are primarily caught using trawl gear. Should blackgill be removed from the complex, the complex will become dominated by trawl-dominant species. Because of this shift, the Council may want to reconsider the current sector allocation of the harvestable surplus of Slope Rockfish South in light of the Allocation Framework and the equity standards specified in the FMP and the MSA. The Council will also need to consider allocation of the harvestable surplus of blackgill rockfish south of 40°10' N lat. The groundfish FMP specifies the need for an FMP amendment to change a formal, long term allocation under rules implemented under FMP Amendment 21.

The specific purposes of the actions are:

1. To reduce the risk of exceeding the blackgill rockfish OFL contribution and harvest guideline south of 40°10' N lat. projected in the 2011 assessment and established consistent with the default 40-10 ACL harvest control rule described in section 4.6 of the Groundfish FMP (available at http://www.pcouncil.org/wp-content/uploads/GF_FMP_FINAL_May2014.pdf). The need for the action is to provide greater resource protection for blackgill rockfish south of 40°10' N lat. while minimizing disruption of current fisheries.

2. To ensure an equitable allocation of the harvestable surplus of blackgill rockfish and the Slope Rockfish South complex in the event blackgill rockfish is removed from the complex and managed with stock-specific harvest specifications.

1.4 Action Area

The action area for the proposed action comprises the fishing grounds used by federally-managed U.S. west coast groundfish fisheries and associated coastal communities south of Cape Mendocino at 40°10' N lat. In general, the fishing grounds are within the west coast EEZ, which stretches from 3 to 200 nautical miles off the coast of California south of Cape Mendocino (Figure 1-1), although groundfish fishing is largely confined to depths of 300 fathoms or less, or roughly within 30 miles of the coast. Groundfish fisheries are an important part of the local economy and social fabric in coastal communities in California.

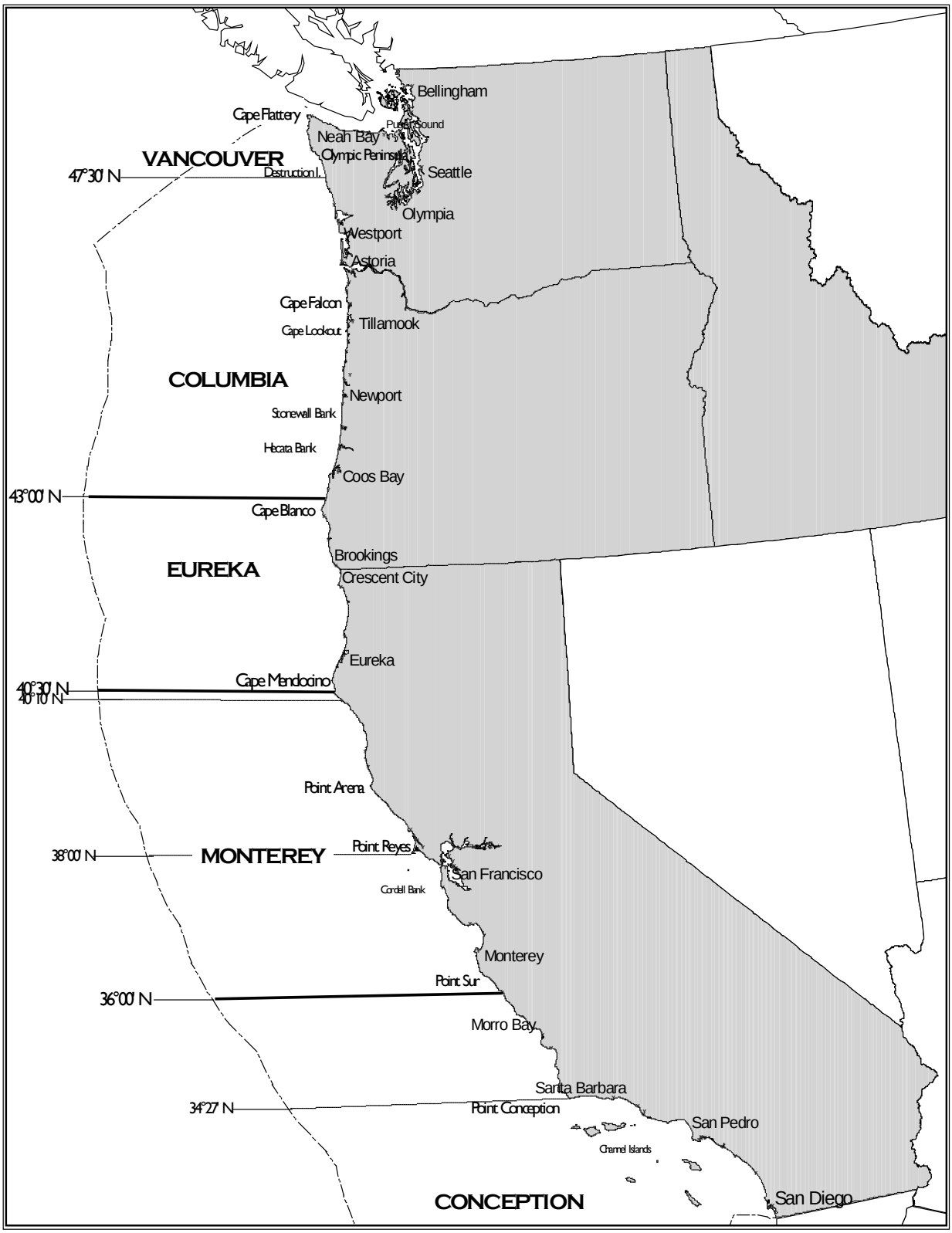

Figure 1-1. The west coast Exclusive Economic Zone and some of the latitudinal management lines used in groundfish management.

1.5 Scoping Process

1.5.1 Background to Scoping

According to the NEPA, the public and other agencies must be involved in the decision-making process for agency actions. Scoping is an important part of this process. Scoping is designed to provide interested citizens, government officials, and tribes an opportunity to help define the range of issues and alternatives that should be evaluated in the EA. NEPA regulations stress that agencies should provide public notice of NEPA-related proceedings and hold public hearings whenever appropriate during EA development (40 CFR 1506.6).

The scoping process is designed to ensure all significant issues are properly identified and fully addressed during the course of the NEPA process. The main objectives of the scoping process are to provide stakeholders with a basic understanding of the proposed action; explain where to find additional information about the project; provide a framework for the public to ask questions, raise concerns, identify issues, and recommend options other than those being considered by the agency conducting the scoping; and ensure those concerns are included within the scope of the EA/EIS.

1.5.2 Council and Agency NEPA Scoping

The Council process, which is based on stakeholder involvement and allows for public participation and public comment on fishery management proposals during Council, subcommittee, and advisory body meetings, is the principal mechanism to scope this proposed action. The advisory bodies involved in groundfish management include the Groundfish Management Team (GMT), with representation from state, federal, and tribal fishery scientists; and the Groundfish Advisory Subpanel (GAP), whose members are drawn from the commercial, tribal, and recreational fisheries, fish processors, and environmental advocacy organizations. Meetings of the Council and its advisory bodies constitute the Council scoping process, involving the development of alternatives and consideration of the impacts of the alternatives.

The Council first determined the need to consider this action at their September meeting in Spokane, Washington and prioritized this initiative at their November 2014 meeting in Costa Mesa, California. Further scoping on this proposed action is scheduled for the April 2015 Council meeting in Rohnert Park, California.

1.5.3 Summary of Comments Received

1.5.3.1 Comments from Non-Governmental Organizations

The GAP recommended this initiative as a priority item as advice to the Council in November 2014 (see Agenda Item J.3.b, Supplemental GAP Report, November 2014).

Mr. Gerry Richter, a representative of the Point Conception Groundfishermen's Association, recommended this initiative be prioritized and completed expeditiously as a public comment to the Council at their November 2014 meeting.

1.5.3.2 Other Scoping Comments

The GMT recommended this initiative as a priority item as advice to the Council in November 2014 (see Agenda Item J.3.b, Supplemental GMT Report, November 2014).

1.5.4 Criteria Used to Evaluate Impacts of the Proposed Action

The proposed action to remove blackgill rockfish from the Slope Rockfish South complex, make formal allocations of blackgill rockfish, and to reallocate the harvestable surplus of the other slope rockfish species currently managed in the Slope Rockfish complex south of 40°10' N lat. to LE trawl and all non-trawl sectors of the west coast groundfish fishery does not affect overall harvest levels of any species other than blackgill, nor does it directly affect management measures for any sector of the fishery other than management measures designed to stay within future blackgill rockfish ACLs. The proposed action is not expected to change the magnitude or distribution of trawl efforts. Such actions and effects are analyzed and decided separately in a biennial Council process. Therefore, the proposed action is expected to have no direct impacts (except for impacts to the blackgill rockfish resource) and potentially low indirect impacts to the west coast biological environment (i.e., affected species) or the physical environment (i.e., west coast marine ecosystems and essential fish habitat).

The anticipated impacts of the proposed action are largely socioeconomic. Therefore, most of the environmental consequences of the proposed action are discussed in section 4.4.

One overall objective of an intersector allocation process is to optimally use the available harvest of target groundfish species. This objective is guided by two of the three management goals in the Groundfish FMP: 1) goal 2 – Economics – maximize the value of the groundfish resource as a whole; and 2) goal 3 – Utilization – achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities (see section 6.1). The proposed action is to determine long term formal allocations of blackgill rockfish and the remaining species in the Slope Rockfish complex south of 40°10' N lat. after blackgill rockfish is removed from the complex, a decision aided by understanding the needs of the directed LE trawl and non-trawl sectors. The sectors' needs are best addressed by limiting the constraints to healthy target species for these sectors without risking the conservation objectives of rebuilding the blackgill rockfish stock using the Council's default 40-10 harvest control rule.

The utilization goal is first addressed in these analyses by comparing alternative 2015 sector allocations of blackgill rockfish and the remaining species in the Slope Rockfish complex south of 40°10' N lat. to the 2003-2013 total catches in each sector. This analysis is also done at the permit level for the LE trawl sector under different equal sharing options for the buyback portion of quota shares of these species.

This portion of the analysis is foreseen but has not yet been done: The economics goal is addressed by first estimating revenue impacts by sector under each of the alternatives and then analyzing the importance of each of the species to each non-tribal directed groundfish sector. The analyses herein apply the sector catch percentages in the alternatives to the ACLs specified in 2015 to determine sector total catch amounts (landings plus discards). Landed catches by sector in 2015 are projected assuming 2013-2014 landings using sector-specific bycatch and discard rates updated from the West Coast Groundfish Observer Program (WCGOP) for the commercial sectors and state sampling programs for the recreational sector. The predicted landed catch is then modeled to determine revenue impacts by sector. Revenue impacts by sector are then compared to status quo 2013 revenue impacts. Revenue impacts are evaluated at the port group level to determine effects to west coast fishing communities. These impacts are then compared to the relative economic resiliency of the communities in the port group as well as their relative dependence on groundfish resources.

2 Description of the Alternatives

2.1 Description of the Alternatives

The proposed strawman alternatives provided here (Table 2-1) may not be the final ones decided for detailed analysis in this EA. A range of alternatives for detailed analysis will be decided at the April 2015 Council meeting.

Table 2-1. Summary of allocation alternatives analyzed in this document.

Alternative	Blackgill Removed from Complex?	Allocation Basis	Slope Rockfish S		Blackgill Rockfish	
			LE Trawl Alloc. %	Non-Trawl Alloc. %	LE Trawl Alloc. %	Non-Trawl Alloc. %
No Action	N	A21 - 2003-2005 Total Catch	63.0%	37.0%	NA	NA
Alt. 1	Y	2003-2013 Total Catch	91.0%	9.0%	41.0%	59.0%
Alt. 2	Y	2011-2013 Total Catch	86.5%	13.5%	35.6%	64.4%
Alt. 3	Y	2003-2005 Total Catch	91.6%	8.4%	44.5%	55.5%
Alt. 4	Y	2003-2010 Total Catch	91.8%	8.2%	43.9%	56.1%
Alt. 5	Y	2003-2012 Total Catch	90.7%	9.3%	39.4%	60.6%

2.1.1 The No Action Alternative

Under the No Action Alternative, blackgill rockfish south of 40°10' N lat. are not removed from the southern Slope Rockfish complex and the Amendment 21 formal sector allocation of **63% of the annual harvestable surplus (as defined by the fishery HG) of southern Slope Rockfish to LE trawl sectors and 37% of the annual harvestable surplus to non-trawl sectors is maintained**. The current allocation of southern Slope Rockfish QS to permittees in the LE trawl fishery remain unchanged under the No Action Alternative. Table 2-2 lists the species currently managed in the Slope Rockfish complex south of 40°10' N lat.

Table 2-2. Species currently managed in the Slope Rockfish complex south of 40°10' N lat.

Common Name	Scientific Name
Aurora Rockfish	*Sebastes aurora*
Bank Rockfish	*S. rufus*
Blackgill Rockfish	*S. melanostomus*
Blackspotted Rockfish	*S. melanostictus*
Pacific Ocean Perch	*S. alutus*
Redbanded Rockfish	*S. babcocki*
Rougheye Rockfish	*S. aleutianus*
Sharpchin Rockfish	*S. zacentrus*
Shortraker Rockfish	*S. borealis*
Yellowmouth Rockfish	*S. reedi*

2.1.2 Alternative 1 Sector Allocations: Remove Blackgill Rockfish from the Southern Slope Rockfish Complex and Reallocate to Groundfish Sectors Using 2003-2013 Total Catch Shares

Under Alternative 1 sector allocations, blackgill rockfish south of 40°10' N lat. are removed from the southern Slope Rockfish complex and the southern Slope Rockfish complex harvestable surplus minus blackgill rockfish, as well as the harvestable surplus of blackgill rockfish, are allocated to groundfish sectors based on 2003-2013 total catch shares to sectors. The reason for basing sector allocations on catch histories during this period are 1) Rockfish Conservation Areas (RCAs) were fully implemented in 2003, thus causing effort shifts to the continental slope seaward of the RCAs; 2) better estimates of total catch by sector are available after full implementation of the WCGOP in 2003; and 3) 2013 is the final year of fully reconciled total catches available for this analysis[1]. **The allocations under this alternative would be 91% of the annual harvestable surplus (as defined by the fishery HG) of southern Slope Rockfish minus blackgill to LE trawl sectors and 9% of the annual harvestable surplus to non-trawl sectors. The annual harvestable surplus of blackgill rockfish would be allocated 41% to LE trawl sectors and 59% to non-trawl sectors.**

Individual quota share (QS) allocations of blackgill rockfish and the remainder of the southern Slope Rockfish complex to LE trawl permits are based on 1994-2003 landings history under three equal sharing options: 1) equal allocation of the buyback permits' landings history portion; 2) 50% of the QS allocated equally; and 3) no portion of QS allocated equally. The LE trawl sector allocation under this alternative was apportioned using each of these individual allocation options to estimate quota pound (QP) allocations available to LE trawl permit owners.

