Preliminary Assessment of Trawl Under-Attainment Issues and SaMTAAC Alternative Qualification Criteria

May 2020

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1.0 Introduction

1.1 Purpose and Organization of Document

Summary: This document is intended to complement the Sablefish Management and Trawl Allocation Attainment Committee's (SaMTAAC) final report, provided to the Council at its June 2020 meeting. It is a partial digest and summary of analysis that was provided to the SaMTAAC but also expands on some information and analysis requests. The document focuses primarily on issues related to the need for action and providing an initial look at the qualification criteria included in the alternatives developed by the SaMTAAC.

The Council charged the SaMTAAC with addressing certain issues related to under attainment of trawl sector allocations and the SaMTAAC worked on that task from June 2018 through April 2020. A number of analyses were produced to support the SaMTAAC deliberations, and can be found posted on the SaMTAAC webpage[1] under the meeting at which they were originally presented. The analyses are being updated and consolidated for presentation to the Council. This document contains the first of those consolidated updates and focuses on: the possible causes of under attainment; the gear-switching[2] concern, description of the fishery, buyers and communities; and a preliminary analysis of qualification criteria included in the alternatives the SaMTAAC has recommended to the Council for consideration. The alternatives referenced in this analysis and the rationale for design of the alternatives are included in the SaMTAAC's final report, provided to the Council at its June 2020 meeting. The focus of the action alternatives developed by the SaMTAAC is a limitation on gear switching. No action also remains an alternative.

After presentation of some background information in Section 1.2 (including a summary of the degree of trawl allocation under attainment), this document starts by providing information on the potential causes of under attainment, including those identified in the purpose and need statement that the SaMTAAC recommends for adoption by the Council (Section 2.0). The SaMTAAC alternatives focus primarily on resolving possible constraints by limiting gear switching. With that context, this report provides some general information on the harvesters that may be affected by the alternatives (Section 3.0), the buyers that receive that fish (Section 4.0), and communities (Section 5.0). Section 6.0 focuses on prospects for changing conditions that may affect trawl sector need for northern sablefish quota pounds (QP) and the amount of gear switching. Finally, with respect to the SaMTAAC recommended alternatives to limit gear switching, Section 7.0 provides information on harvest operations that might and might not qualify for higher levels of gear switching opportunity and their historical levels of gear switching.

[1] SaMTAAC Webpage: https://www.pcouncil.org/actions/groundfish-fmp-amendment-gear-switching-and-sablefish-area-management/

[2] "Gear switching" is the use of non-trawl gear by trawl permitted vessels to catch trawl IFQ.

1.2 Background

Brief History of the FMP and Catch Share Program

Section Summary: The groundfish fishery management plan (FMP) was established in 1982 and has been amended numerous times. In 1994, a license limitation program was established for qualified trawl, longline, and fishpot vessels while all other vessels were allowed to continue to fish in an open access fishery. In the late 1990s and early 2000s, the Council undertook a series of management actions for the longline and fishpot segment of the limited entry fishery (limited entry fixed gear, LEFG), the culmination of which was transition to a tiered system of stackable, permit-specific, sablefish landing limits—essentially a catch share system for that sector. The shorebased trawl individual fishing quota (IFQ) program (a component of the trawl catch share program) was implemented in 2011 under the Amendment 20 catch share program. The subject of the current policy deliberations is the attainment of allocations for the shorebased trawl IFQ program, and in particular, the possible role that IFQ sablefish north of 36° N. lat. ("sablefish north") quota used for gear switching may play in contributing to under attainment of non-whiting allocations.

The Pacific groundfish FMP was first approved in 1982, establishing management measures for over 100 species caught off the West Coast from California to Washington. Since its inception in 1982, the FMP has been amended 33 times (as of the completion of this review), moving from a fishery characterized by high discards and expanding catches and capacity, through various initiatives aimed at reducing fishing capacity, and, finally, to catch shares for the LEFG (longline and fish pot tiered permit stacking) and trawl sector.

