TRAWL RATIONALIZATION TRAILING ACTIONS: WIDOW ROCKFISH REALLOCATION, DIVESTITURE DEFERMENT AND FORFEITURE METHODOLOGY

Magnuson Stevens Act Analysis

and

Draft Environmental Assessment

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Chapter 1 Introduction

This document provides background information about, and analyses for, modifications affecting the catch share program for the shorebased groundfish trawl fishery (a program that provides individual fishing quotas (IFQ) for the harvest of groundfish delivered to shoreside processors and bycatch of Pacific halibut). The proposed action would require an amendment to the regulations implementing the Pacific Coast Groundfish Fishery Management Plan (FMP). The proposed 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.

In addition to addressing MSA mandates, this document serves as a draft environmental assessment (EA) coving the impacts of the action alternatives relative to the No Action Alternative, pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended.

1.1 How this Document is Organized

This document describes the proposed action (Chapter 1), proposes alternatives (Chapter 2), describes the current physical, biological, and socio-economic environments relevant to the proposed action (Chapter 3), and analyzes an alternative provision for the shorebased IFQ program (Chapter 4). The analyses in Chapter 4 compare action alternatives to the No Action Alternative and provide an assessment of potential impacts relative to specified physical, biological, and socio-economic criteria.

1.2 Description of the Proposed Action

This document contains information which will assist the Council and NMFS in determining whether or not to recommend and implement the proposed action. The proposed action is to consider whether to amend the regulations governing the groundfish fishery by modifying the allocation of widow rockfish.

1.3 Purpose and Need for the Proposed Action

The purpose of the proposed action would be to achieve allocations of widow rockfish quota shares based on criteria that are consistent with the Magnuson-Stevens Fishery Conservation and Management Act (MSA), other applicable law, and the goals and objectives of the Pacific Coast Groundfish Fishery Management Plan, including Amendment 20 to that plan (the trawl rationalization program). Under Amendment 20, overfished species, such as widow rockfish, were allocated to permit holders based on the QS allocation of the target species QS with which widow rockfish is incidentally caught. Amendment 20 states that for overfished species QS reallocations will be reconsidered when an overfished species become rebuilt.

> Reallocation with Change in Overfished Status: When an overfished species is rebuilt or a species becomes overfished there may be a change in the QS allocation within a sector (allocation between sectors is addressed in the intersector allocation process). When a stock becomes rebuilt, the reallocation will be to facilitate the re-establishment of historic target fishing opportunities.

Prior to the declaration of overfished status for widow rockfish there was a substantial target fishery for this species. Without a reallocation, the increased fishing opportunity for this stock provided as a result of achievement of rebuilt status and the attendant dramatic increase in the ACL would initially go to QS owners who previously used widow QS as bycatch and may not have historically participated in directed widow targeting. Under such circumstances, absent a reallocation, historical widow fishery participants wanting to take advantage of renewed fishing opportunities would have to purchase widow QS on the market, in common with other later entrants to the fishery. Thus, the proposed action would be needed to implement a policy that allows historical widow fishery participants to benefit from the renewed fishing opportunities through a direct reallocation rather than having to acquire widow QS on the open market.

1.4 Background

1.4.1 Widow Rockfish Target and Bycatch Fisheries

Management of widow rockfish to achieve optimum yield (OY) from the resource on a continuing basis (sustained yield objective) is undertaken by the state and Federal ocean fishery authorities of the United States acting under the Magnuson Stevens Act (MSA). Management of the resource is coordinated under the Pacific Coast Groundfish Fishery Management Plan (Groundfish FMP), adopted by the Pacific Fishery Management Council and approved by the Secretary of commerce. Widow rockfish is one of over 90 species managed under this plan.

Widow rockfish are harvested primarily in the commercial fishery, though some minor amounts are also caught in the recreational fishery. There are numerous commercial gears used in the Pacific Coast groundfish fishery, among which are groundfish trawl gears. There are two primary types of groundfish trawl gears: bottom trawl and midwater trawl. Vessels using midwater gear take widow rockfish both as bycatch on whiting targeted trips and as a strategy targeting on pelagic rockfish (in which it is caught jointly with yellowtail rockfish). Widow rockfish is also caught along with other species on trips using bottom trawl gear.

The nontreaty limited entry groundfish trawl fishery (trawl fishery) is allocated 91 percent of the widow rockfish ACL with the remainder going to nontreaty commercial, tribal, and recreational fisheries. The trawl fishery ACL for widow rockfish is split between the at-sea sectors and shorebased sectors in accordance with an allocation formula established under Amendment 21. Under this formula the greater of 10 percent or 500 mt of the trawl fishery allocation is allocated to all whiting sectors (at-sea and shorebased) with the remainder going to the shorebased nonwhiting fishery. Of the amount allocated to the whiting sectors 42 percent is allocated to the shorebased fishery. This 42 percent is combined with the remainder that went to the shorebased nonwhiting fishery to create a single allocation for the shorebased fishery.

Amendment 20 to the Pacific Coast Groundfish Fishery Management Plan (Groundfish FMP) established the trawl rationalization program (also known as a catch share program), which consists of the shorebased IFQ program and the at-sea cooperative programs, including the Mothership (MS; at sea processing only) and Catcher Processor (C/P) sectors. The trawl rationalization program was implemented in 2011. The IFQ and at-sea cooperative programs replaced the previous catch control tools. For widow targeted trips

cumulative trip limits were used to control catch. Seasonal management (closures) of the whiting fishery was used to control fishing mortality in that fishery.

After a major fishing-down in the 1990s, the widow rockfish became overfished and for most of the last decade, up through 2012, was managed for rebuilding (CITE). Based on a 2011 assessment of widow rockfish, the stock was declared rebuilt and increased fishing opportunities were provided for in the 2013-2014 biennial specifications period. The ACLs for the fishery were further increased for the 2015-2016 biennial specifications period (Figure 1-1).

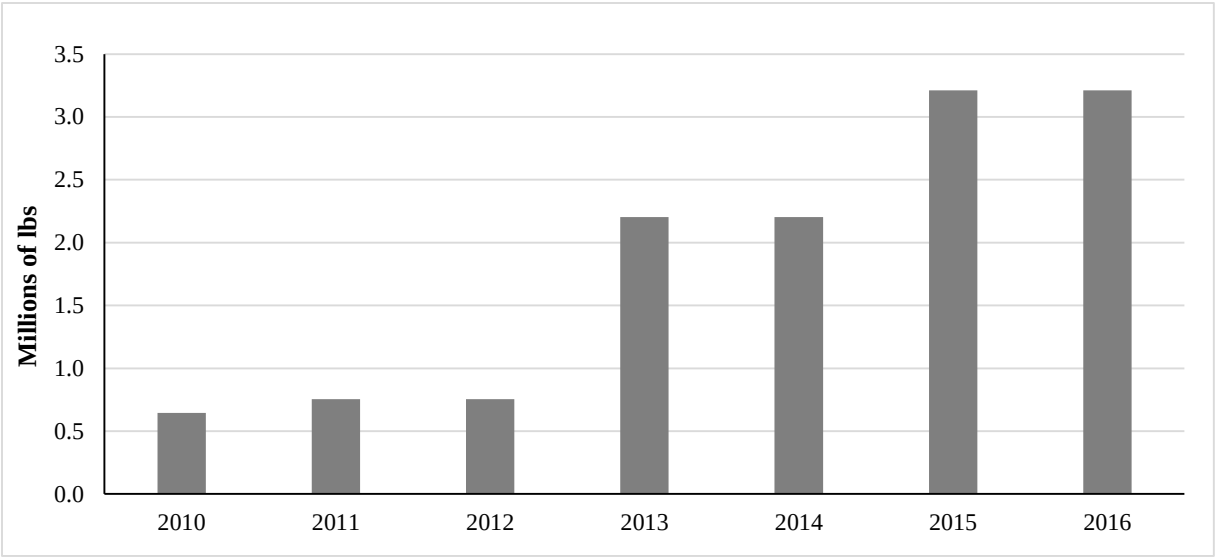

Figure 1-1. Recent and upcoming allocations of widow rockfish to the shorebased trawl fishery, 2010 through 2016.

The shorebased trawl groundfish fishery has been managed under an IFQ program first implemented in 2011, under Amendments 20 and 21 of to the groundfish FMP. Under Amendment 20, separate QS were issued for each of 30 management units (IFQ Categories), one of which was widow rockfish. Each year, those who own the QS are issued an amount of QP proportional to their QS holdings. The QP must be transferred to a vessel account where they must be used to cover the catch of any species covered by the program.

Widow rockfish QS for nonwhiting trips in the shorebased trawl IFQ fishery was originally allocated using an allocation formula for overfished species. Under Amendment 20, overfished species, such as widow rockfish, were allocated to permit holders based on the QS allocation of the target species with which widow rockfish is incidentally caught and logbook information on the depths and latitudes in which each permit had fished in more recent years.

This analysis covers one of several trailing actions that the Council has and continues to pursue for regulatory implementation. These trailing actions address issues related to optimizing the benefits of the catch share program which were outstanding as of the completion of the Council's initial work on the program. These actions also address provisions needed to complete or clarify the final program and new

concerns identified during and after program implementation. For a recent accounting of the Trailing Action process see PFMC 2013c. The history (scoping process) of this Groundfish FMP amendment initiative is reviewed in Section 4.4.4(a)(1).

1.4.2 Divestiture Deadline and QS Forced Divestiture

Amendment 20 includes control limits for all species individually (5.1 percent for widow rockfish) and an aggregate control limit for nonwhiting species of 2.7 percent. All persons controlling QS are required to divest down to these limits by November 30, 2015 for all species except widow rockfish. Any QS of other species held in excess of these limits will be forfeited (forced divestiture). However, there is a moratorium on widow rockfish QS trading, pending the outcome of these Council deliberations on whether or not to reallocate widow rockfish QS now that the species has been rebuilt. The moratorium presents a number of challenges:

- A widow rockfish reallocation could affect where a person's holdings stand in relation to the aggregate non-whiting QS limit (pushing people above or below that limit). For example, a person who divests because they are over the aggregate limit might find that after widow QS reallocation they are now under the limit.
- The reallocation results could change the optimal choices for divesting down to the aggregate limit. For example, a person who finds themselves with substantially more widow QS after reallocation might want to have held on to species that would be taken while targeting widow rockfish.

For these reasons, the Council is considering an extension of the divestiture period as part of this action.

1.5 Council and Agency Scoping

1.5.1 Process

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 NEPA-based initiatives, including EAs. 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. Additionally, the Council receives management advice from its Enforcement Consultants, composed of representatives from each state, NMFS and the USCG. Scientific information is reviewed by the Council's Scientific and Statistical Committee. 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.

Table 1-1. Chronology of meetings and actions leading to widow QS and divestiture deadline delay covered in this document.

Date	Meeting	Action
June, 16-18, 2011	Council meeting, Spokane, WA	The Council finalized recommendations on Amendment 20 and related regulatory actions, including: provisions which prohibited QS trading during the initial years of the program; a deadline by which individual must divest of any QS they are initially allocated in excess of QS control limits; and a provision for consideration of the reallocation of overfished species QS upon the attainment of rebuilt status. http://www.pcouncil.org/bb/2009/0609/E10a_ATT2_0609.pdf http://www.pcouncil.org/bb/2009/0609/E10a_ATT3_0609.pdf http://www.pcouncil.org/wp-content/uploads/June_2009_Minutes.pdf
March 28, 2013	NMFS publishes final rule.	NMFS publishes rule which provides for the start of QS trading for all species except widow rockfish, for which the trading moratorium is continued while widow rockfish QS reallocation is reconsidered. http://www.pcouncil.org/wp-content/uploads/2013-07162.pdf
September 14-18, 2014	Council meeting, Spokane, Washington	The Council prioritized the consideration of widow rockfish QS allocation for action with completion of Council action scheduled for 2014. http://www.pcouncil.org/wp-content/uploads/I6a_Sup_Joint_NMFSandPFMCstaff_Rpt_SEPT2014BB.pdf The Council also decided to consider the delay of divestiture deadline as part of its consideration of the widow rockfish QS reallocation. http://www.pcouncil.org/wp-content/uploads/0914decisions.pdf
November 12-19, 2014	Council meeting, Costa Mesa, CA	The Council adopted a range of alternatives for analysis and public review. http://www.pcouncil.org/wp-content/uploads/1114decisions.pdf
April 2015	Council meeting, Rohnert Park	The Council is scheduled to adopt its final preferred alternative.

1.5.2 Impact Scoping

Impacts of the trawl rationalization program were evaluated as part of the Amendment 20 EIS

1.5.2(a) *Physical and Biological Habitat Impacts*

Reallocation of QS might geographically redistribute harvest over the short term, temporarily redistributing the impacts on the physical and biological environment.

1.5.2(b) *Socio-Economic Impacts*

1.5.2(b)(1)(i) *Impacts on Harvesters*

The direct impact is through the allocation of widow rockfish QS among those owning QS. This will impact the wealth of initial recipients. As a result of reallocation there may be some reduction in transaction costs if those who end up scaling up their operations to harvest fish have to acquire the needed quota from others.

1.5.2(b)(1)(ii) *Impacts on First Receivers and Communities*

There may also be effects on processors and communities as a result of changes in the geographic distribution of QS.

Chapter 2 Alternatives

There is one set of alternatives or suboptions for each of the issues considered in this document

- Widow QS Reallocation
- Delay of the Widow Rockfish QS Divestiture Deadline
- Delay of the Aggregate Nonwhiting QS Divestiture Deadline
- Modification of the QS Forced Divestiture

2.1 Alternatives

In this section a No Action Alternative (Alternative 1) is described along with three action alternatives. For each of the action alternative, QS would be reallocated among the QS accounts based on the history of the permits which were used to establish the accounts when the catch share program was first implemented under Amendment 20 (QS will not be reallocated to the current owners of the LE trawl permits except to the extent that the current QS account owners still own the permits originally used to establish the QS accounts). In situations for which QS allocations to multiple permits were combined into a single QS account at the time of initial allocation, the history of each permit will be evaluated individually, as was done under Amendment 20 (e.g. the worst years will be determined for each permit individually rather than determined collectively for all permits associated with a particular QS account).

Reallocation Alternative 1 (No Action): *Status quo widow QS allocations.*

Reallocation Alternative 2: *Use a Modified Amendment 20 Target Species Allocation Formula* (a portion for the adaptive management program (AMP), a portion divided among all permits equally, a portion based on whiting trip landings history between 1994 and 2003, and a portion based on nonwhiting trip landings history between 1994 and 2002)

Suboptions for determining amount of QS allocated for whiting vs. nonwhiting trips.

Suboption a: *Use an ACL of 2,000 mt* (the widow ACL adopted for the 2016 fishery). Apply Amendment 21 allocation rules to the 2016 widow ACL in order to determine the split of widow rockfish QS between whiting and nonwhiting trips.

Suboption b: *Use an ACL of 3,790 mt.* Same as Suboption a, but use as an ACL an amount equivalent to the 2016 ABC.

Reallocation Alternative 3: *Include Revenue Shares for 2003 through 2010 as a Proxy for Recent Participation* (same as Alternative 2 but take the portion of the QS that would have been allocated based on nonwhiting landing history and allocate half that amount as specified for landings history in Alternative 2 and half of it based on share of nonwhiting exvessel revenue for 2003 through 2010).

Suboption a: *Drop three worst years from the revenue calculation*.

Suboption b: *No drop year provision for the revenue calculation.*

AND: Select Alternative 2 options for the portion of the formula based on Alternative 2.

Reallocation Alternative 4: *Use a Pounds Neutral Reallocation* (leave a base amount of QS unreallocated, such that in 2016 every QS account would receive the same amount of quota

pound (QP) that it received in 2014, the last year of rebuilding; and reallocate the remainder using the Alternative 2 formula.

AND: Select Alternative 2 options for the portion of the formula based on Alternative 2.

Suboptions for All Action Alternatives

Widow QS Divestiture Delay

Widow Delay Suboption A: Maintain the November 30, 2015 deadline.

Widow Delay Suboption B: 12 Months Post Implementation

Aggregate Nonwhiting QS Divestiture Delay

Aggregate Delay Suboption A: Maintain the November 30, 2015 deadline.

Aggregate Delay Suboption B: Exclude Widow from the Calculation

Aggregate Delay Suboption C: Extend Deadline through Widow Reallocation.

Aggregate Delay Suboption D: Extend Deadline through Program Review.

2.1.1 Reallocation Alternative 1 (No Action): Status Quo Widow QS Allocation.

Summary: **Maintain the existing allocations.** Allocations are based on a formula intended to allocate widow QS to those who need it to cover bycatch taken in fisheries directed on other species.

Alternative 1. Detailed Description of Reallocation Alternative 1 (No Action): existing allocation formula

Adaptive Management: 10 percent of the QS is set aside for adaptive management.
Equal division: No widow QS was allocated based on equal division of buyback history.
Whiting/Non-whiting Split: The allocation of the remaining QS was split between whiting and nonwhiting trips based on the proportions derived from the following allocations

Whiting Trips: 28 percent[1] of widow QS for whiting trips
Nonwhiting Trips: 62 percent[1] of the widow QS for nonwhiting trips

Historic Landings Formula for the 28 percent of the widow QS Distributed for Whiting Trips: Distribute in proportion to each permit's whiting allocation--as specified in Amendment 20, Section A-2.1.3, for bycatch species and in regulations at 660.140(d)(8)(iv)(C)(2)(ii) (whiting trips, incidentally caught species).

Historic Landings Formula for the 62 percent of the widow QS Distributed for NonWhiting Trips: Distribute based on the target species QS allocation to a permit, the permit's distribution of catch among areas as recorded in logbooks, and area specific fleet average bycatch rates and logbook information (using 2003-2006 WCGOP information)--as specified in Amendment 20, Section A-2.1.3, for overfished species taken incidentally on nonwhiting trips and in regulations at 660.140(d)(8)(iv)(B)(3) (nonwhiting trip Group 2 species).

[NOTE: 10% for AMP + 28% for whiting trips + 62% for nonwhiting trips equals 100%]

Rationale for Design of the Alternative:

This alternative is the initial QS allocation formula that was implemented as part of the IFQ program for the shorebased fishery which that approved as part of Amendment 20 to the groundfish fishery management plan. Widow rockfish was overfished at the time of initial allocation and the main objective of the alternative was to ensure that widow rockfish was distributed to each permit based on its allocation of QS for target species with which widow was caught. Thus the historic landings taken into account were not the landings of widow rockfish but rather the landings of relevant target species, as represented by allocations of QS for those species for a particular permit. Additionally, for nonwhiting trips information on a permit's geographic distribution of catch from logbooks was used to take into account geographic differences in bycatch rates.

[1] The percent widow QS for each sector is derived as follows, where T = the trawl sector's allocation of widow:
Shorebased trawl whiting share of widow = T x 0.52 (whiting share) x 0.42 (shorebased share of whiting) = 0.22 T
Shorebased trawl nonwhiting share of widow = T x 0.48 (nonwhiting share) = 0.48 T
Total shorebased share = 0.22 T + 0.48 T = 0.7 T
Shorebased trawl whiting share of shorebased widow = 0.22T/0.7T = 0.31
Shorebased trawl nonwhiting share of shorebased widow = 0.48T/.7T = 0.69
Multiply both values by 0.9 to reduce result for the 10 percent AMP set aside.
0.31 x 0.9 = 0.28; 0.69 x 0.9 = 0.62

2.1.2 Reallocation Alternative 2: Use a Modified Version of the Amendment 20 Target Species Allocation Formula

Summary: Reallocate based on the Amendment 20 formula for target species

AMP: 10 % of QS to adaptive management

Equal Division: 28% of widow QS divided equally among all participants (buyback history)

Remainder divided between allocations for whiting and nonwhiting trips

Allocation based on landings 1994-2003 history for whiting trips

Allocation based on landings 1994-2002 history for non-whiting trips

Suboptions for determining portions allocated for whiting vs. nonwhiting trips.

Suboption a: *Use an ACL of 2,000 mt* (the widow ACL adopted for the 2016 fishery). Apply Amendment 21 allocation rules to the 2016 widow ACL in order to determine the split of widow rockfish QS between whiting and nonwhiting trips.

Suboption b: *Use an ACL of 3,790 mt.* Same as Suboption a, but use as an ACL an amount equivalent to the 2016 ABC.

Consider a delay in the QS control limit divestiture deadline.

Widow QS Control Limit Delay **Suboptions**: (see Section 2.1.5)

Aggregate Nonwhiting QS Control Limit Delay **Suboptions**: (see Section 2.1.6)

Alternative 2. Detailed Description – Reallocation Alternative 2: Reallocate Widow QS[2] Using a Modified Version of the Amendment 20 Target Species Allocation Formula

Adaptive Management: Set aside 10 percent of all widow rockfish QS for adaptive management [achieve result specified at 660.140(d)(8)(iv)(F)].

Equal division: Equally divide among all permits,[2] a pool of QS determined using the 1994-2003 whiting and nonwhiting trip widow landings history from Federal limited entry groundfish permits that were retired through the Federal buyback program (70 FR 45695, August 8, 2005) [in conformity with the methods specified at 660.140(d)(8)(iv)(B)(2)(i) and 660.140(d)(8)(iv)(C)(1)]. Based on that process, the amount of all widow rockfish QS is expected to be allocated equally is XX% under suboption a and YY% under suboption b.

Whiting/Non-whiting Split: Divide the remaining widow QS between allocations for whiting and nonwhiting trips based on the following proportions [apply proportions as specified at 660.140(d)(8)(iv)(D) to the remaining 62 percent of the widow QS].

Whiting Trips: The shorebased portion of the whiting sector allocation of widow (42 percent of 500 mt)

Suboption a: *Use an ACL of 2,000 mt* – 9.2 percent of all widow QS will be allocated for whiting trips

Suboption b: *Use an ACL of 3,790 mt* – 4.3 percent of all widow QS will be allocated for whiting trips

Nonwhiting Trips: The 2016 trawl allocation of widow minus 500 mt

Suboption a: *Use an ACL of 2,000 mt* – 52.8 percent of all widow QS will be allocated for nonwhiting trips

Suboption b: *Use an ACL of 3,790 mt* – 57.7 percent of all widow QS will be allocated for nonwhiting trips

Historic Landings Formula for the widow QS Distributed for Whiting Trips: Allocate to permits[2] for whiting trip history as specified for Alternative 1, No Action.

Historic Landings Formula for the widow QS Distributed for Non-Whiting Trips: Allocate to permits[2] for nonwhiting trip history as specified in Amendment 20, Section A-2.1.3, for nonoverfished species and in regulations at 660.140(d)(8)(iv)(B)(2)(ii) (nonwhiting trip Group 1 species) but modify the allocation period to 1994-2002. The formula includes the following elements for each permit

- use a 1994-2002 allocation period,
- measure a permit's widow landings for each year relative to the widow landings of the entire fleet (i.e. measure annual permit history as a percent of the fleet's total landings for a year),
- drop three lowest years

Divestiture Delay Suboptions: see Sections 2.1.5 and 2.1.6.

NOTE: the above, while listed in a different order than in the regulations, is intended to achieve QS allocations which would result from treating widow rockfish as a "Group 1 species" except that the period 1994-2002 would be used for the nonwhiting trip landings history instead of 1994-2003. The net effect with respect to the amount of QS used for each of the above bases for allocation is expected to be as follows.

Suboption a: 10% for AMP + 30.0% for equal allocation + 8.9% for whiting trips + 51.1% for nonwhiting trip landing weight history equals 100%

Suboption b: 10% for AMP + 31.3% for equal allocation + 4.0% for whiting trips + 54.7% for nonwhiting trip landing weight history equals 100%

[2] QS would be reallocated among the QS accounts based on the history of the LE trawl permits which were used to establish the accounts when the catch share program was first implemented under Amendment 20 (QS will not be reallocated to the current owners of the LE trawl permits except to the extent that the current QS account owners still own the permits originally used to establish the QS accounts). In situations for which QS allocations to multiple permits were combined into a single QS account at the time of initial allocation, the history of each permit will be evaluated individually, as was done under Amendment 20 (e.g. the worst years will be determined for each permit individually rather than determined collectively for all permits associated with a particular QS account)

Rationale for Design of the Alternative:

This alternative is based on the Amendment 20 allocation formula used for all nonoverfished species with modifications for the time period used to evaluate the permit history for nonwhiting (changing "1994-2003" to "1994-2002") and modifications for the ACLs used to determine the amount of widow QS allocated for whiting trip history and the amount allocated for nonwhiting trip history (see suboptions). With the exception of the date modification and the ACLs used to determine the split of allocation between whiting and nonwhiting trips, this is the allocation formula, this is the allocation formula which would have been applied under Amendment 20 if widow rockfish had been rebuilt for the 2011 fishery instead of 2013.

For the nonwhiting trips, 2003 is left off the historic allocation period because regulations were designed to discourage widow rockfish harvest. Because only a few vessels made landings that year and because the allocation formula calculates history based on share of the fleets total, a relatively small amount of widow landed by a single permit can constitute a large portion of the fleet total for that year and have a disproportionate effect on the allocation for that permit. Therefore, 2003 is not included in the allocation formula.

The QS allocated based on landing history is distributed between whiting and nonwhiting trips. The portion going for each type of trip is determined by the Amendment 20 allocation formula. Under that formula, when the widow rockfish is rebuilt and the whiting sectors (at-sea and shorebased) are allocated the greater of 500 mt or 10% of the trawl allocation, with the remainder going to the nonwhiting shorebased sector. Of the portion allocated to whiting sectors 42% is allocated to the shorebased sector. This amount is combined with the allocation to the shorebased sector to determine the total allocation for the shoresbased IFQ program. The allocation of QS will be a onetime allocation and the credit that whiting fishery participants receive for their whiting catch history will depend on the level the ACL used to determine the whiting nonwhiting split. If widow QS is reallocated, the allocation is expected to be in place for the 2016 or 2017 fishery. Suboption a uses the 2016 ACL for widow rockfish to determine the whiting/nonwhiting split. However, the 2016 ACL was set substantially below the ABC because widow rockfish was only recently rebuilt and there is substantial uncertainty in the widow rockfish stock assessment. A higher ACL would result in a greater allocation to permits based on their whiting catch history. For many stocks the ACL is set at or near the ABC. For these reasons, Suboption b is provided which uses as an ACL the 2016 ABC instead of the ACL.

2.1.3 Reallocation Alternative 3: Include Revenue Shares for 2003 through 2010 as a Proxy for Recent Participation

Summmary: *S*ame as Alternative 2 but take the portion of the QS that would have been allocated based on nonwhiting landing history and allocate half that amount as specified for landings history in Alternative 2 and half of it based on each permit's share of nonwhiting exvessel revenue for 2003 through 2010).

Suboption a: *Drop three worst years from the revenue calculation.*

Suboption b: *No drop year provision for the revenue calculation.*

Consider a delay in the QS control limit divestiture deadline.

Widow QS Control Limit Delay **Suboptions**: (see Section 2.1.5)

Aggregate Nonwhiting QS Control Limit Delay **Suboptions**: (see Section 2.1.6)

Alternative 3. Detailed Description - Reallocation Alternative 3: Include Revenue Shares for 2003 through 2010 as a Proxy for Recent Participation

Same as Reallocation Alternative 2[2] except modify the section on historic landings for nonwhiting trips as follows.

Historic Landings Formula for the widow QS Distributed for Non-Whiting Trips:

Allocation one half the widow QS to be distributed for nonwhiting trips as described in Alternative 2 (under Alternative 2 suboption a, 26.4 percent of the QS, or under Alternative 2 suboption b 28.85 percent of the QS):

Allocate to permits[2] for nonwhiting trip history as specified in Amendment 20, Section A-2.1.3, for nonoverfished species and in regulations at 660.140(d)(8)(iv)(B)(2)(ii) (nonwhiting trip Group 1 species) but modify the allocation period to 1994-2002. The formula includes the following elements for each permit

- use a 1994-2002 allocation period,
- measure a permit's widow landings for each year relative to the widow landings of the entire fleet (i.e. measure annual permit history as a percent of the fleet's total landings for a year),
- drop three lowest years

Allocation the other half of the widow QS to be distributed for nonwhiting trips as follows:

For each permit, [2] and with respect to the legal limited entry trawl landings of that permit

- use a 2003-2010 allocation period,
- measure a permit's nonwhiting exvessel revenue for each year during that period relative to the nonwhiting revenue of the entire fleet (i.e. as a percent of the fleet's total nonwhiting revenue for a year),
- Drop years: **Suboption a:** *Drop three worst years from the revenue calculation.* For the portion of the formula based on 2003 through 2010 revenue, a permit's three worst years of revenue would be dropped from the calculation.
  Suboption b: *No drop year provision for the revenue calculation.*

After completing these calculations the result for each permit is divided by the sum of the results for the entire fleet to determine each permits share of the QS allocated on the basis of this portion of the allocation formula.

Select Alternative 2 Suboptions: see Alternative 2.
Divestiture Delay Suboptions: see Sections 2.1.5 and 2.1.6.
The net effect with respect to the amount of QS used for each of the above bases for allocation is expected to be as follows.

When Combined With Alternative 2 Suboption a: 10% for AMP + 30.0% for equal allocation + 8.9% for whiting trips + 25.6% for nonwhiting trip landing weight history + 25.6% for nonwhiting trip landing revenue history equals 100%

When Combined With Alternative 2 Suboption b: 10% for AMP + 31.3% for equal allocation + 4.0% for whiting trips + 27.3% for nonwhiting trip landing weight history + 27.3% for nonwhiting trip landing revenue history equals 100%

Rationale for Design of the Alternative:

This alternative considers more recent participation in the fishery, participation after 2003. An allocation alternative based on more recent years of widow rockfish harvest was rejected for reasons described below in Section 2.1.5. These reasons are primarily related to the absence of a directed midwater trawl for widow rockfish or other pelagic rockfish species after 2002. Therefore, more recent period and dependence is being considered through the evaluation of an allocation that would be based on each permit's total nonwhiting groundfish revenue.

The suboption of dropping the three worst years is provided to take into account potential hardships fishermen may have encountered in particular years. This provision is similar to that provided in

Amendment 20 to take hardship into account while minimizing administrative costs that would be associated with considering specific hardships.

2.1.4 Reallocation Alternative 4: Use a Pounds Neutral Reallocation

Summary: Leave a base amount of QS unreallocated, such that in 2016 every permit would receive the same amount of quota pound (QP) that they received in 2014, the last year of rebuilding; and reallocate the remainder using the Alternative 2 formula.

Consider a delay in the QS control limit divestiture deadline.

Widow QS Control Limit Delay **Suboptions**: (see Section 2.1.5)

Aggregate Nonwhiting QS Control Limit Delay **Suboptions**: (see Section 2.1.6)

Alternative 4. Detailed Description - Reallocation Alternative 4: Pounds Neutral Reallocation

Neutral Step: Determine the amount of QS to leave in each QS account such that the amount of QP which would be issued to the account in 2016 would be the same as was issued in 2014. Based on the 2014 shorebased trawl allocation of 994 mt of widow rockfish and the 2016 shorebased trawl allocation of 1,421 mt of widow rockfish, every QS account would retain 70 percent of its total widow rockfish QS (994/1,421 = 70 percent).

90 percent of all widow QS is allocated among QS accounts.
Therefore a total **63 percent** of all widow QS will be left in existing QS accounts (0.7 x 0.9 = 0.63)

Adaptive Management: Set aside **7 percent** of all widow rockfish QS for adaptive management [an additional 3 percent will be set aside for AMP in the following step to achieve a **10 percent set aside**][3]

Remainder: Allocate the remaining 30 percent among permits[2] based on the Alternative 2 allocation formula.

Application of Alternative 2 Suboption a			
Alternative 2 Allocation Basis	Total QS Allocated on this Basis Under Alt 2	Total QS to be Reallocated Under Alt 4	Total QS Reallocated on this Basis Under Alt 4
AMP Set Aside	10%	x 30% =	3.0%
Equal division	28%	x 30% =	9.0%
Whiting Trips	9%	x 30% =	2.7%
Nonwhiting Trips	53%	x 30% =	15.4%
Total	100%		30%

Application of Alternative 2 Suboption b			
Alternative 2 Allocation Basis	Total QS Allocated on this Basis Under Alt 2	Total QS to be Reallocated Under Alt 4	Total QS Reallocated on this Basis Under Alt 4
AMP Set Aside	10%	x 30% =	3.0%
Equal division	28%	x 30% =	9.4%
Whiting Trips	4%	x 30% =	1.2%
Nonwhiting Trips	58%	x 30% =	16.4%
Total	100%		30%

Select Alternative 2 Suboptions: see Alternative 2.

Divestiture Delay Suboptions: see Sections 2.1.5 and 2.1.6.

When Combined With Alternative 2 Suboption a: 10.0% for AMP + 9.0% for equal allocation + 22.3% for whiting trips + 58.7% for nonwhiting trip landing weight history equals 100%
When Combined With Alternative 2 Suboption b: 10% for AMP + 9.4% for equal allocation + 20.8% for whiting trips + 59.8% for nonwhiting trip landing weight history equals 100%

[3] This approach to displaying the 10 percent set aside is taken to make it mathematically simpler to follow the relationship between this alternative and the Alternative 2 allocation formula.

Rationale for Design of the Alternative: This alternatives uses the Alternative formula but leaves enough QS in each account to ensure that the account owner would be worse off in terms of the QP it receives in 2016 relative to its 2014 QP allocation.

2.1.5 Suboptions: Divestiture Delay - Widow QS

In this section widow QS divestiture delay suboptions for each of the reallocation alternatives are described. Divestiture delay suboptions are being considered because until a determination is made on the allocation of widow rockfish QS those who control that QS will not know how much QS they hold in excess of the widow QS control limit.

2.1.5(a) *Widow Delay Suboption A (No Action): Status quo.*

All entities must be at or below the widow rockfish QS control limit by November 30, 2015 as required under current regulation at CFR 660.140(d)(4)(v).

2.1.5(b) *Widow Delay Suboption B: 12 months post implementation.*

Change the divestiture deadline for widow rockfish to a date 12 months after implementation of the QS reallocation (if the Council recommends a widow QS reallocation).

Rationale for Design of the Suboption:
Twelve months is considered an adequate amount of time to divest of QS after QS is redistributed, if such a redistribution occurs.

2.1.6 Suboptions: Aggregate Nonwhiting QS Divestiture Delay

In this section aggregate nonwhiting divestiture delay suboptions for each of the reallocation alternatives are described. A delay in the aggregate nonwhiting QS divestiture deadline is being considered as a suboption for the action alternatives because until a determination is made on the allocation of widow rockfish QS those who control that QS will not know how much QS they hold in excess of the aggregate nonwhiting QS control limit. None of the suboptions would impact the QS divestiture deadline for individual species.

2.1.6(a) *Aggregate Delay Suboption A (No Action): Status quo.*

All entities must be at or below the aggregate nonwhiting QS control limit by November 30, 2015 as required under current regulation at CFR 660.140(d)(4)(v).

2.1.6(b) *Aggregate Delay Suboption B: Exclude Widow from the Calculation.*

Exclude widow from the calculation of an individual's aggregate nonwhiting QS holdings until 12 months after implementation of the widow QS reallocation (if the Council recommends a widow QS reallocation).