2.1.3 Alternative 2 Sector Allocations – Post-Trawl Rationalization: Remove Blackgill Rockfish from the Southern Slope Rockfish Complex and Reallocate to Groundfish Sectors Using 2011-2013 Total Catch Shares

Under Alternative 2 sector allocations, blackgill rockfish south of 40°10' N lat. are removed from the southern Slope Rockfish complex and the southern Slope Rockfish complex harvestable surplus minus blackgill rockfish, as well as the harvestable surplus of blackgill rockfish, are allocated to groundfish sectors based on 2011-2013 total catch shares to sectors. The basis for using sector total catch shares during this period is to explore the effect of trawl rationalization, which was implemented in 2011. **The allocations under this alternative would be 86.5% of the annual harvestable surplus (as defined by the fishery HG) of southern Slope Rockfish minus blackgill to LE trawl sectors and 13.5% of the annual harvestable surplus to non-trawl sectors. The annual harvestable surplus of blackgill rockfish would be allocated 35.6% to LE trawl sectors and 64.4% to non-trawl sectors.**

Individual QS allocations of blackgill rockfish and the remainder of the southern Slope Rockfish complex to LE trawl permits are based on 1994-2003 landings history under three equal sharing options: 1) equal allocation of the buyback permits' landings history portion; 2) 50% of the QS allocated equally; and 3) no portion of QS allocated equally. The LE trawl sector allocation under this alternative was apportioned using each of these individual allocation options to estimate QP allocations available to LE trawl permit owners.

[1] Analysts from the NMFS Northwest Fisheries Science Center West Coast Groundfish Observer Program reconcile annual landed catch and dead discards by sector and publish these estimates in total mortality reports available at http://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_products/data_library.cfm.

2.1.4 Alternative 3 Sector Allocations – Amendment 21 Base Period: Remove Blackgill Rockfish from the Southern Slope Rockfish Complex and Reallocate to Groundfish Sectors Using 2003-2005 Total Catch Shares

Under Alternative 3 sector allocations, blackgill rockfish south of 40°10' N lat. are removed from the southern Slope Rockfish complex and the southern Slope Rockfish complex harvestable surplus minus blackgill rockfish, as well as the harvestable surplus of blackgill rockfish, are allocated to groundfish sectors based on 2003-2005 total catch shares to sectors. The basis for using sector total catch shares during this period is this is the time period used to determine the status quo sector allocations for the southern Slope Rockfish complex under Amendment 21. **The allocations under this alternative would be 91.6% of the annual harvestable surplus (as defined by the fishery HG) of southern Slope Rockfish minus blackgill to LE trawl sectors and 8.4% of the annual harvestable surplus to non-trawl sectors. The annual harvestable surplus of blackgill rockfish would be allocated 44.5% to LE trawl sectors and 55.5% to non-trawl sectors.**

Individual QS allocations of blackgill rockfish and the remainder of the southern Slope Rockfish complex to LE trawl permits are based on 1994-2003 landings history under three equal sharing options: 1) equal allocation of the buyback permits' landings history portion; 2) 50% of the QS allocated equally; and 3) no portion of QS allocated equally. The LE trawl sector allocation under this alternative was apportioned using each of these individual allocation options to estimate QP allocations available to LE trawl permit owners.

2.1.5 Alternative 4 Sector Allocations – Pre-Trawl Rationalization: Remove Blackgill Rockfish from the Southern Slope Rockfish Complex and Reallocate to Groundfish Sectors Using 2003-2010 Total Catch Shares

Under Alternative 4 sector allocations, blackgill rockfish south of 40°10' N lat. are removed from the southern Slope Rockfish complex and the southern Slope Rockfish complex harvestable surplus minus blackgill rockfish, as well as the harvestable surplus of blackgill rockfish, are allocated to groundfish sectors based on 2003-2010 total catch shares to sectors. The basis for using sector total catch shares during this period is to extend the time series of fully reconciled sector total catch shares used in Amendment 21 deliberations up to the year prior to implementation of the trawl rationalization program. **The allocations under this alternative would be 91.8% of the annual harvestable surplus (as defined by the fishery HG) of southern Slope Rockfish minus blackgill to LE trawl sectors and 8.2% of the annual harvestable surplus to non-trawl sectors. The annual harvestable surplus of blackgill rockfish would be allocated 43.9% to LE trawl sectors and 56.1% to non-trawl sectors.**

Individual QS allocations of blackgill rockfish and the remainder of the southern Slope Rockfish complex to LE trawl permits are based on 1994-2003 landings history under three equal sharing options: 1) equal allocation of the buyback permits' landings history portion; 2) 50% of the QS allocated equally; and 3) no portion of QS allocated equally. The LE trawl sector allocation under this alternative was apportioned using each of these individual allocation options to estimate QP allocations available to LE trawl permit owners.

2.1.6 Alternative 5 Sector Allocations – Non-Trawl Target Period: Remove Blackgill Rockfish from the Southern Slope Rockfish Complex and Reallocate to Groundfish Sectors Using 2003-2012 Total Catch Shares

Under Alternative 5 sector allocations, blackgill rockfish south of 40°10' N lat. are removed from the southern Slope Rockfish complex and the southern Slope Rockfish complex harvestable surplus minus blackgill rockfish, as well as the harvestable surplus of blackgill rockfish, are allocated to groundfish sectors

based on 2003-2012 total catch shares to sectors. The basis for using sector total catch shares during this period is to extend the time series of fully reconciled sector total catch shares used in Amendment 21 deliberations up to the year prior to implementation of restrictive cumulative landing limits of blackgill rockfish for the non-trawl sectors. **The allocations under this alternative would be 90.7% of the annual harvestable surplus (as defined by the fishery HG) of southern Slope Rockfish minus blackgill to LE trawl sectors and 9.3% of the annual harvestable surplus to non-trawl sectors. The annual harvestable surplus of blackgill rockfish would be allocated 39.4% to LE trawl sectors and 60.6% to non-trawl sectors.**

Individual QS allocations of blackgill rockfish and the remainder of the southern Slope Rockfish complex to LE trawl permits are based on 1994-2003 landings history under three equal sharing options: 1) equal allocation of the buyback permits' landings history portion; 2) 50% of the QS allocated equally; and 3) no portion of QS allocated equally. The LE trawl sector allocation under this alternative was apportioned using each of these individual allocation options to estimate QP allocations available to LE trawl permit owners.

3 Description of the Affected Environment

3.1 Introduction

This chapter describes the Pacific Coast groundfish fishery and the resources that would be affected by the alternative action. Physical resources are discussed in Section 3.1, biological resources are described in Section 3.2, and socioeconomic resources are described in Section 3.3. The 2014 Status of the Pacific Groundfish Fishery, Stock Assessment and Fishery Evaluation (SAFE) document (PFMC 2014); available at http://www.pcouncil.org/wp-content/uploads/SAFE_Dec2014_v12.pdf) provide detailed information pertaining to the physical, biological, and socioeconomic environment. This document is incorporated by reference.

3.2 Physical Environment

The area affected by the proposed alternatives is the groundfish fishing grounds within the west coast EEZ, which stretches from 3 to 200 nautical miles off the coasts of Washington, Oregon, and California (Figure 1-1). Groundfish fishing is largely confined to depths of 300 fathoms or less, or roughly within 30 miles of the coast. Federally managed groundfish fishing that could be directly affected by the proposed action occurs in Federal waters on the continental slope south of 40°10' N lat., or roughly from 150-300 fm and primarily south of 36° N lat. where most of the targeting of blackgill rockfish has historically occurred.

3.2.1 West Coast Marine Ecosystems

The proposed alternatives would be contained within the California Current ecosystem. The California Current is essentially the eastern limb of the Central Pacific Gyre. It begins where the west wind drift (or the North Pacific Current) reaches the North American Continent. This occurs near the northern end of Vancouver Island (Ware and McFarlane 1989). A divergence in the prevailing wind patterns causes the west wind drift to split into two broad coastal currents, the California Current to the south and the Alaska Current to the north. There are several dominant currents in the region, which vary in geographical location, intensity, and seasonal direction (Hickey 1979).

The California Current ecosystem, like other eastern boundary current ecosystems, are especially difficult to define, as they are characterized by tremendous fluctuations in physical conditions and productivity over multiple timescales (Mann and Lazier 1996; Parrish et al. 1981). Food webs tend to be structured around coastal pelagic species (CPS) that exhibit boom-bust cycles over decadal time scales (Bakun 1996; Schwartzlose, *et al.* 1999). Similarly, the top trophic levels of such ecosystems are often dominated by highly migratory species such as salmon, albacore tuna, sooty shearwaters, fur seals and baleen whales, whose dynamics may be partially or wholly driven by processes in entirely different ecosystems, even different hemispheres. For the purposes of this analysis, the ecosystem is considered in terms of physical and biological oceanography, climate, biogeography, EFH, and the marine protected areas. A more detailed description of the California current ecosystem, and the effects of fishing on this ecosystem, can be found in the 2014 SAFE document (PFMC 2014).

3.2.2 Essential Fish Habitat

The MSA defines EFH to mean "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity" (16 U.S.C. 1802 sec. 3(10)). Regulatory guidelines elaborate that the words "essential" and "necessary" mean EFH should be sufficient to "support a population adequate to maintain a sustainable fishery and the managed species' contributions to a healthy ecosystem." The regulatory guidelines also establish authority for Councils to designate Habitat Areas of Particular Concern (HAPC) based on the vulnerability and ecological value of specific habitats. Councils are required to minimize, to

the extent practicable, the adverse effects of fishing on EFH. NMFS works through a consultation process to minimize adverse effects (50 CFR 600 subpart J).

Amendment 19 revised the groundfish EFH definitions, specified HAPCs, and delineated area closures to mitigate the adverse impacts of fishing on habitat (NMFS 2005). There are 43 areas closed to bottom trawling off the West Coast and 17 areas off Oregon and California that are closed to all bottom-contact gear. Furthermore, all waters deeper than 700 fm is closed to bottom trawling. A comprehensive description of groundfish EFH can be found in the Final Groundfish Essential Fish Habitat EIS (NMFS 2005). Federal regulations (50 CFR 600.815(a)(10)) require that EFH provisions in FMPs to be periodically reviewed and revised, as warranted, at least every 5 years. Section 6.2.4 of the FMP describes the habitat conservation framework.

3.3 Biological Environment

There are over 90 species of groundfish managed under the groundfish FMP. These species include over 60 species of rockfish in the family Scorpaenidae, 7 roundfish species, 12 flatfish species, assorted shark species, skate species, and a few miscellaneous bottom-dwelling marine fish species. Groundfish species occur throughout the EEZ and occupy diverse habitats at all stages in their life history.

Under the Pacific coast groundfish FMP, stocks are defined as healthy, precautionary, or overfished. Healthy stocks are those non-flatfish stocks with current biomass levels greater than 40 percent of their unfished biomass level (depletion is the term used to define the ratio of current spawning biomass relative to unfished spawning biomass); precautionary zone non-flatfish stocks are those with a depletion between 25 and 40 percent, and overfished non-flatfish stocks are those stocks whose abundance has fallen below the depletion threshold of 25 percent. Healthy, precautionary zone, and overfished flatfish stocks are defined as >25%, >12.5% but <25%, and ≤12.5%, respectively To prevent a precautionary zone stock from becoming overfished, an ACL adjustment is made reducing the allowable catch to a level below the ABC. The more the stock biomass is below the precautionary threshold of 40% depletion for non-flatfish stocks or 25% depletion for flatfish stocks, the greater the precautionary adjustment. Table 3 1 presents the groundfish stocks by their biomass status following the 2013 stock assessment cycle. The 2014 SAFE document provides detailed information on species distributions, life histories and management areas for the groundfish species and species complexes (PFMC 2014).

3.3.1 Overfished Groundfish

In 1996, the Sustainable Fisheries Act (SFA) amended the MSA. The SFA required that FMPs identify and rebuild overfished stocks. The FMP was revised to include an overfished species threshold of $B_{25\%}$ (25 percent of estimated unfished biomass level) for non-flatfish stocks and $B_{12.5\%}$ for flatfish stocks. Groundfish stocks with depletion levels that fall below these thresholds are considered overfished. Once a stock has been declared overfished, it remains in overfished status until the biomass reaches the B_{MSY} management target ($B_{40\%}$ for non-flatfish stocks or $B_{25\%}$ for flatfish stocks) and the stock has been declared rebuilt. The currently overfished groundfish species are bocaccio, canary rockfish, cowcod, darkblotched rockfish, Pacific ocean perch (POP), yelloweye rockfish, and petrale sole. Figure 3-1 shows the relative depletion trends for the overfished rockfish stocks and Figure 3-2 shows the relative depletion trend for petrale sole from 1980 to the most recent year each stock was assessed. The three overfished species predominantly caught in LE trawl fisheries are darkblotched rockfish, POP, and petrale sole.

Overfished species are managed under rebuilding plans. Amendment 16-1 set a framework for rebuilding parameters and requirements in the FMP; it also set an initial requirement that NMFS implement rebuilding plans through regulation. Amendments 16-2 (April 13, 2004; 69 FR 19347) and 16-3 (September 28, 2004; 69 FR 57874) revised the FMP to include rebuilding plans for the seven overfished species identified above,

plus lingcod. Lingcod was declared rebuilt beginning in 2006 (December 19, 2005; 70 FR 75115). Amendment 16-4, approved on December 29, 2006 (71 FR 78638), revised the rebuilding parameters for the seven species currently managed via rebuilding plans. Amendment 16-5, approved on February 9, 2010, established a rebuilding plan for petrale sole and revised the existing rebuilding plans. The canary rockfish and POP rebuilding plans were revised in the 2013-2014 specifications process as a regulatory amendment and the cowcod rebuilding plan was revised in a regulatory amendment in the 2015-2016 specifications process. The 2013 assessments for bocaccio, darkblotched rockfish, and petrale sole predicted these stocks would be rebuilt by 2015. Assessments for these stocks will be conducted in 2015 to confirm those predictions. The 2014 SAFE document provides detailed information on overfished species distributions, life histories, and management areas (PFMC 2014).