To address overcapacity, improve efficiency, and meet other economic and biological goals of the FMP, the Council approved a license limitation plan through FMP Amendment 6. This program was implemented for the start of the 1994 fishery. Under the limited entry program, the vast majority of the fish was allocated to the limited entry sector for vessels that qualified for groundfish trawl, longline, or pot gear endorsed permits. The remainder of the fish was allocated to an "open access" component for vessels without permits using any gear except groundfish trawl.

While the license limitation program joined the trawl, longline, and fishpot permitted vessels under a single program, it also preserved with the program the trawl/fixed gear allocations of sablefish that were first established in the 1980s. As part of this limited entry (LE) program a separate open access allocation (OA) of sablefish was created and then the limited entry portion was split between the trawl and fixed gear (FG) sectors. In the late 1990s, sablefish endorsements and tier levels (cumulative limits for a primary directed sablefish fishery) were allocated to qualifying vessels fixed gear vessels. In 2001, the season for the primary fishery was lengthened from about a week to several months and then to seven months in 2002, effectively converting the sablefish tier program to a catch share program for the fixed gear segment of the limited entry fishery.

In 2003, the Council began work on a limited access program for the trawl fishery. That program was implemented in 2011 as Amendment 20 to the groundfish FMP. It created an IFQ program for the shorebased trawl fishery and co-op programs for the at-sea fisheries (mothership and catcher/processor). Separate trawl allocations were established for each of these trawl sectors, as needed. The shorebased IFQ fishery and concerns regarding attainment of its allocations are the focus of the policy considerations addressed by this analysis, and in particular, the possible role of gear switching in contributing to under attainment.

History of Council Deliberation on Gear Switching

> *Section Summary: Gear-switching opportunities were embedded in the structure of the original Amendment 6 license limitation program. The gear-switching provisions of Amendment 20 were developed at a time when many perceived that there were conservation issues in connection with trawl gear that warranted substantial reduction in its use. The path followed by the Council in developing the catch share program both helped trawl fishermen access their quota and allowed fixed gear participants to acquire trawl permits and quota. However, it stopped short of adopting a provision facilitating permanent conversion from trawl to fixed gear, when a motion that would have selected that option was withdrawn in favor of a "go slow" approach.*

The management structures for gear switching within the context of the LE program pre-date the implementation of Amendment 20 IFQ program, going back to the structure of the Amendment 6 license limitation program. Under the license limitation program (implemented in 1994), qualifying vessels received LE permits endorsed for trawl, longline and/or fishpot gear (LE gears). A vessel with an LE permit was allowed to fish the gear for which it was endorsed within the context of the LE fishery. Within the LE fishery, allocations were larger and regulations more liberal than those of the OA fishery. A vessel without a permit was allowed to fish any legal groundfish gear (including LE gears except trawl) within the context of the more restrictive OA fishery. A vessel with an LE permit could also fish gears for which its permit was not endorsed (gear switch). Such vessels were governed by OA management regulations but their harvest was counted against the LE allocation. So, under the Amendment 6 LE program, a vessel with an LE permit endorsed for trawl gear could use fixed gear or other OA gears; but its harvest would be governed by OA regulations and counted against the LE allocation.

Implementation of an IFQ program requires that an amount of fish be identified for management with IFQs. For the trawl IFQ program, this meant that the LE allocations had to be split between the trawl sector and others. This brought to the forefront the question of whether a trawl permitted vessel would continue to have the opportunity to use a non-trawl gear (gear switch), and if so, whether its catch would count against the trawl allocation (require IFQ) or some other allocation. The IFQ program identifies that the scope of the program:

> . . . allows a limited entry trawl vessel to switch between trawl and nontrawl groundfish gears, including fixed gear, for the purpose of catching their QP ("gear switching"). It also

> allows a nontrawl vessel to acquire a trawl permit, and thereby use trawl QP to catch the LE trawl allocation using nontrawl gear. (Section A-1.1 of the IFQ Program)

One of the opportunities envisioned for gear switching was that it might allow trawl vessels to utilize quota that they would not otherwise be able to access in a mixed stock trawl fishery. Additionally, at that time, there was a perception by some that transitioning the fishery away from trawling would have a number of conservation benefits. During development of the program, Council discussions about gear switching included the consideration of a permanent gear conversion provision. At its November 2008 meeting, the Council discussed a motion that would have adopted a program option requiring a permit holder that wished to gear switch for more than two-years to permanently commit to gear switching (gear conversion). At that time, given the uncertainty about how the program would perform, the motion was withdrawn in favor of a "go slow" approach that allowed gear switching, did not require it to be permanent, and would consider the gear switching issue again as part of the program review.