Rationale for Design of the Suboption:
Aggregate Delay Suboption B would minimally disrupting progress toward full implementation of the catch share program. If the Council recommends a widow QS reallocation, then after November 30

2015, entities would be able to hold an amount over the aggregate limit equivalent to their widow QS holdings but the QS holdings for all other species would have to be within the limit.

2.1.6(c) *Aggregate Delay Suboption C: Extend Deadline through Widow Reallocation.*

> Extend the aggregate nonwhiting control limit deadline to correspond with Widow Delay Suboption B (if the Council recommends a widow QS reallocation).

Rationale for Design of the Suboption:
Aggregate Delay Suboption C would delay the deadline for the entire nonwhiting QS control limit so that as those with QS approach the deadline they will have information about their entire holdings of QS.

2.1.6(d) *Aggregate Delay Suboption D: Extend Deadline through Program Review.*

> Extend the aggregate nonwhiting control limit deadline until the implementation of any regulatory changes developed pursuant to the first trawl rationalization program review (the November 30, 2015 deadline would still apply to all individual species except widow rockfish, unless widow rockfish is not reallocated).

Rationale for Design of the Suboption:
Aggregate Delay Suboption D would delay the deadline for the entire nonwhiting QS control limit until after the program review is completed to provide the Council an opportunity for reconsideration of that limit and its potential impacts prior to the time it is imposed.

2.1.7 Alternatives Considered But Rejected from Detailed Analysis

2.1.7(a) *Amendment 20 Deliberations*

Groups Receiving the Allocation. The EIS for Amendment 20 addresses the possibility of allocating to permit owners, vessel owners, skippers and crew, processors, communities and the general public. The decision was made to allocate QS among limited entry trawl permit holders. The impacts of allocating to other groups and the rationale for the Council and NMFS decision on the groups to which the allocation would be made is provided in the Amendment 20 EIS.

Earliest Year Used. Amendment 20 also considered and addressed allocations based on periods prior to 1994, the first year of the license limitation program. The full rationale for the Council and NMFS decision to consider only years from 1994 on is provided in the Amendment 20 EIS.

Basic Elements of the Formula. All of the action alternatives include some element of Alternative 2, which is based on the Amendment 20.allocation formula used for nonoverfished species. Some of the central provisions of this formula are the set-aside of 10 percent of the QS for an adaptive management program, equal allocation of the portion of the QS associated with permits which were bought back at the end of 2003, measurement of a permit's history for each year as a percentage of the fleet history for that year, and the dropping of a permit's worst years from the allocation formula. Alternatives to each of these provisions were considered as part of Amendment 20 and the full rationale for the Council and NMFS decision is provided in the Amendment 20 EIS.

2.1.7(b) *Current Deliberations*

Permit History for 2011-2014. In development of the action alternatives explicitly considered here, the Council rejected consideration of 2011-2014 permit history because of complexities in connecting vessel catch back to QS accounts. Once QS was issued in 2010, limited entry permits became transferable separate from the QS. QS is held in QS accounts and widow QS remains for the most part in the accounts to which it was originally issued, because a trading moratorium has been in place. Each year QP are issued to QS accounts and all QP is transferred to vessel accounts by September 30 of the year. QP also transfers between vessel accounts such that it is not possible to track the QP used to cover fish landed by a particular vessel back to the QS account that generated those QP. Additionally, some fishermen joined together in risk pools to manage their overfished species and QP in these pools was handled in special accounts set up by those pools. Because widow rockfish was overfished in 2011 and 2012, some of the QP used during the period was in accounts administered by managers of the risk pools.

Current Permit Holders. Another alternative would have been to reallocate a portion of the QS to current LE permit holders, rather than allocating only among the QS accounts. Once the QS allocations were distributed in 2010, permit trading started such that the current QS account holders may no longer hold the LE permits for which the allocations were originally issued. Issuing to current permit owners would require identifying a portion of the QS to be allocated on this basis, separate from that reallocated among QS account holders. Under this approach, rather than redistributing among existing QS accounts the reallocation would include a new set of qualified recipients (those acquiring limited entry trawl permits after the initial QS allocation). It is not believed that there has been any expectation that the limited entry permits conveyed after QS issuance would result in the new permit holder receiving additional QS for species already allocated. To make such an allocation might be disruptive and not align with market expectations, and therefore might not be viewed to be fair and equitable.

Use of Post 2002 Widow Rockfish Landings History. An allocation alternative based on more recent years of widow rockfish harvest was rejected because it would reward those who caught widow rockfish when the stock was in overfished status and under rebuilding. Additionally, regulations after 2002 discouraged widow rockfish catch and retention. Therefore, if total pounds were used as the measure or landing history, it would have very little effect on the allocation. Alternatively, if annual landings history for a permit were measured as a proportion of the fleet total (relative history), as it would be for the 1994-2002 period, a small amount of landings by a single vessel could result in a disproportionate amount of allocation for that vessel.

2.1.8 Forced Divestiture Alternatives

In this section a No Action Alternative (Alternative 1) is described along with one action alternative. These action may or may not require regulatory action. See Agenda Item E.6.a NMFS report for additional information.

2.1.8(a) *Forced Divestiture Alternative 1 (No Action)*

NMFS would follow rules published at CFR 660.140(d)(4)(v) and develop additional policy guidance on the QS it would revoke in the event that an entity is over the QS control limit at the time of the divestiture

deadline. That additional policy guidance would apply to situations in which an entity controls multiple QS accounts or is over the aggregate control limit.

2.1.8(b) *Forced Divestiture Alternative 2 (Abandonment Alternative)*

The same as Forced Divestiture Alternative 1 but additionally, individuals would be allowed to abandon QS to bring themselves within the QS control limits in advance of the divestiture deadline.

Rationale for Design of the Alternative:

In some cases there may be no market for quota share that needs to be divested. Participants unable to transfer that quota share for reasons beyond their control, should not be penalized by the loss of control over the choice of which QS they will divest in order to bring themselves down to the aggregate nonwhiting control limit.

2.2 Summary of Impacts

2.2.1 Widow QS Reallocation Alternatives

Table 2-1. Summary of the allocational basis for each alternative.

Allocation Criteria	Alternative 1 (No Action)	Alternative 2 Suboption a	Alternative 3 Suboption a (with Alt 2 Suboption a)	Alternative 4 Suboption a (with Alt 2 Suboption a)
AMP	10%	10.0%	10.0%	10.0%
	Allocations for LE Permits (for distribution to the QS accounts generated by those permits)			
Equal Allocation	0%	30.0%	30.0%	9.0%
Whiting Trips	28%	8.9%	8.9%	22.3%
Nonwhiting Trips	62%	51.1%	25.6%	58.7%
For bycatch needs	62%	-	-	-
Historic Landings	-	51.1%	25.6%	58.7%
Recent Revenue	-	-	25.6%	-

Table 2-2. Summary of impacts described in Chapter 4.

	Impacts of No Action	Impacts Relative to No Action		
	Alternative 1 (No Action)	Alternative 2	Alternative 3	Alternative 4
Physical	Some geographic redistribution of impacts based on changing resource distribution and markets. Harvest fluctuations with ACLs.	Long-term – same as Alt 1 Short-term – unnoticeable geographic redistribution associated with redistribution of QS.	Same as Alt 2.	Same as Alt 2..
Biological	Some geographic redistribution of impacts based on changing resource distribution and	Long-term – same as Alt 1 Short-term – unnoticeable geographic	Same as Alt 2.	Same as Alt 2..

	markets. Harvest fluctuations with ACLs.	redistribution associated with redistribution of QS.		
Socio-economic				
Harvesters	Current QS Distribution Maintained	QS continues to be available for trade. Possible minor economic benefits related to reduction in transaction costs required to move quota to the harvesters most likely to use it to target widow rockfish. Main economic effect a redistribution of wealth and impacts on fairness and equity objectives.		
	Allocation based on bycatch needs. Minimum allocation for an LE Permit = 0.02%. Maximum allocation for an LE Permit = 2.11%.	Distribution favoring those who have historically targeted widow. Minimum allocation for an LE Permit = 0.17%. Maximum allocation for an LE Permit = 2.01%.	Distribution weighs in both historical targeting of widow and total nonwhiting groundfish revenue in more recent years Minimum allocation for an LE Permit = 0.17 percent. Maximum allocation for an LE Permit = 1.46-1.56% (depending on suboptions)	Distribution weighs in those who have historically targeted but amount reallocated is reduced to provide everyone in 2016 with a QP distribution equal to what they received in 2014. Minimum allocation for an LE Permit = 0.08%. Maximum allocation for an LE Permit = 1.61-1.64% (depending on suboptions).
		Vessel owners, captains, crew, those waiting to complete trade agreements and others may be impacted by divestiture delay – delaying the time that at which transactions can occur additional widow QS is available on the market (QS currently held in excess of control limits).		
First Receivers/ Processors	Normal redistributions	Direct redistribution effects for a few first receivers with permits. Indirect redistributional effects with redistributions among harvesters.		
Communities	Normal redistributions	Some reallocation of wealth and short term redistribution of economic activity among communities –low levels of change relative to overall community fishery and general economic activity.		
Government	No action.	Regulatory action using previous data.	Regulatory action using new (2003-2010 data) may require somewhat more effort and more time to implement. QS account holders may turn to states for data and corrections.	Regulatory action using previous data.

2.2.2 Widow QS Divestiture Deadline Delay Suboptions

See NMFS Report and supplemental materials.

2.2.3 Aggregate Nonwhiting QS Divestiture Deadline Delay Suboptions

See NMFS Report and supplemental materials.

2.3 Rationale for Preferred Alternative

To be developed at time of final action.

2.3.1 Widow QS Reallocation Alternatives

2.3.2 Widow QS Divestiture Deadline Delay Suboption

2.3.3 Nonwhiting QS Divestiture Deadline Delay Suboption

Chapter 3 Affected Environments

NMFS and Council staff scoped the range of environmental components that could be significantly affected by the proposed actions. This chapter describes the affected environment in terms of these components. The affected environment reflects conditions as they exist before the proposed actions are implemented and provides a baseline for considering effects. This chapter is organized into the following sections:

- Section 3.1: Physical Environment
- Section 3.2: Biological Environment
- Section 3.3: Socio-economic Environment

This outline closely follows the outline used in the immediately preceding whiting season and chafing gear EAs (PFMC 2014 and PFMC 2015) and incorporates information in the affected environments sections of those document by reference.

3.1 Physical Environment, including Essential Fish Habitat and Ecosystem

This action will make changes affecting the shorebased trawl fishery. With respect to that fishery, the physical environment is impacted by vessels targeting widow rockfish with midwater gear and those catching widow rockfish as bycatch while targeting whiting with midwater gear, and those targeting other groundfish species with bottom trawl gear. Bottom trawl gear is most likely to have the most direct and notable interactions with the physical environment. This action is not expected to appreciably alter fishing activity (see discussion in Section 4.1).

3.1.1 Physical Oceanography.

The activities covered under this document occur within the California current system off the West Coast (Figure 3-1). A more detailed description of the physical and biological oceanography of Pacific Coast marine ecosystems can be found in PFMC 2013b.

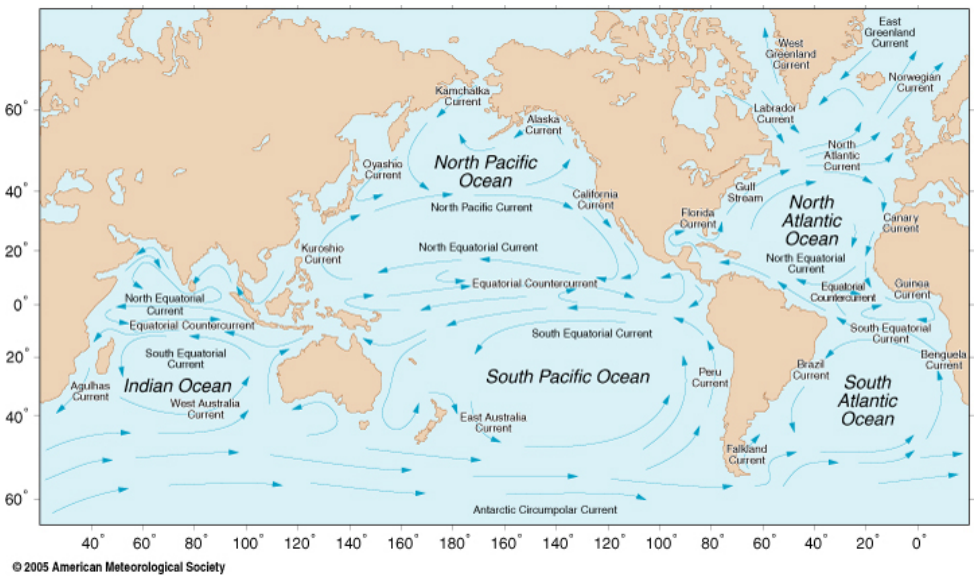

Figure 3-1. Location map of the major ocean currents of the world, including the California Current of the Council management area.

3.1.2 Pacific Marine Ecosystem

The ecosystem off the West Coast is where the groundfish fishery occurs is termed the California current ecosystem (CCE). The trophic interactions in the CCE are extremely complex, with large fluctuations over years and decades (PFMC 2013b). Trophic level fishes and invertebrates of the CCE, including groundfish, are described as a trophic group in Section 3.2.1.2 of the FEP. Mid- to high trophic level fish that feed on zooplankton include midwater rockfish such as widow rockfish and yellowtail rockfish) (Dufault et al. 2009, feeding guilds B and G). However, diets are more varied and most rockfish are omnivorous mid-trophic level predators that may be piscivorous at times.

Within the CCE, spatial patterns of biological distribution (biogeography) have been observed to be influenced by various factors including depth, ocean conditions, and latitude. Cape Mendocino (Mendocino Escapement) is one of the most noteworthy influences to the latitudinal distribution of rockfish species diversity in the action area (**Error! Reference source not found.**). Widow rockfish is managed as a single stock coastwide. The biogeography of the action area is discussed in detail in PFMC 2013c.

3.1.3 Marine Protected Areas, Essential Fish Habitat, and Habitat Areas of Particular Concern

There are numerous Federal and state-managed MPAs distributed throughout the project area. The EIS for Pacific Coast Groundfish EFH (Amendment 19 to the groundfish FMP) contains a complete analysis of these sites. EFH is defined by the Magnuson-Stevens Act as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 U.S.C. 1802(10)). EFH has been described within the project area for highly migratory species, CPS, salmon, and groundfish. EFH for highly migratory species, CPS, and salmon are discussed in detail in Volume 1 of the 2008 groundfish SAFE document (PFMC 2008b), which is incorporated herein by reference. Under Amendment 19,

groundfish EFH is described and has been deemed to include (1) all ocean and estuarine waters and substrates in depths less than or equal to 3,500 m, to the upriver extent of saltwater intrusion, which is defined based on ocean salt content during low runoff periods, and (2) areas associated with seamounts in depths greater than 3,500 m.

3.1.3(a) *Habitat Areas of Particular Concern*

Under the EFH guidelines published in Federal regulations (50 CFR 600.815(a) (8)), habitat areas of particular concern (HAPCs) are types or areas of habitat within EFH that are identified based on the vulnerability and ecological value of specific habitat types. The Council has identified HAPCs by habitat type and by specific geographic areas. HAPCs based on habitat type (estuaries, canopy kelp, sea grass and rocky reefs) may vary in location and extent over time. The most recent assessment of the distribution of HAPCs is provided in Chapter 7 of the groundfish FMP. The coordinates for HAPCs identified by discrete boundaries (areas of interest HAPCs) are provided in Appendix B to the groundfish FMP.

3.1.3(b) *Essential Fish Habitat Conservation Areas (EFHCA)*

An EFHCA, a type of closed area, is a geographic area defined by coordinates expressed in degrees of latitude and longitude at 50 CFR §§ 660.75 through 660.79, subpart C, where specified types of fishing are prohibited. EFHCAs apply to vessels using bottom trawl gear or to vessels using "bottom contact gear," to include bottom trawl gear, among other gear types. Midwater trawling is allowed in EFHCAs when midwater trawl fishing is allowed in adjacent waters by the groundfish regulations (50 CFR 660 Parts C-G available at http://www.trawl.org/Groundfish%20Regulations/pink-pages.pdf).

3.2 Biological Environment

This action affects vessels which target widow rockfish and those which participate in a groundfish targeting strategies that takes widow rockfish as bycatch (mainly whiting trawl but also bottom trawl). Widow rockfish is the subject species of the action alternatives and other species may be incidentally affected; however, the action alternatives are primarily allocative and are expected to have minimal effects on the amount, type, and distribution of fishing activity (see Section 4.2.2).

The groundfish FMP (PFMC 2014b) contains the rules for managing the groundfish fishery. It outlines the areas, species, regulations, and methods that the Council and the Federal government must follow to make changes to the fishery. The FMP also creates guidelines for the biennial process of setting harvest levels.

The biological resources covered in this subsection include those species that share the same marine environment both temporally and spatially with widow rockfish, the principal species under consideration in this assessment.

3.2.1 Groundfish Targeting and Identification of Incidental Catch

Previous to the trawl rationalization program, the retention of catch of non-target groundfish species were limited by bimonthly cumulative trip limits and, for whiting, season restrictions. The fishery is managed

under the groundfish FMP. Retention of nongroundfish bycatch is either prohibited (salmon, crab, halibut) or allowed – subject to other governing regulations. The first year of the trawl rationalization program was 2011. Beginning that year fishers had to cover their groundfish catches of IFQ species with QP and an observer was required onboard the vessel to document total fishery impacts. Trip limits were in place for most non-IFQ species. Individual bycatch quota was provided for halibut to provide an incentive for bycatch avoidance (retention not allowed). The program did not change management of other species.

Historically, widow rockfish has been targeted by itself and jointly with yellowtail rockfish. It is also taken as bycatch on trips with midwater trawl targeting on whiting and bottom trawl targeting primarily on other species. From 2002 through 2010, widow rockfish targeting opportunities and the opportunity to retain widow rockfish bycatch in the trawl fishery were minimal because the stock was overfished and trip limits were low or did not allow retention. Additionally, areas where widow rockfish bycatch has been higher, in the RCAs, have been closed to bottom trawling. Starting in 2011 there was an opportunity to use widow QP to retain widow rockfish but the amount of QP available was limited due to its overfished status. Since widow rockfish was a primary target species in the nonwhiting midwater trawl fishery, this limitation has depressed widow rockfish catch levels in that fishery. The amount of QP available increased in 2013 when the stock became rebuilt and activity in the nonwhiting midwater trawl fishery has increased. Indication of the catch rates of widow rockfish in each of these fisheries is provided in Table 3-1. Additional data on these rates is provided in Section 3.3.1

Table 3-1. Widow rockfish catch rates as a percent of total catch for each strategy.

	Midwater Trawl		
	Nonwhiting	Whiting	Bottom Trawl
2000a/	57.92%		
2001a/	48.21%		
2002a/	29.07%		
2002-20010 b/	d/		0.12%
2011 c	d/		
2012 c/	5.02%	0.16%	0.19%
2013 c/	59.08%	0.24%	0.25%

a/ Washington, Oregon, California state logbook data.
b/ / WCGOP Limited entry (LE) bottom trawl 2002-2010 Excel Sheet – Release Date 2014
http://www.nwfsc.noaa.gov/research/divisions/fram/observation/xls/LE_Trawl_CatchTable_Years_2002-2010_111814.xlsx
c/ WCGOP Groundfish Mortality Reports – Released to GMT
d/ Not available due to confidentiality restrictions.

3.2.1(a) *Species Caught in the Nonwhiting Midwater Trawl Fishery*

For purposes of this analysis, nonwhiting midwater trawl trips are those in which midwater trawl gear was used and less than 50 percent of the catch was Pacific whiting. In Council area fisheries these are trips in which pelagic rockfish species comprised most of the nonwhiting catch but, as will be discussed, this is not always the case. Non-target species data for the pelagic rockfish fishery and other nonwhiting mid-water trawl fisheries were obtained from two sources: (1) The WCGOP database maintained by the NMFS and (2) the State logbook database (PacFIN) maintained by the Pacific States Marine Fisheries Commission.

Information from the WCGOP is provided for the periods 2002-2011 and 2012-2013. For the earlier period, sample data was provided by the observer program for 49 observed tows most of which occurred

in 2011. During this period there was very little targeting of pelagic rockfish with midwater trawl gear. Data for 2012-2013 covers a period of increased targeting which occurred with opportunities provided by the trawl rationalization program and the rebuilding of widow rockfish. For 2002-2011 data is provide for north and south of 40°10' N. latitude. For the latter period all fishing was in the northern area. Catch estimates for these periods and areas are provided in the whiting season EA (Council, 2015) and summarized here.

A total of 62 categories of fish and invertebrates were observed in the coastwide nonwhiting midwater trawl fishery catch during 2002-2011 (Table 3-2). Catches in the north and south management areas were noticeably different with regard to species categories present and relative amounts in the catch. The south area data showed a large catch of bank rockfish (56 mt retained), a southern area minor slope rockfish species, while the north area catch was dominated by yellowtail rockfish (103 mt retained) and widow rockfish (75 mt retained), two major shelf rockfish species in the north area (Council, 2015). Yellowtail and widow rockfish were not encountered in the southern tows. It would appear these were the likely target species of the fisheries, because the bank rockfish catch represented 90 percent of the south area retained catch, while the combined yellowtail rockfish and widow rockfish catches represented 99 percent of the north area retained catch (Council, 2015). Notable discard species in the south area included unidentified rockfish, shortbelly rockfish and Pacific whiting. The major discard species in the north area was Pacific whiting. Groundfish species dominated the catch in both areas: 99 percent in the south area and 97 percent in the north area (Council, 2015). Overfished groundfish and prohibited species were caught in both areas (Table 3-2). CPS was encountered in both areas but no HMS species or Pacific halibut were encountered in either area.

Table 3-2. Species and species groups caught on nonwhiting midwater trawl trips during 2002-2011 by management area and species category. The north and south management areas are divided at 40° 10 N. latitude (West Coast Groundfish Observer Program catch data data provided Janunary 7. 2013).

North		South	
Overfished Groundfish			
Canary Rockfish		Bocaccio Rockfish	Darkblotched Rockfish
Pacific Ocean Perch		Cowcod Rockfish	Petrale Sole
Other Groundfish			
Arrowtooth Flounder	Rockfish Unid	Bank Rockfish	Pacific Hake
Bocaccio Rockfish	Rosethorn Rockfish	Big Skate	Pacific Sanddab
Chilipepper Rockfish	Sablefish	Blackgill Rockfish	Rex Sole
Harlequin Rockfish	Sharpchin Rockfish	California Skate	Rockfish Unid
Lingcod	Shelf Rockfish Unid	Chilipepper Rockfish	Sablefish
Longnose Skate	Silvergray Rockfish	Curlfin Turbot	Sharpchin Rockfish
Pacific Cod	Skate Unid	Dover Sole	Shortbelly Rockfish
Pacific Hake	Spiny Dogfish Shark	English Sole	Skate Unid
Redstripe Rockfish	Widow Rockfish	Greenspotted Rockfish	Spiny Dogfish Shark
Rex Sole	Yellowtail Rockfish	Greenstriped Rockfish	Splitnose Rockfish
		Lingcod	Spotted Ratfish
		Longnose Skate	Stripetail Rockfish
Prohibited Species			
King (Chinook) Salmon	Silver (Coho) Salmon	Dungeness Crab	
CPS			
Jackmackerel		Market Squid	
Other Nongroundfish			
American Shad	Pacific Herring	Armored Box Crab	Ribbonfish Unid
Jellyfish Unid	Shark Unid	King of the Salmon	Sandpaper Skate
Mackeral Unid	Squid Unid	Mola Mola (Sunfish)	Slender Sole
		Pacific Electric Ray	Spot Shrimp
		Red Rock Crab	Squid Unid

a/ Target species comprised an average of 95% of total catch in 2012 and 2013 (West Coast Groundfish Observer Program data from Table 3a of the workbook version of the 2012 and 2013 groundfish mortality reports).
b/ No Pacific Halibut were reported.

The observed trips in 2012 and 2013 produced a total catch of 425.97 mt of fish, 196.5 mt in 2012 and 208.4 mt in 2013 (Council 2015). About 95 percent of the total catch in the two years combined was composed of pelagic rockfish species including yellowtail rockfish (270.30 mt) and widow rockfish (270.3 mt). A variety of species comprised the remainder of the catch including overfished groundfish (canary rockfish, darkblotched rockfish, Pacific Ocean perch and petrale sole), IFQ and nonIFQ groundfish species (45 categories) and nongroundfish species (3 species). Dungeness crab was the only prohibited species encountered. There were no CPS or HMS in the observed catch, however the total catch in this strategy has been very low (roughly just over 200 mt per year of all species). Bycatch data for 2012-2013 is not provided for eulachon, green sturgeon, salmon or Pacific halibut. Preliminary data showing nonwhiting midwater trawl salmon bycatch rates in 2014 is presented in Section 3.2.7.

Table 3-3. Species and species groups caught on nonwhiting midwater trawl trips observed by the West Coast Groundfish Observer Program during 2012 and 2013 (data from Table 3a of the workbook version of the 2012 and 2013 groundfish mortality reports).[a/] All fishing was conducted north of 40° 10 North latitude (N.).

OVERFISHED GROUNDFISH	OTHER GROUNDFISH			NONGROUNDFISH[b/]
Canary Rockfish	Arrowtooth Flounder	*Minor nearshore rockfish (N)*	Rougheye Rockfish	*Protected/Prohibited Species*
Darkblotched Rockfish	Dover Sole	Quillback Rockfish	Sharpchin Rockfish	Dungeness Crab
Pacific Ocean Perch (N)	English Sole	*Minor shelf rockfish (N)*	Shortraker Rockfish	
Petrale Sole	Petrale Sole	Bocaccio Rockfish	Slope Rockfish Unid	
	Lingcod (North)	Chilipepper Rockfish	Splitnose Rockfish	*Non-FMP flatfish*
	Longnose Skate	Greenspotted Rockfish	*Other flatfish*	Slender Sole
	Longspine Thornyhead (N)	Greenstriped Rockfish	Butter Sole	*Non-FMP skate*
	Pacific Cod	Redstripe Rockfish	Curlfin Turbot	Pacific Electric Ray
	Pacific Hake	Rosethorn Rockfish	Flathead Sole	
	Sablefish (N)	Silvergray Rockfish	Pacific Sanddab	
	Shortspine Thornyhead (N)	Stripetail Rockfish	Rex Sole	
	Spiny Dogfish	*Minor slope rockfish (North)*	Rock Sole	
	Starry Flounder	Aurora Rockfish		
	Widow Rockfish	Blackgill Rockfish	Big Skate	
	Yellowtail Rockfish (N)	Redbanded Rockfish	Skate Unid	
			Spotted Ratfish	
			Skate Unid	

a/ Target species comprised an average of 95% of total catch in 2012 and 2013 (West Coast Groundfish Observer Program data from Table 3a of the workbook version of the 2012 and 2013 groundfish mortality reports).
b/ There were no HMS, CPS, boccaccio rockfish, cowcod or yelloweye rockfish.

3.2.1(b) *Species Caught in the Shorebased Whiting Fishery*

Directed whiting fishing vessels and their landings are those that conform to the regulations found at 50 CFR 660, subparts C-G. (in particular §160.131). The fishery is limited to permitted vessels that have declared their intent to participate in the taking of Pacific whiting using specified fishing gear (midwater trawl), during the specified primary whiting season (which may vary by geographic area) and in specified ocean fishing areas. Data for species caught in the IFQ non-tribal shorebased whiting fishery were obtained from the West Coast Groundfish Observer Program (WCGOP) database maintained by the NMFS.

The directed whiting fishery average annual catch during 2007-2010 totaled 57,380 mt of fish and invertebrates. From 2007 through 2010, the nonwhiting bycatch included over 100 species of animals, which comprised 1.24 percent of the total catch for a total of 57,380 mt (PFMC, 2015). Endangered species included eulachon and some stocks of salmon. Overfished groundfish included overfished bocaccio rockfish, canary rockfish, darkblotched rockfish and Pacific Ocean perch. From 2011 through 2012, the nonwhiting bycatch comprised 0.99 percent of the total catch for a total of 85,032 mt (PFMC, 2015). Endangered species included eulachon and some stocks of salmon. Overfished groundfish included overfished bocaccio rockfish, canary rockfish, darkblotched rockfish, Pacific Ocean perch and Petrale sole.

Table 3-4. Species and species groups caught in the shorebased whiting fishery from 2007 through 2013 (Source: 2007-2012 from the 2012 multiyear data product (Bellman, et al. 2013); 2013 groundfish data from the 2013 groundfish mortality report provided by the WCGOP; 2013 data for nongroundfish data is from fish tickets).

TARGET SPECIES	*Minor slope Rockfish (Rf) N.*[a/]	Pacific Cod	**Endangered Species**	**Other Nongroundfish**
Pacific Hake	Aurora Rf	Sablefish (N)	Eulachon	American Shad
NON-TARGET SPECIES	Bank Rf	Sablefish (S)	*(also salmon)*	Bivalves Unid
Groundfish IFQ Species	Blackgill Rf	Shortspine Thornyhead (N)	**Prohibited Species**	Black Skate
Overfished Groundfish	Blackspotted Rf	Starry flounder	Dungeness Crab	Brown Cat Shark
Bocaccio Rf (S) [b/]	Redbanded Rf	Widow Rf	Chum Salmon	California Mussel
Canary Rf	Rougheye Rf	Yellowtail Rf (N)	Chinook Salmon	Echinoderm Unid
Cowcod Rf (S)	Sharpchin Rf	**Groundfish Landing Limit Species**	Coho Salmon	Fish Unid
Darkblotched Rf	Shortraker Rf	Black Rf (N)	Pink Salmon	Hagfish Unid
Pacific Ocean Perch (N)	Slope Rf Unid	Black Rf (S)	Sockeye Salmon	Jellyfish Unid
Petrale Sole	Splitnose Rf	Nearshore Rf Unid	Salmon Unid	Mackerel Unid
Yelloweye Rf	Yellowmouth Rf	Quillback Rf	Pacific Halibut b/	Mixed Species
Non-Overfished Groundfish	Other flatfish	Spiny Dogfish Shark	**CPS**	Mola Mola (Sunfish)
Arrowtooth flounder	Flatfish Unid	**Groundfish Non-Landing Limit**	Market Squid	Octopus Unid
Chilipepper Rf (S)	Flathead Sole	Longnose skate	Northern Anchovy	Other Nongroundfish
Dover sole	Pacific Sanddab	Mixed thornyheads	Pacific Mackerel	Pacific Herring
English sole	Rex Sole	Other groundfish	Pacific Sardine	Pacific Pomfret
Lingcod (N)	Rock Sole	Big Skate	Jack Mackerel	Pink Shrimp
Lingcod (S)	Sand Sole	Grenadier Unid	**HMS**	Prowfish
Longspine Thornyhead (N)	Sanddab Unid	Groundfish Unid	Albacore Tuna	Sea Cucumber Unid
Minor shelf Rf (N)		Skate Unid	Bonito (Shortfin Mako) Shark	Shark Unid
Bocaccio Rf		Shortbelly Rf	Blue Shark	Shrimp Unid
Chilipepper Rf		Soupfin Shark	Common Thresher Shark	Smelt Unid
Greenblotched Rf		Spotted Ratfish		Squid Unid
Greenspotted Rf				Walleye Pollock
Greenstriped Rf				White Sturgeon
Redstripe Rf				Wolf-eel
Rosethorn Rf				
Shelf Rf Unid				
Silvergray Rf				
Stripetail Rf				

a/ N = North of 40°10' N. lat.
b/. S=South of 40°10' N. lat

3.2.1(c) *Species Caught in the Bottom Trawl Fishery*

Data provided here is for vessels using bottom trawl gear from 2002 through 2010 (the most recent sector reports that have been released by the groundfish observer program.

The directed bottom trawl fishery average annual catch during 2002-2010 averaged 5,944 mt of fish and invertebrates. By weight, 93 percent of the catch in the bottom trawl fishery is of species managed under the groundfish plan. Five groundfish species comprise 60 percent of the total weight of landings: Dover

sole, arrowtooth flounder, sablefish, petrale sole and longspine thornyhead. Of the nongroundfish bycatch that comprise the remaining 7 percent, 5 percent is accounted for by 5 categories of bycatch: tanner crab, Pacific halibut, dungeness crab, and "kelp, rocks, wood and mud." An additional 273 species and categories comprise the remaining 2 percent (an average of 445 mt per year). Species for which more than one half metric total was caught from 2002 through 2010 are listed in Table 3-5. Endangered species landed included eulachon and some stocks of salmon. A total of 0.01 mt of eulachon was caught over the entire period. Endangered species included eulachon and some stocks of salmon. Overfished groundfish included overfished bocaccio rockfish, canary rockfish, darkblotched rockfish, Pacific Ocean perch, yelloweye rockfish, and Petrale sole.

Table 3-5. Species and species groups caught in the bottom trawl fishery from 2002 through 2010 for which more than 0.5 mt was caught for the entire period (an average of more than 122 pounds per year).