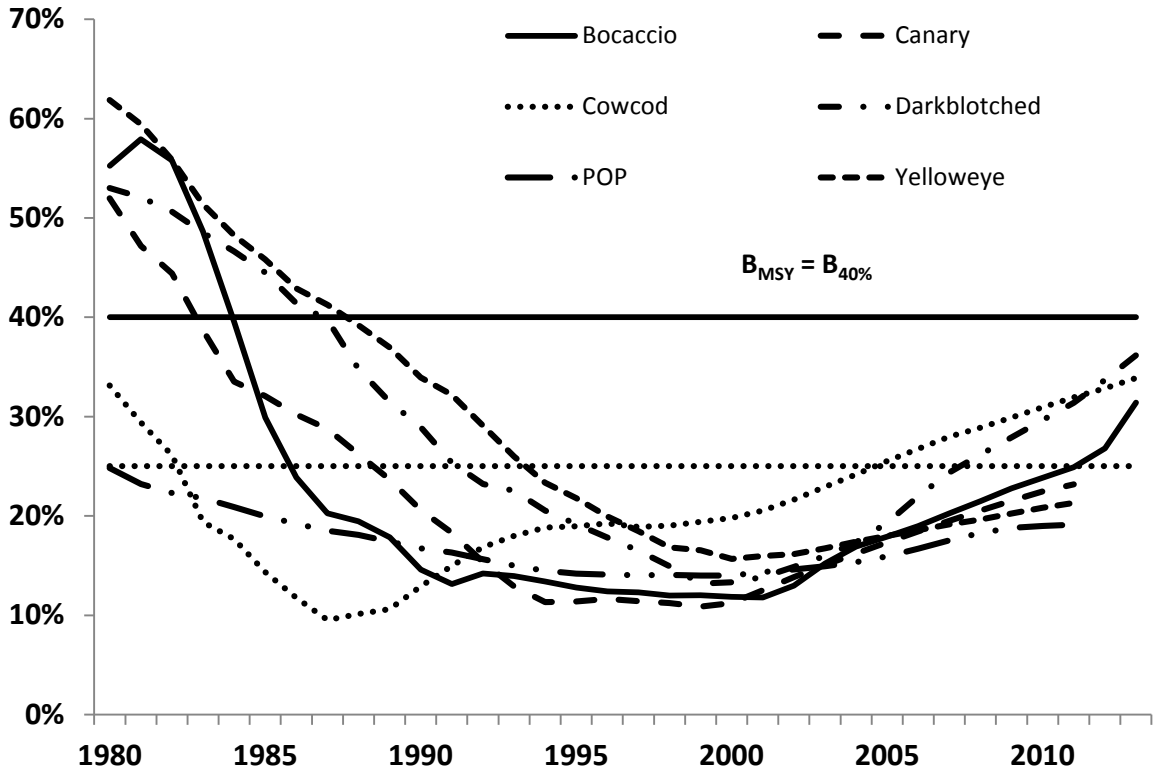

Figure 3-1. Relative depletion trends for rebuilding rockfish species based on the most recent assessments for these stocks.

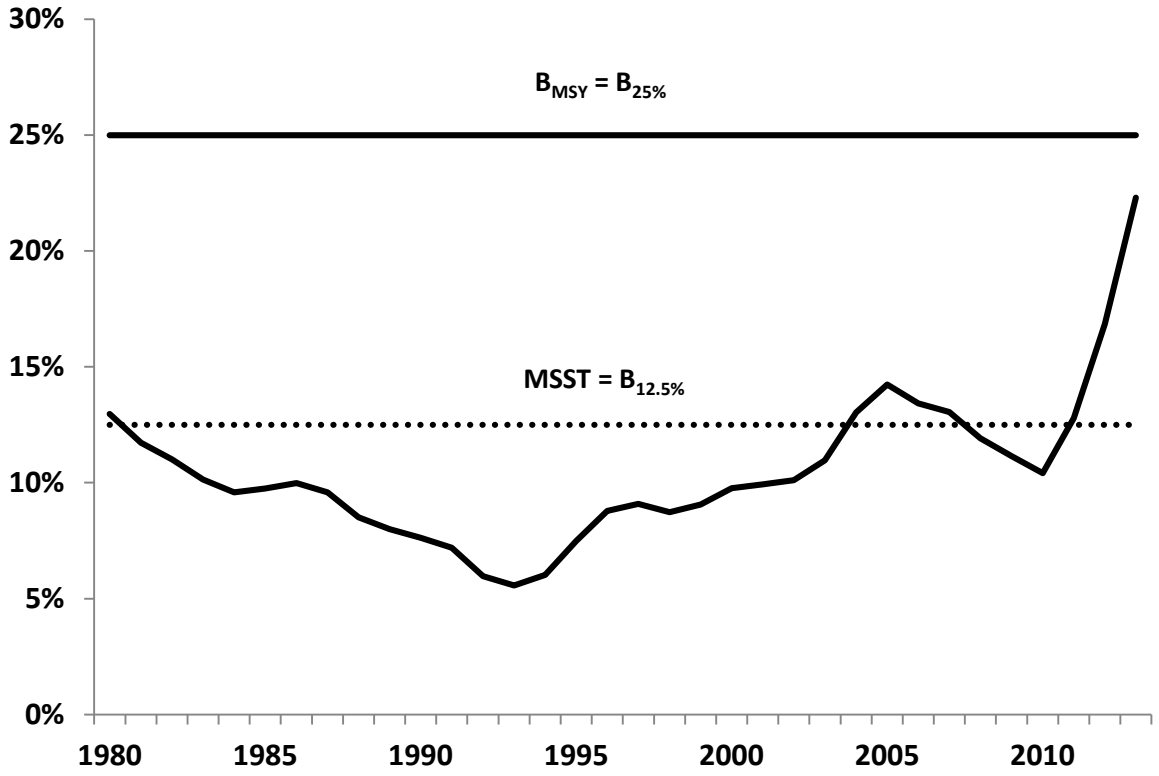

Figure 3-2. Relative depletion trend from 1980 to 2013 for petrale sole based on the 2013 stock assessment.

3.3.1.1 Precautionary and Healthy Groundfish Stocks

Quantitative stock assessments have been prepared for the following precautionary and healthy stocks: lingcod, sablefish, chilipepper rockfish, splitnose rockfish, yellowtail rockfish (north of 40°10' N lat.), shortspine thornyhead (north and south of 34°27' N lat.), longspine thornyhead (north of 34°27' N lat.), Dover sole, English sole, petrale sole, arrowtooth flounder, and starry flounder. A new petrale sole assessment the Council adopted in November 2009 for use in establishing the 2011 to 2012 harvest specifications and management measures indicates that the petrale sole stock is below the overfished threshold (PFMC, November 2009, Agenda Item G.2.a, Attachment 8).

The proposed alternatives consider long-term, formal allocations for Pacific cod, minor slope rockfish, and Other Flatfish complexes. These species are significantly caught or targeted in groundfish fisheries, but have harvest specifications primarily based on catch histories with some precautionary reductions in OYs. Minor rockfish includes the "remaining rockfish," which generally includes species that have been assessed by less rigorous methods than stock assessment, and "other rockfish," which includes species that do not have quantifiable stock assessments. Tables Table 3 2 and Table 3 3 contain a listing of the minor rockfish species by management categories.

The complex, minor nearshore rockfish south of 40°10' N lat., is subdivided into the following management categories: 1) shallow nearshore rockfish, 2) deeper nearshore rockfish, and 3) California scorpionfish. The Other Flatfish complex contains all the unassessed flatfish species in the Groundfish FMP. These species include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, and sand sole. Detailed

information on the stock distribution, life history, stock status, and management history for groundfish species can be found in volume 1, chapter 1 of the 2008 Status of the Pacific Coast Groundfish Fishery, SAFE document (PFMC 2008b).

3.3.2 Non-Groundfish Species

Non-groundfish species that are harvested commercially, such as California halibut, Pacific halibut, CPS, highly migratory species, Dungeness crab, shrimp, prawns, and sea cucumber, occur in the area. Other species that occur in the action area include Pacific salmon, marine mammals, turtles, and seabirds. Further information on the distribution and life history of these species can be found in the most recent SAFE document, Volume 1, Chapter 1, Section 1.5 (PFMC 2008b).

3.3.3 Protected Species

3.3.3.1 Salmon

Salmon caught in west coast fisheries have life cycle ranges that include coastal streams and river systems from Central California to Alaska and marine waters along the U.S. and Canada seaward into the north central Pacific Ocean, including Canadian territorial waters and the high seas. Chinook, or king salmon (*Oncorhynchus tshawytsch*a), and coho, or silver salmon (*O. kisutch*), are the main species caught in Council-managed ocean salmon fisheries. In odd-numbered years, catches of pink salmon (*O. gorbuscha*) can also be significant, primarily off Washington and Oregon.

Section 7 of the ESA requires Federal agencies, in consultation with and with the assistance of the U.S. Secretary of Commerce, to ensure that their actions are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat that has been designated for those species. NMFS issued biological opinions (BOs) under the ESA pertaining to the effects of the Pacific Coast groundfish FMP fisheries on Chinook salmon on August 10, 1990, November 26, 1991, August 28, 1992, September 27, 1993, May 14, 1996, and December 15, 1999. The August 1992 BO included an analysis of the effects of the Pacific whiting fishery on listed Chinook salmon. The BOs indicate that Chinook is the salmon species most likely to be affected by the groundfish fishery, while other salmon species are rarely encountered in the Pacific whiting and other groundfish fisheries. The following "evolutionarily significant units" (ESUs) of ESA-listed Chinook are most likely to be affected by the groundfish fisheries: Snake River fall Chinook (threatened), Upper Willamette River Chinook (threatened), Lower Columbia River Chinook (threatened), Puget Sound Chinook (threatened), Sacramento River winter-run Chinook (endangered), California coastal Chinook (threatened), and Central Valley spring-run Chinook (threatened). Further information on the distribution and life history of these salmon species can be found in the most recent SAFE document (PFMC 2014).

3.3.3.2 Marine Mammals

Approximately thirty species of marine mammals, including seals and sea lions, sea otters, and whales, dolphins, and porpoise, occur within the EEZ. Many marine mammal species seasonally migrate through Pacific Coast waters, while others are year-round residents. Federal legislation in the form of the Marine Mammal Protection Act (MMPA) and the ESA guide marine mammal species protection and conservation policy. Under the MMPA, NMFS is responsible for the management of cetaceans and pinnipeds, while the U.S. Fish and Wildlife Service (USFWS) manages sea otters. Stock assessments review new information every year for strategic stocks (those whose human-caused mortality and injury exceeds the potential biological removal [PBR]) and every three years for non-strategic stocks. Marine mammals whose abundance falls below the optimum sustainable population are listed as "depleted" according to the MMPA.

Fisheries that interact with species listed as depleted, threatened, or endangered may be subject to management restrictions under the MMPA and ESA. Species listed as endangered under the ESA include sperm whale (*Physeter macrocephalus*), humpback whale (*Megaptera novaeangliae*), blue whale (*Balaenoptera musculus*) and fin whale (*Balaenoptera physalus*). Species listed as threatened under the ESA include Steller sea lion (*Eumetopias juba*tus) eastern stock Guadalupe fur seal (*Arctocephalus townsendi*), southern sea otter (*Enhydra lutris*) California Stock. Species listed as depleted under the MMPA include northern fur seal (*Callorhinus ursinus*), eastern Pacific stock killer whale (*Orcinus orca*) eastern north Pacific, southern resident Stock.

NMFS publishes an annual list of fisheries based on the level of serious injury and mortality of marine mammals occurring incidentally in that fishery. The categorization of a fishery in the list of fisheries determines whether participants in that fishery are subject to certain provisions of the MMPA, such as registration, observer coverage, and take reduction plan requirements. The Pacific Coast groundfish fisheries (with the exception of sablefish pot gear) are in Category III, indicating a remote likelihood of, or no known, serious injuries or mortalities, to marine mammals.

3.3.3.3 Seabirds

The California Current System supports more than two million breeding seabirds and at least twice that number of migrant visitors. Tyler et al. (1993) reviewed seabird distribution and abundance in relation to oceanographic processes in the California Current System and found that over 100 species have been recorded within the EEZ. These species include albatross, shearwaters, petrels, storm-petrels, cormorants, pelicans, gulls, terns and alcids (murres, murrelets, guillemots, auklets and puffins). In addition, millions of other birds are seasonally abundant in the EEZ, including waterfowl, waterbirds (loons and grebes), and shorebirds (phalaropes). There is considerable overlap of fishing areas and areas of high bird density in this highly productive upwelling system. The species composition and abundance of birds vary spatially and temporally. The highest seabird biomass is found over the continental shelf, and bird density is highest during the spring and fall when local breeding species and migrants predominate. Seabird species listed as endangered under the ESA include short-tail albatross (*Phoebastria albatrus*), California brown pelican (*Pelecanus occidentalis*), and California least tern (*Sterna antillarum browni*). The only species listed as threatened under the ESA is the marbled murrelet (*Brachyramphs marmoratus*).

3.3.3.4 Sea Turtles

Four sea turtle species have been sighted off the U.S. west coast: loggerhead (*Caretta care*tta), green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), and olive ridley (*Lepidochelys olivacea*). Under the ESA, green, leatherback, and olive ridley sea turtles are listed as endangered; loggerheads are listed as threatened. Although sea turtles have been sighted off the west coast, no takes of these species have been documented in the groundfish fishery.

3.3.3.5 Green Sturgeon

The Southern Distinct Population Segment (DPS) of green sturgeon (*Acipenser medirostris*) (71 FR 17757, April 7, 2006) were recently listed as threatened under the ESA. Green sturgeon are found from Ensenada, Mexico, to Southeast Alaska. Green sturgeon are not abundant in any estuaries along the Pacific coast, although they are caught incidentally in the estuaries by the white sturgeon fishery.