Under attainment of Trawl Allocations

> *Section Summary: There are a number of goals and objectives in the FMP which relate to the importance of fully utilizing fishery allocations. Prior to the IFQ program, the trawl sector was managed with trip limits, leading to high discards and other management measures such as gear and area restrictions. While catch for some species such as Dover sole has decreased with the implementation of the catch shares program, even as ACLs have increased, other fisheries, such as the midwater rockfish, have seen growth meeting or exceeding pre-IFQ levels as stocks have rebuilt.*

The SaMTAAC was appointed to address a number of concerns about total attainment of the trawl sector allocations. These concerns relate to goals and objectives of the FMP as well as Amendment 20, which created the trawl catch share program. While maximum feasible utilization[3] may contribute to a number of goals and objectives of the FMP, the following are those most directly related.

Groundfish Fishery Management Plan,

> Goal 3—Utilization. Within the constraints of overfished species rebuilding requirements, achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities.
>
> Objective 9: Develop management measures and policies that foster and encourage full utilization (harvesting and processing), in accordance with conservation goals, of the Pacific Coast groundfish resources by domestic fisheries.

[3] Goals and objectives on full utilization are explicitly or implicitly subject to other constraints. For example, FMP Goal 3 on utilization is a third priority goal, below the FMP's conservation and economic goals.

Amendment 20 (emphasis added):

> Goal: Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, *provides for full utilization of the trawl sector allocation*, considers environmental impacts, and achieves individual accountability of catch and bycatch.
>
> Objective 6. Promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.
>
> Objective 7. Provide quality product for the consumer.

Prior to the implementation of the IFQ program in 2011, the trawl fishery was managed with cumulative trip limits and gear and area restrictions. Species such as Dover sole, thornyheads, and Pacific whiting had specific shoreside allocations, but this was not true for all 30 species which are now managed with IFQ. While this makes it difficult to directly compare attainments prior to catch shares and during the IFQ era, examinations of catch amounts and attainment of ACLs of trawl dominant species such as Dover sole do show a decline in catch in the early years of the program. Other species however, such as widow and yellowtail rockfish, have seen catch grow to levels at or above those levels since the implementation of the LE license program. For a look at catch trends and attainments of trawl dominant species along with sablefish, please see Supplemental Attachment 2 from the January SaMTAAC meeting. Further detail on catch amounts by non-whiting trawl vessels prior to catch shares and during the IFQ era can be found in Section 2.1. This section focuses on the IFQ era (2011-2019) and the attainment of IFQ, particularly non-whiting, allocations.

Figure 1 below shows the percent utilization of all non-whiting IFQ allocations harvested and unharvested from 2011 to 2019 and the overall amount of allocation pounds caught versus those unharvested. Note that surplus carryover issued in a year are included in the QP available to catch in that year, such that QP available may be slightly more than the actual allocation. While Pacific whiting is an IFQ species, it is removed from this figure as it is on a different scale [about 3x larger allocations than next highest species (Dover sole) in the same year] and the policy solutions considered here are focused on the non-whiting fishery. Pacific whiting attainment has ranged from 47 percent in 2015 to 99 percent in 2013 with recent attainment in 2017-2019 averaging 83 percent. Average attainment of non-whiting species in the first four years of the program (2011-2014) ranged from about 24 percent to 35 percent although the quota available during that time was also the lowest across the time series. In 2015, the Dover sole ACL increased from 25,000 to 50,000 mt (or over 55 million pounds); with 95 percent allocated to trawl fisheries, the overall attainment decreased to about 21 percent as landings for Dover sole did not increase to the same degree as the allocation. In 2016, there was a small increase in percentage utilization and usage. Then, in 2017, the re-emergence of the non-whiting midwater trawl fishery with the rebuilding of canary rockfish (leading to 16x greater ACLs compared to 2016) along with increases in ACLs for widow rockfish (over 6x greater), in addition to other changes, resulted in over 50 million

additional QPs allocated to the IFQ fishery. Even though nonwhiting quotas in aggregate were over 50 percent greater in 2017-2019 than in 2011-2014, the fishery was able to bring utilization rates closer to 2011-2014 levels reaching an average of 26 percent. A good portion of this increase is associated with the implementation of the trawl gear exempted fishing permit (EFP) (and subsequent rulemaking) along with marketing initiatives by industry (further discussion in Section 2.2).