Groundfish species	**Petrale Sole**	**Non-groundfish species**	Kelp Rocks Wood Mud
Arrowtooth Flounder	Popeye Grenadier	Albacore Tuna	Chinook Salmon
Aurora Rockfish	Quillback Rockfish	Aleutian Skate	Longnose Cat Shark
Bank Rockfish	Redbanded Rockfish	American Shad	Mixed Species
Big Skate	Redstripe Rockfish	Anemone Unid	Octopus Unid
Blackgill Rockfish	Rex Sole	Angulatus Tanner Crab	Opaleye
Black Rockfish	Rockfish Unid	Armored Box Crab	Pacific Halibut
Bocaccio Rockfish	Rock Sole	Bigfin Eelpout	Pacific Herring
Butter Sole	Rosethorn Rockfish	Black Coral	Pacific Sardine
California Grenadier	Rougheye Rockfish	Black Skate	Pacific Sleeper Shark
California Skate	Sablefish	Blacktail Snailfish	Pacific Staghorn Sculpin
Canary Rockfish	Sanddab Unid	Blob Sculpin	Pacific Tom Cod
Chilipepper Rockfish	Sand Sole	Brittle/Basket Star Unid	Pink Surfperch
Cowcod Rockfish	Sharpchin Rockfish	Brown Box Crab	Plainfin Midshipman
Curlfin Turbot	Shelf Rockfish Unid	Brown Cat Shark	Ragfish
Darkblotched Rockfish	Shortbelly Rockfish	Brown Smoothhound Shark	Sandpaper Skate
Deepsea Skate	Shortraker Rockfish	California Halibut	Sculpin Unid
Dover Sole	Shortraker/Rougheye Rockfish	California Slickhead	Sea Cucumber Unid
English Sole	Shortspine/Longspine Thornyhead	Cat Shark Unid	Sea Snail Unid
Flatfish Unid	Shortspine Thornyhead	Common/Giant Pacific Octopus	Sea Star Unid
Flathead Sole	Silvergray Rockfish	Corals Unid	Shark Unid
Greenspotted Rockfish	Skate Unid	Crab Unid	Slender Sole
Greenstriped Rockfish	Slope Rockfish Unid	Decomposed Fish	Slickhead Unid
Grenadier Unid	Soupfin Shark	Deepsea Sole	Smelt Unid
Lingcod	Spiny Dogfish Shark	Dogfish Shark Unid	Snailfish Unid
Longnose Skate	Splitnose Rockfish	Dungeness Crab	Sponge Unid
Longspine Thornyhead	Spotted Ratfish	Eelpout Unid	Squid Unid
Pacific Cod	Starry Flounder	Egg Case Unid	Sunstar Starfish
Pacific Electric Ray	Starry Skate	Filetail Cat Shark	Tanner Crab Unid
Pacific Flatnose	Stripetail Rockfish	Garbage/Trash	Tanneri Tanner Crab
Pacific Grenadier	Vermilion Rockfish	Giant Grenadier	Threadfin Slickhead
Pacific Hake	Widow Rockfish	Giant Squid	Twoline Eelpout
Pacific Ocean Perch	**Yelloweye Rockfish**	Humboldt (Jumbo) Squid	Urchin Unid
Pacific Sanddab	Yellowmouth Rockfish	Invertebrate Unid	Walleye Pollock
	Yellowtail Rockfish	Irregular Echinoids	White Anemone
		Jellyfish Unid	White Croaker
			Wolf-eel

a/ WCGOP Limited entry (LE) bottom trawl 2002-2010 Excel Sheet – Release Date 2014
http://www.nwfsc.noaa.gov/research/divisions/fram/observation/xls/LE_Trawl_CatchTable_Years_2002-2010_111814.xlsx

3.2.2 Overfished Groundfish Species

There are currently six overfished rockfish stocks (bocaccio south of 40º10' N. latitude, canary rockfish, cowcod south of 40º10' N. latitude, darkblotched rockfish, Pacific ocean perch, and yelloweye rockfish)

and one overfished flatfish stock (petrale sole) managed under rebuilding plans (PFMC 2014a). All species of overfished groundfish are actively managed in all ocean management areas and fisheries where they occur, as explained below. They occur as bycatch in the pelagic rockfish fishery as shown in WCGOP data (Table 3-2) and in the Pacific whiting shorebased fishery as shown in Table 3-4. New assessments and rebuilding analyses for these overfished stocks do not indicate any need to modify existing rebuilding plans since all these analyses indicate progress towards rebuilding is on track and, in most cases, ahead of schedule.

3.2.3 Other Non-target Groundfish Species

Other groundfish species (other than target species and overfished groundfish) are frequently caught in the nonwhiting midwater trawl and shorebased whiting fishery. The Groundfish Harvest Specifications for 2015-2016 (PFMC 2015) describe the species and stocks managed under the Groundfish FMP. More than 90 fish species are managed under the Groundfish FMP. WCGOP data from 2002-2011 collected in the nonwhiting midwater trawl fishery showed that three species or species groups made up 73 percent of the incidental catch: bank rockfish, Pacific whiting and unidentified rockfish (Council 2015). WCGOP data for 2007-2013 for the whiting fishery show that the largest incidental catch tonnages were for yellowtail rockfish, widow rockfish, dogfish shark (Council, 2015). The bottom trawl fishery is a multi-species strategy which includes a mixture of strategies. In 2012 there were 16 species and species groups for which more than 100 mt was caught: petrale sole, arrowtooth flounder,dover sole, english sole, Pacific sanddab, rex sole, chilipepper rockfish, yellowtail rockfish, longspine thornyhead, shortspine thornyhead, lingcod, sablefish, Pacific cod, whiting, spiny dogfish, longnose skate, and unidentified skate. These species comprised 93 percent of the catch in this fishery.

A synopsis of biological information on widow rockfish is provided here. Biological information for many of the bycatch species identified in this report can be found on the Council web page at: www.pcouncil.org.

3.2.3(a) *Widow Rockfish*

Biology (CDFG 2001b): Widow rockfish *(Sebastes entomelas)* are found from Todos Santos Bay, Baja California, to Kodiak Island, Alaska. Peak abundance is off northern Oregon and southern Washington, with significant aggregations occurring south to central California. While many commercial catches occur at bottom depths between 450 and 750 feet, young fish occur near the surface in shallow waters, and adults have been caught over bottom depths to 1,200 feet. It exhibits extreme night and day movement during spring and summer feeding migrations as it feeds on a variety of pelagic fishes or zooplankton. It is commonly found at depths of 160 to 1,500 feet but has been found from the surface to 2,600 feet. Widow rockfish often form midwater schools, usually at night, over bottom features such as ridges or large mounds near the shelf break. There appears to be some seasonal movement of fish among adjacent grounds, and there is evidence that fish move from area to area as they age, with fish of the same size tending to stay together.

Fishery Management: Widow rockfish was an untargeted species prior to 1979. In 1979 a highly directed midwater trawl fishery developed for widow rockfish. Schooling behavior of widow rockfish allows them to be targeted easily by fishermen, and catches (when the fishery was active) were often 100 percent widow rockfish. Midwater trawling for widow rockfish historically occurred at night when they

formed dense off-bottom schools, which dispersed at dawn (Tagart 1987; Ralston and Pearson 1997). The targeted widow fishery stopped in 2002 after it was declared overfished. Since the Trawl Rationalization Program began in 2011 and widow stocks being rebuilt, some targeting has started again.

An Oregon-based widow rockfish fishery took place during 1991-2003 on Cobb Seamount, located outside of the US EEZ, approximately 280 nautical miles northwest of the northern Oregon coast (Douglas 2011). U.S. fishing activity on the Cobb Seamount ceased in early 2004 when NMFS stopped issuing high seas permits for net gear types.

Stock Status (He et al. 2011): The most recent widow rockfish assessment in 2011 applied to widow rockfish located in the territorial waters of the U.S., including the Vancouver, Columbia, Eureka, Monterey, and Conception areas. The stock is assumed to be a single mixed stock and subject to five major fisheries. The stock was declared overfished in 2001. A stock that has declined to less than 25 percent of its unfished spawning biomass is considered "overfished" until it rebuilds to 40 percent of its unfished spawning biomass. The most recent stock assessment showed that the stock had rebuilt to a depletion level of 51 percent and a spawning stock size of 36,342 mt.

Management Performance (He et al. 2011 and GMT 2013): Management uncertainty is low since widow rockfish is a trawl-dominant species and there is mandatory 100 percent observer coverage in trawl fisheries (PFMC 2014b).

The combined fishery catches of widow rockfish during 1999-2001, prior to the species being declared overfished, achieved between 92 percent and 98 percent and averaged 95 percent of the HG. From 2002-2012 the widow rockfish catch ranged from 5 percent to 74 percent and averaged 47 percent of the HG.

3.2.4 Pacific Halibut

Pacific halibut (*Hippoglossus stenolepis*) are managed by the bilateral (U.S./Canada) International IPHC with implementing regulations set by Canada and the U.S. in their own waters. Pacific halibut mortality in the groundfish trawl fishery is managed with individual bycatch quotas (IBQ). There was no halibut catch in the WCGOP sampling of the non-whiting midwater trawl fishery conducted during 2002-2011 (PFMC, 2015). A total of 4.5 mt was caught in 2002-2012 shorebased whiting fishery samples (PFMC, 2015).

3.2.5 Coastal Pelagic Species

CPS (Pacific sardine, Pacific mackerel, jack mackerel, northern anchovy, and market squid) are taken incidentally in the groundfish fishery and are believed to be most vulnerable to midwater trawl gear compared to other groundfish gear types because of their off bottom schooling behavior. Small amounts (<0.13 mt) of CPS were observed caught in the nonwhiting midwater trawl fishery during 2002-2013 (PFMC, 2015). A total of 450 mt of CPS was estimated caught in the shorebased whiting fishery during 2002-2012 (PFMC, 2015).

3.2.6 Highly Migratory Species (HMS)

HMS include tunas, migratory pelagic sharks, billfish and swordfish. No HMS species were observed in nonwhiting onboard observation samples from 2007-2013 (PFMC, 2015). HMS that were recorded in

2002-2012 shorebased whiting catches collectively weighed about 11 mt compared to a whiting catch of 775,780 mt.

3.2.7 Salmonids (Including ESA Listed Stocks)

Salmon caught in West Coast groundfish fisheries originate in fresh water streams and rivers from Central California to Alaska. NMFS has identified eight evolutionarily significant units (ESUs)[4] that are most likely to be caught in the groundfish fisheries. Those ESUs range geographically from the Sacramento River to Puget Sound and are subject to the 2006 consultation (Table 3-6). Widow rockfish QS reallocation is not expected to affect salmon bycatch rates.

Table 3-6. Endangered Species Act Status of West Coast salmon and steelhead (highlighted ESUs are those subject to the 2006 consultation).

Species	ESU	Status	ESU	Status
Sockeye	Snake rive	Endangered	Ozette Lake	Threatened
Chinook	**Sacramento River Winter-run**	Endangered	**Lower Columbia River**	Threatened
	Upper Columbia River Spring-run	Endangered	**Upper Willamette River**	Threatened
	Snake River Spring/Summer -run	Threatened	**Central Valley Spring-run**	Threatened
	Snake River Fall-run	Threatened	**California Coastal**	Threatened
	Puget Sound	Threatened	Central Valley Fall & Late Fall-run	Species of Concern
Coho	Central California Coast	Endangered	Oregon Coast	Threatened
	Southern Oregon/Northern California	Threatened	Puget Sound/Strait of Georgia	Species of Concern
	Lower Columbia River	Threatened		
Chum	Hood Canal Summer-run	Threatened	Columbia River	Threatened
Steelhead	Southern California	Endangered	California Central Valley	Threatened
	Upper Columbia River	Threatened	Upper Willamette River	Threatened
	Central California Coast	Threatened	Middle Columbia River	Threatened
	South Central California Coast	Threatened	Northern California	Threatened
	Snake River Basin	Threatened	Puget Sound	Threatened
	Lower Columbia River	Threatened	Oregon Coast	Species of Concern

Chinook salmon have been the primary salmonid species impacted in West Coast trawl fisheries, including the directed whiting midwater trawl fishery, by over 90 percent for trawl fisheries in combination (Table 3-7).

[4] An ESU, or evolutionarily significant unit, is a Pacific salmon population or group of populations that is substantially reproductively isolated from other conspecific populations and that represents an important component of the evolutionary legacy of the species. The ESU policy (56 FR 58612) for Pacific salmon defines the criteria for identifying a Pacific salmon population as a DPS, which can be listed under the ESA." Source: http://www.nmfs.noaa.gov/pr/glossary.htm#esu

Table 3-7. Estimated bycatch of salmon (no. of fish) in all U.S. west coast fisheries observed by the West Coast Groundfish Observer Program (WCGOP) and the At-Sea Hake Observer Program (A-SHOP) from 2002-2010, as well as salmon bycatch in shoreside Pacific whiting sectors.

	Nonwhiting Sectors	Whiting Sectors	Total	Percent
Chinook	37,466	51,620	89,086	91%
Chum	51	735	789	1%
Coho	338	1,688	2,026	2%
Pink	2	4,982	4,984	5%
Sockeye	0	4	4	0%
Unspecified	178	351	529	1%
Total	38,037	59,380	97,417	100%
Percent	39%	61%	100%	

NMFS first consulted under the ESA on the effects of the fishery on listed salmonids in 1990 and reinitiated consultation several times thereafter.

The effects of ongoing implementation of the groundfish FMP on listed salmonid species were considered in a biological opinion 1999 biological opinion which focused on bycatch of Chinook salmon, which comprises the largest portion of salmonid bycatch in the whiting fishery. Bycatch consists primarily of unlisted salmonid species; however, some ESA-listed evolutionarily significant units (ESUs) are caught in small numbers.

The 1999 opinion determined that the fishery was not likely to jeopardized any of the listed ESUs and provided an incidental take statement estimating that total Chinook bycatch (listed and unlisted fish) for the whiting fishery (mothership, catcher/processor (C/P), shorebased, and tribal combined), would likely be 11,000 Chinook per year or 0.05 fish per metric ton (mt) of whiting catch. The 1999 biological opinion indicated consultation must be reinitiated if Chinook bycatch rates exceed 0.05 Chinook salmon/mt whiting or catch exceeds 11,000 Chinook per year. For the bottom trawl fishery, the 1999 biological opinion estimated that 6,000 to 9,000 Chinook salmon would be taken annually. The biological opinion concluded that if the bottom trawl fishery changes substantially in magnitude or character or if bycatch exceeds 9,000 salmon, consultation must be reinitiated.

In 2013, NMFS reinitiated section 7 consultation on the FMP to address the effects on salmonids caused by the re-emerging use of midwater trawl gear to target non-whiting groundfish species such as yellowtail and widow rockfish. That consultation will likely be completed before final action is taken on widow rockfish allocation.

3.2.8 Forage Fish Species

These are lower trophic level species that are preyed upon by higher level species such as most groundfish species, including Pacific whiting. The shorebased whiting fishery data for 2002-2012 show an estimated total catch of potential forage fish of about 553 mt, which was nearly (99 percent) all American shad and Pacific herring (Table 3-4, Table 3-2).

3.2.9 Miscellaneous Non-groundfish Species

A wide variety of nongroundfish species have been recorded in nonwhiting midwater trawl, whiting midwater trawl and bottom trawl fisheries (see Table 3-2, Table 3-3, Table 3-4, and Table 3-5).

3.2.10 Marine Mammals, Seabirds, and ESA-Listed Species (Other Than Salmonids)

A list of marine mammals, seabirds, and ESA-listed species in the project area is provide in Table 3-8. These species and fishery impacts are more fully described in the FEIS for the 2015-2016 groundfish specifications. These species are not likely to be affected under any of the action alternatives. More information is available on these species in the referenced documents and in the FEIS for the 2015-2016 groundfish specifications (Council, 2015)

Table 3-8. List of marine mammals, seabirds, and ESA-listed species (other than salmonids) in the project area (St = Status; T = threatened; E = endangered).

Class/ Species	Listing	St	Determination	Source
Fish				
Green Sturgeon (*Acipenser medirostris*)	ESA	T	No Jeopardy (likely to adversely affect)	NMFS (2012)
Eulachon (*Thaleichthys pacificus*)	ESA	T	No Jeopardy (likely to adversely affect)	NMFS (2012)
Bull trout (*Salvelinus confluentus*)	ESA	T	May affect, but is not likely to adversely affect	USFWS (2012)
Marine Mammals				
30 species in U.S. West Coast waters (Trawl Interaction)	MMPA Cat III		Remote likelihood of/no known incidental mortality or serious injury of marine mammals	
Humpback Whales (*Megaptera novaeangliae*)	ESA	E	No Jeopardy (likely to adversely affect)	NMFS (2012)
Stellar Sea Lions (*Dennochelys coriacea*)	ESA	E	No Jeopardy (likely to adversely affect)	NMFS (2012)
Sei Whales (*Balaenoptera borealis*)	ESA	E	May affect, but is not likely to adversely affect	NMFS (2012)
North Pacific Right Whales (*Eubalaena japonica*)	ESA	E	May affect, but is not likely to adversely affect	NMFS (2012)
Blue Whales (*Balaenoptera musculus*)	ESA	E	May affect, but is not likely to adversely affect	NMFS (2012)
Fin Whales (*Balaenoptera physalus*)	ESA	E	May affect, but is not likely to adversely affect	NMFS (2012)
Sperm Whales (*Physter macrocephalus*)	ESA	E	May affect, but is not likely to adversely affect	NMFS (2012)
Southern Resident Killer Whales (*Orcinus orca*)	ESA	E	May affect, but is not likely to adversely affect	NMFS (2012)
Guadalupe Fur Seals (*Arctocephalus townsendi*)	ESA	T	May affect, but is not likely to adversely affect	NMFS (2012)
Southern Sea Otter (*Enhydra lutris nereis*)	ESA	E	May affect, but is not likely to adversely affect	USFWS (2012)
Reptiles				
Leatherback Sea Turtles (*Dennochelys coriacea*)	ESA	E	No Jeopardy (likely to adversely affect)	NMFS (2012)
Green Sea Turtles (Chelonia mydas)	ESA	T	May affect, but is not likely to adversely affect	NMFS (2012)
Olive Ridley Sea Turtles (Lepidochelys olivacea),	ESA	T	May affect, but is not likely to adversely affect	NMFS (2012)
Loggerhead Sea Turtles (Carretta carretta)	ESA	E	May affect, but is not likely to adversely affect	NMFS (2012)
Critical Habitat for				
Bull trout			May affect, but is not likely to adversely affect	
Green Sturgeon (*Acipenser medirostris*)	ESA		Not likely to adversely modify critical habitat	NMFS (2012)
Eulachon (*Thaleichthys pacificus*)	ESA		Not likely to adversely modify critical habitat	NMFS (2012)
Humpback Whales (*Megaptera novaeangliae*)	ESA		N/A	NMFS (2012)
Stellar Sea Lions (*Dennochelys coriacea*)	ESA		Not likely to adversely modify critical habitat	NMFS (2012)
Leatherback Sea Turtles (*Dennochelys coriacea*)	ESA		Not likely to adversely modify critical habitat	NMFS (2012)
Seabirds				
10 species interact with groundfish gears (2002-2009)				Jannot et. al. (2011)
Common murre (*Uria aalge*)			Interact with trawl fishery	Jannot et. al. (2011)
Leach's storm petrel (Oceanodroma leucorhoa)			Interact with trawl fishery	Jannot et. al. (2011)
Northern fulmar (Fulmarus glacialis)			Interact with trawl fishery	Jannot et. al. (2011)
Short-tailed Albatros (*Phoebastria albatrus*)	ESA	E	No Jeopardy	USFWS (2012)
Marbled Murrelet (*Brachyrampphus marmoratus*)	ESA	E	May affect, but is not likely to adversely affect	USFWS (2012)
California least tern (*Sterna anillarum browni*)	ESA	E	May affect, but is not likely to adversely affect	USFWS (2012)

3.3 Socio-Economic Environment

Amendment 21 to the groundfish plan describes formal allocations of groundfish species and species' complexes for sectors of the groundfish fishery.

Section 3.2 in the 2013-14 Groundfish Harvest Specifications FEIS (PFMC 2012c) describes commercial fisheries targeting groundfish and characterizes west coast fishing communities with respect to groundfish fisheries. That information is a useful resource upon which the draft 2015-16 Groundfish Harvest Specifications EIS (Draft 2015-16 Specs) (PFMC 2014b) is based. The 2014 Groundfish SAFE document (PFMC 2014b) contains a series of tables summarizing landings and ex-vessel revenue in groundfish fisheries, landings and revenue by port, and indicators of fishery participation. These data are summarized in the Draft 2015-16 Specs to highlight current fishery trends. Long-term historical landings, revenue, and price data (the full PacFIN database time series) and a recent a 10-year baseline period of 2003-2012 are used in the Draft 2015-16 Specs to characterize fisheries and communities**.**

3.3.1 Harvest Sector

The earliest records of foreign landings of widow rockfish were in 1966. U.S. catches of widow rockfish began in 1973 (117 mt), peaking in 1981 (26,938 mt as shown in Table 4-1). Since the 1981 peak through 2002 there has been a steady decline in the landings of widow rockfish to 2,258.3 mt in 2001 and to 431.6 mt in 2002. Catches were mostly from commercial fisheries. Catches from recreational fisheries ranged from 3 mt in 2002 to 375 mt in 1982. The dominant gear type historically has been the midwater trawl. During the early 1990s, bottom trawl catches nearly matched the midwater trawl catches. Since the late 1990s, midwater trawl again became the dominant gear type (He, et al. 2003). During 2002 through 2010, total annual widow rockfish commercial fishery landings ranged from 43 to 432 mt and averaged 203.6 mt (He, et al 2011).

3.3.1(a) *Nonwhiting Midwater Trawl Fishery*

Widow rockfish QP is needed by vessels to cover their directed catch of widow rockfish which is often taken in a strategy that targets pelagic rockfish. The widow rockfish and yellowtail rockfish composition of nonwhiting tows with one of these two species for 1997-2001 and 2011-2014 is shown in Figure 3-2 and Figure 3-3, respectively. The figure for the earlier period indicates that there is likely a substantial capability for targeting and catching widow rockfish with little incidental catch. Forty percent of the tows were 98 percent or more widow rockfish. In the more recent period, there has been less targeting on widow, likely because of the limited availability of widow quota. This targeting may increase given recent increases in the widow ACLs.

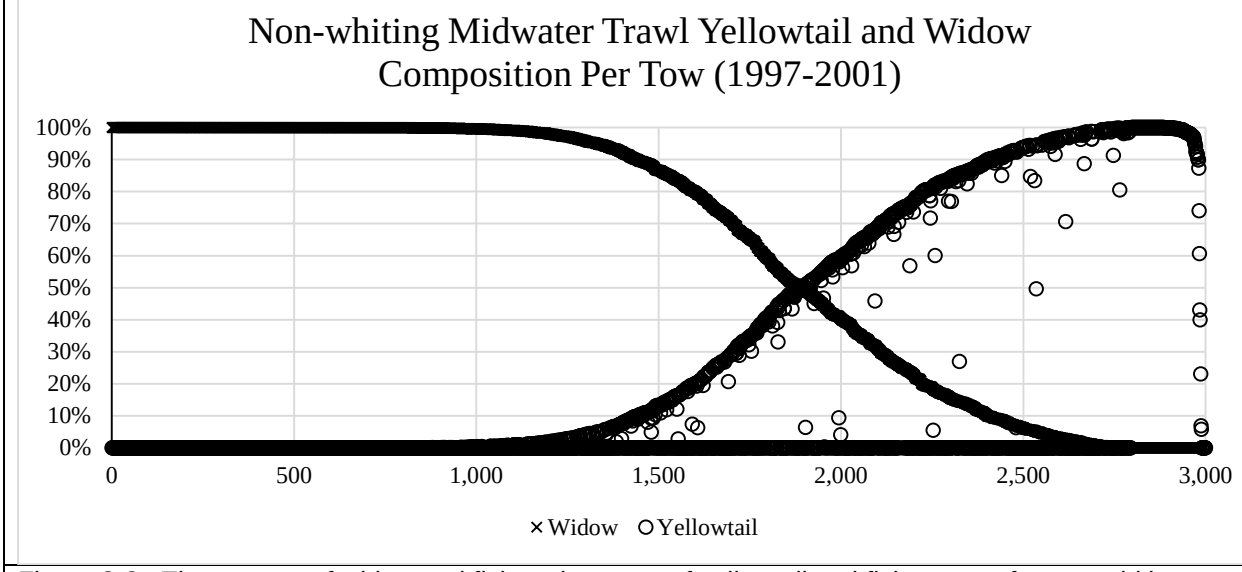

Figure 3-2. The percent of widow rockfish and percent of yellowtail rockfish per tow for non-whiting targeted midwater tows with widow rockfish or yellowtail rockfish (1997-2001)) (there were 470 non-whiting midwater tows with neither widow rockfish nor yellowtail rockfish).

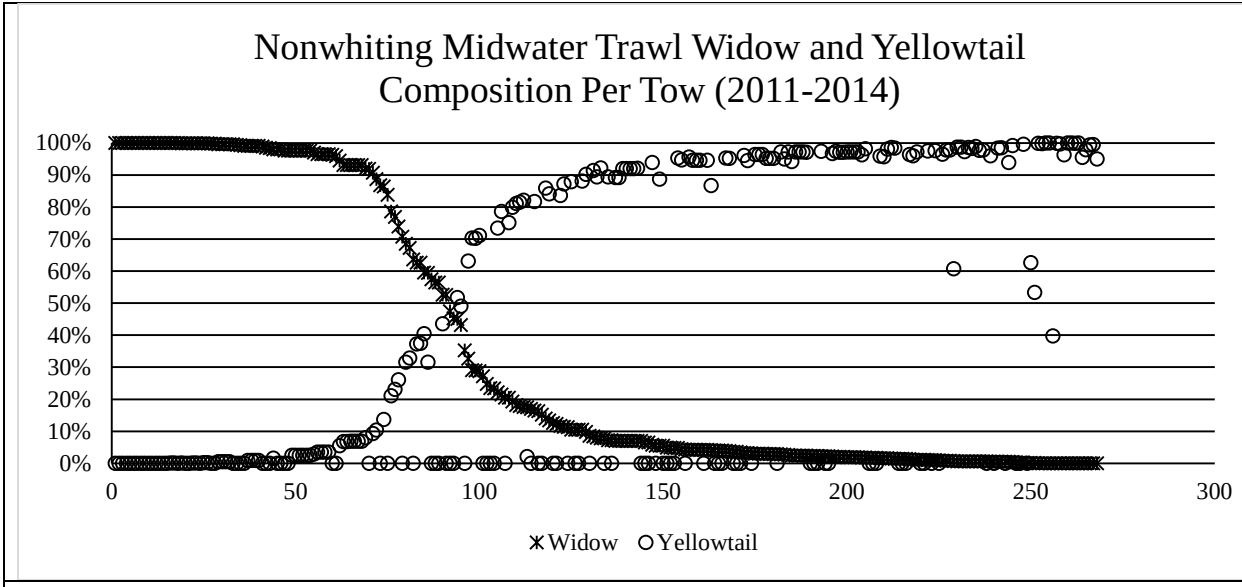

Figure 3-3. The percent of widow rockfish and percent of yellowtail rockfish per tow for non-whiting targeted midwater tows with widow rockfish or yellowtail rockfish (2011-2014).

3.3.1(b) *Directed Shorebased Whiting Fishery*

The percent of widow and yellowtail rockfish caught in whiting directed tows from 2007-2001 is displayed in Figure 3-4. Widow rockfish comprised more than one percent of fewer than 200 of over 8,000 tows in the shorebased whiting fishery.

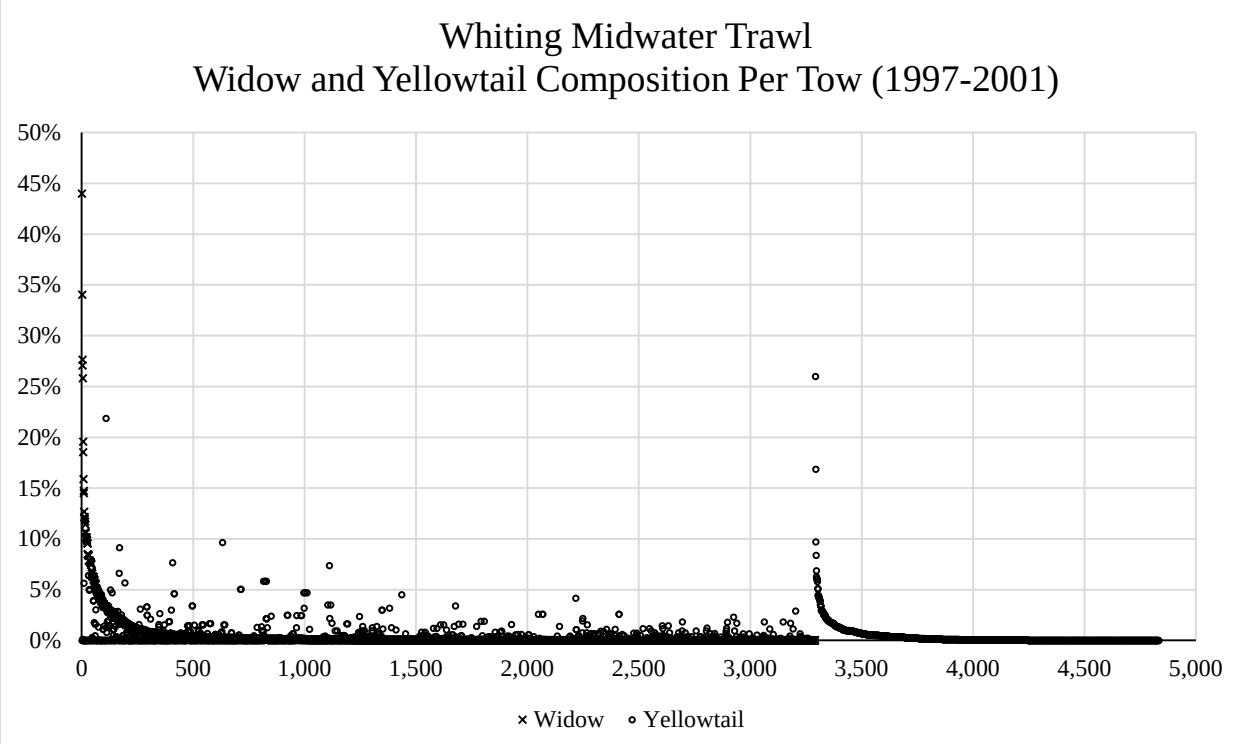

Figure 3-4. For shorebased sector whiting targeted midwater tows with widow rockfish or yellowtail rockfish, the percent of widow rockfish per tow (3,335 whiting tows with no widow rockfish or yellowtail rockfish and are not included in this graph).

3.3.1(c) *Directed Bottom Trawl Fishery*

The percent of widow and yellowtail rockfish caught in bottom trawl fishery from 2007-2001 is displayed in Figure 3-5.

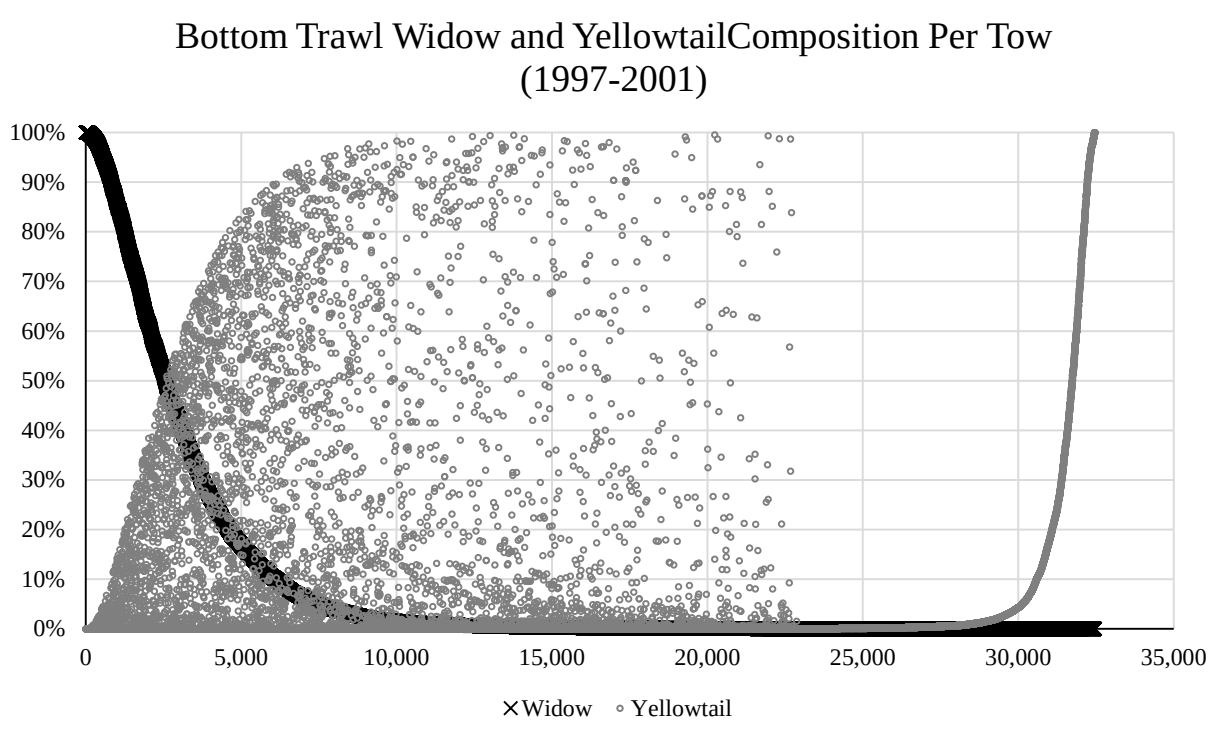

Figure 3-5. For bottom trawl tows with widow rockfish or yellowtail rockfish, the percent of widow rockfish and percent of yellowtail rockfish per tow (131,387 bottom trawl tows with no widow rockfish or yellowtail rockfish are not included in this graph).

3.3.2 Tribal Sector

The reader is referred to the Draft 2015-2016 Specs EIS (PFMC 2014c) for a description of the tribal groundfish fisheries, which is here incorporated by reference. For 2015 and 2016, 100 mt of widow rockfish is deducted from the ACLs in each year to account for mortality in tribal fisheries, primarily the Makah tribe, which requires 100 percent retention of rockfish catch.

3.3.3 Recreational Fishery

The reader is referred to the Draft 2015-2016 Specs EIS for a description of Council area recreational fisheries. Widow rockfish is neither a target nor a substantial bycatch species in the recreational fishery. Widow rockfish incidental catch is monitored but the fishery is not directly constrained to meet management targets for widow rockfish.

3.3.4 First Receivers and Processors

3.3.5 Fishing Communities

3.3.6 Observer Providers and Other Support Sectors

3.3.7 Government Entities

The National Marine Fisheries Service administers the trawl rationalization program and is the main governing body that will be directly impacted by an action alternative. No implementing actions are anticipated to be necessary by the coastal state fishery management agencies (WDFW, ODFW, and CDFW) and tribes, though there may be some minor indirect impacts on the states, as discussed in Chapter 4.

Chapter 4 Impacts on the Affected Environments

4.1 Direct and Indirect Impacts to the Physical Environment, including Essential Fish Habitat and Ecosystem

4.1.1 No Action (Alternative 1)

Under the No Action Alternative, impacts to the physical environment by the trawl fishery will continue, with its activities modified by other past present and reasonably foreseeable future actions (cumulative impacts) described in Section 4.4. Widow rockfish can be harvested with both bottom trawl and midwater gear. While gear switching is allowed in the trawl fishery (e.g. use of fishpot or longline gear), widow rockfish are not generally targeted with commercial gears other than trawl. Trawl gears impact physical habitat primarily when they come into contact with it. Trawl doors and footrope are the primary points of contact between the gear and substrate. The body of the net and codend generally fly above the bottom to minimize drag and net wear. Midwater trawl is the gear most likely to be used to target on widow rockfish (Table 3-1). Regulation require the midwater trawl gear be very lightly constructed such that contact with hard structures would likely cause damage to the net. Because of this fishermen generally try to avoid contact with hard habitat structures but there may be more incidental contact with soft bottom (CITE). Bottom trawl gear is designed for contact with soft and hard substrates (CITE).

With the increasing ACLs for widow rockfish and yellowtail rockfish, there have been increases in the amount of targeting of pelagic rockfish with midwater trawl gear in more recent years. Previously, when higher harvest levels of widow rockfish were allowed, widow rockfish was targeted with both midwater and bottom trawl gear (Figure 4-1). Targeting of widow rockfish with bottom trawl gear has not occurred recently and is not expected in the near future. Widow rockfish are generally found on the shelf in the water column associated with hard habitat structures of the ocean shelf. These areas are currently closed to bottom trawling (within the boundaries of rockfish conservation areas). Under the individual accountability provided by the trawl rationalization program, the RCAs may be re-opened to bottom trawl gear at some time in the future; however, the amount of bottom trawling over hard habitat on the shelf is expected to remain low so long as there are highly constraining overfished species that might be caught in larger numbers on the shelf. Because of these regulations and disincentives it is unlikely that there will be substantial use of bottom trawl gear to harvest widow rockfish.