3.4 Socioeconomic Environment

3.4.1 Groundfish Fishery

NMFS approved FMP Amendment 6 for a groundfish license limitation (limited entry) program on September 4, 1992. The groundfish fishery was operating under a LE system beginning in 1994. Under the groundfish LE program, vessels were issued limited entry permits (LEPs) based on catch history. Each LEP is endorsed for used with trawl and/or fixed gears. Most of the Pacific coast commercial groundfish harvest is taken by the LE fleet. The smaller portion of the commercial groundfish fishery that is not permitted, and which targets groundfish or catches and retains groundfish caught incidentally to a non-groundfish fishery, is the open access fishery. The gears used by participants in open access fisheries include longline, vertical hook and line, troll, pot, setnet, trammel net, shrimp and prawn trawl, California halibut trawl, and sea cucumber trawl gears. Open access trawl gear may not be used to target groundfish, but may land incidental groundfish caught while targeting other state managed species. Open access trap/pot and longline vessels may target groundfish under certain restrictions.

The Makah, Quileute, Hoh, and Quinault Tribes off the Washington coast participate in tribal commercial, ceremonial and subsistence fisheries for groundfish according to their treaty rights; however, they do not fish in the area affected by the proposed action.

In addition to commercial and tribal participants, there are state-managed recreational fisheries that harvest groundfish. Marine recreational fisheries consist of charter vessels, private vessels, and shore anglers. Charter vessels are larger vessels for hire, which typically can fish farther offshore than most vessels in the private recreational fleet. Shore-based anglers often fish in intertidal areas, within the surf, or off jetties. Recreational fisheries are managed by a series of seasons, area closures, and bag limits.

3.4.1.1 Limited Entry Trawl

Non-whiting trawl vessels use midwater trawl gear and small and large footrope bottom trawl gear (defined at 50 CFR660.302 and 660.322(b)). The LE non-whiting trawl vessels catch a wide range of species. By weight, the following species account for the bulk of non-whiting landings: Dover sole, arrowtooth flounder, petrale sole, sablefish, longspine thornyhead and shortspine thornyhead, and yellowtail rockfish. Larger non-whiting LE trawl vessels focus more heavily on the DTS complex in deep water, while smaller trawl vessels focus more heavily on the shelf. Large trawl vessels also tend to participate in the trawl fishery for more months of the year than small trawl vessels.

Management measures intended to reduce the directed and incidental catch of overfished rockfish and other depleted species have significantly reduced rockfish catches in recent years. The primary management measures used to control effort in the non-whiting trawl fisheries are an individual fishing quota (IFQ) system combined with closed area management, gear restrictions, and cumulative landing limits for non-quota species. Non-whiting trawl vessels are subject to area closures including trawl Rockfish Conservation Areas (RCA) and EFH closures. RCA closures are designed to reduce catch of overfished species by prohibiting fishing in areas where overfished rockfish species are relatively abundant. RCAs are adjusted inseason.

3.4.1.2 Limited Entry Fixed Gear

LE fixed gear vessels use longline and fish pots (traps) to target groundfish. LE fixed gear vessels principally target sablefish, a species that tends to reside in relatively deep water, although blackgill rockfish has been an important target species south of 34°27' N lat. Like trawl, closed areas are used to control catch of overfished species. The LE fixed gear sector cannot fish within the boundaries of the non-trawl RCAs

(the boundaries are different the trawl RCAs). Some overfished rockfish species, such as yelloweye rockfish, are more vulnerable to being caught with fixed gear; therefore, the use of fixed gear is more restricted on the continental shelf than trawl.

LE fixed gear vessels may also participate in open access fisheries or in the LE trawl fishery. Like the LE trawl fleet, LE fixed gear vessels deliver their catch to ports along the Washington, Oregon, and California coast.

3.4.1.3 Directed Open Access

Directed open access vessels use various non-trawl gears to target particular groundfish species or species groups. Longline and hook and line gear are the most common open access gear types used by vessels directly targeting groundfish and are generally used to target sablefish, rockfish, and lingcod. Pot gear is used for targeting sablefish, thornyheads, and rockfish. Though largely prohibited from use under current regulations, setnet gear was used in the past to target rockfish, including chilipepper rockfish, widow rockfish, bocaccio, yellowtail rockfish, and olive rockfish, and, to a lesser extent, vermilion rockfish off southern and central California. Groundfish retention and landings by open access vessels are regulated under the Groundfish FMP. Open access vessels must comply with non-trawl RCA restrictions and with cumulative trip limits established for the open access sector, as well as other operational restrictions imposed in the regulations.

Though fishery managers divide the open access sector into directed and incidental categories, such segregation is difficult, as the choice depends on the intention of the fishers. Over the course of a year or during a single trip, fishermen may engage in different strategies, and they may switch between directed and incidental fishing categories. Such changes in strategy are likely the result of a variety of factors, including the potential economic return from landing a particular mix of species.

Rockfish, thornyheads, and sablefish account for most of the open access landings and revenue, and hook and line is the major gear type used for open access landings. Fixed gears are used to catch most open access groundfish, although non-shrimp trawl gear and net gear also make substantial landings. Open access landings in the state of California have a large live fish component (as does the limited entry fixed gear sector).

3.4.2 Groundfish Management

Since 2000, groundfish management has been heavily centered on the need to rebuild overfished stocks. West coast groundfish stocks are highly inter-mixed, meaning that overfished species co-occur and are caught in common with more abundant groundfish stocks (stocks with healthy or precautionary status). This intermixed nature of groundfish stocks means that eliminating the directed targeting of overfished species usually does not achieve the catch reductions needed to meet rebuilding goals. To adequately constrain total catch of overfished species, management measures have constrained target-fishing opportunity on the more abundant stocks that co-occur with overfished species to reduce the catch of overfished species. The need to constrain harvest of healthy stocks has economic implications for the harvesters, processors, and communities due to the loss of landings and revenue that could have been derived from both overfished species and many target species that co-occur with those overfished species.

3.4.2.1 Groundfish Allocations

The Pacific coast groundfish fishery is managed on a biennial calendar with harvest specifications and management measures being announced every other year. During each cycle, the harvest specifications for each species or species complex is set for two sequential years. Fishery specifications include ABCs,

designation of OYs (which may be represented by harvest guidelines [HGs] or quotas for species that need individual management,) and allocation of commercial ACLs between the open access and LE segments of the fishery. The specifications include fish caught in state ocean waters (0 to 3 nm offshore) as well as fish caught in the EEZ (3 to 200 nm offshore).

An allocation is the apportionment of a harvest specification for a specific purpose, to a particular person or group of persons. Allocation of groundfish resources is generally a direct allocation stated as a numerical quota or HG for a specific gear or fishery sector, but indirect allocation also occurs as a result from management measures. Direct allocation occurs when numerical quotas, HGs, or other management measures are established with the specific intent of affecting a particular group's access to the fishery resource. Most fishery management measures allocate fishery resources to some degree, because they invariably affect access to the resource by the different participants.

The FMP allows groundfish resources to be allocated to accomplish a single biological, social, or economic objective, or a combination of such objectives. The entire resource, or a portion thereof, may be allocated to a particular group, although the MSA requires that allocation among user groups be fair and equitable, reasonably calculated to promote conservation, and determined in such a way that no group, person, or entity receives an undue excessive share of the resource. Allocative impacts of all proposed management measures should be analyzed and discussed during the decision-making process. In addition to the requirements described in Section 6.2.3 of the FMP, the FMP requires the Council to consider the following actors when intending to recommend direct allocation of the resource:

1. Present participation in and dependence on the fishery, including alternative fisheries
2. Historical fishing practices in and historical dependence on the fishery
3. The economics of the fishery
4. Any consensus harvest sharing agreement or negotiated settlement between the affected participants in the fishery
5. Potential biological yield of any species or species complex affected by the allocation
6. Consistency with the MSA national standards
7. Consistency with the goals and objectives of the FMP

The modification of a formal allocation cannot be designated as routine and, under the policy adopted under FMP Amendment 21, requires an FMP amendment.

FMP Amendment 6 established the commercial non-treaty LE program and established procedures for allocating species and species complexes between the LE and open access fisheries. Chapter 11.2.2 for the FMP addresses the allocation of groundfish between the limited and open access fisheries. Allocations for the open access fishery are based on historical catch levels for the period from July 11, 1984, to August 1, 1988, by exempted, longline, and fishpot gears used by vessels that did not receive an endorsement for the gear. Based on the record of landings over this period, an open access percentage of catch was determined. LE and open access allocations are derived by applying the percentage to the commercial harvest guideline or quota. The commercial harvest guideline or quota is the ACL after subtracting any recreational fishery estimates or tribal allocations harvest guidelines or set-asides, projected bycatch in non-groundfish fisheries, and estimated research catch.

4 Environmental Consequences

4.1 Introduction

The proposed action to remove blackgill rockfish from the southern Slope Rockfish complex and to make a formal intersector allocation of blackgill and to modify the formal allocation of the harvestable surplus of southern Slope Rockfish to LE trawl and non-trawl (both LE and OA) sectors of the west coast groundfish fishery neither affects overall harvest levels of any species, nor does it affect management measures for any sector of the fishery. The proposed actions are not expected to change the magnitude or distribution of trawl efforts compared to the No Action Alternative. Therefore, the proposed action is expected to have no differential direct impacts and potentially low indirect impacts to the west coast biological environment (i.e., affected species) or the physical environment (i.e., west coast marine ecosystems and EFH).

Related actions to this proposed action include the biennial harvest specifications, with decision-making for the 2017 and beyond fishing seasons scheduled to begin later this year (the first harvest specifications decisions for fisheries in 2017 and beyond are scheduled for Council consideration in September 2015). While the proposed actions for intersector allocations of blackgill rockfish and the Slope Rockfish complex south of 40°10' N lat. may not have direct impacts on the physical or biological environment, corresponding actions in the biennial specifications process may change the way the trawl fishery is managed and may result in changes in the timing, location, and intensity of harvest patterns, as will be described in any analyses informing those decisions.

The anticipated impacts of the proposed allocation actions for are largely socioeconomic, although there are biological impacts anticipated for blackgill rockfish. Therefore, most of the environmental consequences of the proposed actions are discussed in Section 4.4.

4.2 Impacts of the Alternatives on the Physical Environment

NMFS completed an EIS to comprehensively evaluate groundfish habitat and the effects of groundfish fishing on that habitat in response to litigation (American Oceans Campaign v. Daley et al., Civil Action No 99-982(GK)). The action analyzed in the EFH EIS, authorizing harvest of groundfish within EFH, is incorporated by reference. A Record of Decision for Pacific Coast Groundfish EFH was issued on March 8, 2006, and it concluded that partial approval of Amendment 19 to the FMP would minimize to the extent practicable adverse impacts to EFH from fishing. Amendment 19, approved on March 8, 2006, provides for a comprehensive strategy to conserve EFH, including its identification, designation of HAPC, and the implementation of measures to minimize, to the extent practicable, adverse impacts to EFH from fishing. The final rule implementing Amendment 19 provided measures necessary to conserve EFH.

There is currently insufficient information to predict the effects of fishing on the marine ecosystem in any precise way. NEPA regulations address this issue. When an agency is evaluating reasonably foreseeable significant adverse effects, there is incomplete or unavailable information, and the costs of obtaining it are exorbitant or the means unknown, the agency must (1) so state, (2) describe the importance of the unavailable information to the assessment, (3) summarize any existing scientific information, and (4) evaluate impacts based on generally accepted scientific principles (40 CFR Part 1502.22), which may accord with the best professional judgment of agency staff.

NMFS acknowledges that the information necessary to fully evaluate impacts on the marine ecosystems cannot be reasonably obtained at this time, and impacts are generally unknown. While it is not possible to fully evaluate the impacts to the physical environment, the level of potential significant impact to EFH and the marine ecosystem from the proposed actions is anticipated to be low or have no expected differential impact from the No Action Alternative.

The action alternatives are not expected to significantly change the magnitude or distribution of bottom trawl or non-trawl effort compared to the No Action Alternative. No change in fishing activity would occur in areas that are currently closed to fishing with specific gears, because no changes are anticipated to RCAs or other EFH conservation measures. Because all of the alternatives are similar to indirect allocations that have occurred through the biennial specifications and management measures, and because the alternatives do not affect overall harvest levels or fishing practices, the effects of these alternative allocations are not significant on EFH or the marine ecosystem.

4.3 Impacts of the Alternatives on the Biological Environment

4.3.1 Protected Species

When compared to the No Action Alternative, no differential impacts from any of the alternatives for are anticipated to salmonids (ESA-listed and non-listed). This action would not affect overall harvest levels of groundfish other than the affected slope rockfish species, including blackgill rockfish, nor would fishing practices change as a result of this action. Under any of the alternatives, west coast groundfish fishing would remain under guidance contained in the BO for listed salmonids taken incidentally in this fishery.

4.3.2 Overfished Groundfish Species

Blackgill rockfish are primarily caught on the continental slope off southern California with 65% of the historical catch occurring south of Pt. Conception at 34°27' N lat. (Field and Pearson 2011). Given that the two overfished slope rockfish species (i.e., darkblotched rockfish and POP) on the west coast are species occurring primarily in waters north of Pt. Conception (darkblotched are rare south of 38° N lat. and POP are rare south of 40°10' N lat.). To the extent that implementation of any of the action alternatives effectively reduces trawl targeting of blackgill rockfish and that effort shifts north to areas where darkblotched rockfish or POP are incidentally caught or, if effort shifts onto the shelf where overfished shelf rockfish are found, there could be an increased bycatch of these species. However, IFQ management has effectively kept trawl impacts on overfished species within prescribed allocations. The 100% monitoring requirement for LE trawl efforts and implementation of IFQ for all overfished species has created a precise and effective management strategy to reduce impacts on overfished species and other species of concern.

4.3.3 Blackgill Rockfish and Other Species Currently Managed in the Slope Rockfish Complex South of 40°10' N lat.

Total catches of the species currently managed in the Slope Rockfish complex south of 40°10' N lat., including blackgill rockfish, by sector and year are provided for the 2003-2013 period in Table 4-1. These years are used in this analysis since these are the years of available total catches reconciled by the WCGOP (full implementation of WCGOP occurred in 2003) and 2003 was the first year of full implementation of the trawl and non-trawl RCAs. Full implementation of the WCGOP allows more precise estimates of discard mortalities of affected slope rockfish stocks, which better informs considerations of new intersector allocations since future sector limits are expected to be based on total catch. Full implementation of RCAs is also an important consideration in this analysis since the affected LE trawl and non-trawl fleets began shifting effort to the slope in 2003 as RCA implementation closed shelf areas where these fleets directed much of their effort previously.