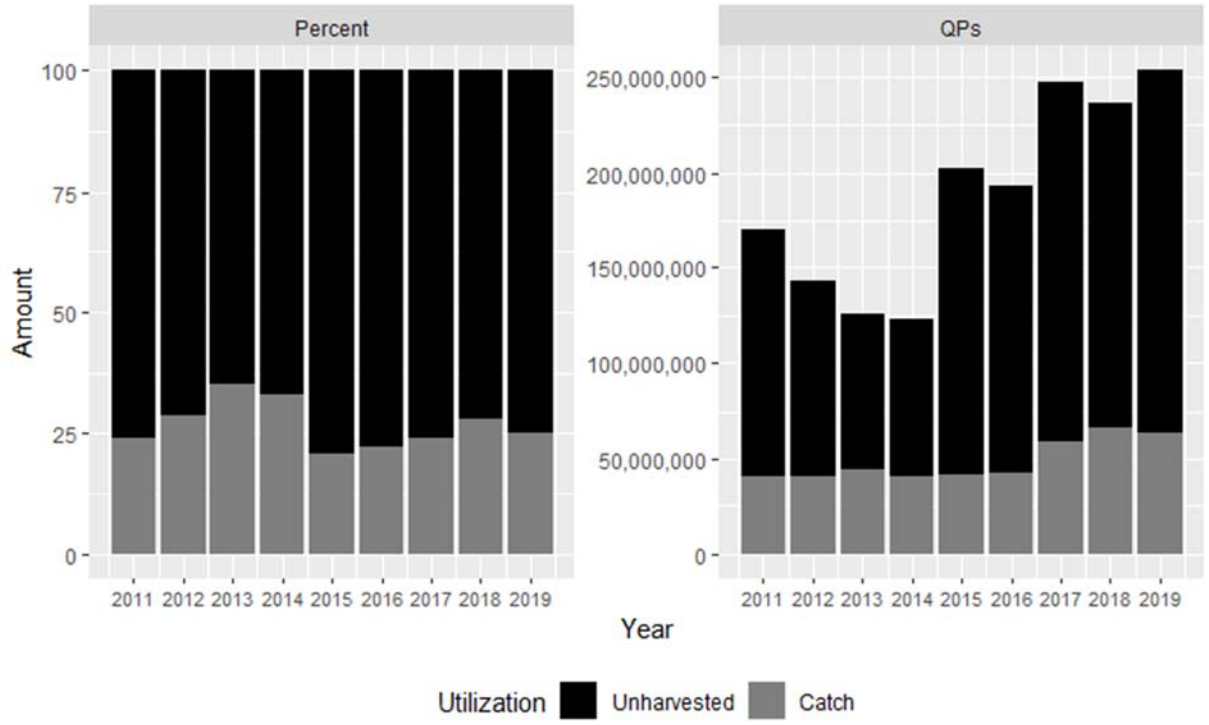


Figure 1. Shorebased IFQ utilization of non-whiting species, 2011-2019. Left panel: Percent of total allocations for all species caught and left unharvested. Right panel: Total amount of allocation QPs caught and unharvested.