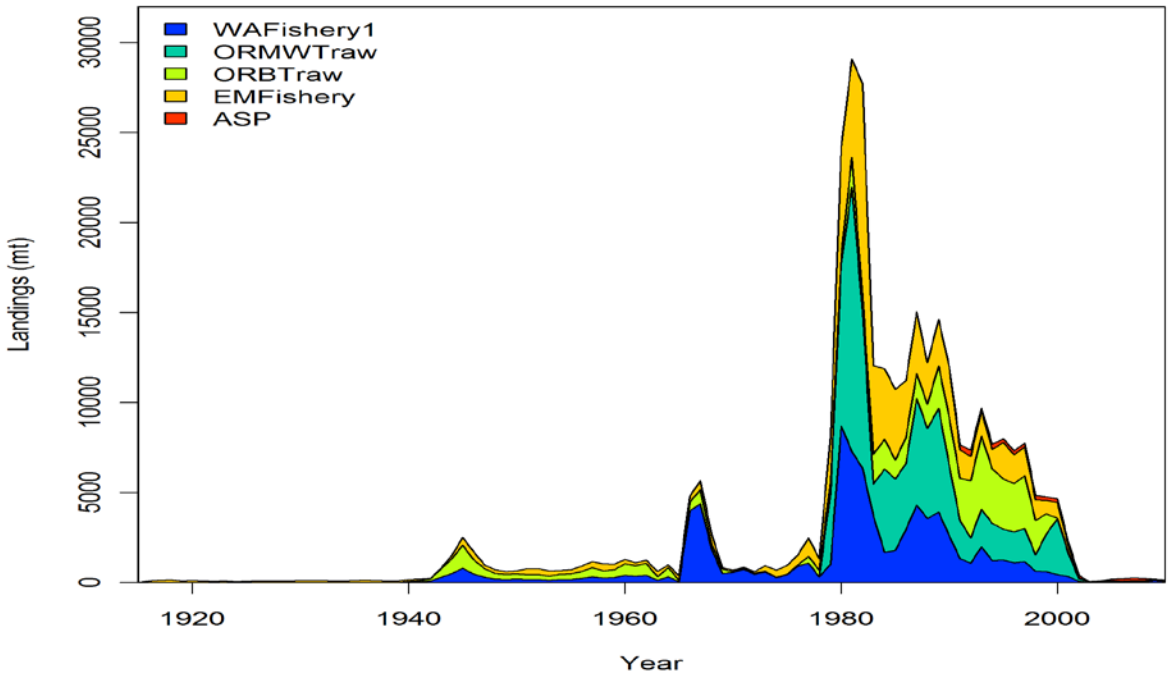

Figure 4-1. Historic commercial catch of widow rockfish by gear/area type -- Washiginton fishery (WAFishery 1), Oregon midwater trawl (ORMWTraw), Oregon bottom trawl (ORBTraw), California (EM Fishery); and At-sea whiting fishery (ASP) (source: He, et.al., 2011).

ACLs and the associated trawl allocations of widow rockfish and yellowtail rockfish are increasing further in 2015 and 2016 and those increases will likely result in increased fishing and associated impacts to the physical environment. These regulatory changes, along with other regulatory changes for the 2015-2016 period, are covered as part of the actions taken in the biennial specifications (PFMC-SPEX, 2015). Harvest levels are expected to continue to fluctuate in future years based on natural stock and environmental fluctuations and because of uncertainties in stock assessments. As these harvest levels fluctuate impacts to the physical environment will fluctuate.

With respect to impacts on the physical environment, catch per unit effort and gears used are not expected to change under the No Action alternative. The main impact mechanism of concern in this action is the potential for geographic reallocation of harvest. Under the No Action Alternative management under the trawl rationalization program would continue. The Amendment 20 evaluation of the trawl rationalization program determined that, over the long term, fishery and market conditions will largely determine the geographic distribution of harvest within the limits of the management context and that these conditions would not be altered by initial allocations. Quota is expected to be fished out of ports in which the highest profits can be generated. Such profits are expected to be a function of

- Port costs (e.g. fuel prices and dock space)
- Prices offered by buyers
- Distance to fishing grounds (affecting operation costs, risk, etc.)
- CPUE on the fishing grounds
- Species mixes on the fishing grounds (including probability of encountering overfished species)

Under this system, the geographic redistribution of harvest is expected to be limited by properties of the natural and socio-economic system. For example, localized depletion of a resource would encourage redistribution of effort to areas of the coast which have been fished less intensely, evening out the distribution of harvest. Excess supply of fish to a particular port might drive local exvessel fish prices down, or excess demand for port services might drive prices for those services up—encouraging redistribution of effort to other areas. Allowing the system to fluctuate in response to these environmental and price signals allows the fishery as a collective endeavor to take into account more information than would be possible through government data collection and direct management. However, at the same time, sideboards have been established to keep geographic fluctuation within bounds necessary to address conservation concerns, and fishery performance is monitored in order to determine whether additional limits are needed.

Two of the primary side-boards on geographic variation of harvest are stock units and protected habitat areas. Latitudinal management lines separate some stock units, and quota allocated for the stock in one area may not be used to harvest a different stock unit of the same species in another area. This ensures that any geographic concentration of harvest does not harm long term stock productivity and also achieves a measure of distribution of impacts across the physical environment. Additionally, the Council has conducted an evaluation of essential fish habitat for all of its fishery management plans, including consideration of those habitat areas which might be of particular concern (see Section 3.1.3(a)). As a result of that process conservation measures have been established for habitat areas where it has been determined that additional protection was needed (see Section 3.1.3(b)).

One indicator of the likely geographic distribution of harvest is the geographic distribution of those who own the widow QS. Because the location of the QS owner does not determine where the associated QP will be fished, the utility of QS owner locations is limited. The nature of the relationship between QS owner location and likely fishing areas is described further in the following section on the impacts of the alternatives on the physical environment. Despite this shortcoming, a comparison of the fluctuation in the geographic distribution of QS through market transactions across time will be useful in evaluating the degree of significance of changes in geographic distribution of QS imposed through direct reallocation under one of the action alternatives. Widow QS has been under a moratorium, therefore data on yellowtail QS transfers (a species often caught with widow rockfish) is provided to illustrate the amount of geographic shift that of that has occurred during the first year that trading has been allowed (Table 4-1). The geographic shift in the distribution of yellowtail rockfish QS was relatively small. For comparison Table 4-1 also shows the amount of between year fluctuation in the geographic distribution of yellowtail rockfish landings, comparing 2013 to 2014. These data show that despite a QS trading moratorium being in effect there was substantial fluctuation in the geographic distribution of landings.

Table 4-1. Yellowtail QS distribution of harvest in 2013 and 2014 and QS allocations based on registered community of residence as of the start of QS trading January 1, 2014 and changes in QS distribution as of the start of 2015 (whiting and nonwhiting landings). a/

Communities	2013		2014		Initial QS Allocations Balances a Start of 2014a/	Changes in Allocations QS Change (Percent Change) As of Start of 2015
	Share of Landing Shares	2013 Mt Landed	Share of Landings	Mt Landed		
Bellingham	38%	143	21%	241	1.7%	0.0%
Seattle					16.2%	1.3%
Grays Harbor					1.4%	0.0%
Ilwaco-Willapa Bay					3.8%	0.0%
Astoria	62%	234	79%	899	9.8%	0.0%
Tillamook					3.5%	0.0%
Newport					15.9%	-1.6%
Coos Bay	0%	1	2%	1	13.3%	0.0%
Brookings					4.2%	0.0%
Crescent City					0.4%	0.8%
Eureka					1.8%	0.0%
Fort Bragg	None	None			2.5%	0.0%
Bodega Bay			None	None	0.5%	0.0%
San Francisco					2.2%	0.0%
Monterey					3.5%	-1.4%
Morro Bay					2.1	1.4%
Other Non-Coastal	N/A	N/A	N/A	N/A	9.1	0.4%

a/ A trading moratorium was in place from 2011 through the end of 2013. During that period two QS accounts changed hands in response to court orders. Otherwise, QS did not move between account holders during this period.

Table 4-2. Widow rockfish distribution of harvest in 2013 and 2014 (whiting and nonwhiting landings).a/

Communities	2013		2014	
	Share of Landing Shares	2013 Mt Landed	Share of Landings	Mt Landed
Bellingham	16%	40	15%	91
Seattle				
Grays Harbor				
Ilwaco-Willapa Bay				
Astoria	82%	198	85%	530
Tillamook				
Newport				
Coos Bay	2%	5	0%	3
Brookings				
Crescent City				
Eureka				
Fort Bragg				
Bodega Bay				
San Francisco				
Monterey				
Morro Bay				
Other Non-Coastal	N/A	N/A	N/A	N/A

a/ The redistribution of landings among ports within the region is more substantial than the between region changes, with a **swing of up to about 20 percent** of the landings from one port to another.

The Council's groundfish FMP provides for monitoring and response to adverse impacts to habitat. Amendment 19 added a provision for ongoing data collection pertaining to habitat impacts and a five year review of its habitat policies.

Summary of Impacts

Thus, under the No Action Alternative geographic fluctuation in the distribution of harvest is possible with the attendant modifications to the impacts on the physical environment, however, the natural environment and market mechanisms are expected to limit the degree of geographic reallocation. With geographic relocation, an effort increase in one area (and increases in associated impacts to the physical environment) would be largely offset by effort decreases in other areas (and decreases in associated impacts to the physical environment) such that total habitat impacts will not likely change with changes in geographic distribution. Additionally, existing policy provides some sideboards to the impacts to the physical environment—through limits on allowable levels of harvest as well as ongoing monitoring of habitat impacts and the opportunity for adaptive response if problems arise. This action will open no new areas to fishing.

4.1.2 Action Alternatives (Alternative 2, Alternative 3, and Alternative 4)

The final environmental impact statement (FEIS) for Amendment 20 (A-20) evaluated fishery impacts on the physical environment under the pre-trawl rationalization management regime (No Action) in comparison to those expected under trawl rationalization (action alternatives) with a variety of different program specifications, including different initial QS allocation formulas (Section 4.20.3). With respect to essential fish habitat and ecosystem impacts, it identified three impact mechanisms:

- Changes in catch that can be traced through the food web
- Shifts in location of catch
- Gear switching.

For the physical environment, the A-20 FEIS found that impacts would vary between the No Action and action alternatives but not among the action alternatives, i.e. that variations in QS allocation formulas and other administrative features of the program (e.g. control limits) would not result in variation in the impacts among the alternatives. The exception to this might be vessel QP limits, which varied between alternatives. Higher limits could result in greater consolidation within the fleet and could redistribute effort to intensify impacts in local areas that could differentially impact the physical environment.

The action alternatives covered in this document would change the QS allocation formulas for widow rockfish. Vessel QP limits would not be affected. As was the conclusion in the Amendment 20 FEIS, changing the distribution of QS is not expected to have a long-term impact on the geographic distribution of fishing (i.e. impact on where the QP are fished). Changing the distribution of widow QS is not expected to change overall harvest levels, effort levels, catch per unit effort, or the gears used; but could have some potential short term impacts on the geographic distribution of harvest, as compared to the No Action alternative. Over the long term, factors discussed above with respect to geographic fluctuation under the No Action Alternative would be expected to result in geographic distributions under the any of the action alternatives that are similar to the No Action Alternative. Over the short term, effort out of a particular port could be increased (or decreased) depending on the initial allocation, increasing (or decreasing) the likelihood that the physical environment local to that port is impacted. The pattern observed for yellowtail trading in comparison to the shifts in yellowtail harvest indicates that the geographic redistribution of harvest as a result of the reallocation may be difficult to detect given other influences over the distribution of harvest.

Each year QP are allocated to the holders of QS. That QP is then transferred to vessels which use it to cover their catch. QS owners that also own vessels are probably most likely to fish the QP on their own vessels. First receivers owning QS are also most likely to have the related QP delivered to their facilities (though first receives with facilities in multiple ports may shift deliveries among those ports). These vessel and first receiver ownership factors create an initial link between who owns the QS and where the associated QP is most likely to be fished. However, QS owners that own vessels may choose not to fish their QP for a variety of reasons (e.g. distance to good fishing grounds or a surplus of QP for a particular species relative to the QP for other species caught in the same complex). First receivers may choose not to have QP landed at their own facilities for similar reasons. QS owners facing such circumstances and QS owners who do not own vessels or first receiver facilities might choose to transfer their QP to others with whom they have business relations (e.g. the vessel they lease their LE permit to or a vessel that delivers fish to them), to friends and family, or on the QP market. These transactions will likely entail a balancing of social and economic incentives and the geographic redistributions will depend on the geography of their relationships and the geographic locations of those willing to offer the highest prices.

For the short term, it is not possible to predict where the QP would be used that result from the redistribution of QS under the action alternatives, and as discussed, over the long term there is not likely to be a difference among the alternatives with respect to the distribution of fishing activities. We can however, provide some indicators of the degree of potential geographic redistribution that might be involved in the action alternatives.

The first indicator of the amount of potential short term geographic shift in effort is the total amount of QS reallocated. The total amount of QS redistributed would be the most under Reallocation Alternative 2 (27.9 percent) and the least under Reallocation Alternative 4 (8.1 percent) (Table 4-3).

Table 4-3. Total amount of QS reallocated under each suboption, relative to no action.

		Total Amounts of Quota Reallocated			
	Reallocation Alt 2 Suboption a	Reallocation Alt 2 Suboption b	Reallocation Alt 3 Suboption a	Reallocation Alt 3 Suboption b	Reallocation Alt 4
Total QS Reallocated	26.9%	27.9%	24.1%	24.3%	8.1%

a/ Alternatives 3 and 4 are modelled using Alternative 2 Suboption a.

The second indicator is the geographic redistribution of QS among QS owners, based on the QS owners address of record. The largest change for a single port area is for the owners who reside in Monterey which would experience an aggregate reduction of 8.61% QS under Alternative 2 (Table 4-16). Owners in Monterey are followed by owners residing in Newport and Coos Bay which would experience an aggregate change of up to about three to four percent QS, depending on the alternative; and owners in Eureka and Fort Bragg which would experience an aggregate change of up to about two to three percent, depending on the alternative. These changes are larger than observed yellowtail rockfish QS in its first year of trading but small relative to the types of between port fluctuations in landings occurring even in the absence of QS trading.

For reasons discussed above, over the short term QS allocated to QS owners that are also first receivers might be more likely to stay within the geographic area than QS allocated to those who do not own such physical capital. Most of the QS going to first receivers goes to those that have multiple sites on the coast. How these entities choose to distribute changes in the QP they receive as a result of shifts in their

QS holdings is not possible to predict. For the remainder, the total fluctuation in the amount of QS distributed under the alternatives is only 0.5% QS (Table 4-14).

Summary of Impacts

Over the long-term, geographic distribution of harvest is expected to be similar to No Action. It is not possible to discern a difference among the action alternatives with respect to the distribution of harvest activities over the long term. Over the short term, there may be some differences in the geographic distribution of harvest, as compared to No Action, and therefore associated impacts to the physical environment, based on the initial geographic distribution of QS. However, it is not possible to predict the geographic changes and shifts in harvest patterns due to other causes is likely to swamp any changes resulting from the geographic reallocation of QS. Any changes to impacts on physical environment would be limited by factors in the natural and economic environment that tend to balance out geographic distributions, by habitat conservation areas, and by ongoing monitoring which provides an opportunity for management response, as described for the No Action alternative.

4.2 Direct and Indirect Impacts to the Biological Environment

In addition to groundfish, coastal pelagic species, highly migratory species, salmon, steelhead, green sturgeon, eulachon, marine mammals, and seabirds also use the waters where the fishery is prosecuted. These species, including ESA-listed and protected species are described briefly in Section 3.2 . The result of this assessment with respect to impacts to the biological environment is similar to the result for the impacts to the physical environment (Section 4.1).

4.2.1 No Action (Alternative 1)

Under the Alternative 1 (no action), the fishery is expected to continue (as described in Chapter 3 and the first paragraphs of Section 4.1.1), as modified by other past present and reasonably foreseeable future actions (cumulative impacts) described in Section 4.4. Widow rockfish is expected to be taken primarily in the nonwhiting midwater trawl fishery, but also as incidental catch in the whiting midwater trawl fishery and the bottom trawl fishery. Widow rockfish and yellowtail rockfish are two pelagic rockfish species often caught together in the nonwhiting midwater trawl fishery, which generally targets pelagic rockfish. With the increasing ACLs for widow rockfish and yellowtail rockfish, there have been increases in the amount of targeting of pelagic rockfish with midwater trawl gear. With this increase in fishing, increased gear interactions with other species is expected. The increased ACLs for these species and the potential interactions impacts on other species were taken into account in the EIS for the 2015-2016 groundfish specifications. These levels of harvest and the associated species interactions are not expected to change under the no action alternative.

Summary of Impacts

No short- or long-term impacts under no action (Alternative 1).

4.2.2 Action Alternatives (Alternative 2, Alternative 3, and Alternative 4)

The analysis in the Amendment 20 final environmental impact statement (FEIS) provides template for the important considerations for the action alternatives in this document. Amendment 20 evaluated fishery impacts on the biological environment under the pre-trawl rationalization management regime (Amendment 20 - no action) in comparison to those expected under trawl rationalization (Amendment 20 - Action Alternatives) with a variety of different program specifications, including different initial QS allocation formulas. These impacts were covered in Amendment 20 FEIS sections on fish resources (Section 4.17), ESA-listed salmon (Section 4.18), and other protected species (marine mammals and seabirds) (Section 4.19). With respect to the biological environment the following potential impact mechanisms were identified:

- Fish Resources
    - Increase in target species catch
    - Reduction in bycatch rates for overfished species
    - Increase/decrease in Pacific halibut bycatch
    - Improved monitoring leading to better specification of harvest levels
- ESA- Listed Salmon
    - Increase/decrease in Chinook salmon incidental take
    - Improved bycatch monitoring
- Other Protected Resources (Marine Mammals and Seabirds)
    - Increase/decrease in protected species incidental take
    - Improved bycatch monitoring

For the biological environment, the Amendment 20 FEIS found that impacts would vary between the Amendment 20 No Action and action alternatives but not among the Amendment 20 action alternatives, i.e. that variations in QS allocation formulas and other administrative features of the program (e.g. control limits) would not result in variation in the long-term impacts among the alternatives, with the exception of vessel QP limits. Vessel QP limits varied between alternatives and it was posited that greater consolidation within the fleet could redistribute effort to intensify impacts in local areas that could differentially impact biological resources.

The action alternatives covered in this document would change the QS allocation formulas for widow rockfish. Vessel QP limits would not be affected.

Given the Amendment 20 conclusion that differences in trawl rationalization program details of this nature would not differentially impact the biological environment over the long term, and given that since then no previously unidentified impact mechanisms or results have been identified, no difference in biological environment impacts is expected between any of the alternatives considered in this document (including differences between the No Action and action alternatives). An increase in the targeting on pelagic rockfish is expected to continue with increasing ACLs regardless of whether or not there is a reallocation or modifications to other administrative provisions.

Over the short-term there could be some geographic variation in the location of fishing but the shift any shift likely to be insignificant relative to other interannual fluctuations caused by other factors as described for the physical environment in Section4.1. A geographic shift in the location of harvest could have some impact on the mix of species encountered incidentally, to the degree that encounter rates vary geographically. However, in general, fishing is likely to occur over similar substrates, at similar depths,

and in areas of greater widow rockfish aggregations regardless of the area of the coast along which fishing occurs, reducing the likelihood of substantial differences in the species mixes encountered. As indicated by the data on geographic distribution of yellowtail rockfish landings, the distribution of harvest over the short term is difficult to predict and likely only loosely influenced by the geographic distribution of those who own the QS. The geographic shifts that occur through reallocation under one of the action alternatives would be expected to be within range of that which might occur even if there were no reallocation—shifts that occur in response to changes in the natural and socio-economic environment. As described in 4.1.1, the degree of variation in locations of fishing is limited by characteristics of the natural and economic systems as well as the monitoring and opportunity for adaptive response provided by the fishery management system.

While the conservation impacts of the alternatives are minimal, the allocation program itself is part of a system that mitigates the socio-economic impacts of the program of conservation measures implemented through the groundfish FMP and associated regulations.

Summary of Impacts

Reallocation of widow QS is not expected to impact the level of widow QS harvest and therefore no measurable differences in impacts to the biological environment are expected under any of the action alternatives relative to one another or to the no action alternative over the long-term. Over the short-term there may be some minor geographic variation in impacts and some attendant differences in incidentally encountered species are possible but the direction of these shifts are difficult to predict and influence of the geographic distribution of the QS owners is likely to be minor. A management system that includes 100 percent at-sea monitoring provides the opportunity for adaptive response if any changes in encounter levels become problematic.

4.3 Direct and Indirect Impacts to the Socio-Economic Environment

The following are considered in this assessment of impacts:

- Substantial participation in the fishery
- Current harvests
- Historical harvests
- Harvester dependence on the fishery
- Employment in the harvesting sector
- Employment in the processing sector
- processor dependence on the fishery
- Geographic redistributions
- Community participation in the fishery
- Community dependence on the fishery
- Effects on excessive shares
- Impacts on small entities

Entry level opportunities were considered as part of the Amendment 20 deliberations. The reallocation of QS will not affect the features of Amendment 20 pertinent to those opportunities.

4.3.1 Commercial Harvest Sector (Non-Tribal, Including QS Owners)

The alternatives considered here directly affect QS owners. Vessel owners, operators and crew members will be impacted to the degree that reallocation to QS owners results in the redistribution of fishing activity among vessels.

4.3.1(a) *Allocation Formula Alternatives*

4.3.1(a)(1) Impacts on QS Owners

4.3.1(a)(1)(i) *No Action (Alternative 1)*

Under the no action alternative it is likely that the QP issued to holders of QS will find their way through the market to vessels interested in targeting on widow, primarily with midwater gear (see discussion in Section 4.1.1), benefiting the owners of the QS, the vessel owners, and vessel operators and crew, as well as the processors receiving the fish (Section 4.3.4) and the residents of the communities that gain from the related activities (Section 4.3.6).

Status Quo Distribution of QS

The existing allocations were made to those with substantial participation in the fishery as evidenced by the history of the limited entry permits held by the initial recipients at the time of initial allocation. Current harvesting and dependence was taken into account by the fact that these individuals were the current holders of the permit (providing an opportunity for even the most recent entrants to receive an initial allocation) and historic harvests and dependence were taken into account based on the landing history of each individual permit. The original QS allocations were made based on each permit's history of whiting trips and nonwhiting trips. For whiting trips, widow rockfish was allocated pro rata in proportion to each permits allocation of whiting QS. For nonwhiting trips, widow rockfish was allocated based on the nonoverfished species QS a permit was allocated and logbook information indicating where the permit had been fishing. This information was used to allocate to permits based on their expected need for widow rockfish QP to cover incidental harvest while targeting on other species. The bases for these allocations are extensively documented in the Amendment 20 FEIS (PFMC, 2010) and elaborated further in the EA produced for reconsideration of the whiting allocations (PFMC, 2013). Those analyses also addressed other factors such as employment in the harvesting and processing sectors, processor dependence, geographic redistributions, community participation and dependence, excessive shares and impacts on small entities.

The initial distribution of widow QS as allocated to 164 individual permits is displayed in Figure 4-2. In many cases where a single owner owned multiple permits, the allocations for individual permits were combined into a single QS account for that owner. Thus after initial implementation the 164 permits with catcher vessel history generated 128 QS accounts. There has been a moratorium on the trading of widow QS since the time of initial issuance but there have two transfers of QS from one account to another in response to court orders.

Much of this analysis focuses on the allocations to permits, in order to provide comparisons to the original basis and criteria for allocation under Amendment 20. In addition, an evaluation of QS ownership was conducted starting with the QS accounts. QS accounts were aggregated based on a

comparison of the listed owners' publically available addresses and business names. In some cases where there was correspondence between addresses but not the names of the listed owners, publically available corporate records were checked to determine whether the common address was happenstance (for example, a situation where two different QS owners use as a common bookkeeper and use that bookkeeper's mailing address for business purposes). Additionally, it was assumed that where two or more individuals owned separate QS accounts and also owned a joint QS account that all such accounts were effectively under a single ownership. On these bases, the 128 accounts were consolidated into 99 likely ownership entities. This approximation does not take into account cross ownership that is not reflected in business names or addresses or other publically available records. The results are provided in Figure 4-3. Based on the displayed approximations, it appears that one QS owner may own QS in excess of the 5.1 percent widow QS control limit. There may be more entities above this limit to the degree that there are business relationships which are not reflected in publically available information

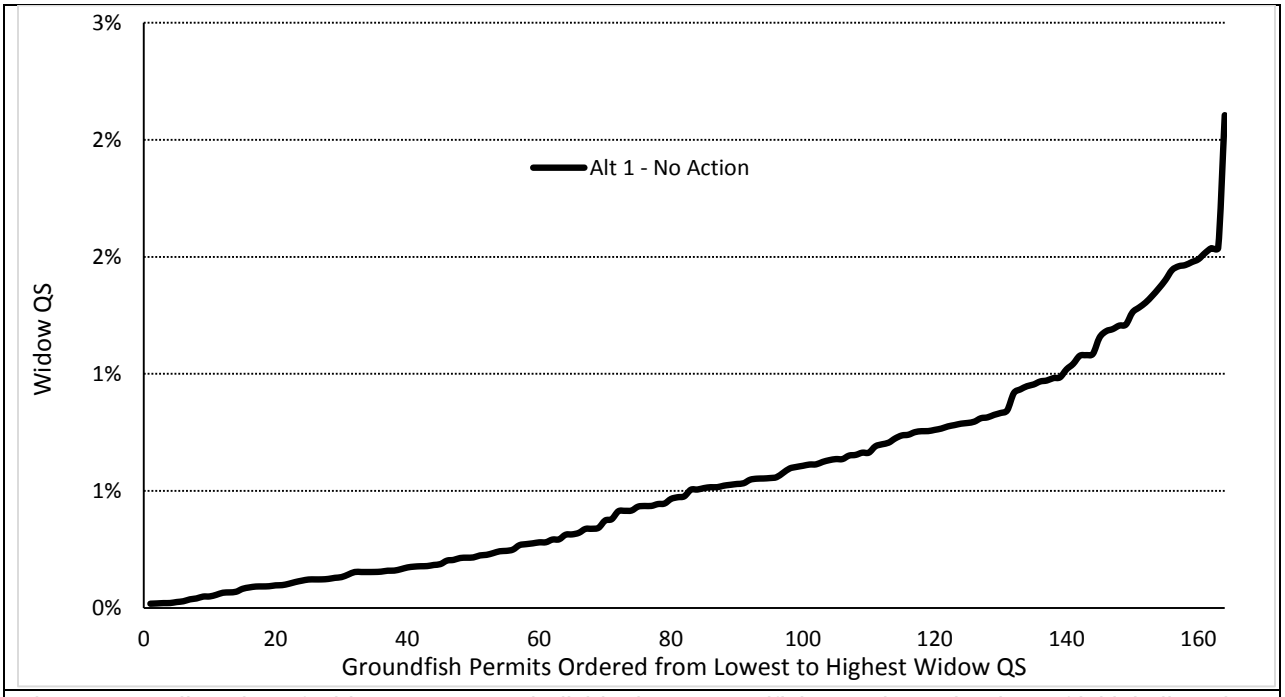

Figure 4-2. Allocation of widow QS among individual LE groundfish permits at the time of initial allocation (in 2010).

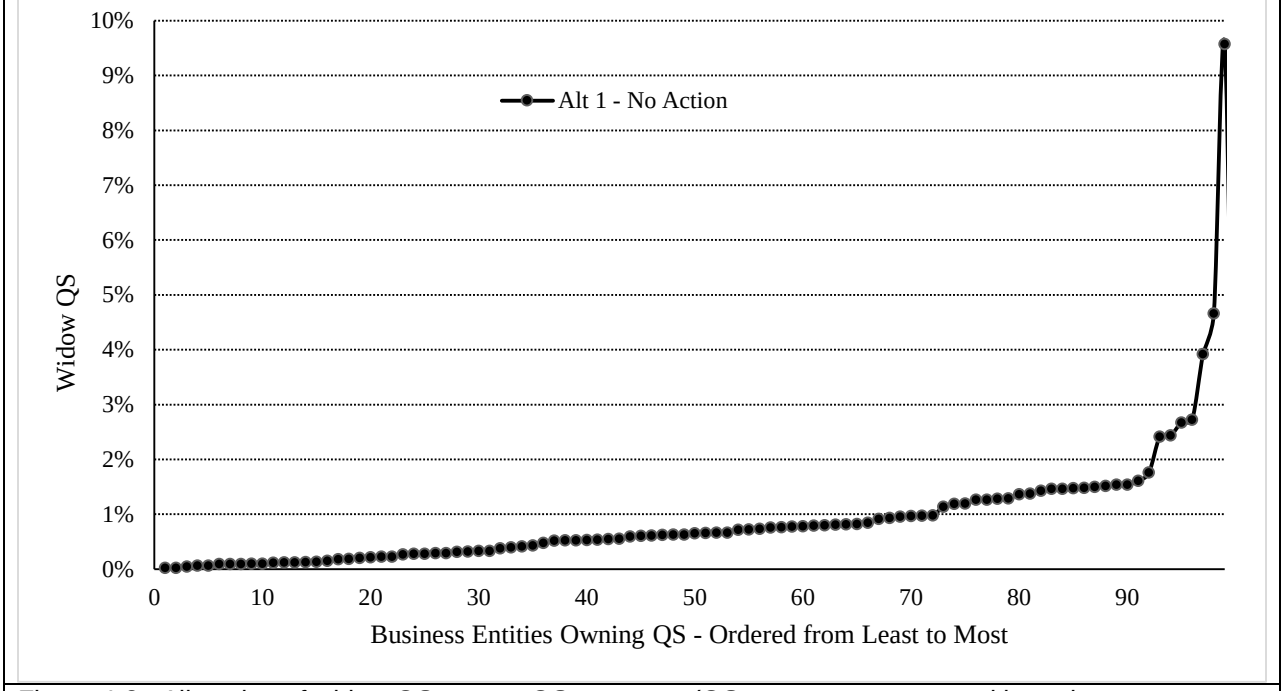

Figure 4-3. Allocation of widow QS among QS owners – (QS accounts aggregated based on a comparison of publically available information) (widow rockfish control limits is 5.1%).

Dependence

The initial allocations of widow rockfish QS was based on the expectation that vessels would be dependent on widow QS to access their target species allocations, rather than dependent on it for the revenue generated by catching widow rockfish. With rebuilding there is an opportunity for vessels to develop economic reliance on widow quota for direct revenue (rather than as an input needed to access other species). When converted to exvessel revenue equivalents, widow QS is a relatively minor portion of the QS portfolios issued for QS accounts. An analysis was conducted to determine the portion that widow QS represented of each QS account's initial allocations based on exvessel value equivalents. To determine exvessel revenue equivalent, nonwhiting QS was converted to QP based on 2015 trawl allocations and multiplied by average 2013 exvessel prices. The resulting exvessel values were reduced based on average fleet attainment of harvest for species other than widow rockfish. For each of these calculations data used is the most recent available and the results are considered the best estimates for 2015. The exvessel value equivalent of the widow QS was divided by the exvessel value equivalent for all species to provide an indicator of QS owner "reliance" on widow QS as a percent of total nonwhiting holdings. Values including whiting quota will be provided to the Council as a supplement at the Council meeting.

Based on these results it be seen that for the present distributions, widow QS comprise a relatively small portion of the exvessel revenue equivalents of the nonwhiting QS (Figure 4-4). In this figure, business identifiers are arrayed across the bottom from those that currently have the least total QS to those that have the most. Above each point on the horizontal axis representing a business are plotted three points: (1) the value of the non-widow QS endowment, (2) the value of widow QS (which in many instances is barely visible) and (3) the percent of the value of the total nonwhiting QS represented by widow QS.

Because trading of non-widow QS has started, in some cases these equivalents do not reflect the original account endowments. For example, for the first business identifier on the far left, only widow rockfish remains in the account, so the widow rockfish share (100%) is off the chart. For the remaining accounts, the most value any single account holder has in widow is 10% of their total holdings.

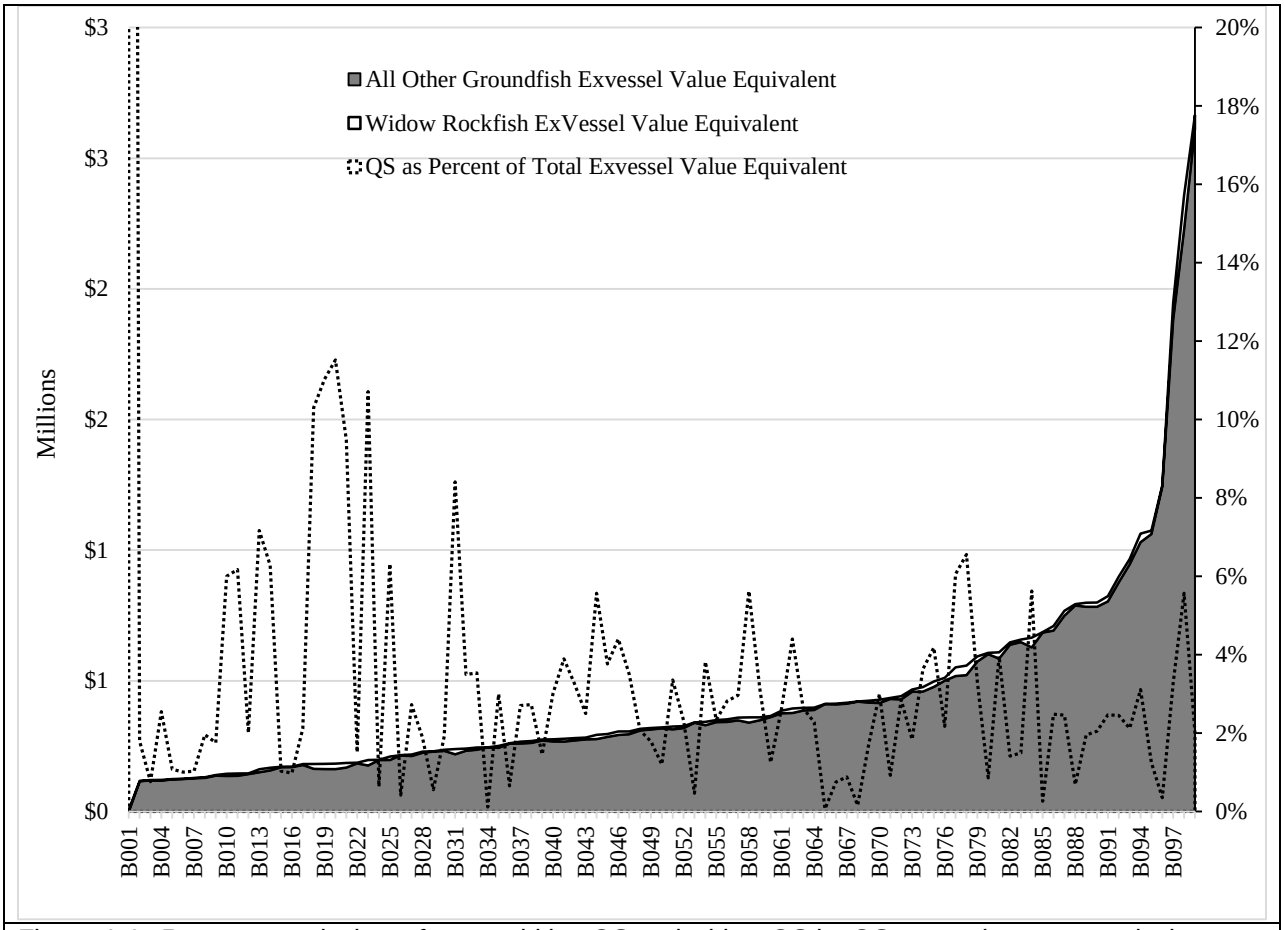

Figure 4-4. Revenue equivalents for nonwhiting QS and widow QS by QS owner (revenue equivalents have been adjusted to account for the fleet's under-harvest of available QP for most species, except for the value of widow QP, 100% of which are assumed caught); and the percent of owners' total QS value equivalent represented by their widow QS holdings (dotted line).