Table 4-1. Total catches of blackgill rockfish and other species currently managed in the Slope Rockfish complex south of 40°10' N lat., 2003-2013.

Sectors	Sub-sectors	Species	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Grand Total
LE Trawl	LE Trawl Species Total		45.6	51.5	41.0	45.7	29.4	10.8	9.0	4.0	6.1	24.6	9.2	277.0
	At-Sea Hake													0.0
	LE Trawl Permit - Fixed Gear	Aurora Rockfish									0.1	0.2	0.3	0.5
	LE Trawl Permit - Trawl Gear		45.6	51.5	41.0	45.7	29.4	10.8	9.0	4.0	6.0	24.4	8.9	276.4
	Shoreside Hake				0.0									0.0
	LE Trawl Species Total		85.5	109.8	24.6	22.1	27.9	95.3	57.5	13.4	27.8	16.6	45.7	526.1
	At-Sea Hake													0.0
	LE Trawl Permit - Fixed Gear	Bank Rockfish											0.0	0.0
	LE Trawl Permit - Trawl Gear		85.5	109.8	24.2	22.1	27.9	95.3	57.5	13.4	27.8	16.6	45.7	525.7
	Shoreside Hake				0.4									0.4
	LE Trawl Species Total		54.8	80.4	52.1	36.2	25.7	37.7	54.0	61.3	16.0	79.2	53.5	550.9
	At-Sea Hake													0.0
	LE Trawl Permit - Fixed Gear	Blackgill Rockfish									1.7	6.1	15.1	22.9
	LE Trawl Permit - Trawl Gear		54.8	80.4	52.1	36.2	25.7	37.7	54.0	61.3	14.3	73.1	38.4	528.0
	Shoreside Hake					0.0								0.0
	LE Trawl Species Total											0.1		0.1
	At-Sea Hake													0.0
	LE Trawl Permit - Fixed Gear	Blackspotted Rockfish												0.0
	LE Trawl Permit - Trawl Gear											0.1		0.1
	Shoreside Hake													0.0
	LE Trawl Species Total		0.0	1.0		0.0	0.2	0.2			0.0	0.1	0.0	1.6
	At-Sea Hake													0.0
	LE Trawl Permit - Fixed Gear	Pacific Ocean Perch												0.0
	LE Trawl Permit - Trawl Gear		0.0	1.0		0.0	0.2	0.2			0.0	0.1	0.0	1.6
	Shoreside Hake													0.0
	LE Trawl Species Total		2.8	0.7	0.6	0.8	1.4	3.0	2.3	1.3	0.2	0.7	0.5	14.3
	At-Sea Hake	Redbanded Rockfish												0.0
	LE Trawl Permit - Fixed Gear												0.0	0.0

Sectors	Sub-sectors	Species	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Grand Total
	LE Trawl Permit - Trawl Gear		2.8	0.7	0.6	0.8	1.4	3.0	2.3	1.3	0.2	0.7	0.5	14.3
	Shoreside Hake													0.0
	LE Trawl Species Total		0.0	0.1				0.0	0.0		0.0	0.2	0.1	0.5
	At-Sea Hake													0.0
	LE Trawl Permit - Fixed Gear	Rougheye Rockfish												0.0
	LE Trawl Permit - Trawl Gear		0.0	0.1				0.0	0.0		0.0	0.2	0.1	0.5
	Shoreside Hake													0.0
	LE Trawl Species Total			0.8	5.6	0.2	0.2		4.7	0.6	0.0	0.3	0.9	13.1
	At-Sea Hake													0.0
	LE Trawl Permit - Fixed Gear	Sharpchin Rockfish												0.0
	LE Trawl Permit - Trawl Gear			0.8	5.6	0.2	0.2		4.7	0.6	0.0	0.3	0.9	13.1
	Shoreside Hake													0.0
	LE Trawl Species Total			0.0			0.7	0.7	3.3	0.6		0.0		5.5
	At-Sea Hake													0.0
	LE Trawl Permit - Fixed Gear	Shortraker Rockfish												0.0
	LE Trawl Permit - Trawl Gear			0.0			0.7	0.7	3.3	0.6		0.0		5.5
	Shoreside Hake													0.0
	LE Trawl Species Total													0.0
	At-Sea Hake													0.0
	LE Trawl Permit - Fixed Gear	Shortraker/Rougheye Rockfish												0.0
	LE Trawl Permit - Trawl Gear													0.0
	Shoreside Hake													0.0
	LE Trawl Species Total		2.2	2.5	0.6	58.7	7.0	0.3	6.8	0.8	1.9	1.0	7.5	89.2
	LE Trawl Permit - Fixed Gear	Slope Rockfish Unid									0.3	0.0		0.3
	LE Trawl Permit - Trawl Gear		2.2	2.5	0.6	58.7	7.0	0.3	6.8	0.8	1.7	1.0	7.5	88.9
	Shoreside Hake													0.0
	LE Trawl Species Total											0.0		0.0
	At-Sea Hake	Yellowmouth Rockfish												0.0
	LE Trawl Permit - Fixed Gear													0.0

Sectors	Sub-sectors	Species	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Grand Total
	LE Trawl Permit - Trawl Gear											0.0		0.0
	Shoreside Hake													0.0
	LE Trawl Complex Total		191.0	246.8	124.6	163.5	92.4	148.1	137.6	82.0	52.1	122.7	117.3	1478.1
	At-Sea Hake		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LE Trawl Permit - Fixed Gear	Slope Rockfish South Complex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	6.3	15.3	23.7
	LE Trawl Permit - Trawl Gear		191.0	246.8	124.2	163.5	92.4	148.1	137.6	82.0	50.0	116.4	102.0	1454.0
	Shoreside Hake		0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Non-Trawl	Non-Trawl Species Total		3.0	1.5	0.5	0.3	0.3	1.0	7.1	0.8	0.6	0.3	0.1	15.5
	Nearshore Fixed Gear	Aurora Rockfish	0.0	0.0		0.0		0.0	0.0	0.0			0.0	0.0
	Non-Nearshore Fixed Gear		3.0	1.5	0.5	0.3	0.3	1.0	7.1	0.8	0.6	0.3	0.1	15.5
	Non-Trawl Species Total		1.1	1.1	2.0	3.9	1.2	0.3	0.3	0.1	1.1	0.4	0.2	11.7
	Nearshore Fixed Gear	Bank Rockfish	0.0	0.1	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.8
	Non-Nearshore Fixed Gear		1.1	1.0	1.8	3.7	1.2	0.3	0.2	0.1	1.1	0.4	0.0	10.9
	Non-Trawl Species Total		127.6	70.5	35.9	57.7	22.4	33.6	81.5	85.2	135.1	116.3	18.1	783.8
	Nearshore Fixed Gear	Blackgill Rockfish	4.1	3.2	2.0	3.8	0.3	0.4	2.4	0.5	0.4	2.3	1.0	20.6
	Non-Nearshore Fixed Gear		123.4	67.3	33.9	53.8	22.0	33.3	79.0	84.7	134.7	114.0	17.0	763.2
	Non-Trawl Species Total											8.8		8.8
	Nearshore Fixed Gear	Blackspotted Rockfish										0.0		0.0
	Non-Nearshore Fixed Gear											8.8		8.8
	Non-Trawl Species Total			0.1	0.0	0.1		0.0	0.1	0.0			0.0	0.3
	Nearshore Fixed Gear	Pacific Ocean Perch		0.1		0.0			0.0					0.1
	Non-Nearshore Fixed Gear				0.0	0.0		0.0	0.1	0.0			0.0	0.2
	Non-Trawl Species Total		0.5	2.4	0.6	2.1	0.4	1.9	1.2	0.3	0.3	0.9	0.2	10.7
	Nearshore Fixed Gear	Redbanded Rockfish		0.2		0.0	0.0		0.0		0.0	0.0		0.2
	Non-Nearshore Fixed Gear		0.5	2.2	0.6	2.1	0.4	1.9	1.2	0.3	0.3	0.9	0.2	10.6
	Non-Trawl Species Total		0.1		1.7	0.2	3.0	0.2	3.1	0.0	0.3	0.2		9.0
	Nearshore Fixed Gear	Rougheye Rockfish	0.0			0.0			0.0					0.0
	Non-Nearshore Fixed Gear		0.1		1.7	0.2	3.0	0.2	3.1	0.0	0.3	0.2		9.0
	Non-Trawl Species Total	Sharpchin Rockfish							0.1			0.0		0.1

Sectors	Sub-sectors	Species	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Grand Total
	Non-Nearshore Fixed Gear								0.1			0.0		0.1
	Non-Trawl Species Total	Shortraker Rockfish							0.2					0.2
	Non-Nearshore Fixed Gear								0.2					0.2
	Non-Trawl Species Total	Shortraker/Rougheye Rockfish	0.0											0.0
	Non-Nearshore Fixed Gear		0.0											0.0
	Non-Trawl Species Total	Slope Rockfish Unid	7.6	7.2	5.1	2.3	1.4	0.7	0.7	2.1	1.7	3.6	3.6	36.0
	Nearshore Fixed Gear		0.1	0.2	0.3	0.4	0.1	0.1	0.0	0.0	0.0	0.1	0.0	1.3
	Non-Nearshore Fixed Gear		7.5	6.9	4.8	2.0	1.3	0.5	0.7	2.1	1.7	3.5	3.6	34.7
	Non-Trawl Species Total	Yellowmouth Rockfish				0.0			0.0					0.1
	Nearshore Fixed Gear					0.0			0.0					0.0
	Non-Nearshore Fixed Gear					0.0			0.0					0.0
	Non-Trawl Species Total	Slope Rockfish South Complex	139.8	82.7	45.9	66.6	28.7	37.7	94.3	88.5	139.1	130.6	22.2	876.1
	Nearshore Fixed Gear		4.2	3.7	2.6	4.4	0.5	0.5	2.5	0.6	0.4	2.4	1.2	22.9
	Non-Nearshore Fixed Gear		135.6	79.0	43.3	62.2	28.2	37.2	91.8	87.9	138.7	128.2	21.0	853.2
Set-Aside	Set-Aside Species Total			0.1	0.1	0.0		0.0	0.1	0.1				0.4
	California Halibut													0.0
	Incidental	Aurora Rockfish		0.1	0.1	0.0		0.0	0.1	0.1				0.4
	Pink Shrimp			0.0										0.0
	Tribal At-Sea Hake													0.0
	Set-Aside Species Total		14.8	19.4	10.4	11.3	7.5	1.1	0.1			1.0	8.1	73.9
	California Halibut													0.0
	Incidental	Bank Rockfish	14.8	19.4	10.4	11.3	7.5	1.1	0.1			1.0	8.1	73.9
	Pink Shrimp													0.0
	Tribal At-Sea Hake													0.0
	Set-Aside Species Total		9.9	1.9	0.3	1.2	0.2	3.1	0.5	5.6		0.0	0.1	22.8
	California Halibut													0.0
	Incidental	Blackgill Rockfish	9.9	1.9	0.3	1.2	0.2	3.1	0.5	5.6		0.0	0.1	22.8
	Pink Shrimp													0.0
	Tribal At-Sea Hake													0.0

Sectors	Sub-sectors	Species	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Grand Total
	Set-Aside Species Total													0.0
	California Halibut	Blackspotted Rockfish												0.0
	Tribal At-Sea Hake													0.0
	Set-Aside Species Total			0.0	0.0					0.0				0.1
	California Halibut													0.0
	Incidental	Pacific Ocean Perch			0.0									0.0
	Pink Shrimp			0.0						0.0				0.1
	Tribal At-Sea Hake													0.0
	Set-Aside Species Total		0.0	0.1	0.0			0.0			0.0		0.0	0.2
	California Halibut													0.0
	Incidental	Redbanded Rockfish	0.0	0.1	0.0			0.0			0.0		0.0	0.2
	Pink Shrimp			0.0										0.0
	Tribal At-Sea Hake													0.0
	Set-Aside Species Total													0.0
	California Halibut	Rougheye Rockfish												0.0
	Tribal At-Sea Hake													0.0
	Set-Aside Species Total			0.0										0.0
	California Halibut													0.0
	California Halibut	Sharpchin Rockfish												0.0
	Pink Shrimp			0.0										0.0
	Tribal At-Sea Hake													0.0
	Set-Aside Species Total													0.0
	California Halibut	Shortraker Rockfish												0.0
	Tribal At-Sea Hake													0.0
	Set-Aside Species Total													0.0
	California Halibut	Shortraker/Rougheye Rockfish												0.0
	Tribal At-Sea Hake													0.0
	Set-Aside Species Total	Slope Rockfish Unid	1.3	0.3	0.3	4.8	0.0	0.0	0.1	0.1	0.1	0.0	0.0	7.0
	California Halibut								0.0					0.0

Sectors	Sub-sectors	Species	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Grand Total
	Incidental		1.2	0.3	0.3	4.8	0.0	0.0	0.0	0.1	0.1	0.0	0.0	6.8
	Pink Shrimp		0.1	0.0	0.0				0.0	0.0			0.0	0.2
	Set-Aside Species Total													0.0
	California Halibut	Yellowmouth Rockfish												0.0
	Tribal At-Sea Hake													0.0
Grand Total			356.9	351.3	181.6	247.5	128.8	190.0	232.8	176.2	191.3	254.5	147.8	2458.6

Blackgill rockfish south of 40°10' N lat. has never been subject to potential overfishing even when comparing the total catch against the ABC/OFL contribution of the stock to the southern Slope Rockfish complex (Table 4-2). In fact, the total catch since 2003 never exceeded the annual OY/ACL contribution of the stock to the complex. However, the annual total catch prior to 2013 did exceed the more conservative harvest specifications implemented in 2013, which were based on the results of the more pessimistic 2011 assessment. The large reduction in total catch from 2012 to 2013 (63.4%) is the result of implementing very low cumulative landing limits for the non-trawl sectors to discourage targeting. There are limited management measures to discourage trawl targeting under the status quo management of blackgill in the southern Slope Rockfish complex, where LE trawl quota is allocated based on the annual allocation of the harvestable surplus of southern Slope Rockfish species in aggregate at the complex level. Clearly, if that quota is largely taken in efforts to target blackgill, the most marketable rockfish of those readily caught in the southern Slope Rockfish complex, then there are few selective management strategies that will effectively reduce trawl impacts on the stock.