A tabulation of results for individual QS accounts, before taking into account ownership of multiple accounts, is provided in Table 4-4 and Table 4-5. Table 4-4 provides data for the original 128 accounts and distribution of QS among those accounts. It shows that those QS permits most reliant on widow QS (those that rank in the 80+ percentile and averaging between about 5 and 8 percent reliance) tended to have lower total endowments of QS for all species. Those in the 20-40 percentile category (between about 1.5 and 1.6 percent reliance on average) also tended to have lower amount of total QS (in exvessel revenue equivalents).

Table 4-5 takes into account trading of non-widow QS that has occurred since January 1, 2014. It provides data on the current 133 QS accounts holding nonwhiting groundfish QS. Five new accounts have appeared since QS trading started. These five new accounts have no widow QS. Compared with Table

4-4, the increased reliance on widow reflected in the 80+ percentile column of this table (between about 5.2 and 46.4 percent reliance on average) likely reflects widow QS remaining in accounts from which at least some of the non-widow QS has been transferred). At the same time, the reduced reliance shown in the 0-20 percentile column may reflect the inclusion of new accounts which have not yet been able to obtain widow QS.

Table 4-4. QS account reliance on widow QS based on adjusted [a/] exvessel revenue equivalents at time of initial issuance [nonwhiting only, adjusted to account for under-attainment of QP harvest (except widow) based on 2011-2013 QPs debited].

	Percentile Rank (Least to Most Dependence)					
	0-20 percentile	20- 40 percentile	40-60 percentile	60-80 percentile	80-100 percentile	Totals
Number of QS Accounts	26	26	26	25	25	128
QS Account Exvessel Revenue Equivalent All Nonwhiting Species	Number QS Accounts / Average Percent Reliance on Widow QS					
< $150 thousand	2 / 0.9%	11 / 1.6%	2 / 2.6%	1 / 2.9%	3 / 5.8%	19
$150-$300 thousand	8 / 0.5%	5 / 1.5%	8 / 2.5%	8 / 3.5%	16 / 8.0%	45
$300-$450 thousand	12 / 0.4%	6 / 1.5%	9 / 2.4%	11 / 3.3%	6 / 5.2%	44
> $450 thousand	4 / 0.6%	4 / 1.5%	7 / 2.3%	5 / 3.4%	-	20

a/ To determine exvessel revenue equivalent, QS was converted to QP based on 2015 trawl allocations and multiplied by average 2013 exvessel prices. The resulting exvessel values were reduced based on average fleet attainment of harvest for species other than widow rockfish.

Table 4-5. QS account reliance on widow QS based on adjusted [a/] exvessel revenue equivalents based on "current" account balances on 10/03/2014[b/] [nonwhiting only, adjusted to account for under-attainment of QP harvest (except widow) based on 2011-2013 QPs debited].

	Percentile Rank (Least to Most Dependence)					
	0-20 percentile	20- 40 percentile	40-60 percentile	60-80 percentile	80-100 percentile	
Number of QS Accounts	27	27	27	26	26	133
QS Account Exvessel Revenue Equivalent All Nonwhiting Species	Number QS Accounts / Average Percent Reliance on Widow QS					
< $150 thousand	2 / 0.4%	8 / 1.5%	5 / 2.3%	1 / 2.9%	7 / 46.4%[c/]	23
$150-$300 thousand	10 / 0.3%	6 / 1.4%	7 / 2.5%	8 / 3.6%	12 / 8.5%	43
$300-$450 thousand	10 / 0.3%	9 / 1.4%	9 / 2.4%	12 / 3.2%	6 / 5.2%	46
> $450 thousand	5 / 0.4%	4 / 1.4%	6 / 2.3%	5 / 3.4%	1 / 5.6%	21

a/ To determine exvessel revenue equivalent, QS was converted to QP based on 2015 trawl allocations and multiplied by average 2013 exvessel prices. The resulting exvessel values were reduced based on average fleet attainment of harvest for species other than widow rockfish.
b/ While widow rockfish has been under a trading moratorium, QS for all other species started trading at the beginning of 2014.
c/ Of the accounts in this category, 3 have only widow QS or more than 90% widow by value) remaining in their account (all other QS has been transferred out of the accounts).
d/ On 10/03/2014 there were five QS accounts which held QS for non-whiting species other than widow rockfish but which did not hold (non-whiting species) QS in 2011.

Status Quo Allocations Relative to Widow Landing History

While widow QS was allocated to cover expected bycatch needs, for some permits the resulting allocation was in relative proportion to their widow QS landing history, while many others with no widow landings history received substantial allocations. In Figure 4-5 each permit receiving an allocation is represented

by a single dot. The vertical axis (y-axis) represents the share of widow QS allocated and the horizontal axis (x-axis) represents the share of widow landings history for each permit (i.e., relative history after dropping the three worst years). Dots that fall on or very near the y-axis represent permits that received widow QS allocations but had no or minimal widow landings history. The highest of these is above 3 percent. Dots that fall on or very near the x-axis represent permits with widow landings history but no or minimal widow QS allocations. The highest of these points is at 2.5%. The diagonal line represents situations where permits would have received widow QS in direct proportion to their 1994-2002 widow landings history.

Among 164 permits eligible to receive allocations, there are 10 with zero values lying on the horizontal axis (i.e., permits with no widow landings history) and no permits with zero values lying exactly on the vertical axis (i.e., there are no permits with zero nonwhiting landings-based widow QS allocated under status quo, although there are 18 permits with less than a 0.1% share). Altogether there are 102 permits lying above the 45-degree line (nonwhiting landings-based QS allocated under status quo allocations is greater than the share of 1994-2002 widow landings), and 62 permits below the line (nonwhiting landings-based QS under status quo is less than the share of 1994-2002 widow landings).

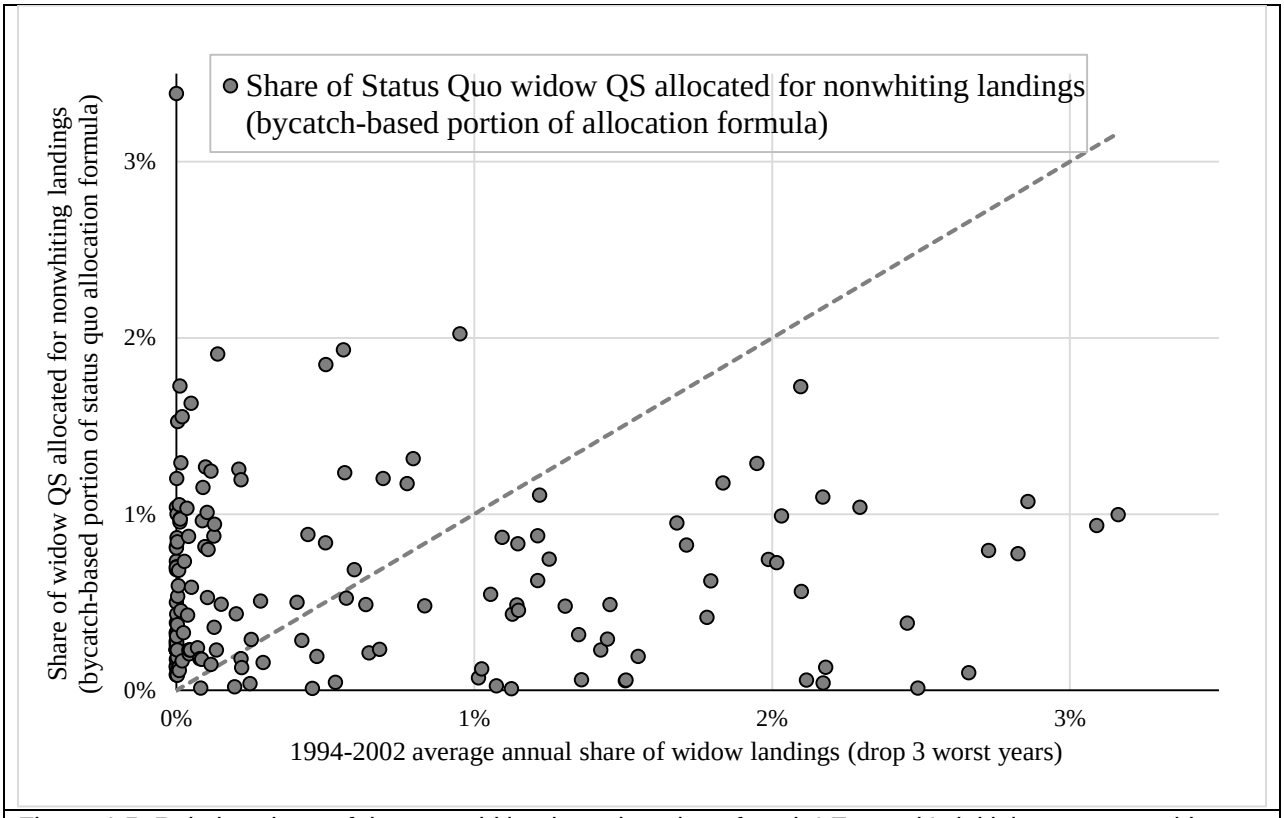

Figure 4-5. Relative share of the non-whiting-based portion of each LE permit's initial status quo widow QS allocation (vertical axis) compared with the permit's share of total 1994-2002 widow rockfish landings (horizontal axis).

While Figure 4-5 shows only the portion of the QS allocated for nonwhiting landings, Figure 4-6 contrasts landings history with the full widow QS allocations provided under status quo. Here again it can be seen that the status quo allocations diverge greatly from the historic widow rockfish landings—as

would be expected given the criteria that were used to allocate QS for species that were overfished at the time of initial allocation, such as widow rockfish.

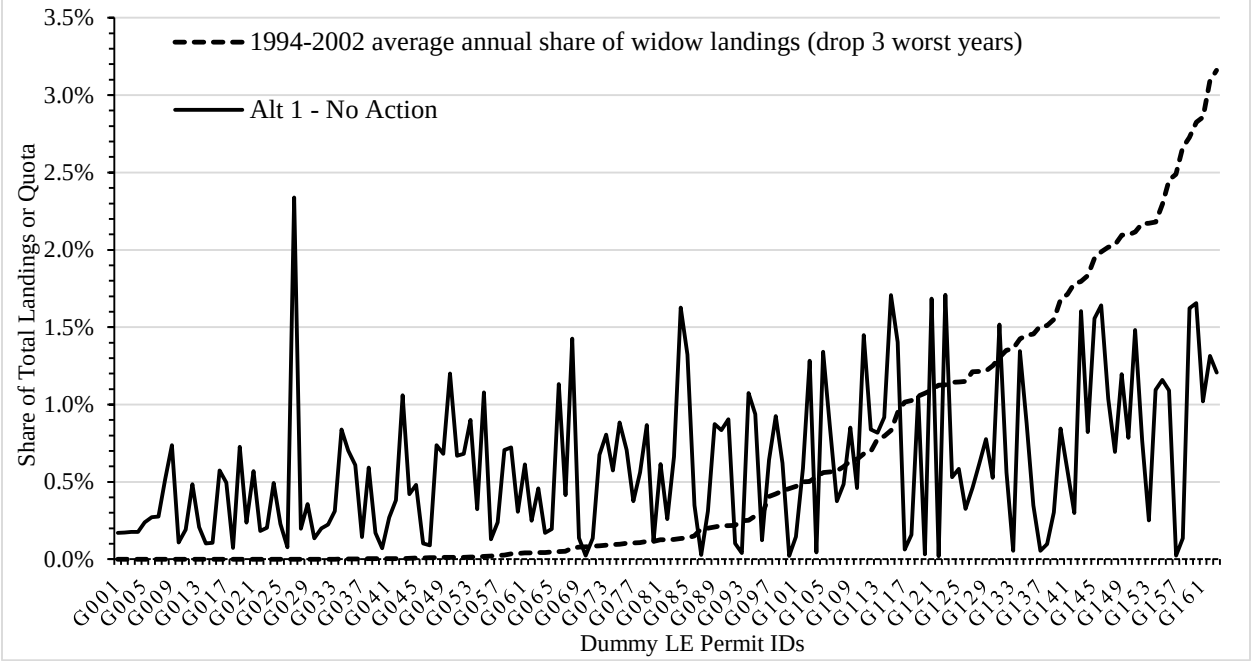

Figure 4-6. Allocation of widow QS among individual vessel **LE permits** under Alternative 1 – No Action compared with average relative widow rockfish landings during 1994-2002.

Status Quo Allocations Relative to Recent Revenues

This section looks at how the status quo allocation compares to more recent groundfish fishery participation measured by exvessel revenues. As with the 1994-2002 catch history, there are substantial differences between recent nonwhiting revenues and the status quo widow rockfish QS allocations (Figure 4-7).

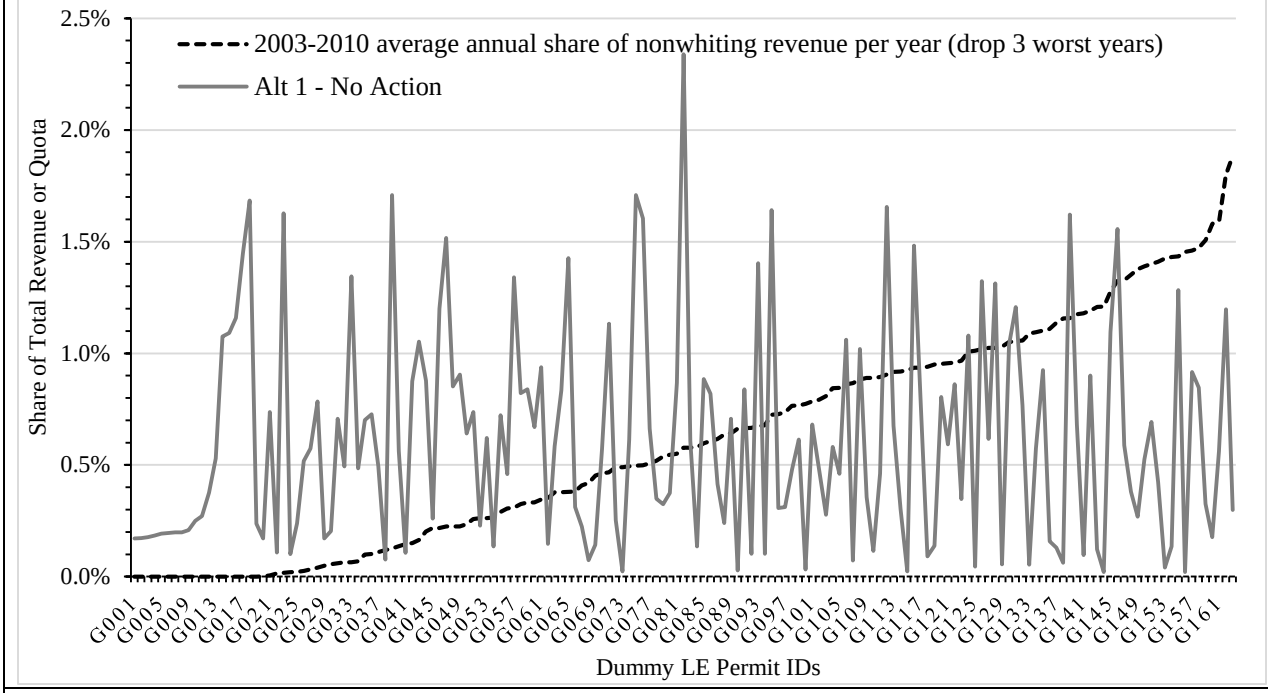

Figure 4-7. Allocation of widow QS among individual vessel **LE permits** under Alternative 1 – No Action compared with average relative nonwhiting groundfish exvessel revenue during 2003-2010.

4.3.1(a)(1)(ii) ***Action Alternatives 2, 3, and 4)***

The direct impact of the action alternatives would be on QS owners. Widow QS would be reallocated among QS accounts based on the landings history of the permits that originally generated the accounts. To the degree that the owners of these QS accounts would otherwise need to purchase QS to restore their historic widow rockfish fishing opportunity, there may be some savings in transaction costs. Otherwise, the main effect is a redistribution of wealth amount holders of QS accounts, to the benefit of those whose accounts are associated with a history of relatively greater widow landings, i.e. more substantial participation in the targeted widow rockfish fishery (Action Alternatives 2, 3, and 4) and those with stronger nonwhiting revenue from 2003 through 2010, i.e. higher levels of more recent participation in the fishery in general (Alternative 2). Those with strong widow landings history would be most benefited by Alternative 2, followed by Alternatives 3 and 4. Those with stronger recent history in the nonwhiting fishery would be most benefited by Alternative 3. Because of their higher more recent revenues, these entities may also be more dependent on the fishery as a whole.

There are a total of nine possible permutations of the alternatives and suboptions. Many of the permutations result because Alternative 2 allocations are an element in both Alternative 3 (which has its own suboptions) and Alternative 4. This yields the combinations identified in Table 4-6. The bulk of the

analysis will be focused on Alternative 1, Alternative 2 suboption a, Alternative 2 suboption b, Alternative 3 Suboption a with Alternative 2 Suboption a, and Alternative 4 with Alternative 2 Suboption a. Section 4.3.1(a)(1)(iii) provides a more detailed analysis of all the suboptions.

Table 4-6. Listing of alternatives, suboptions and abbreviations.

Alternatives	Suboptions	Combinations	Abbreviations
Alternative 1 – No Action			Alt 1
Alternative 2 – Amendment 20 Target Species Formula	Suboption a		Alt 2(a)
	Suboption b		Alt 2(b)
Alternative 3 – Include Revenue (2003-2010)	Suboption a	With Alt 2 Sub a	Alt 3(a) with 2(a)
	Suboption b	With Alt 2 Sub a	Alt 3(b) with 2(a)
	Suboption a	With Alt 2 Sub b	Alt 3(a) with 2(b)
	Suboption b	With Alt 2 Sub b	Alt 3(b) with 2(b)
Alternative 4 – Pounds Neutral		With Alt 2 Sub a	Alt 4 with 2(a)
		With Alt 2 Sub b	Alt 4 with 2(b)

1994-2002 Landings History Compared to 2003-2010 Landing History

One of the more significant differences between the action alternatives is the contrast between allocating based on 1994-2002 widow landings history (Alternatives 2 and 4) and allocating based on both widow landings history and 2003-2010 exvessel revenue from all nonwhiting groundfish (Alternative 3). Figure 4-8 contrasts these two allocational bases. As in Figure 4-5, each point represents one of the original permits receiving an allocation. The height relative to the vertical axis represents the share of revenue and the distance along the horizontal axis represents the share of widow rockfish landings history. Dots (squares) directly on or very near the vertical axis represent permits with little or no widow landings history that, under Alternative 2, would receive only an equal allocation (plus an allocation in proportion to their whiting landings history). There appear to be a large number of permits in this category. Dots on or very near the horizontal axis permits represent permits with no recent revenue history that, under Alternative 2, would receive an equal allocation, the allocation portion calculated based on their widow landing history, plus a widow landings history-based allocation portion. There are only eight or so permits in this category. Permits with little or no widow landings history nor nonwhiting groundfish revenues during the respective qualification periods are clustered near the origin. The diagonal line represents situations where permits have similar shares of 1994-2002 widow landing history and more recent (2003-2010) nonwhiting revenue.

Among 164 permits eligible to receive allocations, there are 10 with zero values lying on the horizontal axis (i.e., permits with no widow landings history) and 19 permits with zero values on the vertical axis (i.e., permits with zero nonwhiting groundfish revenue history during 2003-2010).

Altogether there are 95 permits lying above the 45-degree line (2003-2010 nonwhiting groundfish revenue share is greater than their share of 1994-2002 widow landings), and 65 permits below the line (2003-2010 nonwhiting groundfish revenue share is less than their share of 1994-2002 widow landings).

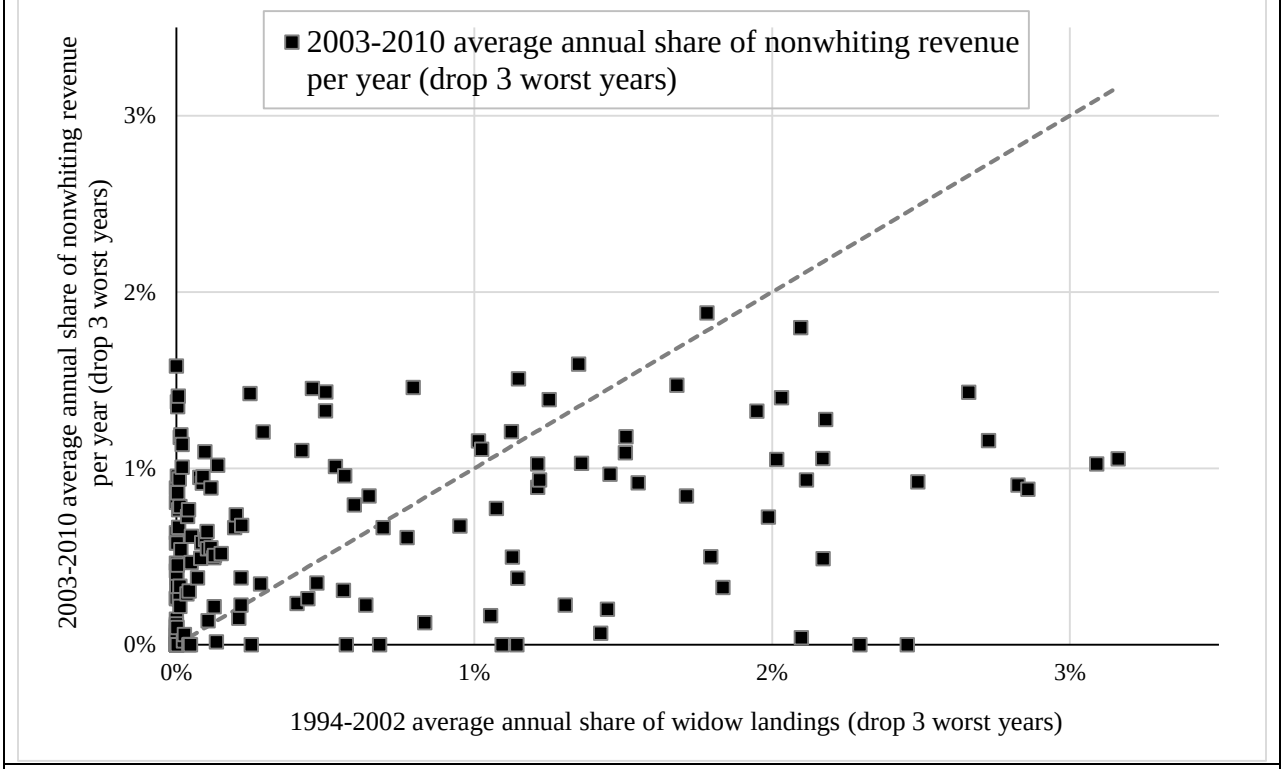

Figure 4-8. Relative share of each LE permit's average 2003-2010 nonwhiing groundfish exvessel revenue (vertical axis) compared with the permit's share of total 1994-2002 widow rockfish landings (horizontal axis).

General Results - Permit Level

Allocations are examined at the permit level to provide a direct comparison between the basis of allocation under Amendment 20 and the results under the proposed reallocation alternatives. Any QS reallocated will not go to the limited entry permits but would instead be associated with the original QS accounts generated after the initial allocations to those permits.

Alternative 2 would reallocate based on the Amendment 20 allocation formula while Alternative 3 would also include exvessel revenue from 2003 through 2010. Relative to status quo, Figure 4-9 illustrates that under both formulas, as a result of the equal allocation portion, the minimum amount of widow QS a permit would receive is about 0.17% (indicated with an arrow in the figure). A number of permits at the lower end of the status quo allocation would end up at the higher end of the range for Alternative 2(a) and Alternative 3(a) allocations (i.e., permits with high allocation levels showing on the left-hand side of the figure). In general, those receiving the highest allocations under Alternative 2(a) would also be receiving the highest under Alternative 3(a), but at a lower level (see many of the values within the large oval). There are some exceptions to this (see boxes inside oval). Conversely, those receiving lower allocations under Alternative 2(a) (and in some cases the minimum amounts because they have no 1994-2002 widow landing history) would experience higher allocations under Alternative 3(a) (see boxes along bottom of the figure).

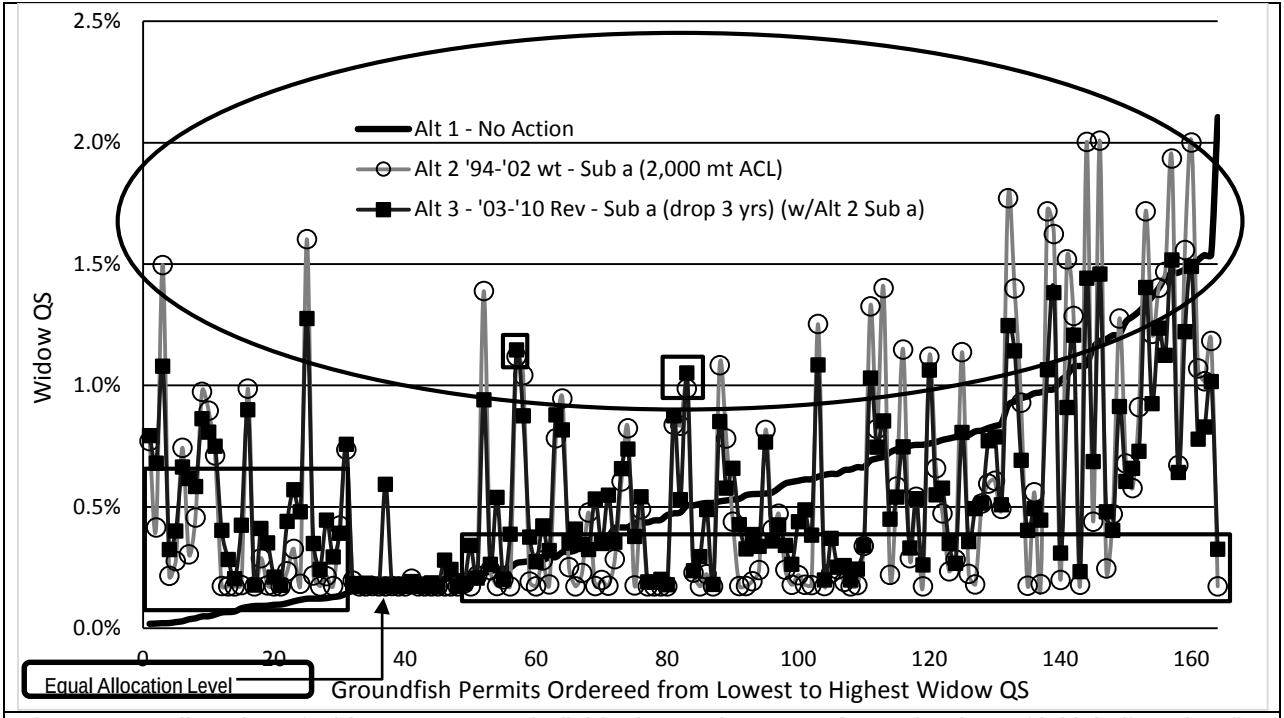

Figure 4-9. Allocation of widow QS among individual vessel **LE permits** at the time of initial allocation (in 2010) compared with allocations under Alternative 2(a) and Alternative 3(a) (for each permit there are three markers that line up vertically, one for each alternative).

The results for Alternative 4 are comparable to those of Alternative 2(a) with changes reduced in scale because of the smaller amount of the total QS that is reallocated. The portion reallocated is based on the Alternative 2(a) formula therefore the patterns, while diminished in magnitude, are the same. For example, the two high Alternative 2(a) values shown on the left side of Figure 4-9 also appear as high values under Alternative 4 in Figure 4-10 (although their QS values are lower under Alternative 4).

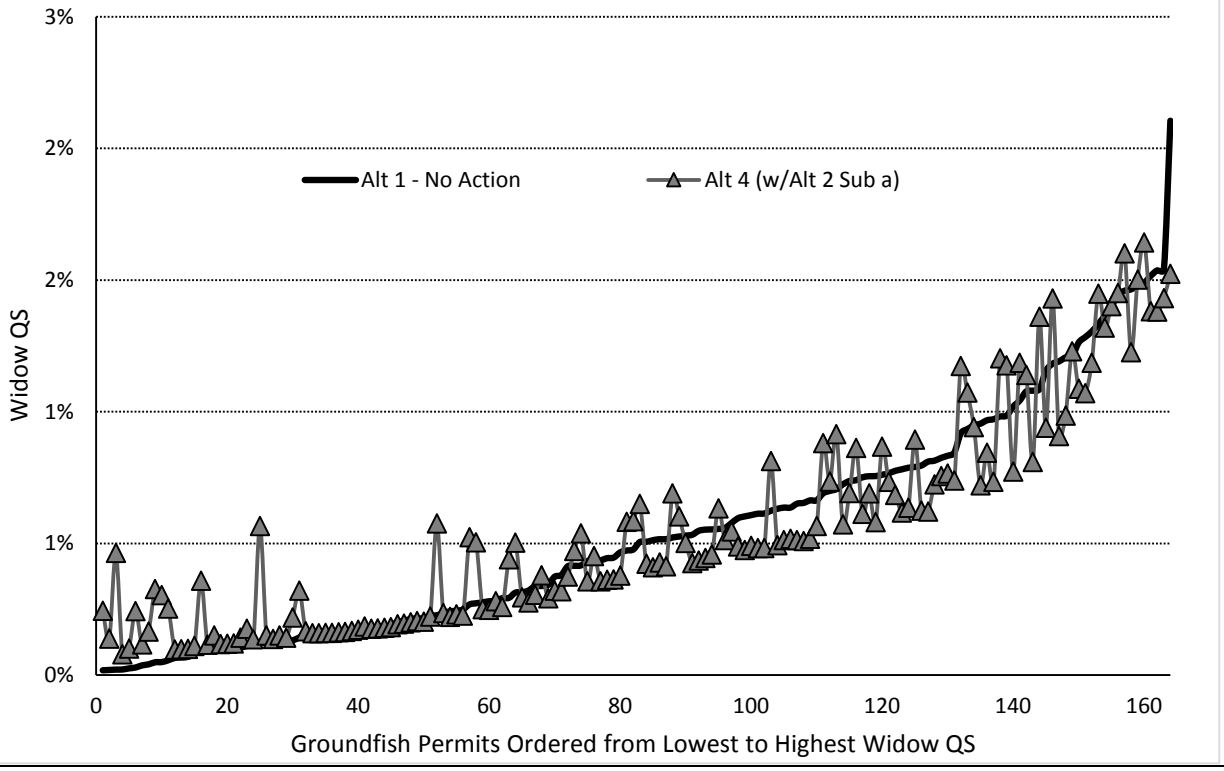

Figure 4-10. Allocation of widow QS among individual vessel **LE permits** at the time of initial allocation (in 2010) compared with allocations under Alternative 4.

Some statistics on the differences between the alternatives are provided in Table 4-7. In general, there are nine more permits that would gain (and nine fewer that would lose) under Alternative 3(a) than under the other two action alternatives (87 as opposed to 78). Alternative 3(a) is between Alternatives 2(a) and Alternative 4 with respect to all the other parameters listed in Table 4-7 except for the number receiving increases greater than the average increase (38 as compared to 33 in each of the other alternative) and the number receiving decreases larger than the average decrease (30 as compared to 40 in each of the other alternative). The greater number receiving increases higher than the average under Alternative 3(a) indicates that the amount by which each of the allocations exceeds the average amount of increase is less than under the other alternatives.

Table 4-7. Statistics on reallocation of widow QS among the original LE permits under the action alternatives.

	Alt 2 - (a): Landings History + 2,000 mt ACL Based	Alt 3 - (a): Landings History + Revenue (drop 3) Based[a/]	Alt 4: 2014 Pounds-Neutral[a/]
QS Reallocated	28.8%	24.9%	8.7%
Maximum Allocation	2.01%	1.52%	1.64%
Minimum Allocation	0.17%	0.17%	0.08%
Number with Increased QS	78	87	78
Avg QS Allocated	0.79%	0.64%	0.54%
Average Increase	+0.369%	+0.286%	+0.111%
Number Increased More Than Average	33	38	33
Max Increase	+1.48%	+1.15%	+0.44%
Number with Reduced QS	86	77	86
Avg QS Allocated	0.33%	0.45%	0.56%
Average Reduction	-0.34%	-0.32%	-0.10%
Number reduced More Than Average	40	30	40
Max Reduction	-1.93%	-1.78%	-0.58%

a/ Modelling of Alternative 3 and Alternative 4 assume Alternative 2 suboption a.

General Results - Ownership Level

As described in Section 4.3.1(a)(1)(i), publically available information was used to infer an association between QS accounts and to construct a data set to estimate the concentration of QS among QS permit owners. Alternatives were compared using these data. Alternatives 1, 2(a) and 3(a) are contrasted in Figure 4-11. Under these alternatives, the maximum widow QS held under one ownership would be expected to drop from above 9 percent under status quo down to about 5 percent. As was the pattern when results at the permit level were reviewed, in general, those with larger allocations tend to do better under Alternative 2 (highlighted in the circles) and those with smaller allocations tend to do better under Alternative 3(a) (in the box along the bottom), with the exception of a few at the top of the range of the allocations (shown in the boxes on the right hand side of the figure). Alternatives 1 and 4 are contrasted in Figure 4-12. Here again, the allocation of the top recipient is substantially reduced, but only down to around 7.5 percent, compared with a level of around 5 percent in the other action alternatives.

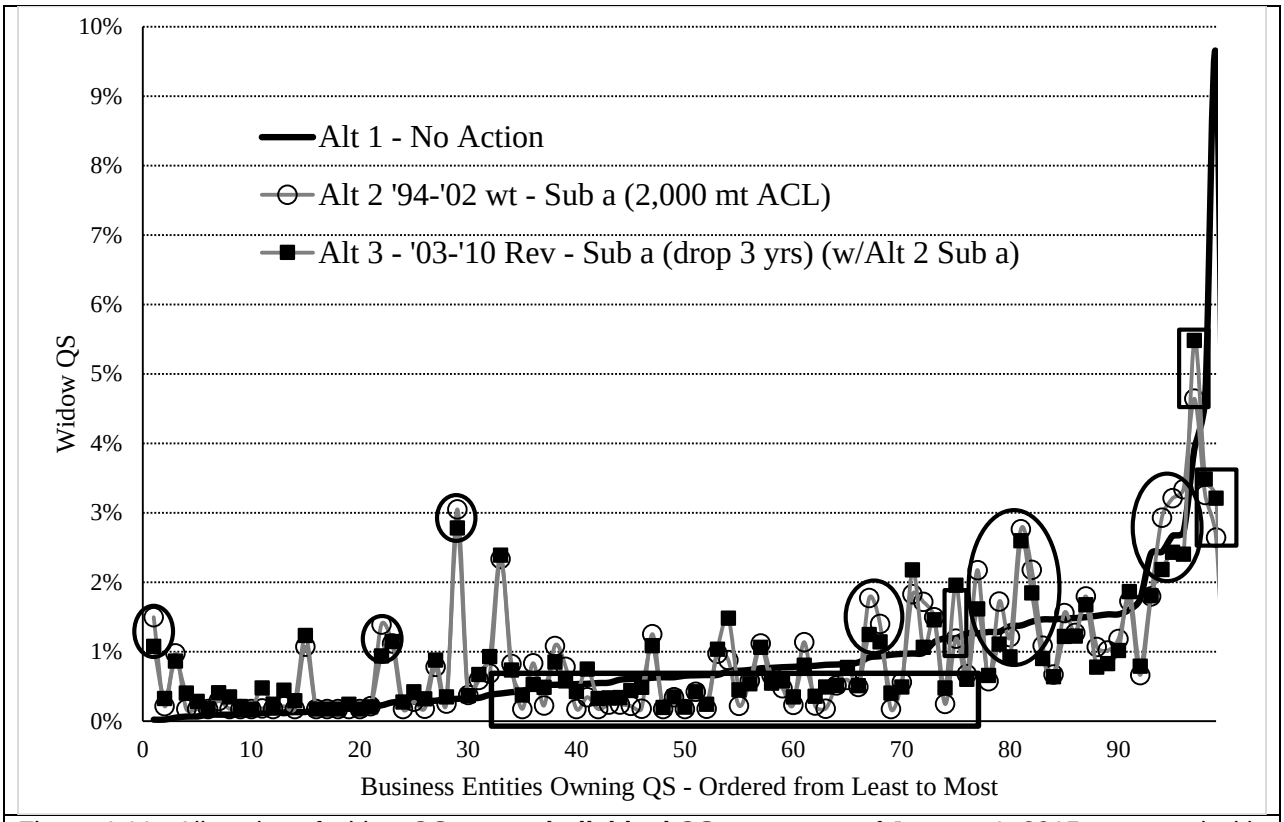

Figure 4-11. Allocation of widow QS among **individual QS owners** as of January 1, 2015 compared with allocations under Alternative 2(a), and Alternative 3(a) (boxes are drawn around some of the stronger gainers under Alternative 3(a) relative to Alternative 2(a), and circles are drawn around those who would receive less under Alt 3(a) than under Alt 2(a)).

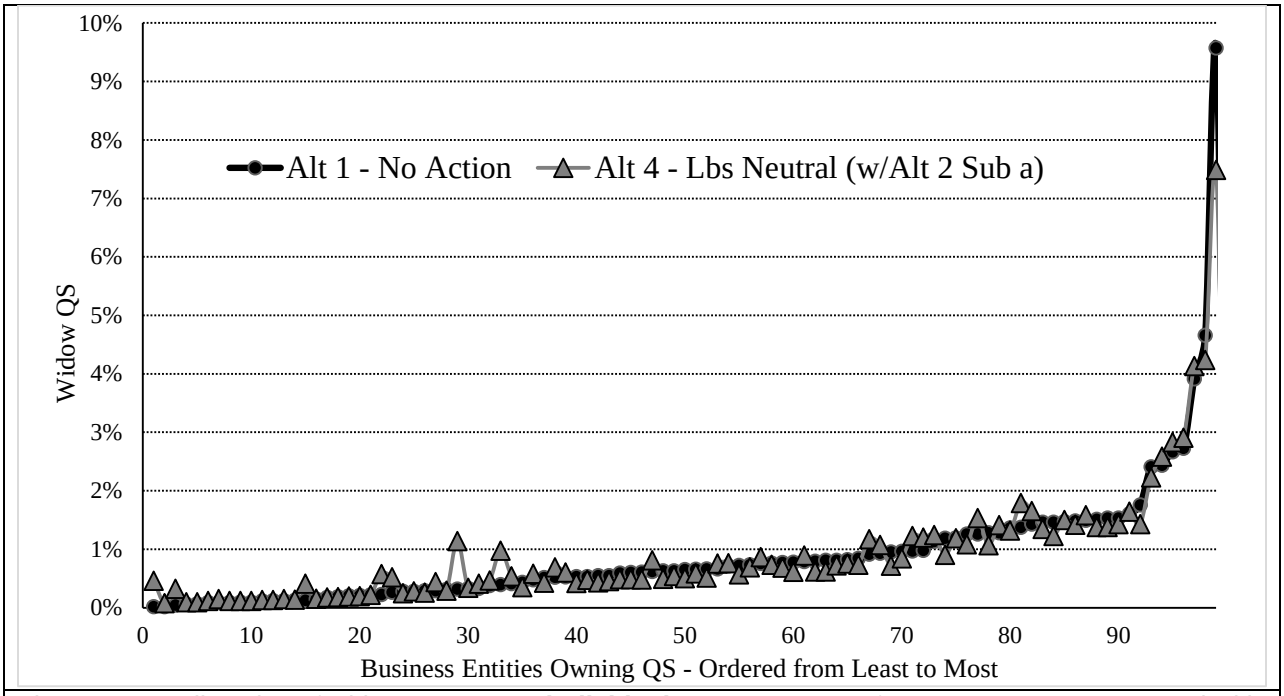

Figure 4-12. Allocation of widow QS among **individual QS owners** as of January 1, 2015 compared with allocations under Alternative 4.

Performance Relative to 1994-2002 Landings History

One of the proposed allocation criteria is landings history. This section evaluates the performance of the action alternatives relative to 1994-2002 widow rockfish landings history. Figure 4-13 arrays LE permits along the horizontal axis from most to least landings history and shows the corresponding allocation results under each alternative. Variations from the trend line for Alternative 2 are due to QS amounts allocated based on whiting history rather than widow rockfish landings. In Figure 4-14 the permits appear in the same order but there is wider variation because 2003-2010 exvessel revenue is also weighted into the allocation formula. Compared with Alternative 2, under Alternative 3 more permits with lower historic landings get larger allocations and the maximum allocations are lower. Figure 4-15 provides the same display for Alternative 4. This figure shows substantially more variation from historic landings because under Alternative 4, approximately 70 percent of the allocation continues to be distributed on the basis of the status quo allocations (see Figure 4-6 for the comparison of status quo allocations to historic landings).

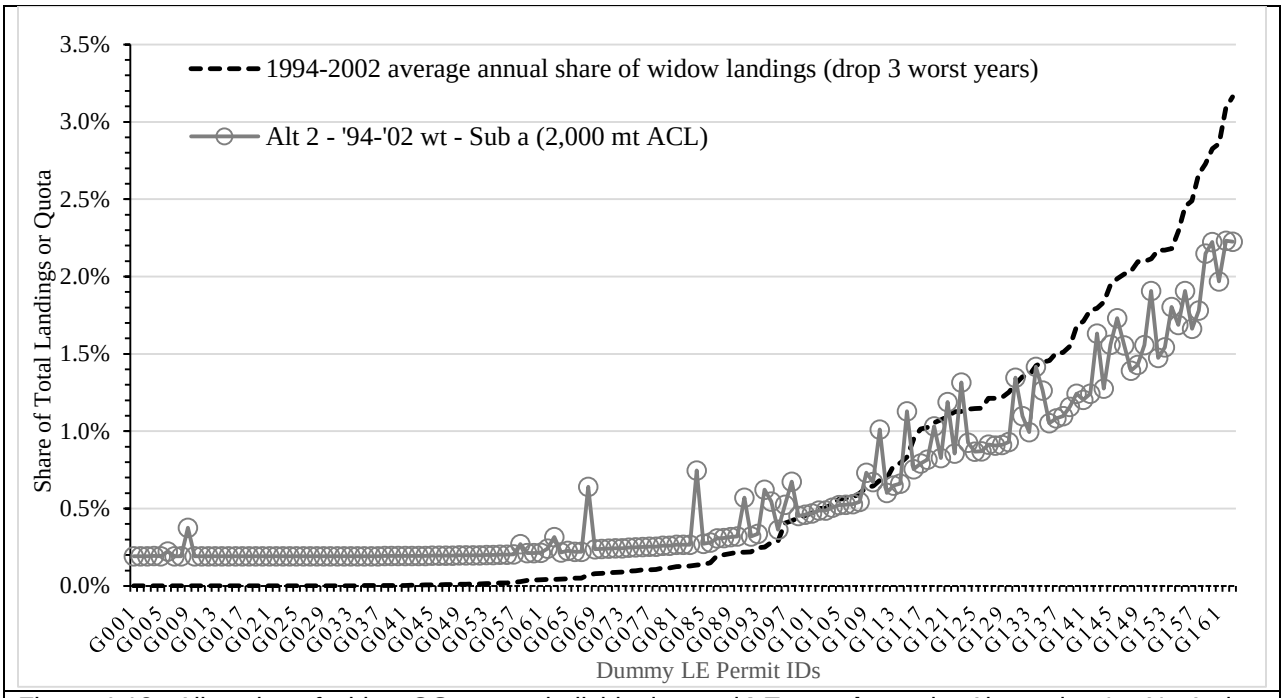

Figure 4-13. Allocation of widow QS among individual vessel **LE permits** under Alternative 1 – No Action and Alternative 2(a) compared with average relative widow rockfish landings during 1994-2002.

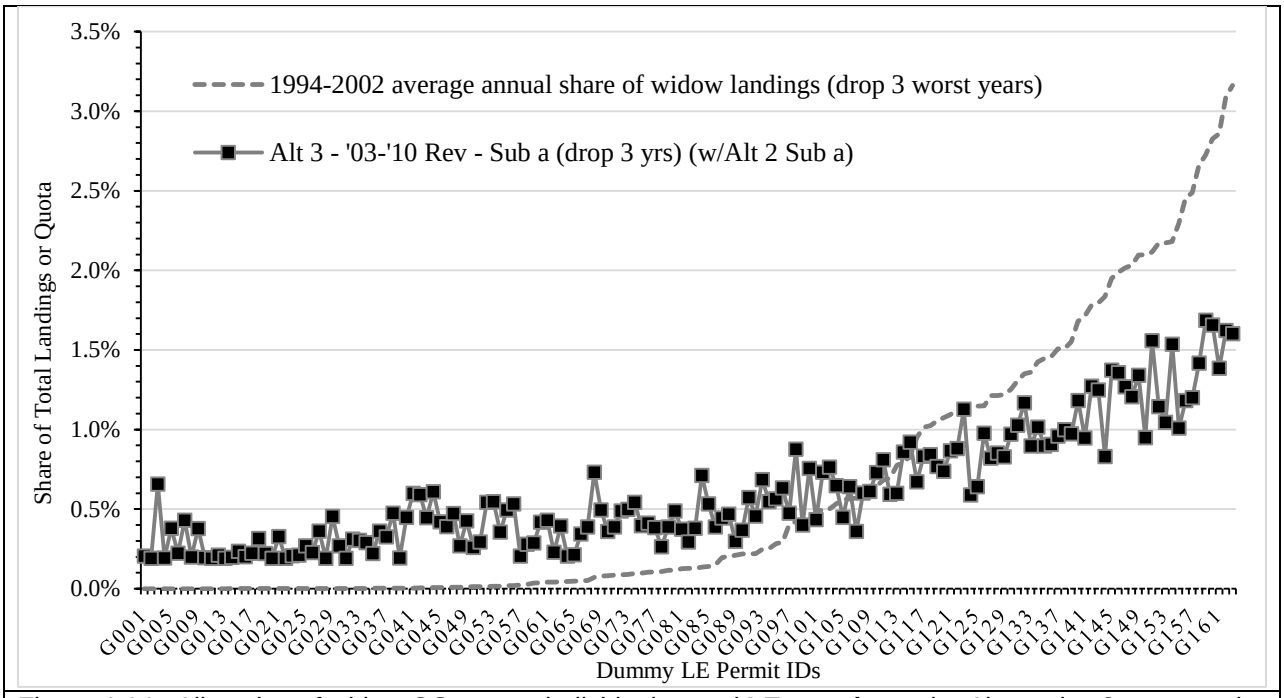

Figure 4-14. Allocation of widow QS among individual vessel **LE permits** under Alternative 3 compared with average relative widow rockfish landings during 1994-2002.

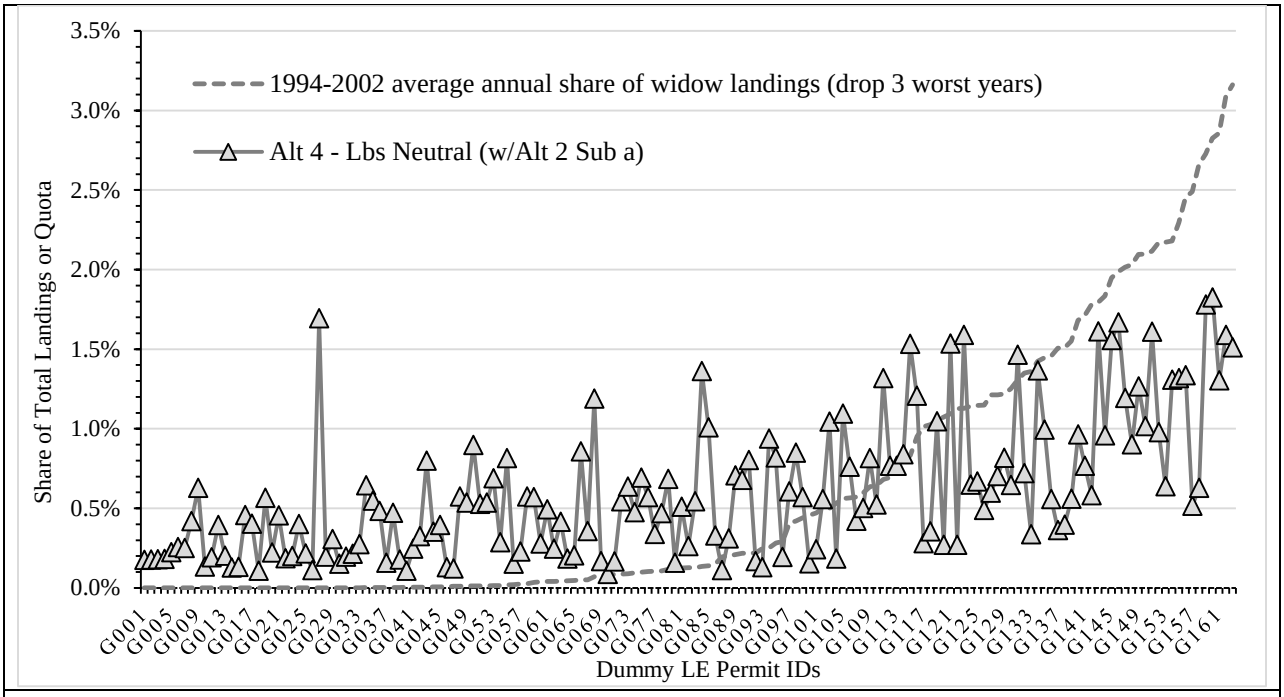

Figure 4-15. Allocation of widow QS among individual vessel **LE permits** under Alternative 4 compared with average relative widow rockfish landings during 1994-2002.

Performance Relative to 2003-2010 ExVessel Revenue

One of the proposed allocation criteria is more recent exvessel revenue. This section evaluates the performance of the action alternatives relative to 2003-2010 non-whiting exvessel revenue. Figure 4-16, Figure 4-17 and Figure 4-18 array LE permits along the horizontal axis from lowest to greatest exvessel revenue history and provide the allocation results for each alternative. Because Alternative 2 is based on earlier lands history and there is not a strong correlation between earlier landings history and more recent revenue levels, allocations under Alternative 2 show substantial deviation from the 2003-2010 exvessel revenue line. In Figure 4-17, the permits appear in the same order but there is a greater correlation between the Alternative 3 allocations because the allocation formula under Alternative 3 is partially based on more recent (2003-2010) non-whiting revenue history. Alternative 4 is based on a combination of the status quo formula, intended to meet bycatch needs, and Alternative 2 based on 1994-2002 widow landings history, neither of which show a strong correlation with 2003-2010 revenue history. Therefore the Alternative 4 allocation results deviate substantially from 2003-2010 exvesel revenues. The minimum allocations are also lower under Alternative 4 than under any of the other alternatives.

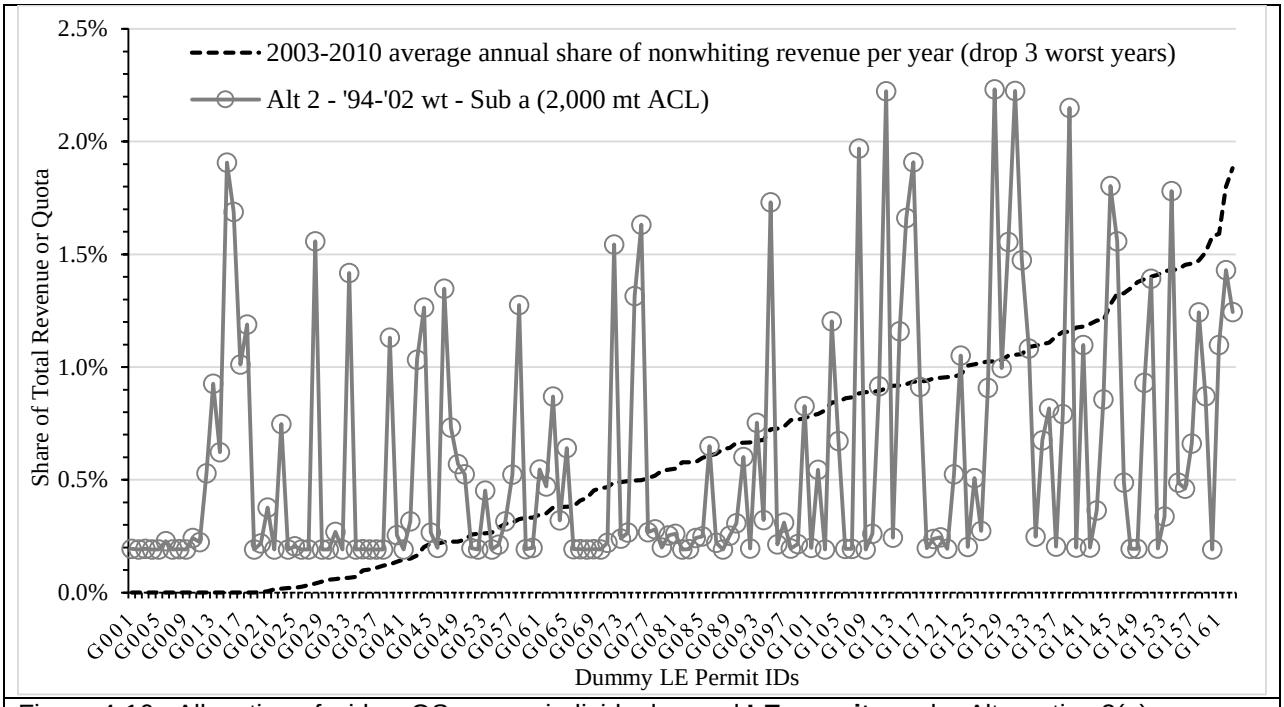

Figure 4-16. Allocation of widow QS among individual vessel **LE permits** under Alternative 2(a) compared with average relative nonwhiting groundfish exvessel revenue during 2003-2010.

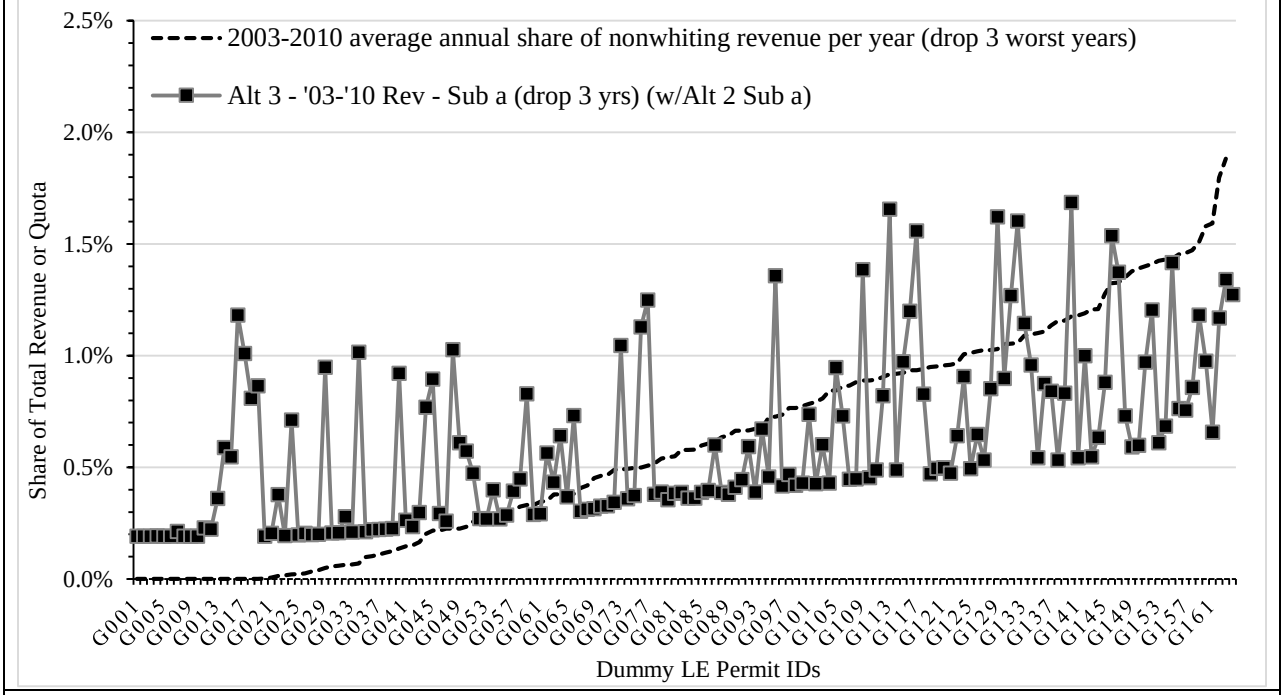

Figure 4-17. Allocation of widow QS among individual vessel **LE permits** under Alternative 3 and Alternative 4 compared with average relative nonwhiting groundfish exvessel revenue during 2003-2010.

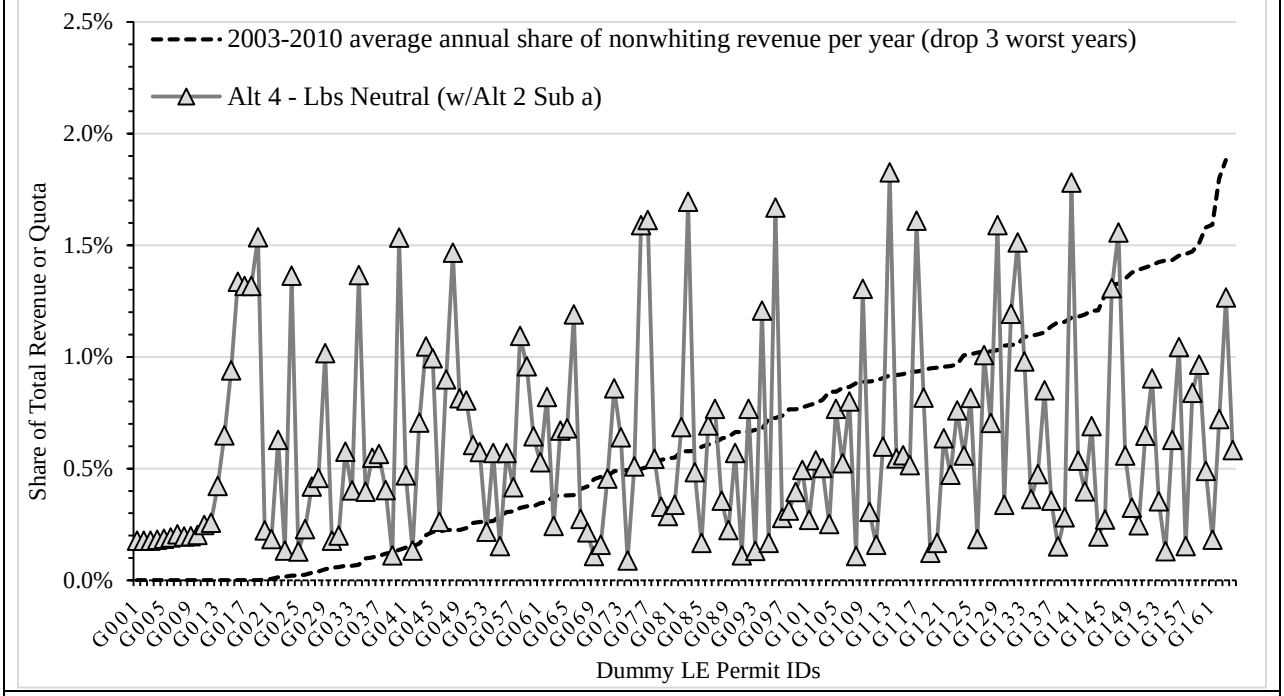

Figure 4-18. Allocation of widow QS among individual vessel **LE permits** under Alternative 3 and Alternative 4 compared with average relative nonwhiting groundfish exvessel revenue during 2003-2010.

Performance Relative to QP Allocations

Alternative 4 was designed to ensure that no entity would receive less QP in 2016 than it did in 2014 under the lower 2014 trawl allocation. Figure 4-19 demonstrates that Alternative 4, as specified, achieves this objective. The QS allocations under Alternative 4 were converted to QP using the 2016 shoreside trawl allocation of widow, and the results are compared to the status quo QS allocations converted to QP using the 2012 and 2014 shoreside trawl allocations of widow. In all cases the resulting individual QP allocations under Alternative 4 are higher compared with results of status quo (initial) QS applied to the 2014 trawl sector allocation.

In Figure 4-20 and Figure 4-21, Alternatives 2(a) and 3(a) are evaluated against the same standard. For both of these alternatives many permits would fail to receive QP allocation amounts at or above the 2014 level of their status quo allocation, but most would receive QP above the 2012 level. Under Alternative 2(a), eight permits would fall below the 2012 level, and under Alternative 3(a) two permit's QP would fall below the 2012 level.

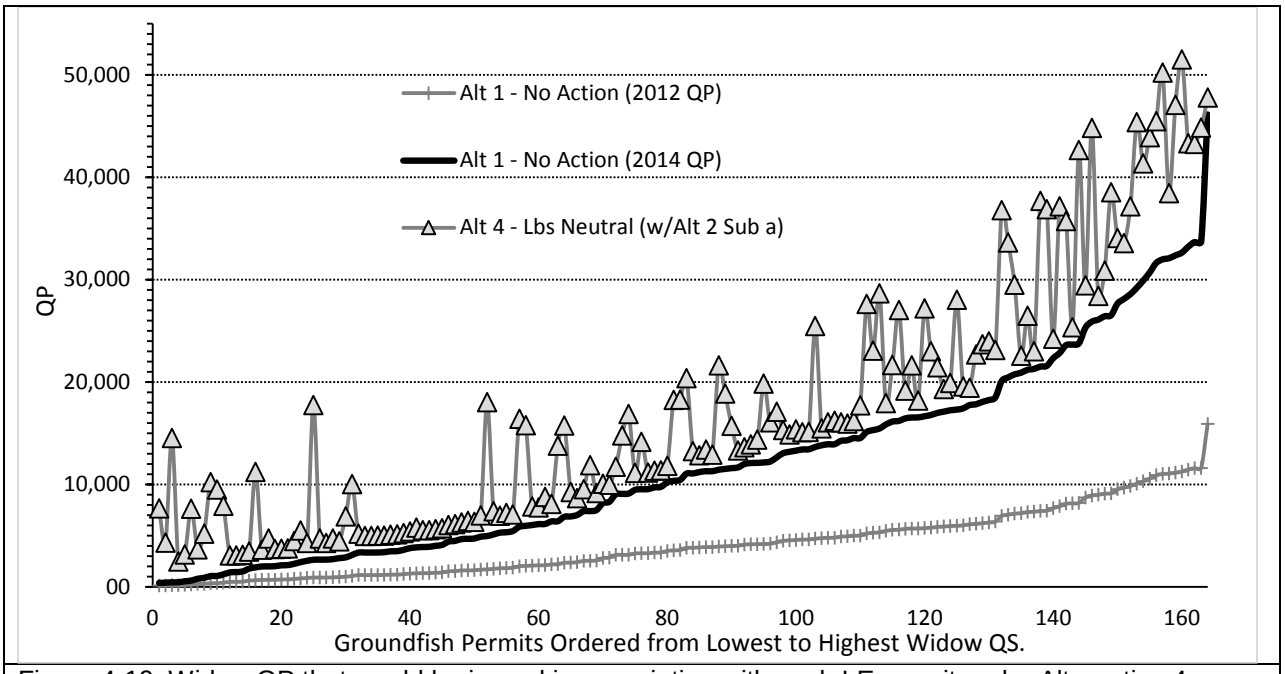

Figure 4-19. Widow QP that would be issued in association with each LE permit under Alternative 4 (based on the 2016 trawl allocation) compared with QP issued based on each LE permit's status quo QS allocations in 2012 and 2014.

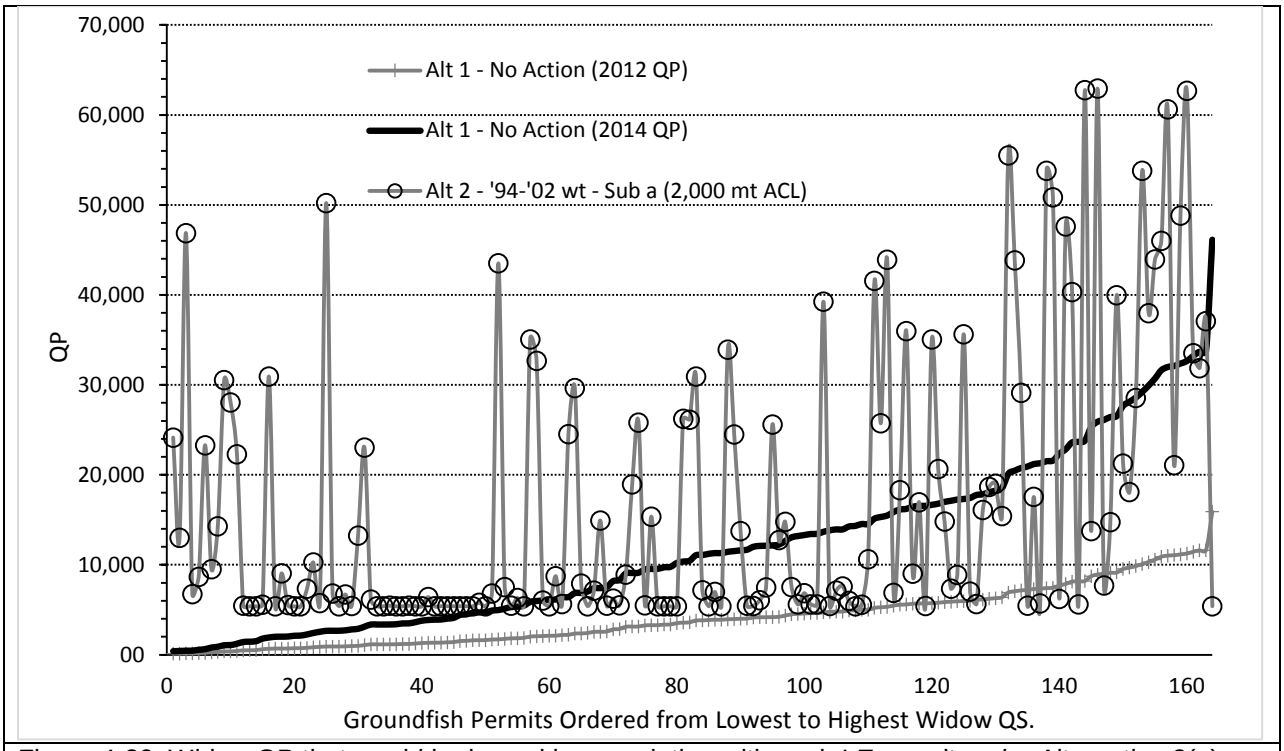

Figure 4-20. Widow QP that would be issued in association with each LE permit under Alternative 2(a) (based on the 2016 trawl allocation) compared with QP issued based on each LE permit's status quo QS allocations in 2012 and 2014.

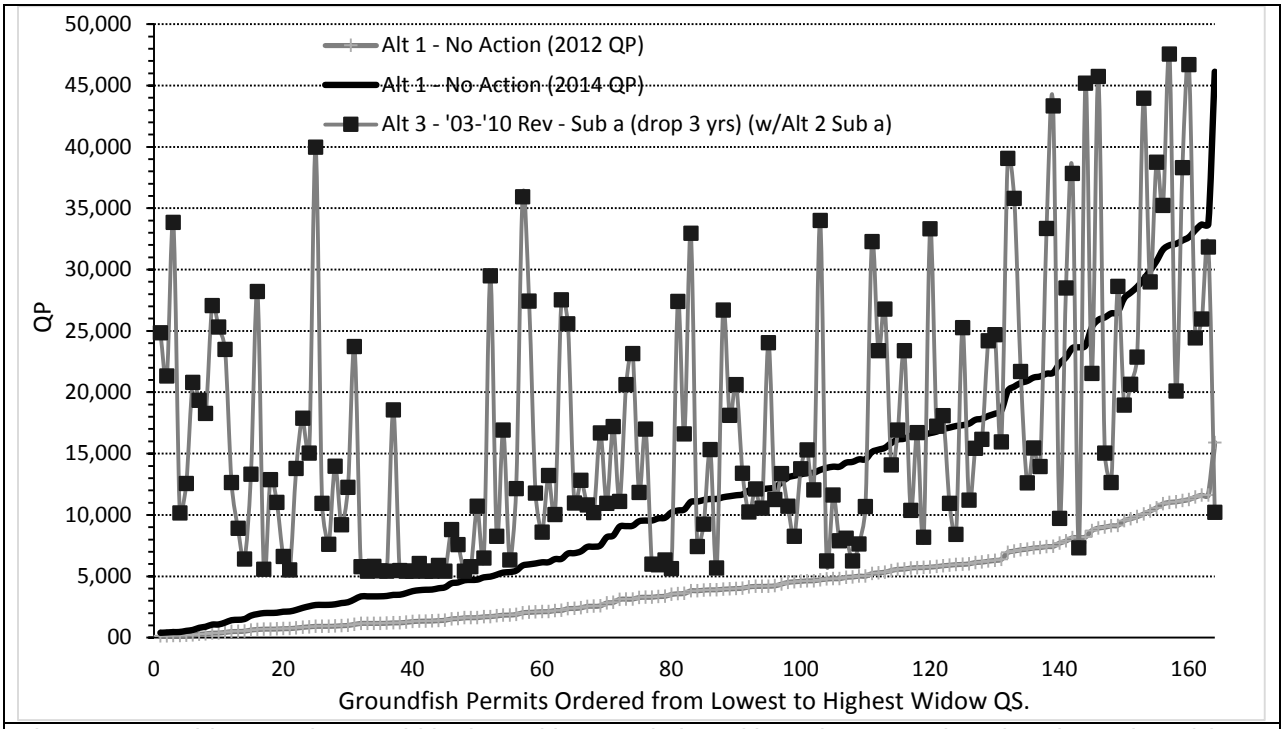

Figure 4-21. Widow QP that would be issued in association with each LE permit under Alternative 3(a) (based on the 2016 trawl allocation) compared with QP issued based on each LE permit's status quo QS allocations in 2012 and 2014.