The default harvest control rule for blackgill rockfish south of 40°10' N lat. is implementing the Council 40-10 ACL control rule to inform the stock's ACL contribution. If annual total catch is maintained at the ACLs projected using the 40-10 rule, the stock is predicted to rebuild slowly from approximately a 30% depletion ratio in 2013 to a 36% depletion ratio in 2022 (Table 4-3). The consideration to remove blackgill from the southern Slope Rockfish complex will allow more precise management of blackgill to achieve the predicted results under the Council's default harvest control rule.

Table 4-2. Total catch (in mt) of blackgill rockfish south of 40°10' N lat. relative to the ACL/OY (annual total catch limit in mt; OY prior to 2011 and ACL thereafter) and ABC/OFL (annual overfishing limit in mt; ABC prior to 2011 and OFL thereafter) contributions of blackgill to the Slope Rockfish South complex, 2003-2013.

	Total Catch	ACL/OY (Annual Total Catch Limit)	ABC/OFL (Overfishing Limit)	% of ACL/OY	% of ABC/OFL
2003	192.3	306	343	62.8%	56.0%
2004	152.8	306	343	49.9%	44.5%
2005	88.4	306	343	28.9%	25.8%
2006	95.1	306	343	31.1%	27.7%
2007	48.3	292	292	16.5%	16.5%
2008	74.4	292	292	25.5%	25.5%
2009	136.0	282	282	48.2%	48.2%
2010	152.1	282	282	53.9%	53.9%
2011	151.1	267	279	56.6%	54.2%
2012	195.5	263	275	74.3%	71.1%
2013	71.6	106	119	67.6%	60.2%

Table 4-3. Projected spawning output, depletion, and annual catch limits for blackgill rockfish south of 40°10' N lat. based on implementation of the Council's default 40-10 harvest control rule.

Year	Assuming ABC Removals and a 40-10 Adjustment		
	Spawning output (larvae 10^6)	Depletion	Annual Catch Limit (mt)
2013	357,200	30.1%	106
2014	367,126	30.9%	110
2015	376,517	31.7%	114
2016	385,375	32.4%	117
2017	393,708	33.1%	120
2018	401,527	33.8%	123
2019	408,850	34.4%	125
2020	415,697	35.0%	128
2021	422,091	35.5%	130
2022	428,060	36.0%	132

4.4 Impacts of the Alternatives on the Socioeconomic Environment

4.4.1 Summary of the Socioeconomic Impacts Associated with Intersector Allocations of Blackgill Rockfish and the Slope Rockfish complex South of 40°10' N lat.

Two criteria are used to evaluate impacts of the trawl and non-trawl allocation alternatives: 1) the utilization of blackgill rockfish and the southern Slope Rockfish complex by each sector, and 2) a comparison of historical catches of these species by trawl and non-trawl sectors to the amount available to these sectors in 2015 under the alternatives.

4.4.1.1 Utilization of Yields by Limited Entry Trawl and Non-Trawl Sectors

One objective of this re-allocation process beyond minimizing risk of overfishing blackgill rockfish, is optimal use of the available harvest of target groundfish species. This objective is guided by two of the three management goals in the Groundfish FMP: 1) goal 2 – Economics – maximize the value of the groundfish resource as a whole; and 2) goal 3 – Utilization – achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities (see Section 6.1). While the proposed action is to determine long-term equitable allocations of blackgill rockfish and the southern Slope Rockfish complex to the LE trawl sector, this decision cannot be made without understanding the needs of the directed non-trawl sectors. This is the intent of this analysis of the alternatives and understanding how target opportunities may be constrained by the bycatch of some of the species under consideration in the proposed action, not the least of which is blackgill rockfish. These analyses attempt to tease out these constraints to all the groundfish sectors, so that trawl allocations will not unnecessarily constrain other groundfish sectors by allocating enough yield for their historic needs.

The utilization goal is first addressed in these analyses by understanding the available yields or ACLs of the groundfish species under consideration during 2003 to 2013 and the harvests in each sector relative to these ACLs and relative to the annual catch in all non-treaty directed sectors combined. Significant utilization of a groundfish species by a sector is defined as catching an average of at least 10% of the total annual catch during the 2003 to 2013 period. Dominant utilization of a groundfish species by a sector is

defined as catching an average of at least 90% of the total annual non-treaty catch during the 2003 to 2013 period. Species thus categorized are "sector-dominant." This evaluation is done for the LE trawl sector (note the at-sea whiting trawl sectors are not affected by the proposed action since those fisheries are prosecuted north of 40°10' N lat. and therefore outside the action area), and the non-trawl sectors combined (i.e., the LE longline and pot/trap sectors combined referred to as the LE fixed gear sector, the directed open access sector, and the recreational sector[2]). Catches of slope rockfish and all other species managed in the groundfish FMP in the incidental open access sector are considered as set-asides in the west coast groundfish management framework.

Blackgill rockfish is the dominant species in the current Slope Rockfish complex south of 40°10' N lat. caught in directed groundfish fisheries during 2003-2013, with 59.9% of all identified species in the catch comprised of blackgill (Table 4-4). Of all the species caught in any significant amount during 2003-2013 of those currently managed in the Slope Rockfish complex south of 40°10' N lat., blackgill rockfish is the one species caught significantly by both LE trawl and non-trawl sectors (Table 4-5 and Figure 4-1)[3]. The presence of blackgill rockfish in the southern Slope Rockfish complex led to the current Amendment 21 sector allocations of 63% LE trawl and 37% non-trawl (allocations under the No Action alternative), arguably giving the non-trawl sectors a higher percentage of the harvestable surplus of the complex than would likely occur if blackgill were not managed in the complex. A comparison of sector total catches in 2003-2013 for the entire complex (Figure 4-2) indicates the significant take of slope rockfish by non-trawl sectors, largely from targeting blackgill. However, under a scenario where blackgill is removed from the complex, the remaining slope rockfish species are trawl-dominant in aggregate (Figure 4-3 and Table 4-5).

Table 4-4. Percent of total catch in directed groundfish fisheries during 2003-2013 of all identified species in the Slope Rockfish complex south of 40°10' N lat., ranked from highest to lowest.

Species	Percent of Total Catch of All Identified Species
Blackgill Rockfish	59.9%
Bank Rockfish	24.1%
Aurora Rockfish	13.1%
Redbanded Rockfish	1.1%
Sharpchin Rockfish	0.6%
Rougheye Rockfish	0.4%
Blackspotted Rockfish	0.4%
Shortraker Rockfish	0.3%
Pacific Ocean Perch	0.1%
Yellowmouth Rockfish	0.0%
Shortraker/Rougheye Rockfish	0.0%
All Identified Species	100.0%

[2] The recreational groundfish fishery rarely impacts slope rockfish species since that fishery is typically prosecuted inshore on the shelf and in nearshore waters where slope rockfish do not occur.

[3] Note that the 2015 ACL contribution of blackgill rockfish is projected from the 2011 assessment, which informed southern Slope Rockfish harvest specifications implemented beginning in 2013. Blackgill catches in previous years that exceeded the 2015 blackgill rockfish ACL contribution do not constitute past overfishing.

Table 4-5. Sector total catch average percent of species currently managed in the Slope Rockfish complex south of 40°10' N lat., 2003-2013.

Species	Sectors	Ave. Percent (2003-2013)	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Aurora Rockfish	LE Trawl	94.7%	93.9%	97.2%	98.8%	99.2%	99.0%	91.5%	56.1%	84.0%	91.2%	98.7%	98.5%
	Non-Trawl	5.3%	6.1%	2.8%	1.2%	0.8%	1.0%	8.5%	43.9%	16.0%	8.8%	1.3%	1.5%
Bank Rockfish	LE Trawl	97.8%	98.8%	99.0%	92.3%	85.1%	95.8%	99.7%	99.6%	99.2%	96.2%	97.4%	99.6%
	Non-Trawl	2.2%	1.2%	1.0%	7.7%	14.9%	4.2%	0.3%	0.4%	0.8%	3.8%	2.6%	0.4%
Blackgill Rockfish	LE Trawl	41.3%	30.0%	53.3%	59.2%	38.5%	53.5%	52.8%	39.9%	41.8%	10.6%	40.5%	74.7%
	Non-Trawl	58.7%	70.0%	46.7%	40.8%	61.5%	46.5%	47.2%	60.1%	58.2%	89.4%	59.5%	25.3%
Blackspotted Rockfish	LE Trawl	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%
	Non-Trawl	99.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.4%	0.0%
Pacific Ocean Perch	LE Trawl	85.5%	100.0%	95.1%	0.0%	6.8%	100.0%	97.8%	0.0%	0.0%	100.0%	100.0%	94.3%
	Non-Trawl	14.5%	0.0%	4.9%	100.0%	93.2%	0.0%	2.2%	100.0%	100.0%	0.0%	0.0%	5.7%
Redbanded Rockfish	LE Trawl	57.2%	85.2%	22.9%	53.4%	27.2%	77.6%	61.0%	65.9%	82.4%	38.9%	42.7%	77.4%
	Non-Trawl	42.8%	14.8%	77.1%	46.6%	72.8%	22.4%	39.0%	34.1%	17.6%	61.1%	57.3%	22.6%
Rougheye Rockfish	LE Trawl	5.3%	26.2%	100.0%	0.0%	0.0%	0.0%	0.7%	0.1%	0.0%	6.3%	54.2%	100.0%
	Non-Trawl	94.7%	73.8%	0.0%	100.0%	100.0%	100.0%	99.3%	99.9%	100.0%	93.7%	45.8%	0.0%
Sharpchin Rockfish	LE Trawl	99.4%	0.0%	100.0%	100.0%	100.0%	100.0%	0.0%	98.6%	100.0%	100.0%	93.6%	100.0%
	Non-Trawl	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%	6.4%	0.0%
Shortraker Rockfish	LE Trawl	96.2%	0.0%	100.0%	0.0%	0.0%	100.0%	100.0%	94.0%	100.0%	0.0%	100.0%	0.0%
	Non-Trawl	3.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.0%	0.0%	0.0%	0.0%	0.0%
Shortraker/Rougheye Rockfish	LE Trawl	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Non-Trawl	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Slope Rockfish Unid	LE Trawl	71.3%	22.6%	25.7%	10.2%	96.2%	83.1%	29.4%	90.3%	27.1%	53.0%	22.6%	67.3%
	Non-Trawl	28.7%	77.4%	74.3%	89.8%	3.8%	16.9%	70.6%	9.7%	72.9%	47.0%	77.4%	32.7%

Species	Sectors	Ave. Percent (2003-2013)	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Yellowmouth Rockfish	LE Trawl	47.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
	Non-Trawl	52.1%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
Grand Total - All Slope RF	LE Trawl	62.8%	57.7%	74.9%	73.1%	71.1%	76.3%	79.7%	59.3%	48.1%	27.2%	48.5%	84.1%
	Non-Trawl	37.2%	42.3%	25.1%	26.9%	28.9%	23.7%	20.3%	40.7%	51.9%	72.8%	51.5%	15.9%
Grand Total Based on Average 2003-13 Total Catch - All Slope RF Except Blackgill	LE Trawl	90.9%	91.7%	93.2%	87.9%	93.4%	91.3%	96.4%	86.7%	86.4%	89.9%	75.3%	93.9%
	Non-Trawl	9.1%	8.3%	6.8%	12.1%	6.6%	8.7%	3.6%	13.3%	13.6%	10.1%	24.7%	6.1%

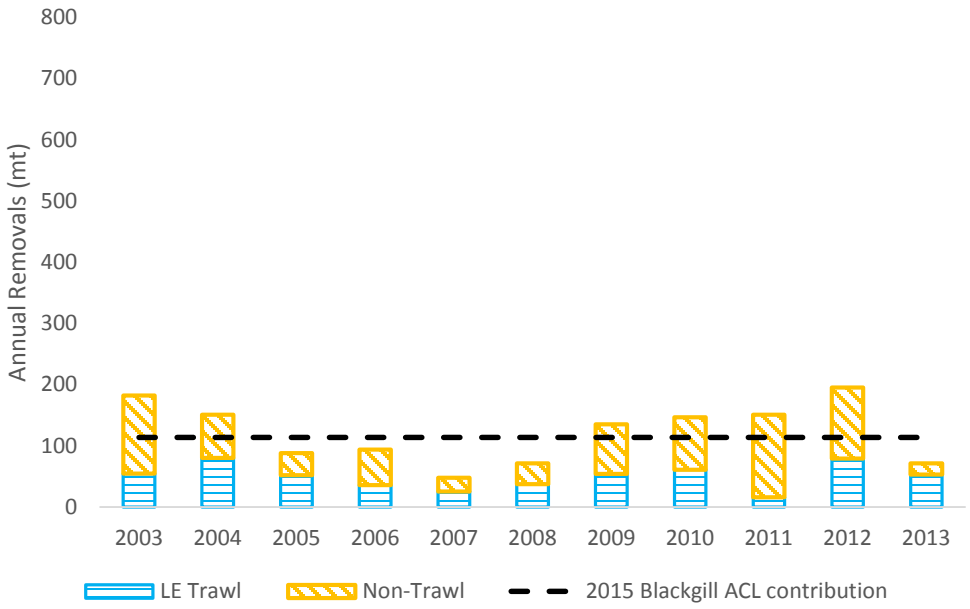

Figure 4-1. Annual removals of blackgill rockfish south of 40°10' N lat. by directed groundfish sectors relative to the 2015 ACL contribution of blackgill to the southern Slope Rockfish complex ACL.