4.3.1(a)(1)(iii) ***Action Alternative Suboption Comparisons***

This section provides information to indicate the influence of suboption choice on the allocation results. The Alternative 2 suboptions affect results not only for Alternative 2 but also Alternative 3 and Alternative 4, which rely in part on Alternative 2. Table 4-8 lists the figures in this document in which alternatives and suboptions are contrasted.

Table 4-8. Guide to figures illustrating differences between the allocation alternative suboptions.

2-Way Comparisons		Figure in Which Results are Displayed For:		
First Alternative	Second Alternative	All Permits	Permits without Whiting History	Permits with Whiting History
Alternative 2 Suboption a	Alternative 2 Suboption b	Figure 4-22	Figure 4-23	Figure 4-24
Alternative 3 Suboption a (Using Alt 2, Subopt a for base)	Alternative 3 Suboption b (Using Alt 2, Subopt a for base)	Figure 4-25	a/	a/
Alternative 3 Suboption a (Using Alt 2, Subopt a for base)	Alternative 3 Suboption a (Using Alt 2, Subopt b for base)	Figure 4-26	a/	a/
Alternative 4 (Using Alt 2, Subopt a for base)	Alternative 4 (Using Alt 2, Subopt b for base)	Figure 4-27	a/	a/

a/ Combination was omitted because differences are slight and can be inferred from other figures.

A statistical comparison of all the suboptions is provided in Table 4-10.

Alternative 2 – Comparison of Suboption (a) to Suboption (b)

Alternatives suboptions a and b vary in the relative emphasis that the allocation formula places on whiting and nonhwhiting trips (Table 4-9).

Table 4-9. Amount of widow QS allocated under Alternative 2 on the basis of whiting and nonwhiting catch histroy.

	Alternative 2	
	Suboption a	Suboption b
Whiting allocation portion	8.9%	4.0%
Portion based on nonwhiting catch	51.1%	54.7%

Suboption a attaches more than twice as much weight to whiting history as suboption b. For most permits, allocating more QS on the basis of nonwhiting trips (suboption b) results in slightly higher allocations. The permits that receive lower allocations under suboption b tend to be those that received higher status quo allocations and a few permits that would receive the highest allocations under Alternative 2 (see circled points in Figure 4-22). Results are broken out separately for permits with whiting history and those without whiting history in Figure 4-23 and Figure 4-24. As would be expected, permits with whiting history were generally favored by suboption a, though a number would receive somewhat higher widow QS allocations under suboption b in (see circled points in Figure 4-23). These results are driven by each individual permit's balance of whiting and nonwhiting landings. For permits that have only non-whiting history, suboption b provides a consistent small bump in each permit's allocation compared with suboption a (Figure 4-24).

Table 4-10. Statistics on widow QS reallocation among LE permits under the alternatives and suboptions.

	Alternative 1 (No Action)	Alternative 2 (Landings History)		Alternative 3 (Landings History and Recent Revenue)				Alternative 4 (Pounds Neutral)	
				Suboption a (drop three years)		Suboption b (no drop years)			
		Suboption a ACL Based [2(a)]	Suboption b: 3,790 mt ACL [2(b)]	With 2(a)	With 2(b)	With 2(a)	With 2(b)	With 2(a)	With 2(b)
QS Reallocated	-	28.8%	29.9%	24.9%	26.9%	25.2%	27.2%	8.7%	9.0%
Maximum Allocation	2.11%	2.01%	2.01%	1.52%	1.46%	1.56%	1.49%	1.64%	1.61%
Minimum Allocation	0.02%	0.17%	0.19%	0.17%	0.17%	0.17%	0.17%	0.08%	0.08%
Number with Increased QS	-	78	79	87	86	86	86	78	79
Avg QS Allocated	-	0.79%	0.74%	0.64%	0.63%	0.64%	0.65%	0.54%	0.48%
Average Increase	-	+0.369%	+0.379%	+0.286%	0.312%	+0.292%	0.316%	+0.111%	0.114%
Number Increased More Than Average	-	33	34	38	38	38	37	33	34
Max Increase	-	+1.48%	+1.55%	+1.15%	1.24%	+1.20%	1.30%	+0.44%	0.47%
Number with Reduced QS	-	86	85	77	78	78	78	86	85
Avg QS Allocated	-	0.33%	0.37%	0.45%	0.46%	0.45%	0.44%	0.56%	0.62%
Average Reduction	-	-0.34%	-0.35%	-0.32%	-0.344%	-0.32%	-0.348%	-0.10%	-0.106%
Number Reduced More Than Average	-	40	37	30	33	32	34	40	37
Max Reduction	-	-1.93%	-1.92%	-1.78%	-1.77%	-1.77%	-1.76%	-0.58%	-0.58%

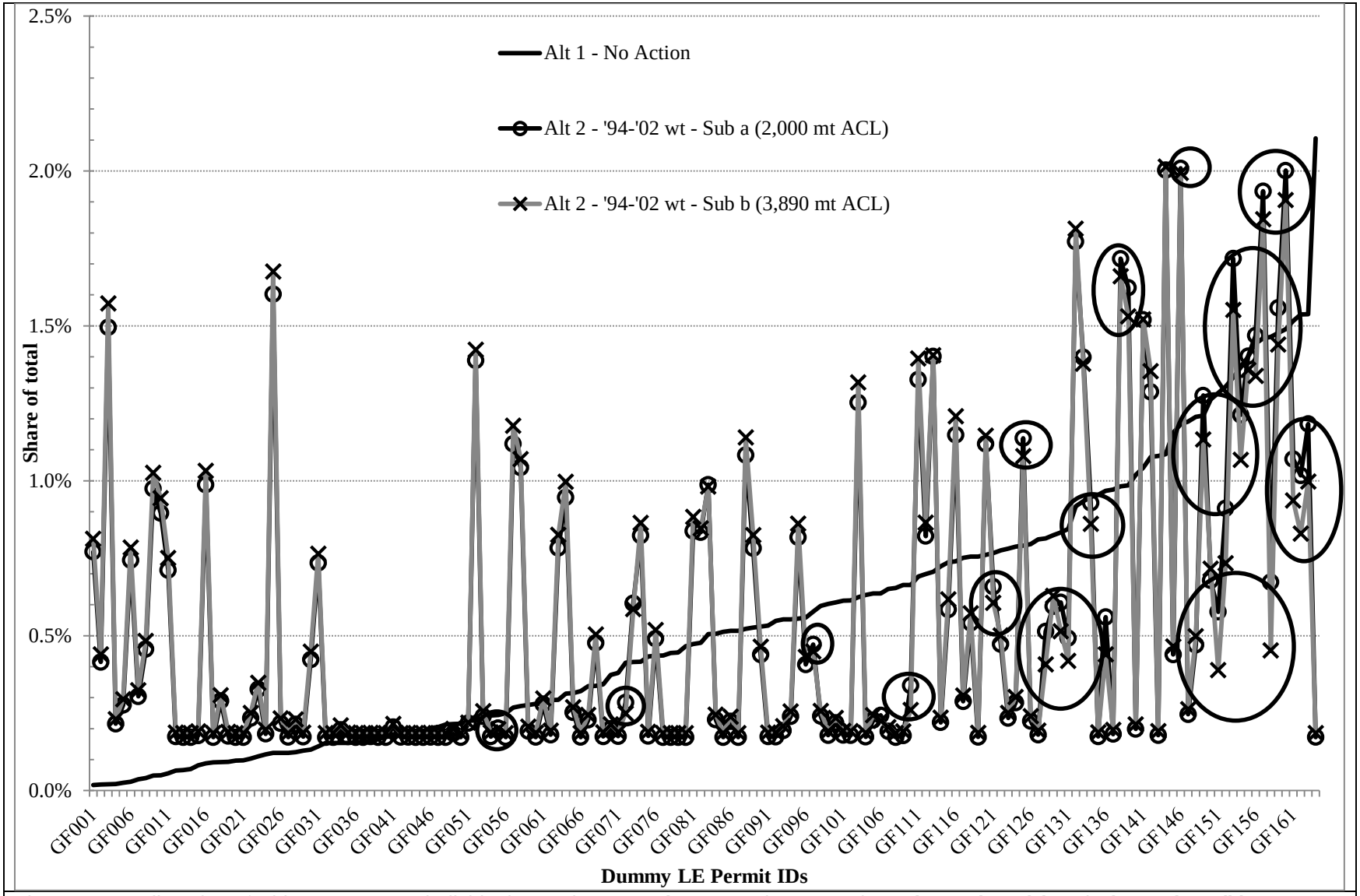

Figure 4-22. Allocation of widow QS among individual vessel **LE permits** comparing No Action, **Alternative 2(a)** and **Alternative 2(b).**

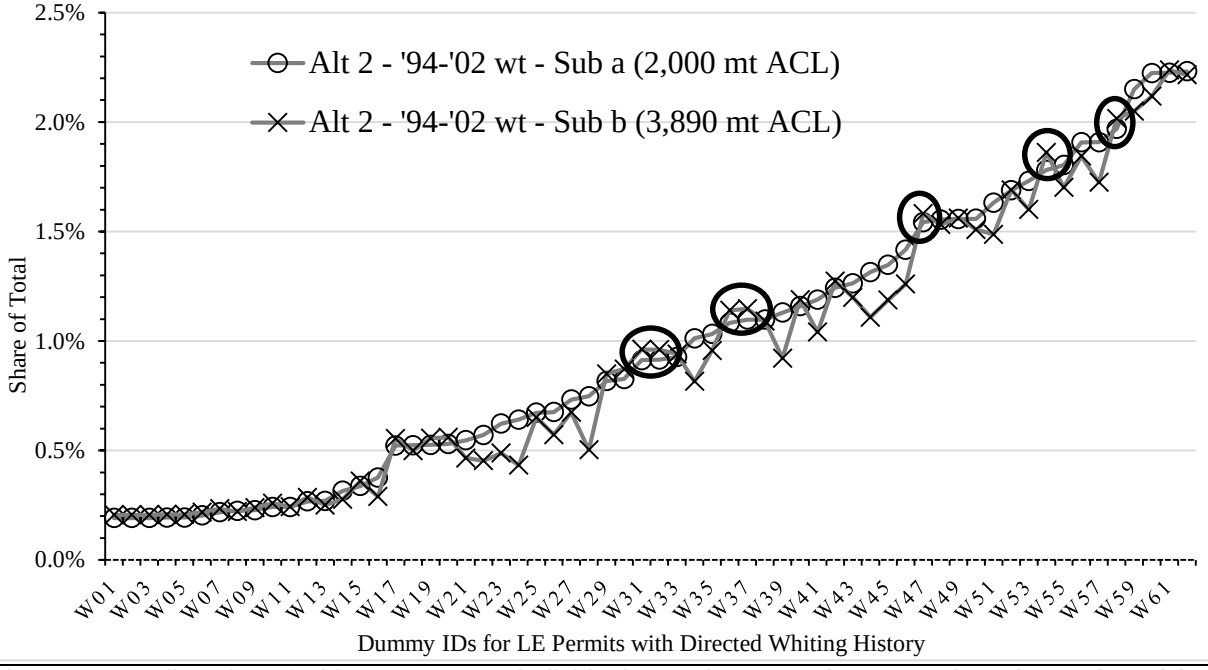

Figure 4-23. Allocation of widow QS among individual vessel **LE permits** comparing **Alternative 2(a)** with **Alternative 2(b)** for permits with **some directed whiting history** from 1994-2003.

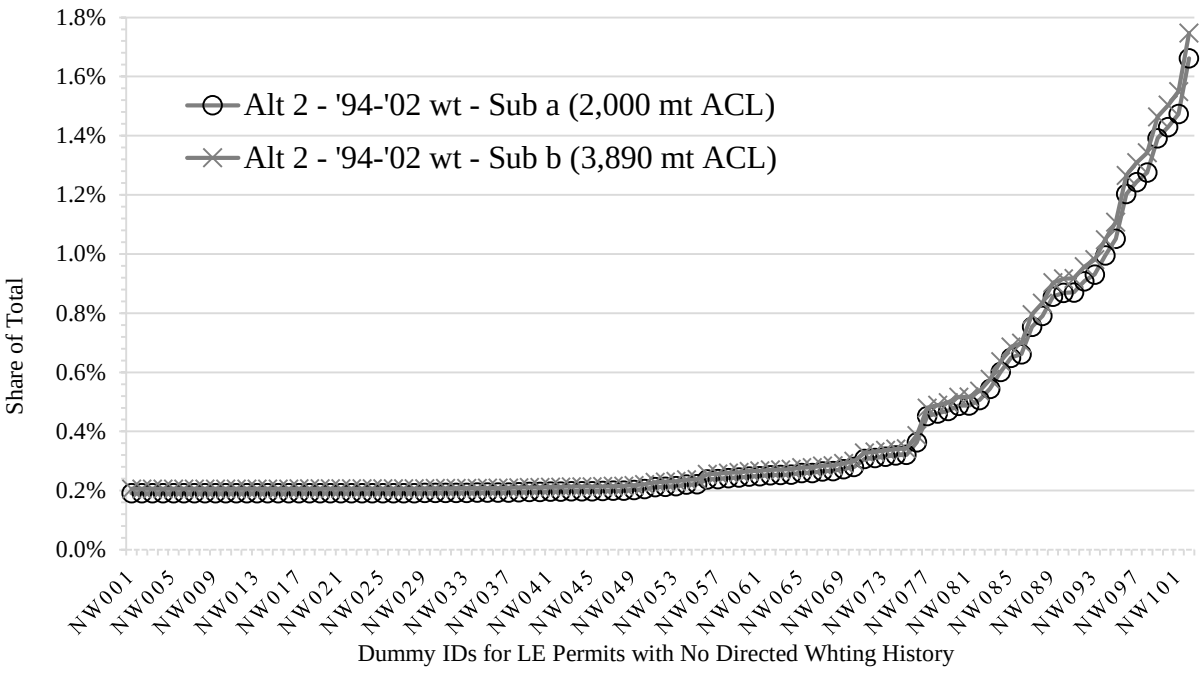

Figure 4-24. Allocation of widow QS among individual vessel **LE permits** comparing **Alternative 2(a)** with **Alternative 2(b)** for permits with **no directed whiting history** from 1994-2003.

Alternative 3 – Comparison of Suboption (a) to Suboption (b)

Alternative 3 suboption a drops each permits worst three years from calculation of the permit's nonwhiting revenue history. In general, this provision favors permits that have had some variability in their landings history. Such permits might be expected to experience a slight rise in allocation. Permits that have been consistent performers across all the years (and thus would not gain much from dropping their worst years) would receive somewhat lower allocations because of the increased credit given to permits with more variable history. While this provision was primarily intended to address hardship conditions that individual operators encountered, it also benefits harvesters whose history may vary for other reasons such as those who in some years participate more heavily in non-groundfish fisheries (or in Alaska) and less heavily in groundfish. The differences in allocation results between these two alternative suboptions are relatively small (Figure 4-24).

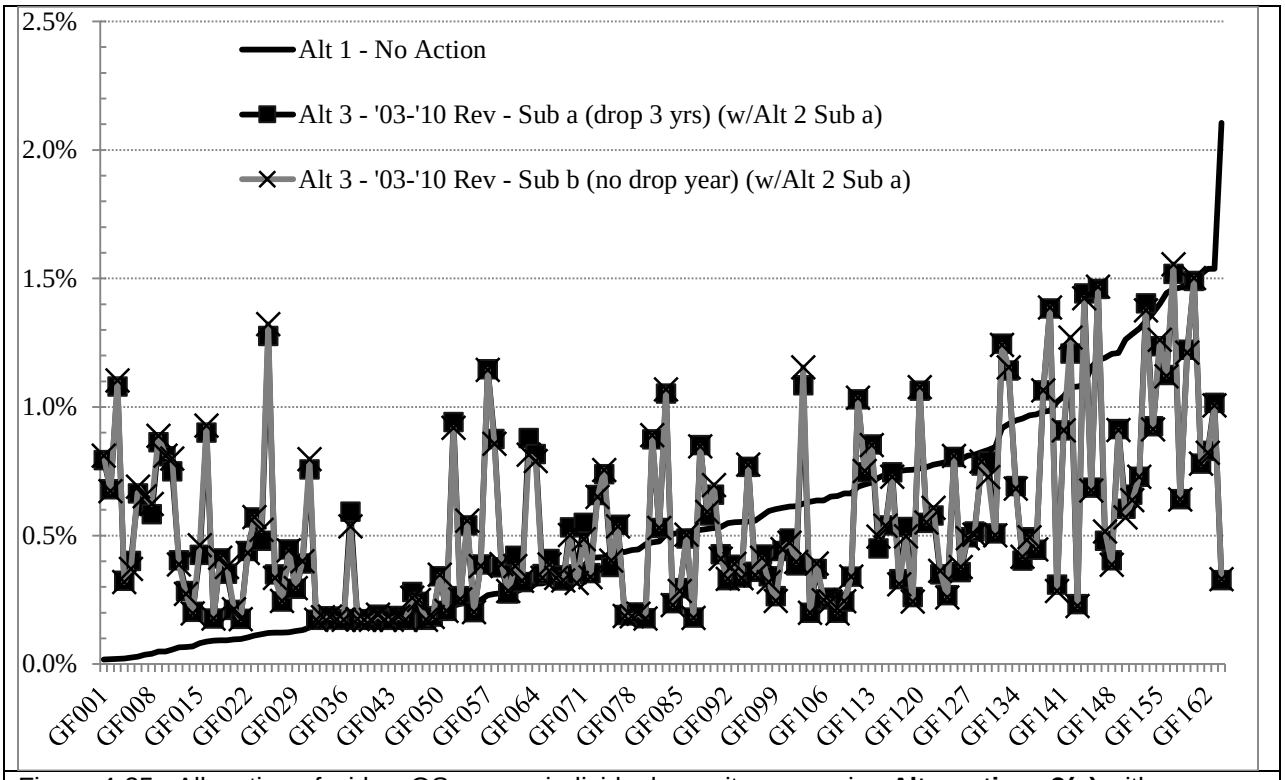

Figure 4-25. Allocation of widow QS among individual permits comparing **Alternatives 3(a)** with **Alternative 3(b)** (both with Alternative 2(a) allocations used for the widow landings-based portion).

Influence of Alternative 2 Suboption Choices on Alternative 3 Results

Since the Alternative 2 allocations are a component of Alternative 3, the Alternative 2 suboptions, which affect the amount of allocation credit given for whiting and nonwhiting trips, also influence the Alternative 3 results. However, the effect of the suboption choice on the amount of the allocation going for whiting trips is the same for both Alternative 2 and Alternative 3, i.e., under Alternative 2(a) the amount of widow QS allocated for whiting trips history is 8.9% and if Alternative 3 is selected in combination with Alternative 2(a), 8.9% will also be allocated based on whiting trip history. Similarly suboption b of Alternative 2 results in a 4.0 percent widow QS allocation based on whiting trips regardless of whether it is selected as part of Alternative 2 or selected as part of the specification under

Alternative 3. The effect of the Alternative 2 suboption choice on the results for Alternative 3 are depicted in Figure 4-26.

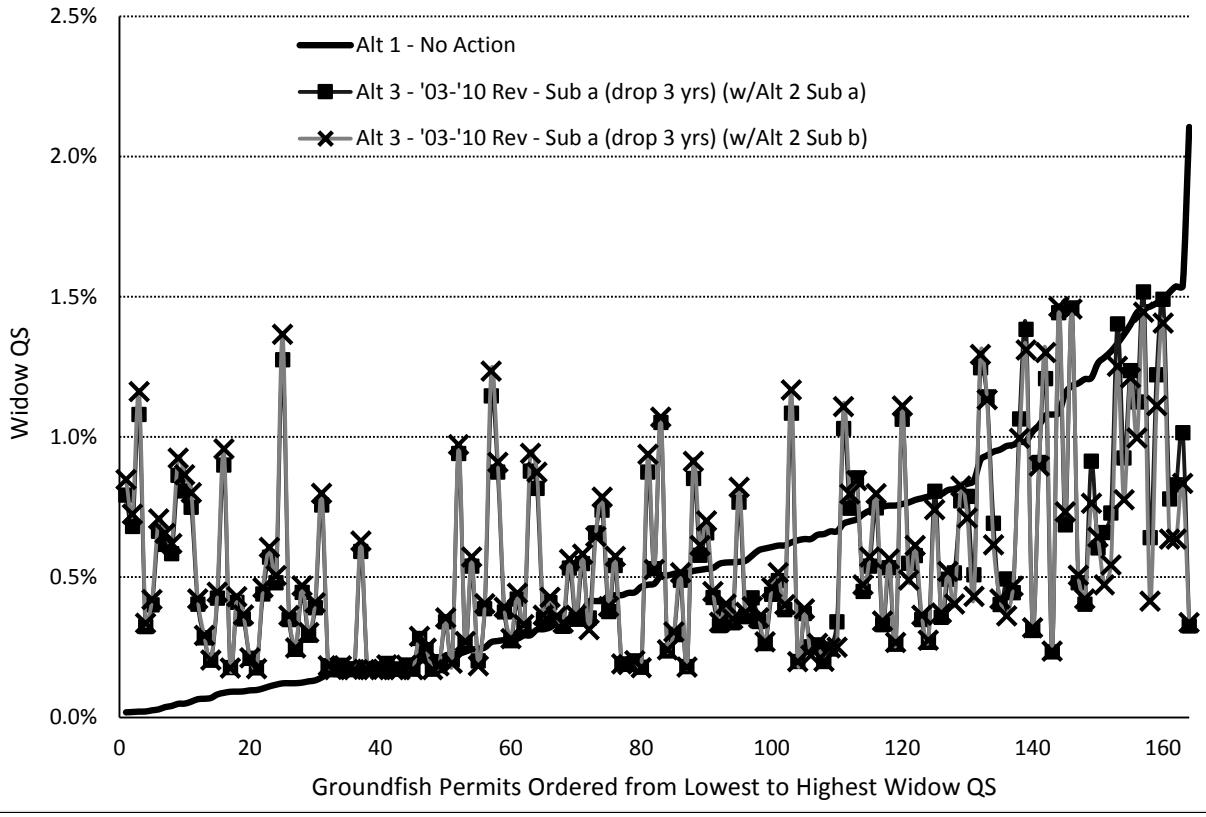

Figure 4-26. Allocation of QS among individual vessel **LE permits** comparing **Alternatives 3(a) (**with Alternative 2(a) as the base) to Alternative 3(a) (with Alternative 2(b) as the base).

Influence of Alternative 2 Suboption Choices on Alternative 4 Results

While the effect of the choice of Alternative 2 suboption on the whiting/nonwhiting split of the widow QS allocation is the same regardless of whether the suboption choice was made under Atlernative 2 or Alternative 3, under Alternative 4 the effect is different because the amount of QS being reallocated is only 30 percent of the total. The total amounts allocated based on whiting and nonwhiting history under the suboptions are displayed in Table 4-11. The pattern of differences in individual allocations between Alternative 4 with Alternative 2 suboption a and Alternative 4 with Alternative 2 suboption b are the same as the pattern between Alternative 2 suboption a and Alternative 2 suboption b, but the amplitude of differences is less since only about 30% of the QS is being reallocated under Alternative 4 (compare Figure 4-27 to Figure 4-22).

Table 4-11. Amount of widow QS allocated under Alternative 4 on the basis of whiting and nonwhiting catch history.

	Alternative 4 combined with	
	Alternative 2 Suboption a	Alternative 2 Suboption b
Whiting allocation portion	22.3%	20.8%
Portion based on nonwhiting catch	58.7%	59.8%

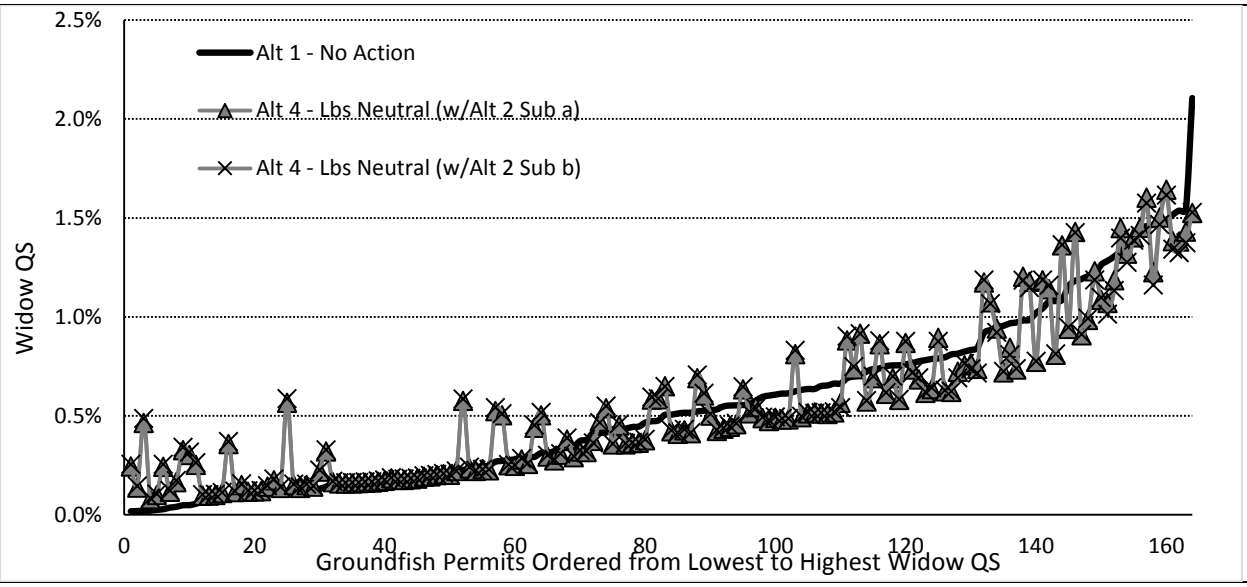

Figure 4-27. Allocation of QS among individual vessel **LE permits** comparing **Alternative 4 (**with Alternative 2(a) as the base) to **Alternative 4** (with Alternative 2(b) as the base).

4.3.1(a)(2) Impacts on Vessel Owners

4.3.1(a)(2)(i) *No Action (Alternative 1)*

Under the no action alternative it is likely that the QP issued to holders of QS will find its way to vessels interested in targeting on widow, through various channels, including the market to vessels (see discussion in Section 4.1.1).

Owners of vessels that participate in the trawl fishery rely on income from the fishery to sustain their businesses. That income may come either through leasing their vessels out to harvesting operations or using the vessels themselves as part of their own harvest operation.

There appear to be 17 vessels registered to limited entry permits for which a direct link to a QS account cannot be established by an examination of owner names, addresses, and other publically available information (there may be other confidential information available which could be used to establish links but that information is not used in this analysis, see fifth row of Table 4-12). These 17 vessels may be reliant on transfers of QP on the market or other business arrangements.

Of 151 QS accounts, 119 appear to be associated with entities that also own vessels, 17 of which are also first receivers (Table 4-12). An additional 5 QS accounts are associated with first receivers for which an ownership link to a vessel is not apparent. This leaves 27 accounts with no apparent link to vessels or first receivers. These are the accounts most likely to be a source of QP for vessels not associated with QS accounts. About 25% of the widow QS is held in these accounts, which are controlled by 27 entities, however a majority of these accounts have no widow QS.

Table 4-12. Asset holding of business entities by mix of holdings.

Holdings of Business Entities	Number of Entities	Number of Vessels	Number of First Receiver Licenses	Number of QS Accounts	Widow QS
QS Accounts Vessels	74	102	n/a	102	59%
QS Accounts Vessels First Receivers Licenses	4	17	10	17	6%
QS Accounts First Receivers Licenses	4	n/a	11	5	0.1%
QS Accounts Only	27	n/a	n/a	27	25%
Vessel Only	15	**17**	n/a	n/a	n/a
First Receiver Only	14	n/a	21	n/a	n/a
First Receiver and Vessel	1	1	1	n/a	n/a
	139	137	43	**151**	90%

a/ Not included in this table are 9 entities owning first receiver sites but not first receiver licenses or other fishing assets and one entity that owns a trawl limited entry permit but not a vessel, QS account, or first receiver site or license.

4.3.1(a)(2)(ii) ***Action Alternatives (Alternatives 2, 3 and 4)***

Overall, the action alternatives will reduce the amount of QS held by entities for which a link to a vessel or first receiver could not be established based on an examination of publically available records; and, concurrently, the owners of QS accounts associated with vessels and first receivers will generally experience an increase in their widow QS under the action alternatives (Table 4-13).

The impact on QP prices from of this shift in the ownership of QS is uncertain. On the one hand, the increased amount of QP demanded by vessels without QS should be offset by a decrease in the amount of QP demanded by vessel owners and first receivers with QS accounts, resulting in a potentially neutral effect on QP prices. On the other hand, if those who own QS accounts and vessels or first receivers are generally less willing to sell QP at a given price than individuals that only have QS accounts then market price may increase with the reallocations. If QP prices were to increase as a result of the reallocation, there would be some negative impact on the profits on the owners of vessels which do not have their own QP account. This would impact the 15 owners of 17 vessels that do not also own QS accounts to the degree that they fish their own vessels (as opposed to leasing their vessels out). If any of these owners lease their vessels out the lease prices might be impacted. However, overall, widow is likely to constitute a relatively small amount of an entities overall fishing activity, as reflected in Figure 4-4 which shows exvessel value equivalents of widow allocations relative to the exvessel value equivalents of QS allocations for all species. Thus the level of dependence on widow QS is likely relatively low.

Table 4-13. Widow QS allocations to QS accounts associated and not associated with vessels, by alternative.

Holdings of Business Entities	Number of Entities	Alt 1	Alt 2 SubOpt a	Alt 2 SubOpt b	Alt 3 SubOpt a (With Alt 2--SubOpt a)	Alt 4 (With Alt 2--SubOpt a)
QS Accounts Vessels	74	58.9%	65.3%	64.9%	64.5%	60.9%
QS Accounts Vessels First Receivers Licenses	4	6.0%	6.5%	6.5%	7.1%	6.2%
QS Accounts First Receivers Licenses	4	0.1%	0.2%	0.2%	0.4%	0.2%
QS Accounts Only	27	24.9%	17.9%	18.4%	18.0%	22.8%

4.3.1(a)(3) Impacts on Captains and Crew

4.3.1(a)(3)(i) *No Action (Alternative 1)*

Captain and crew generally are generally paid shares based on vessel revenue. This is expected to continue under status quo, with those who are on vessels that target widow rockfish benefiting from the increased widow ACLs as QP is transferred to those vessels.

4.3.1(a)(3)(ii) *Action Alternatives (Alternatives 2, 3 and 4)*

Under the action alternatives, there would be some redistribution of QS and those working on vessels will likely be benefited or adversely affected depending on the QS holdings of the harvesting businesses that control the vessels on which they work. Under Alternative 2, those most likely to be advantaged are those working on vessels associated with QS accounts which have a strong landing history in the 1994-2002 widow rockfish fishery (the accounts that were generated from permits having a strong history) or, under Alternative 3, a historic landing history and strong more recent (2002-2010) revenue.

4.3.1(b) *Divestiture Deadline Delay Suboptions – Widow QS*

See NMFS report and supplemental materials.

4.3.1(c) *Divestiture Deadline Delay Suboptions - Nonwhiting QS*

See NMFS report and supplemental materials.

4.3.2 Tribal Sector

The tribal fishery harvests widow rockfish, however, no mechanism has been identified by which tribal management, harvest, and marketing is not expected to be impacted by the any of the alternatives.

4.3.3 Recreational Fishery

As discussed briefly in Section 3.3.3, the recreational fishery takes only minimal amounts of widow rockfish and no mechanism has been identified by which the recreational fishery would be impacted by the alternatives.

4.3.4 First Receivers and Processors

4.3.4(a) *Allocation Formula Alternatives*

4.3.4(a)(1) No Action (Alternative 1)

Under the no action alternative there would continue to be a fluctuation in deliveries between ports and consequently, first receivers, as described in Section 4.1.2. First receivers with multiple sites are less likely to be impacted by these fluctuations.

4.3.4(a)(2) Action Alternatives

Some first receivers, received an initial allocation of widow QS because they owned limtied entry trawl permits. These first receivers will be directly impacted by the reallocation alternatives. Initial allocations and the change that would be expected under each alternative is provided in Table 4-14. The exvessel value equivalent of these QS allocation is provided in Table 4-15.

The allocation among harvesters may indirectly impact first receivers operating in the community to which those harvesters prefer to deliver and first receivers with sites in only one port will be more impacted than those with sites in multiple ports. Geographic redistribution among ports and the exvessel value equivalent of those reallocations are provided in Table 4-16 and Table 4-17, respectively. Exvessel value equivalents will fluctuate as exvessel prices and the ACLs for widow rockfish fluctuate.

Table 4-14. Total amount of QS reallocated among first receivers under each suboption, relative to no action.

		Change in Allocations			
	Alt 1 (No Action)	Reallocation Alt 2 Suboption a	Reallocation Alt 2 Suboption b	Reallocation Alt 3 Suboption a[a/]	Reallocation Alt 4[a/]
First Receivers with Single Sites (2 entities)	2.1%	-0.2%	-0.3%	-0.5%	-0.1%
First Receivers with Multiple Sites (2 entities)	4.0%	0.8%	0.9%	1.9%	0.2%
Total	6.2%	0.6%	0.6%	1.4%	0.2%

a/ Alternatives 3 and 4 are modelled using Alternative 2 Suboption a.

Table 4-15. Exvessel value equivalent[a/] of allocations for first receivers for widow QS under status quo and projected changes under each alternative.

		Change in Allocations (Exvessel Value Equivalent of Change)			
	Alt 1 (No Action)	Reallocation Alt 2 Suboption a	Reallocation Alt 2 Suboption b	Reallocation Alt 3 Suboption a[b/]	Reallocation Alt 4[b/]
First Receivers with Single Sites	28,795	-2,742	-4,114	-6,856	-1,371
First Receivers with Multiple Sites	54,848	10,970	12,341	26,053	2,742
Total	85,014	8,227	8,227	19,197	2,742

a/ Calculated using 2013 average widow rockfish exvessel price and 2015 trawl allocation.
b/ Alternatives 3 and 4 are modelled using Alternative 2 Suboption a.

4.3.4(b) *Divestiture Deadline Delay Suboptions -- Widow QS*

See NMFS report and supplemental materials.

4.3.4(c) *Divestiture Deadline Delay Suboptions - Nonwhiting QS*

See NMFS report and supplemental materials.

4.3.5 Observer Providers and Other Support Sectors

No mechanism has been identified by which observer providers or other support sectors would be impacted by the alternatives.

4.3.6 Fishing Communities

4.3.6(a) *Allocation Formula Alternatives*

4.3.6(a)(1) No Action (Alternative 1)

As discussed in Section 4.1.2, substantial shifts in the distribution of landings is occurring under status quo. Such shifts are likely to continue to occur in response to changing ocean availability of the stock, market conditions and distribution of infrastructure.

4.3.6(a)(2) Action alternatives

As discussed in Section 4.1.2, over the long term the reallocation of QS is not expected to substantially affect the distribution of landings relative to status quo but there may be some short term variations if those receiving the allocations run their own harvesting or processing operations (and hence are more likely to use the QS in the areas of their own operations). At the same time, the variations among ports resulting from QS reallocation are likely to be smaller than some of the inter port variations in landings observed to date (see Section 4.1.2). The allocations will directly impact the distribution of wealth among participants in various communities, indirectly impacting the communities. The QS redistributions are provided in Table 4-16. The exvessel revenue equivalents are provided in Table 4-17. In the context of fishery activity and overall economic activity, the values represented in Table 4-17 are likely relatively small and more significant for the individual QS recipient. However, exvessel value equivalents will fluctuate as exvessel prices and the ACLs for widow rockfish fluctuate.

Table 4-16. Allocations based on registered community of residence for widow QS under status quo and projected changes under each alternative.

Communities	Reallocation Alt 1 (No Action)	Projected Changes in Allocations (QS Change)			
		Reallocation Alt 2 Suboption a	Reallocation Alt 2 Suboption b	Reallocation Alt 3 Suboption a[a/]	Reallocation Alt 4[a/]
Bellingham	1.89%	+1.24%	+1.23%	+1.38%	+0.37%
Seattle	9.11%	+2.03%	+1.80%	-0.22%	+0.61%
Grays Harbor	2.76%	-0.63%	-0.93%	-0.88%	-0.19%
Ilwaco-Willapa Bay	1.85%	+0.52%	+0.67%	+1.09%	+0.16%
Astoria	7.56%	-1.89%	-1.56%	-0.02%	-0.57%
Tillamook	2.37%	+0.61%	+0.68%	+0.33%	+0.18%
Newport	20.92%	-0.66%	-2.05%	-4.03%	-0.20%
Coos Bay	6.28%	+6.28%	+6.78%	+7.39%	+1.89%
Brookings	2.66%	+3.61%	+3.64%	+3.51%	+1.08%
Crescent City	0.16%	+0.31%	+0.34%	+0.66%	+0.09%
Eureka	0.99%	+2.20%	+2.36%	+2.50%	+0.66%
Fort Bragg	6.30%	-2.83%	-2.62%	-1.77%	-0.85%
Bodega Bay	0.33%	+0.26%	+0.30%	+0.34%	+0.08%
San Francisco	3.94%	-1.79%	-1.65%	-1.50%	-0.54%
Monterey	12.60%	-8.61%	-8.33%	-7.99%	-2.59%
Morro Bay	0.81%	-0.63%	-0.62%	-0.32%	-0.19%
Other Non-Coastal	9.47%	-0.02%	-0.04%	-0.48%	-0.01%
Total Reallocation Among Ports		17.1%	17.8%	17.2%	5.1%

a/ Alternatives 3 and 4 are modelled using Alternative 2 Suboption a.

Table 4-17. Exvessel value equivalent of allocations based on registered community of residence for widow QS under status quo and projected changes under each alternative.

Communities	Reallocation Alt 1 (No Action)	Projected Changes in Allocations (Exvessel Value Equivalent of Change)			
		Reallocation Alt 2 Suboption a	Reallocation Alt 2 Suboption b	Reallocation Alt 3 Suboption a[b/]	Reallocation Alt 4[b/]
Bellingham	25,908	16,996	16,931	18,936	5,106
Seattle	124,859	27,815	24,625	-3,061	8,356
Grays Harbor	37,858	-8,583	-12,774	-12,062	-2,579
Ilwaco-Willapa Bay	25,418	7,138	9,121	14,915	2,144
Astoria	103,636	-25,960	-21,323	-278	-7,799
Tillamook	32,458	8,398	9,311	4,493	2,523
Newport	286,881	-9,003	-28,081	-55,277	-2,705
Coos Bay	86,099	86,147	92,977	101,372	25,881
Brookings	36,509	49,433	49,923	48,181	14,851
Crescent City	2,150	4,200	4,645	9,015	1,262
Eureka	13,629	30,210	32,388	34,291	9,076
Fort Bragg	86,410	-38,828	-35,913	-24,214	-11,665
Bodega Bay	4,579	3,588	4,121	4,633	1,078
San Francisco	53,991	-24,585	-22,687	-20,507	-7,386
Monterey	172,705	-118,034	-114,286	-109,520	-35,460
Morro Bay	11,113	-8,643	-8,454	-4,357	-2,597
Other Non-Coastal	129,869	-288	-521	-6,558	-86
Total	1,234,075				

a/ Calculated using 2013 average widow rockfish exvessel price and 2015 trawl allocation.
b/ Alternatives 3 and 4 are modelled using Alternative 2 Suboption a.

4.3.6(b) *Divestiture Deadline Delay Suboptions - Widow QS*

Divestiture delay suboptions are not expected to have noticiable implications for communities.

4.3.6(c) *Divestiture Deadline Delay Suboptions - Nonwhiting QS*

Divestiture delay suboptions are not expected to have noticiable implications for communities.

4.3.7 Government Entities

4.3.7(a) *Allocation Formula Alternatives*

4.3.7(a)(1) No Action (Alternative 1)

No change relative to baseline. Publish rule/notice to commence trading of widow QS.

4.3.7(a)(2) Action alternatives

The action alternatives will entail some additional Federal governing costs to promulgate regulations, modify software, cleanup data sets, and reissue quota. States may receive requests from fishermen regarding their data. Alternative 3 may involve more data cleanup than the other alternatives because it entails a time period not covered under the previous Amendment 20 allocation formula. Additionally, the action alternatives will require action to delay divestiture.

4.3.7(b) *Divestiture Deadline Delay Suboptions - Widow QS*

See NMFS report and supplemental materials.

4.3.7(c) *Divestiture Deadline Delay Suboptions - Nonwhiting QS*

See NMFS report and supplemental materials.

4.4 Cumulative Impacts

A cumulative effects analysis is required by the Council on Environmental Quality (CEQ) (40 CFR part 1508.7). The purpose of a cumulative effects analysis is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective, but rather, the intent is to focus on those effects that are truly meaningful. A formal cumulative impact assessment is not necessarily required as part of an EA under NEPA as long as the significance of cumulative impacts has been considered (U.S. EPA 1999). The following addresses the significance of the expected cumulative impacts as they relate to the federally-managed groundfish fishery.

4.4.1 Consideration of the Affected Resources

In Chapter 3 (Description of the Affected Environment), the affected resources that exist within the fishery environment of Target and Non-Target species are identified. Therefore, the significance of the cumulative effects will be discussed in relation to these affected resources listed below.

1. Physical Environment, including EFH and Ecosystems.

2. Biological Resources, including:
- Groundfish Target Species,
- Non-target Fish Species,
- Protected Fish Species, including ESA, and
- Marine Mammals and Seabirds.

3. Socioeconomic Environment, including harvesters, first receivers, communities, observer providers and government.

4.4.2 Geographic Boundaries

The analysis of impacts focuses on actions related to the harvest of widow rockfish in directed midwater trawl fisheries and as bycatch in bottom trawl and the shorebased midwater trawl whiting fisheries. Pacific whiting and pelagic rockfish complex species. The core geographic scope for each of the affected resources listed above is focused on the Eastern Pacific Ocean (Chapter 3), and in particular within the range of widow rockfish described in Section 3.2.3(a) that is part of the EEZ and state waters off of Washington, Oregon, and California. The core geographic scope for endangered and protected resources can be considered the overall range of these resources in the Eastern Pacific Ocean. For human communities, the core geographic boundaries are defined as those U.S. fishing communities directly involved in the harvest or processing of the managed resources, which were found to occur in coastal states.

4.4.3 Temporal Boundaries

The temporal scope of past and present actions for the affected resources is primarily focused on actions that have occurred after FMP implementation (1982) and more importantly, since implementation of the trawl rationalization program in 2011. For endangered species and other protected resources, the scope of past and present actions is on a species-by-species basis (Section **Error! Reference source not found.**) and is largely focused on the 1980s and 1990s through the present, when NMFS began generating stock assessments for marine mammals and sea turtles that inhabit waters of the U.S. EEZ. The temporal scope of future actions for all affected resources extends about three years into the future. This period was chosen because the dynamic nature of resource management for this species and lack of information on projects that may occur in the future make it very difficult to predict impacts beyond this timeframe with any certainty.

4.4.4 Actions Other than the Proposed Action

4.4.4(a) *Past, Present, and Reasonably Foreseeable Future Actions*

4.4.4(a)(1) Fishery-related Actions

The historical management practices of the Council have resulted in positive impacts on the health of widow rockfish. Numerous actions have been taken to manage the fisheries for these species through amendment and specifications actions. In addition, the nature of the fishery management process is intended to provide the opportunity for the Council and NMFS to regularly assess the status of the fisheries and to make necessary adjustments to ensure that there is a reasonable expectation of meeting the objectives of the FMP and the targets associated with any rebuilding programs under the FMP. The statutory basis for Federal fisheries management is the Magnuson-Stevens Act. To the degree with which this regulatory regime is complied, the cumulative impacts of past, present, and reasonably foreseeable future Federal fishery management actions on the affected resources should generally be associated with positive long-term outcomes. Constraining fishing effort through regulatory actions can often have negative short-term socioeconomic impacts. These impacts are usually necessary to bring about long-term sustainability of a given resource, which should, in the long term, promote positive effects on human communities, especially those that are economically dependent upon widow rockfish as target species or as incidental catch in pursuit of other target fisheries (such as midwater whiting and bottom trawl fisheries).

In addition, NMFS has approved harvest specifications for 2015 and 2016 for groundfish stocks and the Council will soon begin developing harvest specifications for 2017 and 2018. Ini 2015 and 2016 ACLs for some pelagic rockfish species (yellowtail and widow rockfish) are being increased, in particular for widow rockfish, since it has been declared recovered from overfishing. Whiting are a shorter lived species for which harvest levels fluctuate more widely on an interannual basis. NMFS has approved for 2015-2016 a 33 percent increase in the ACLs for widow rockfish and a 140 percent increase for yellowtail rockfish, the two primary pelagic species targeted with midwater trawl gears. Changes to the whiting ACLs will not be recommended until the start of 2015.

The ACL levels recommended by the Council in the 2015-2016 harvest specifications are expected to bring an increase in benefits for the fishing industry. Additional actions are outlined in the following section. Together, they are expected to have a synergistic effect, contributing further to the original goals and objectives set out for the trawl rationalization program in Amendment 20.

Trawl Rationalization Trailing Actions

The Council and NMFS continue to work together on the trawl rationalization trailing actions. All of these actions are expected to increase benefits from the fishery. Details on each action are available on the Council website http://www.pcouncil.org/groundfish/fishery-management-plan/trailing-actions/. The main trailing actions are as follows:

Trawl/Fixed gear permit stacking. This action allows fixed gear and trawl permits to be registered to the same vessel at the same time. Implementation is expected in the spring of 2016.

Observer/Catch Monitoring Rule. At its April 2012 meeting, the following additional NMFS-proposed trailing actions were approved for implementation. NMFS published a proposed rule for these actions (public comment deadline ended March 21, 2014). A final rule is expected in the spring of 2015.

- Implementation of certification and de-certification requirements for observer providers
- Numerous revisions to details of the observer program provisions
- Revision to briefing periods in catch monitor certification requirements

Continue Adaptive Management Program Pass-through. The current pass-through of the QP allocated for the QS set-aside for the adaptive management program (10 percent of the nonwhiting QS) was set to expire at the end of 2014. The Council has recommended a rule to continue that pass-through until after the trawl catch share program review. The final rule published December 17, 2014 (79 FR 75070).

Trawl Catch Share Program Review. The Council decided that it will commence its first review of the catch share program in November 2016.

Elimination of the Prohibition on Whiting At-sea Processing South of 42º N. latitude. During its next EFP cycle, the Council may consider issuing EFPs to allow this activity.

Gear Issues (under Council consideration, deliberations delayed). Gear issues include multiple gears on a trip, gear modifications to increase efficiency, and restrictions on areas in which gears may be used. The final chafing gear regulation to allow for increased codend coverage on midwater trawl nets was published on December 2, 2014.

Cost Recovery. Cost recovery was implemented in 2014, resulting in the collection of fees that may vary each year and are a percent of ex-vessel value of groundfish. The fees for 2014 were 3 percent of ex-vessel value for the shorebased fishery and lesser amounts for the at-sea fisheries. For details see: Compliance Guide Pacific Coast Groundfish Trawl Rationalization Program, Cost Recover (http://www.westcoast.fisheries.noaa.gov/publications/fishery_management/groundfish/public_notices/cost-recovery-compliance-guide.pdf). In the context of this additional cost, alternatives which alleviate production costs or allow for the generation of more net revenue may be more beneficial to stability in the industry than would be the case if costs were otherwise expected to remain stable.

Quota Share/Quota Pound (QS/QP) Control Rules – Safe Harbors for Risk Pools. At its September 2011 meeting, the Council recommended providing risk pools a safe harbor from the QS control rules. At its September 2013 meeting, the Council agreed that implementation of this recommendation could wait until the five-year program review.

Surplus QP Carryover. As part of its action on the 2013-2014 specifications, the Council adopted an interim solution to partially address full implementation of the surplus carryover provision for nonwhiting species. The Council requested further analysis and development of options to ensure that, in the long term, the surplus carryover provisions can be implemented with greater certainty. Whiting is scheduled to be addressed after the trawl catch share program review that is scheduled for November 2016.

Whiting Cleanup Rule. The cleanup rule is expected to define a whiting trip as any trip with more than 50 percent whiting by weight (consistent with Amendment 20), provide rules for the disposition of prohibited species retained in the maximized retention fishery, and restrict the use of midwater gear in the RCAs to the area north of 40° 10'. It will interact with this rule in that the season opening specified here as a whiting season opening that allows the use of midwater gear for any species will be re-specified as an opening for the use of midwater gear to target whiting and an opening for the use of midwater gear to

target nonwhiting species (mainly pelagic rockfish). The dates for both of these openings will be changes to comport with the alternative adopted pursuant to the decision which this EA supports. Implementation of the whiting cleanup rule is expected in 2015.

Electronic Monitoring. EM (cameras) may be proposed as a replacement for the 100-percent observer coverage requirement. This proposal will be evaluated for use in the shorebased whiting fishery under EFP conditions beginning in 2015. EM policy has been under Council development since 2011 (http://www.pcouncil.org/groundfish/trawl-catch-share-program-em/). Some participants in the IFQ program have reported difficulties in securing observers in a timely or consistent manner, so vessels may prefer the flexibility to turn on an EM (or video monitoring) system and leave port immediately versus waiting for an observer (ibid). The EM system would perform the function of monitoring compliance with IFQs. Therefore, EM is being explored as a flexible and economically viable substitute for the use of human observers in the trawl catch share program. EM is planned to be implemented on an experimental basis in the directed shorebased whiting fishery in 2015.

Vessel owners or their representatives will be required to apply for and receive an EFP from NMFS, which will specify the conditions under with EM equipment may be used to monitor their fishing operations to document fishery discards. At its September 2014 meeting, the Council selected its final preferred alternatives for an EM program EFP for the Pacific coast limited entry trawl groundfish fishery catch shares program beginning in 2015 (http://www.pcouncil.org/wp-content/uploads/blog_tables_Final_Preferred_Alts_FINAL.pdf).

Fishery Ecosystem Plan

The Fishery Ecosystem Plan (FEP) is a living document, which means that the Council plans to regularly amend and update it. The current FEP was adopted by the Council in April 2013 (see: http://www.pcouncil.org/wp-content/uploads/FEP_FINAL.pdf). The FEP is meant to be an informational document. It is not meant to be prescriptive relative to Council fisheries management. Information in the FEP, results of the Integrated Ecosystem Assessment, and the Annual State of the California Ecosystem Report may be available for consideration during the routine management processes for fisheries managed in each FMP. How exactly these items will affect fishery management decisions is at the discretion of the Council.

At its March 2015 meeting the Council is scheduled to consider final adoption of an FEP and accompanying amendments to each of its FMPs, including Amendment 25 to the groundfish FMP. Amendment 25 will restrict future development of fisheries for the suite of ecosystem component species shared between all four FMPs (groundfish, salmon, CPS, and HMS) until and unless the Council has had an adequate opportunity to both assess the scientific information relating to any proposed directed fishery and consider potential impacts to existing fisheries, fishing communities, and the greater marine ecosystem. Those ecosystem component species shared between all four FMPs are as follows: round herring, thread herring, mesopelagic fishes (families: *Myctophidae*, *Bathylagidae*, *Paralepididae*, and *Gonostomatidae*), Pacific sand lance; Pacific saury, silversides, smelts, and pelagic squids (families: *Cranchiidae*, *Gonatidae*, *Histioteuthidae*, *Octopoteuthidae*,*Ommastrephidae* (except Humboldt squid, *Dosidicus gigas*),*Onychoteuthidae*, and *Thysanoteuthidae*).

Area Modifications (EFH and RCAs)

Starting at its April 2015 meeting, the Council will be considering modifications to RCA lines and activity restrictions concurrent with its deliberations on an EFH amendment to the groundfish FMP.

4.4.4(a)(2) Non-fishing Actions

Non-fishing activities that introduce chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment pose a risk to all of the identified affected resources. Human-induced non-fishing activities tend to be localized in nearshore areas and marine project areas where they occur. Examples of these activities include, but are not limited to, agriculture, port maintenance, coastal development, marine transportation, marine mining, dredging, and the disposal of dredged material. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality, and may indirectly constrain the sustainability of the managed resources, non-target species, and protected resources. Decreased habitat suitability would tend to reduce the tolerance of these species to the impacts of fishing effort. Mitigation of this outcome through regulations that would reduce fishing effort could then negatively impact human communities. The overall impact to the affected species and their habitats on a population level is unknown, but likely neutral to low negative, since a large portion of these species have a limited or minor exposure to these local non-fishing perturbations.

For many of the proposed non-fishing activities to be permitted under other Federal agencies (such as offshore energy facilities, etc.), those agencies would conduct examinations of potential impacts on the affected resources. The Magnuson-Stevens Act (50 CFR 600.930) imposes an obligation on other Federal agencies to consult with the Secretary of Commerce on actions that may adversely affect EFH. The eight regional fishery management councils are engaged in this review process by making comments and recommendations on any Federal or state action that may affect habitat, including EFH, for their managed species, and by commenting on actions likely to substantially affect habitat, including EFH. In addition, under the Fish and Wildlife Coordination Act (Section 662), “whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the U.S., or by any public or private agency under Federal permit or license, such department or agency first shall consult with the U.S. Fish and Wildlife Service (USFWS), Department of the Interior, and with the head of the agency exercising administration over the wildlife resources of the particular state wherein the” activity is taking place. This act provides another avenue for review of actions by other Federal and state agencies that may impact resources that NMFS manages in the reasonably foreseeable future. In addition, NMFS and the USFWS share responsibility for implementing the ESA. ESA requires NMFS to designate "critical habitat" for any species it lists under the ESA (i.e., areas that contain physical or biological features essential to conservation, which may require special management considerations or protection) and to develop and implement recovery plans for threatened and endangered species. The ESA provides another avenue for NMFS to review actions by other entities that may impact endangered and protected resources whose management units are under NMFS’ jurisdiction.

The effects of climate on the biota of the California Current ecosystem have been recognized for some time. The El Niño/Southern Oscillation (ENSO) is widely recognized to be the dominant mode of inter-annual variability in the equatorial Pacific, with impacts throughout the rest of the Pacific basin and the globe. During the negative (El Niño) phase of the ENSO cycle, jet stream winds are typically diverted northward, often resulting in increased exposure of the Pacific Coast of the U.S. to subtropical weather systems. The impacts of these events to the coastal ocean generally include reduced upwelling winds, deepening of the thermocline, intrusion of offshore (subtropical) waters, dramatic declines in primary and secondary production, poor recruitment, reduced growth and survival of many resident species (such as salmon and groundfish), and northward extensions in the range of many tropical species. Concurrently, top predators such as seabirds and pinnipeds often exhibit reproductive failure. In addition to inter-annual variability in ocean conditions, the North Pacific seems to exhibit substantial inter-decadal variability, which is referred to as the Pacific (inter) Decadal Oscillation.

Within the California Current itself, Mendelssohn, et al. (2003) described long-term warming trends in the upper 50 to 75 m of the water column. Recent paleoecological studies from marine sediments have indicated that 20th century warming trends in the California Current have exceeded natural variability in ocean temperatures over the last 1,400 years. Statistical analyses of past climate data have improved our understanding of how climate has affected North Pacific ecosystems and associated marine species productivities. Our ability to predict future impacts on the ecosystem stemming from climate forcing events remains poor at best.

4.4.5 Magnitude and Direction of Past, Present, and Reasonable Foreseeable Future Actions

In determining the magnitude and significance of the cumulative effects, the additive and synergistic effects of the proposed action, as well as past, present, and future actions, must be taken into account. The following section first presents the effects of past, present, and reasonably foreseeable future actions on each of the managed resources. This is followed by a discussion on the synergistic effects of the proposed action, as well as past, present, and reasonably foreseeable future actions (Section 4.4.7.).

4.4.5(a) *Physical Environment, including Habitat and Ecosystem*

Those past, present, and reasonably foreseeable future actions, whose effects may impact habitat (including EFH) and the direction of those potential impacts, are listed in Table 4-18, below. The direct and indirect negative impacts are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on habitat is expected to be limited (low) due to a lack of exposure to habitat at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on habitat and EFH is unquantifiable. As described above, NMFS has several means under which it can review non-fishing actions of other Federal or state agencies that may impact NMFS' managed resources and the habitat on which they rely prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of direct and indirect negative impacts those actions could have on habitat utilized by resources under NMFS' jurisdiction.

Table 4-18. Summary of the effects of past, present, and reasonably foreseeable future actions on habitat.

Action	**Past to the Present**		**Reasonably Foreseeable Future**
Original FMP and subsequent Amendments to the FMP	**Indirect Positive**		
Agricultural runoff	**Direct Negative - nearshore areas**		
Port maintenance	**Uncertain – Likely Direct Negative - nearshore areas**		
Offshore disposal of dredged materials	**Direct Negative - project area**		
Marine transportation	**Direct Negative - primarily in marine traffic corridors**		
Installation of pipelines, utility lines and cables	**Uncertain – Likely Direct Negative - project area**		
Offshore Energy Facilities (wind, tidal, etc.)			**Potentially Direct Negative - project area**
2015-2016 Biennial Harvest Specifications			**Positive**
Trawl Rationalization Trailing Actions			**Uncertain – Likely Direct and Positive**
Summary of past, present, and future actions excluding those proposed in this document	**Overall, actions have had, or will have, neutral to positive impacts on habitat, including EFH**		

Past fishery management actions taken through the FMP process have had a positive cumulative effect on habitat and EFH. It is anticipated that the future management actions will result in additional direct or indirect positive effects on habitat through actions which protect EFH for federally-managed species and protect ecosystem services on which these species' productivity depends. These impacts could be broad in scope. All of the affected resources are interrelated; therefore, the linkages among habitat quality and EFH, managed resources and non-target species productivity, and associated fishery yields should be considered. For habitat and EFH, there are direct and indirect negative effects from actions which may be localized or broad in scope; however, positive actions that have broad implications have been, and it is anticipated will continue to be, taken to improve the condition of habitat. There are some actions such as coastal population growth and climate change (including related ocean acidification), which may indirectly adversely impact habitat and ecosystem productivity. Overall, the past, present, and reasonably foreseeable future actions affecting habitat have had a neutral to positive cumulative effect.

4.4.5(b) *Biological Environment*

Those past, present, and reasonably foreseeable future actions, and the direction of those potential impacts, are summarized in Table 4-19 below. The indirectly negative actions described in this table are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on the managed resources is expected to be limited due to a lack of exposure to the population at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on productivity of the managed resources is unquantifiable. As described above, NMFS has several means under which it can review non-fishing actions of other Federal or state agencies that may impact NMFS' managed resources prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on resources under NMFS' jurisdiction.

Table 4-19. Summary of the effects of past, present, and reasonably foreseeable future actions on biological resources.

Action	**Past to the Present**	**Reasonably Foreseeable Future**
Original FMP and subsequent Amendments to the FMP	**Indirect Positive**	
Agricultural runoff	**Indirect Negative - nearshore areas**	
Port maintenance	**Uncertain – Likely Indirect Negative - nearshore areas**	
Offshore disposal of dredged materials	**Indirect Negative - project area**	
Marine transportation	**Indirect Negative - primarily in marine traffic corridors**	
Installation of pipelines, utility lines and cables	**Uncertain – Likely Negative - project area**	
Offshore Energy Facilities (wind, tidal, etc.)		**Uncertain – Likely Indirect Negative - project area**
2015-2016 Biennial Harvest Specifications		**Indirect Positive**
Trawl Rationalization Trailing Actions		**Uncertain – mixed but most Indirect Positive**
Summary of past, present, and future actions excluding those proposed in this document	**Overall, actions have had, or will have, positive impacts on the biological resources**	

Past fishery management actions taken through the FMP have had a positive cumulative effect on the managed resources. It is anticipated that the future management actions, described in Table 4-19, will result in additional indirect positive effects on the managed resources through actions which reduce and monitor bycatch, protect habitat, and protect ecosystem services on widow rockfish and associated species productivities depend. In addition, past fishery management actions taken through the FMP process have mitigated the cumulative effect on ESA-listed and MMPA-protected species through implementation of gear requirements and area closures, as needed. It is anticipated that future management actions will result in positive effects on protected resources. The impacts of these future actions could be broad in scope, and it should be noted the biological resources are often coupled, in that they utilize similar habitat areas and ecosystem resources on which they depend. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to the biological resources have had a positive cumulative effect (high positive impact, relative to overexploitation).

4.4.5(c) *Socioeconomic Environment*

Those past, present, and reasonably foreseeable future actions, whose effects may impact the socioeconomic environment and the direction of those potential impacts, are summarized in Table 4-20 below. The indirectly negative actions described in this table are localized where they occur. Therefore, the magnitude of those impacts on the managed resources is expected to be limited due to a lack of exposure to the population at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on productivity of the managed resources is unquantifiable. As described above, NMFS has several means under which it can review non-fishing actions of other Federal or state agencies that may impact NMFS' managed resources prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on resources under NMFS' jurisdiction.

Past fishery management actions taken through the FMP have had high positive and some high short-term negative effects on the socioeconomic environment. The short-term negative effects are generally believed to be offset by the longer-term positive overall effects related to having a healthy and productive ocean environment, as compared to the situation of depleted resources and low productivity that would have been expected without those actions. It is anticipated that the future management actions, described in Table 4-20, will result in additional indirect high long-term positive effects to the socioeconomic environment through actions which achieve conservation objectives while providing a regulatory environment which allows the industry to maximize the socioeconomic value derivable from the resource.

Table 4-20. Summary of the effects of past, present, and reasonably foreseeable future actions on human communities.

Action	**Past to the Present**		**Reasonably Foreseeable Future**
Original FMP and subsequent Amendments to the FMP	**Indirect Positive**		
Agricultural runoff	**Indirect Negative - nearshore areas**		
Port maintenance	**Uncertain – Likely Mixed - nearshore areas**		
Offshore disposal of dredged materials	**Indirect Negative - project area**		
Marine transportation	**Mixed - primarily in marine traffic corridors**		
Installation of pipelines, utility lines and cables	**Uncertain – Likely Mixed - project area**		
Offshore Energy Facilities (wind, tidal, etc.)			**Uncertain – Likely Mixed project area**
2015-2016 Biennial Harvest Specifications			**Indirect Positive**
Trawl Rationalization Trailing Actions			**Uncertain – Likely Positive**
Summary of past, present, and future actions excluding those proposed in this document	**Overall, actions have had, or will have, positive impacts on human communities**		

4.4.6 Action Alternative Impacts on all of the Affected Resources

The following sections review the most important dynamic interactions between past, present, and reasonably foreseeable future actions and the alternatives. A summary is provided at the end.

4.4.6(a) *Physical Environment*

- Under the No Action Alternative, there may be some increase in impacts to the physical environment associated with increasing ACLs for widow and yellowtail rockfish which are targeted primarily with midwater trawl gear. There may also be changing impacts associated with the whiting fishery depending on the ACLs for future years (the ACL for 2015 will not be set until the spring of 2015).
- Relative to this, the reallocation of widow rockfish QS is not expected to increase impacts to the physical environment. Increased ACLs will expand allowable catches and therefore increased fishing opportunities. Any change in habitat impacts will would be the result of geographic redistribution of the quota. Such impacts are expected to short term and minor relative to the geographic fluctuations that appear to be induced by other influences.

4.4.6(b) *Biological Environment*

- Under the No Action Alternative, there may be some increase in impacts to the biological environment associated with increasing ACLs for yellowtail and widow rockfish, which are targeted with midwater trawl gear, and other increases and decreases to the ACLs which are anticipated to be implemented as part of the Council's recommendations for the 2015-2016 specifications. There may also be changing impacts associated with the whiting fishery depending on the ACLs for future years (the ACL for 2015 will not be set until the spring of 2015). ACL levels will also likely fluctuate when the 2017-2018 harvest specifications are implemented (the directions of such fluctuations will not be known until stock assessments are completed and policy choices made).
- Relative to this, the widow QS reallocations entailed in the Action Alternative are not expected to affect harvest of targeted species and hence not affect bycatch species. If there are some short-term geographic redistributions of harvest, bycatch rates might vary slightly. Catch and bycatch in the trawl fishery is carefully monitored. Total catch of IFQ species is controlled by the QS, the amounts of which will not be altered by the reallocation of QS. With respect to other bycatch adaptive response is possible if bycatch is higher than expected and becomes problematic from a conservation perspective.

4.4.6(c) *Socioeconomic Environment*

- Under the No Action Alternative, there are numerous trawl trailing actions in progress which are expected to enhance benefits from the rationalized fishery. This action is one of those. Together they are expected to have a synergistic effect contributing further to the original goals and objectives set out for the trawl rationalization program in Amendment 20.
- Relative to this, the trawl rationalization program implemented a system which achieved conservation objectives and included measures to mitigate any adverse socio-economic, impacts

including impacts on fairness and equity. One of those measures included in Amendment 20 called for the Council to consider redistribution of QS when an overfished stock becomes rebuilt (as described in Section 1.3). Since widow rockfish is now rebuilt, an action alternative on widow QS reallocation is being considered pursuant to that equity consideration. The measure may also have some minor benefits in reducing transaction costs if QS is reallocated to those who would otherwise be buying the QS to re-establish their historic widow rockfish targeting strategies.

4.4.6(d) *Summary*

The action alternatives described in Section 2.1. The magnitude and significance of the cumulative effects, which include the additive and synergistic effects of the proposed action, as well as past, present, and reasonably foreseeable future actions, are discussed throughout this section.

Impacts to the physical environment are projected to be neutral compared to the No Action Alternative (Table 4-21). The main impact of present actions that may affect the degree of impacts of the Action Alternative and the No Action Alternative is the increase in the ACLs for pelagic species for the 2015-2016 groundfish specifications recently approved by NMFS. Increases in these ACLs has been analyzed in the EIS accompanying those specifications (PFMC 2015). The increases in the ACLs may increase the overall impacts of midwater trawling activities on the physical environment (and possibly bottom trawl), but the reallocation of widow QS is not expected to noticeably add to or reduce those impacts (as discussed in Section 4.1).

Table 4-21. Magnitude and significance of the cumulative effects; the additive and synergistic effects of the proposed action, as well as past (P), present (Pr), and reasonably foreseeable future actions (RFF).

Affected Resources Affected Resources	**Status in 2013**	**Magnitude of Net Impact of P, Pr, and RFF Actions**	**Magnitude of the Impact of the Proposed Action**	**Significant Cumulative Effects**
Physical Resources, including Habitat	Complex and variable (Section 3.1)	Neutral Section 4.4.6(a)	Neutral (Section 4.1)	**None**
Biological Resources	Complex and variable (Section 3.2)	Neutral Section 4.4.6(b)	Neutral (Section 4.2)	**None**
Socioeconomic/ Human Communities	Complex and variable (Section 3.3)	Positive Section 4.4.6(c)	Positive (Section Section 4.3)	**None**

Impacts on the biological resources are primarily a function of the areas fished, gear types used, and level of effort, and of these, area fished is the only factor that might be affected. The levels of whiting harvests vary in the between years, but have been relatively stable over time (see 2013-2014 biennial specifications for the groundfish fishery (PFMC 2012d), discussed in Section 3.2.1.1 of this EA). With a reduced population size there is reduced harvest opportunity for whiting by all fishers, which may shift effort to other fisheries to the degree that fishery or individual fisher quotas allow.

Processors and communities will also have reduced product and fishery income, respectively, from the whiting resource, and they too will have to depend on other fisheries or income sources to make up for the reduced landings. In the context of this downturn, alternatives which alleviate production costs may be more beneficial to stability in the industry than would be the case if harvest levels were expected to remain stable. When the whiting population increases, the effects are reversed.

In addition, Pacific Coast trawl vessels engage in other fisheries and derive substantial revenues from those fisheries. Notable ones include shrimp and albacore. The income that trawlers receive from these other fisheries is far from stable, and, as a result, can be expected to fluctuate in future years depending on the abundance or availability of these other resources to harvest. The availability of these other fishing opportunities somewhat diminishes the importance of any gain in economic efficiencies under the action alternative, as compared to a situation in which vessels relied only on the whiting or pelagic rockfish fisheries.

Therefore, when this action is considered in conjunction with all the other pressures placed on fisheries by past, present, and reasonably foreseeable future actions, it is not expected to result in any significant impacts, positive or negative. Based on the information and analyses presented in these past FMP documents and this document, there are no significant cumulative effects associated with the action proposed in this document.