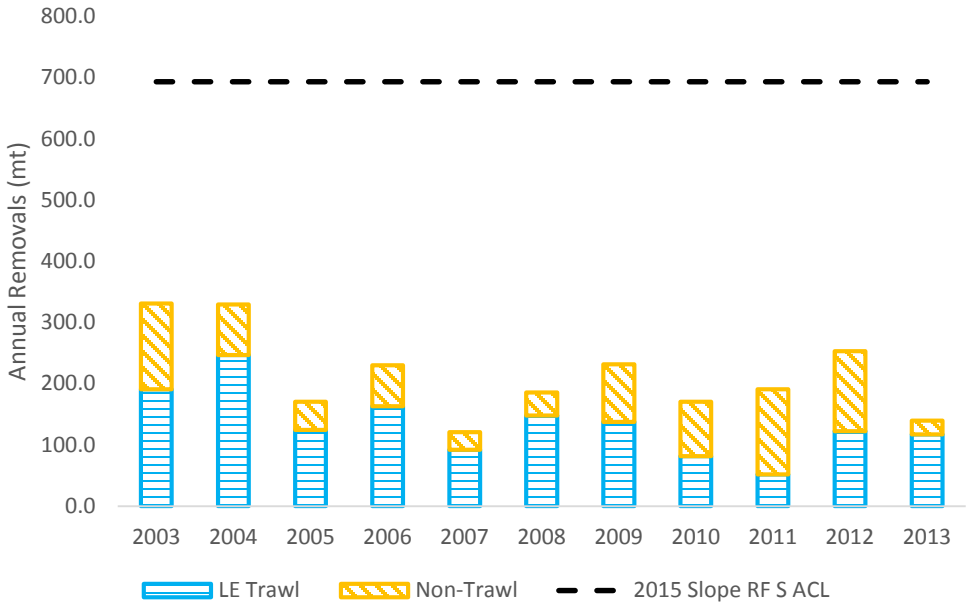

Figure 4-2. Annual removals of species in the Slope Rockfish complex south of 40°10' N lat. by directed groundfish sectors relative to the 2015 southern Slope Rockfish complex ACL.

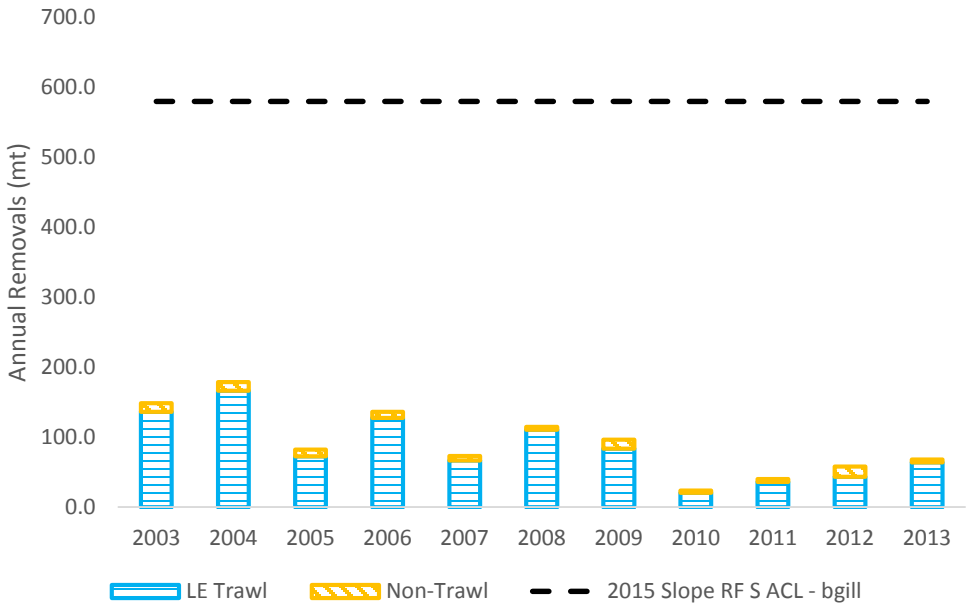

Figure 4-3. Annual removals of all other species in the Slope Rockfish complex south of 40°10' N lat. except blackgill rockfish by directed groundfish sectors relative to the 2015 southern Slope Rockfish complex ACL minus the blackgill rockfish ACL contribution.

There is little contrast in sector allocation percentages between the action alternatives with a range of LE trawl allocations for blackgill rockfish of 35.6% to 44.5% and a range of LE trawl allocation percentages for the remaining southern Slope Rockfish species of 86.5% to 91.8% (Table 2-1). However, the difference in sector allocation percentages between the No Action alternative where blackgill remains in the southern Slope Rockfish complex and the action alternatives is significant with 63% of the harvestable surplus of the complex apportioned to the LE trawl sector under the No Action alternative.

All of the action alternatives would result in a lower allocation of blackgill to the LE trawl sector than the sector caught in most years in the analysis (Figure 4-4). Alternative 2 provides the lowest LE trawl allocation percentage of blackgill and is a lower level of harvest when applied to the 2015 blackgill ACL contribution than observed in 9 of the 11 years in the analysis, while the other action alternatives provide a level of harvest for the LE trawl sector lower than observed in 7 of the 11 years in the analysis (Figure 4-4). However, given the objective of reducing LE trawl impacts on blackgill while it recovers from its precautionary status, an allocation lower than recent observed catches is needed.

The action alternatives provide a lower allocation of blackgill to non-trawl sectors than most catches observed in the analysis (Figure 4-5). All of the alternatives provide a blackgill non-trawl allocation higher than the observed harvest in 2013 when non-trawl targeting was effectively reduced with lower cumulative landing limits. Alternatives 3 and 4 provide a lower non-trawl allocation than the sectors' catches observed in 7 of the 11 years in the analysis while the other action alternatives provide a lower non-trawl allocation than observed in 6 of the 11 years in the analysis (Figure 4-5).

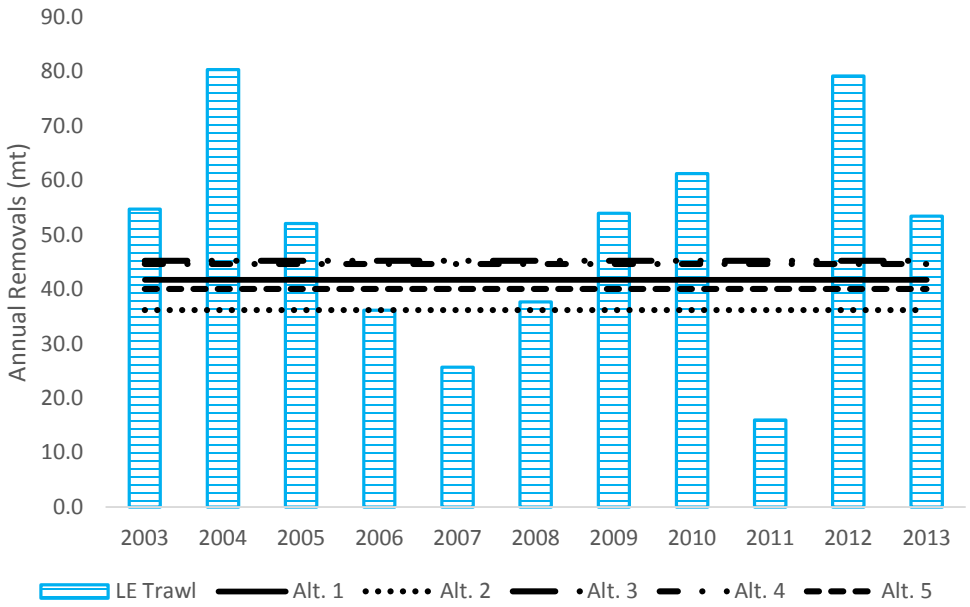

Figure 4-4. Total annual catches of blackgill rockfish south of 40°10' N lat. during 2003-2013 by the LE trawl groundfish sector relative to alternative LE trawl allocations assuming the 2015 fishery harvest guideline.

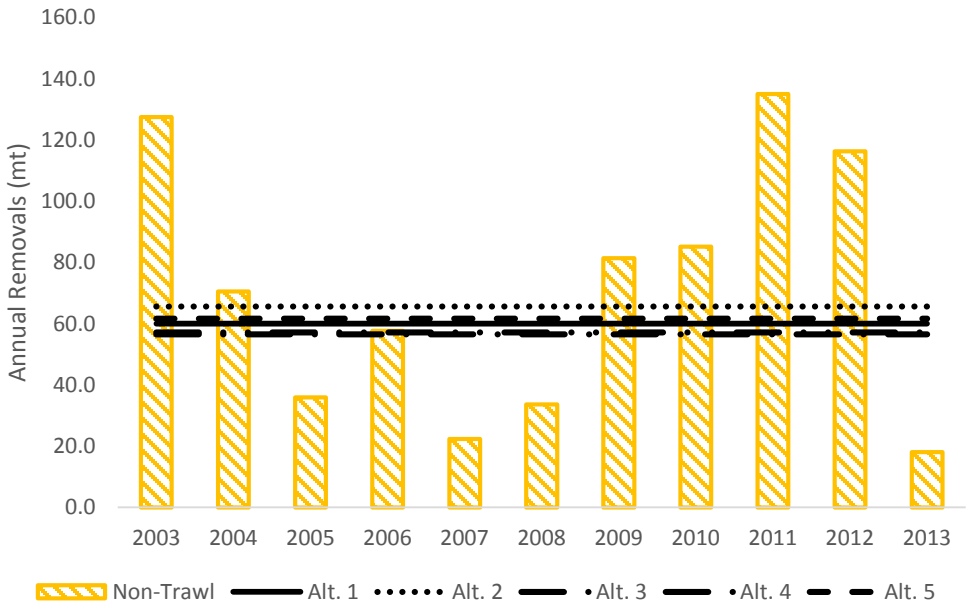

Figure 4-5. Total annual catches of blackgill rockfish south of 40°10' N lat. during 2003-2013 by the non-trawl groundfish sectors relative to alternative non-trawl allocations assuming the 2015 fishery harvest guideline.

None of the directed sectors are adversely affected by the alternative allocations of the remaining species in the southern Slope Rockfish complex since allocations are significantly higher than the observed sector catches since 2003 (Figure 4-6 and Figure 4-7). None of these alternatives are predicted to constrain access to target species on the slope south of 40°10' N lat. other than blackgill rockfish where the proposed action is to eliminate targeting on the stock.

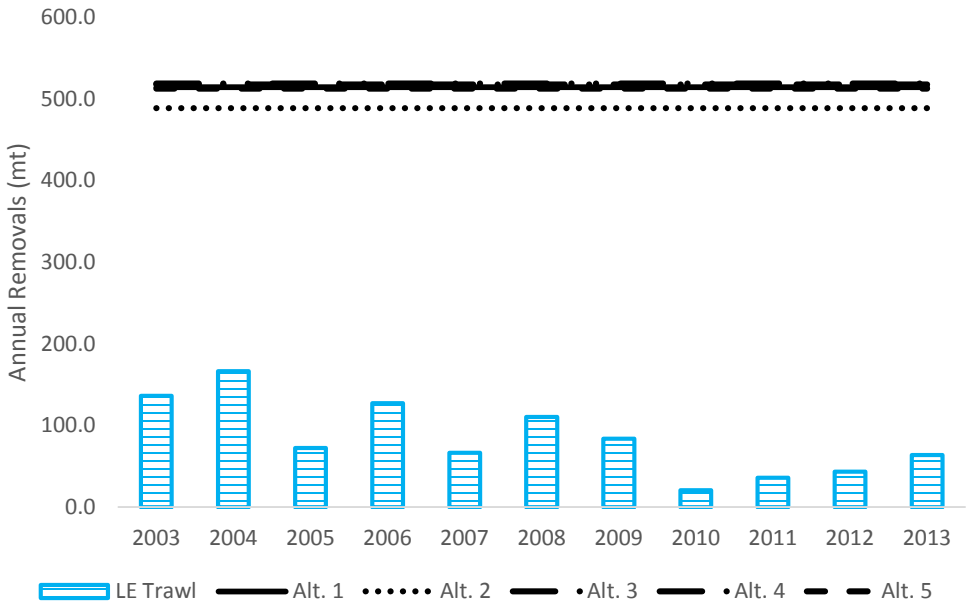

Figure 4-6. Total annual catches of the remaining species in the Slope Rockfish South complex minus blackgill rockfish during 2003-2013 by the LE trawl groundfish sector relative to alternative LE trawl allocations assuming the 2015 fishery harvest guideline.

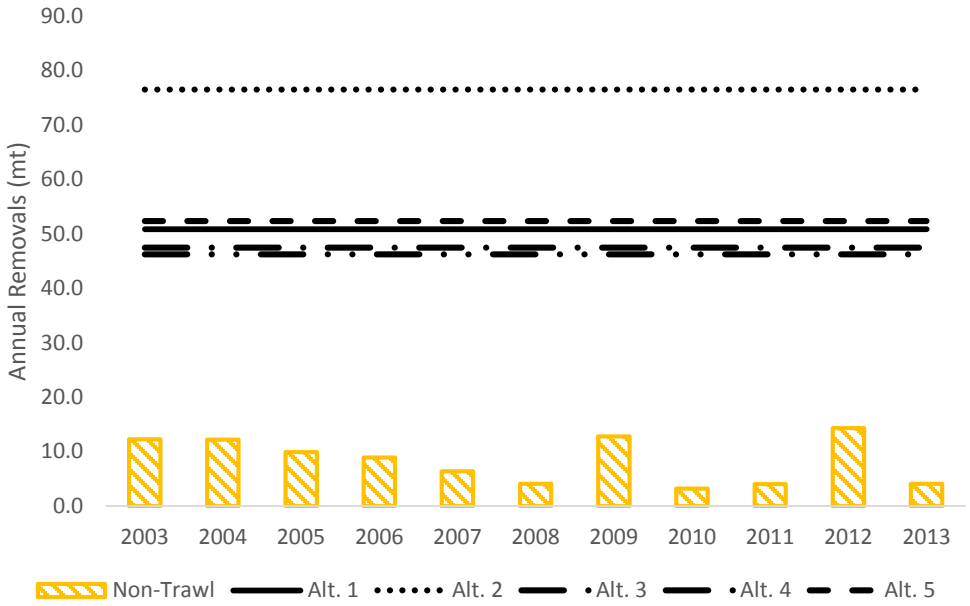

Figure 4-7. Total annual catches of the remaining species in the Slope Rockfish South complex minus blackgill rockfish during 2003-2013 by the non-trawl groundfish sectors relative to alternative non-trawl allocations assuming the 2015 fishery harvest guideline.

4.4.2 Summary of the Socioeconomic Impacts Associated with LE Trawl Permit Allocations of Alternative Limited Entry Trawl Allocations of Blackgill Rockfish and the Slope Rockfish Complex South of 40°10' N lat.

Individual allocations of QS for blackgill rockfish and the remainder of the Slope Rockfish South complex to LE trawl permits are based on 1994-2003 landings history using relative pounds as in the original Amendment 20 individual allocations but under three equal sharing options: 1) equal allocation of the buyback permits' landings history portion; 2) 50% of the QS allocated equally; and 3) no portion of QS allocated equally. The LE trawl sector allocation under each alternative was apportioned using each of these three individual allocation options to estimate QP allocations available to LE trawl permit owners.

From 2003 to 2013 the estimated pooled average share of the LE trawl sector's total catch of the Slope Rockfish South complex that consisted of blackgill rockfish was 37.3%, ranging from 22.1% (2006) to 74.8% (2010) (Figure 4-8). Applying this proportion (37.3%) to the LE trawl sector's 2015 Slope Rockfish South complex allocation (420 mt) results in an implied "No Action" LE trawl sector blackgill rockfish allocation of 156.6 mt. This amount is more than triple the maximum trawl sector allocation under the action alternatives.

Different alternative trawl sector allocations do not affect the relative positions of the LE trawl permits that would be eligible to receive initial blackgill rockfish quota share allocations. Figure 4-9 shows the blackgill rockfish individual quota pound (QP) allocations to LE permits under the alternative sector allocations assuming equal sharing of the buyback portion (30%) of quota share (QS). Figure 4-10 shows the blackgill rockfish individual QP allocations to LE permits under the alternative sector allocations assuming equal sharing of the buyback portion (50%) of QS. Figure 4-11 shows the QP allocations to LE permits assuming no equal sharing of QS. Of 164 LE trawl permits, 90 would receive zero QS allocations under equal sharing option 3 based on their blackgill rockfish landings history. However, these permits would be eligible to receive an equal sharing portion of QS under equal sharing options 1 and 2.

Under sector allocation Alternatives 1 – 5 (including accounting for a 10% assignment of QS to the adaptive management program (AMP)), no more than 13 permits would receive 2015 blackgill rockfish quota pound allocations that exceed 1 mt. The maximum number of 13 permits exceeding 1 mt occur under both Alternative 3 and Alternative 4. The following are the maximum individual blackgill rockfish 2015 QP allocations under the sector allocation action alternatives. These maxima all occur under the respective "No Equal Sharing" option 3:

- Alternative 1: 5.0 mt
- Alternative 2: 4.3 mt
- Alternative 3: 5.4 mt
- Alternative 4: 5.3 mt
- Alternative 5: 4.8 mt

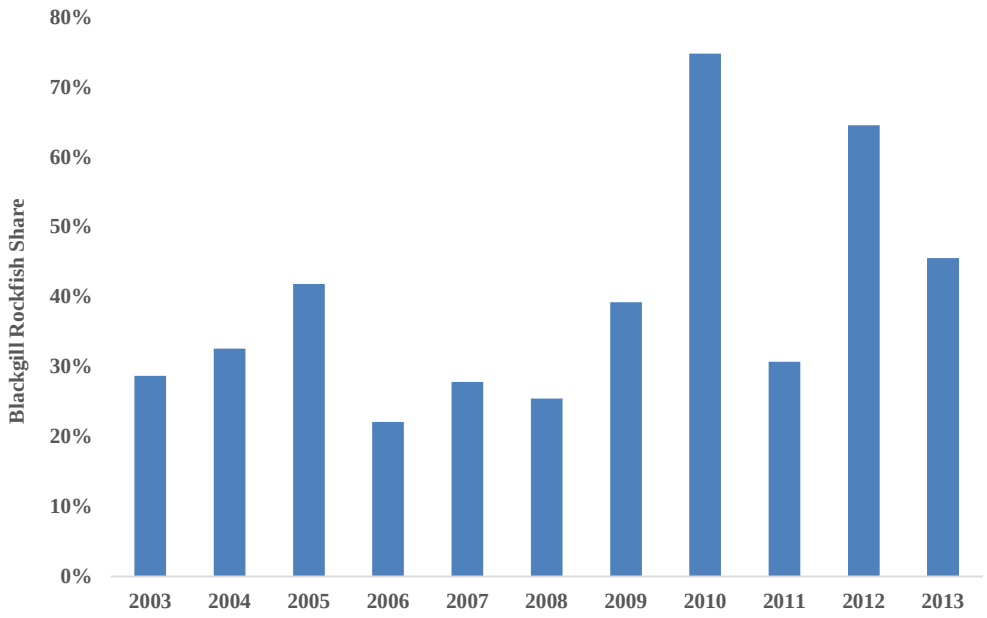

Figure 4-8. Annual share of the limited entry trawl catch of Slope Rockfish South species comprised of blackgill rockfish.

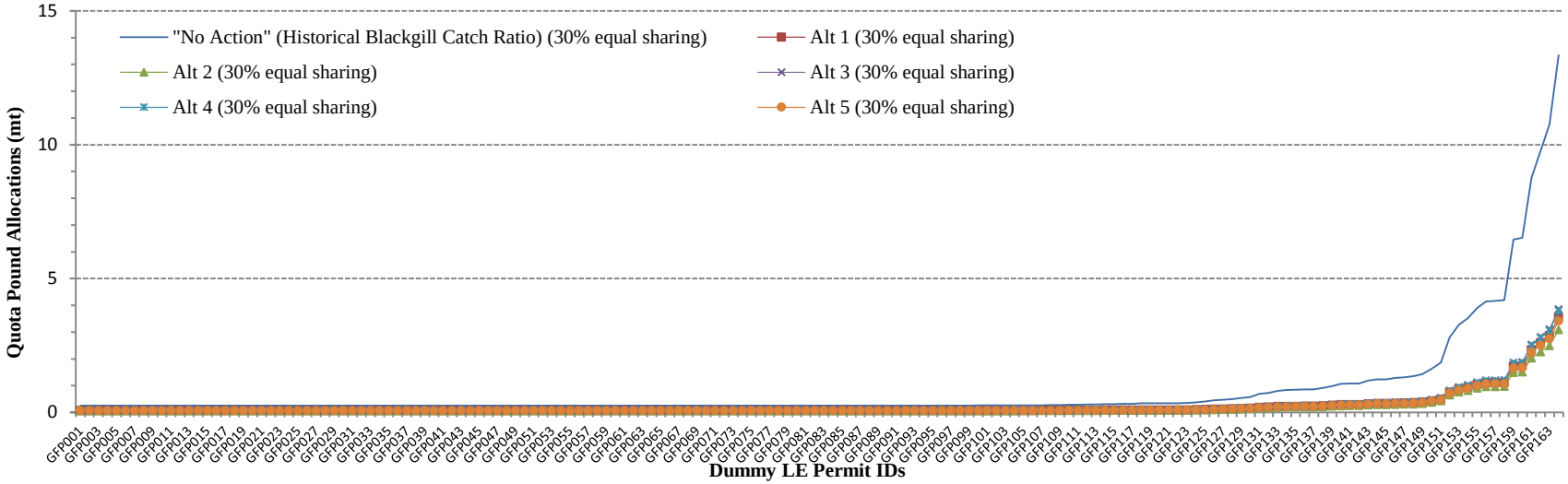

Figure 4-9. Blackgill rockfish individual quota pound allocations to limited entry permits under alternative sector allocations assuming equal sharing of the buyback portion (30%) of quota share.

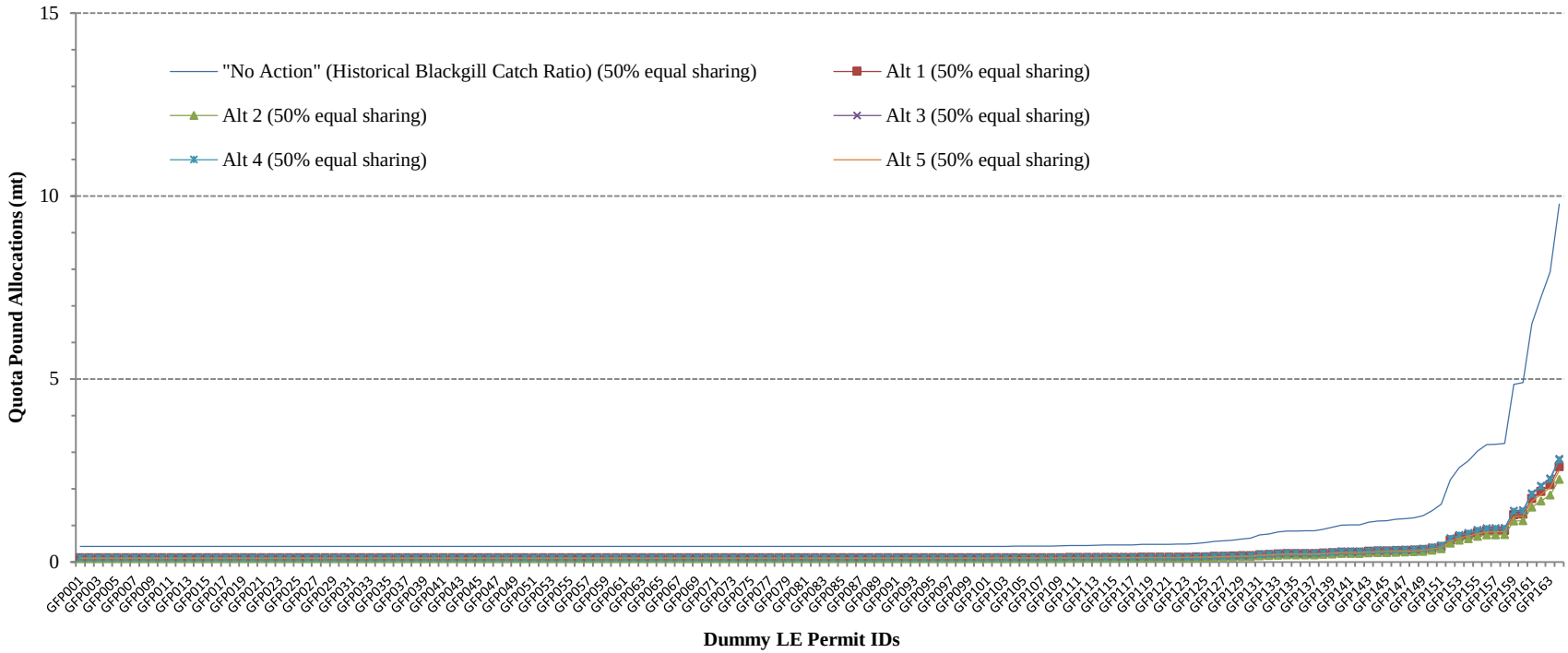

Figure 4-10. Blackgill rockfish individual quota pound allocations to limited entry permits under alternative sector allocations assuming equal sharing of the buyback portion (50%) of quota share.

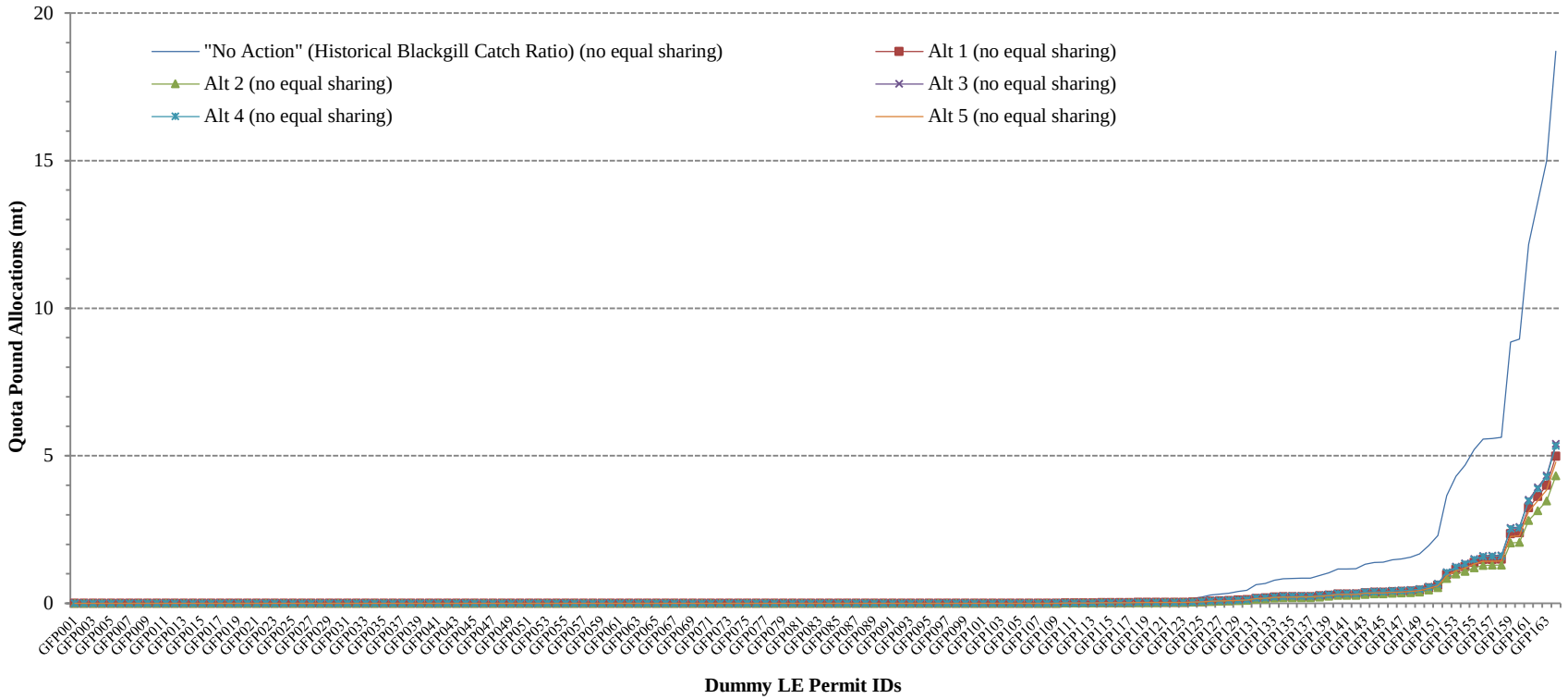

Figure 4-11. Blackgill rockfish individual quota pound allocations to limited entry permits under alternative sector allocations assuming no equal sharing of the buyback portion of quota share.

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