While overall IFQ attainment has varied, there have only been a select number of IFQ species that consistently see high percent attainment (Table 1 below). Petrale sole and sablefish north of 36° N. lat. ("sablefish north") had greater than 90 percent allocation attainment in each year. Other species with greater than 90 percent attainment include Pacific whiting (2011-2013) and widow rockfish (2018-2019). Additionally, in 2015, canary rockfish was fully attained; however, this was at a time when canary was overfished (ACL of 122 mt) and a single vessel took most of the sector allocation in a "lightning strike" tow. The vast majority of IFQ species see less than 50 percent attainment, with most years seeing more than half of the 30 IFQ species[4] with less than 25 percent attainment. Overall, the revenue generated in the non-whiting trawl fishery (including gear-switched landings) has averaged $31.7 million from 2011 to 2019. Species with more than 50

[4] In 2013, lingcod began being managed north and south of 40° 10 N. lat.

percent attainment in a year account for about $18.7 million in ex-vessel revenue, or 58.7 percent of the non-whiting fishery revenue, on average.

Table 1. Number of IFQ species by percent attainment of the allocation, 2011-2019

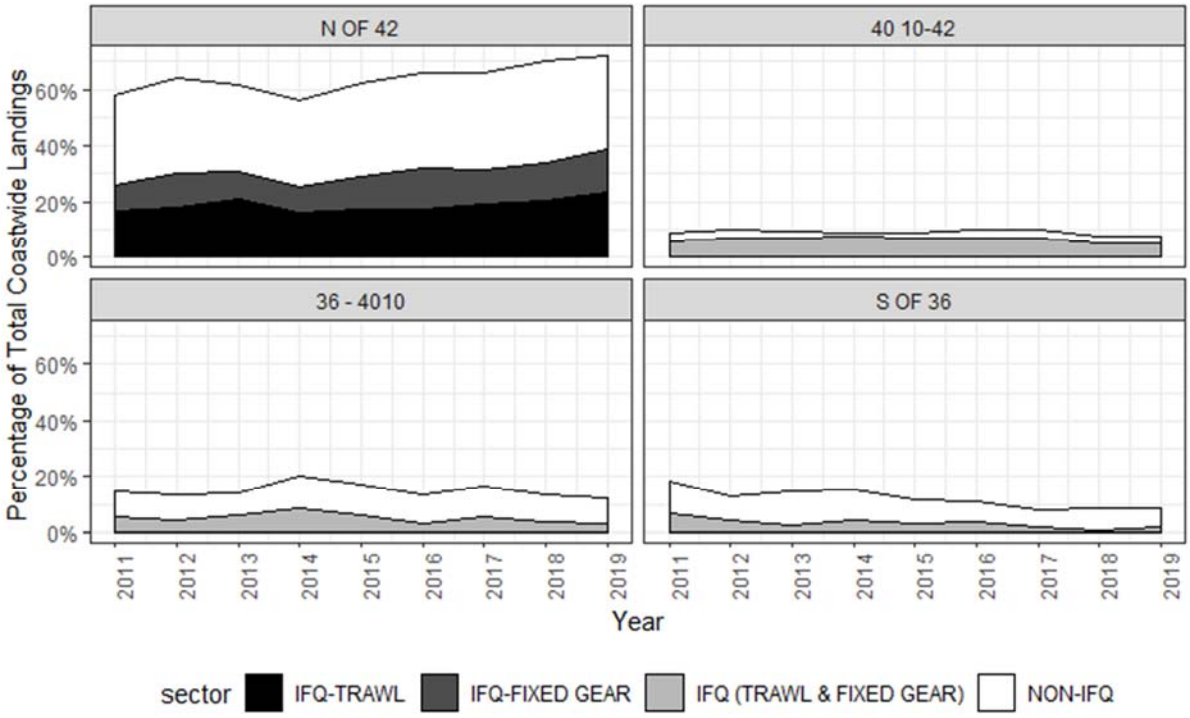
Attainment	2011	2012	2013	2014	2015	2016	2017	2018	2019
0-25%	18	12	13	14	15	16	16	17	17
25-50%	7	13	11	11	10	9	9	6	7
50-90%	1	1	3	3	2	3	3	4	3
90+ %	3	3	3	2	3	2	2	3	3

Sablefish Harvest

Section Summary: Sablefish north is highly attained across all sectors while sablefish south of 36° N. lat. ("sablefish south") has averaged 44 percent ACL attainment since 2011. Approximately 50 percent of sablefish north is taken by non-IFQ fisheries (LEFG, OA, and tribal fisheries) while the other 50 percent is caught by the IFQ sector. Gear-switched catch has averaged around 30 percent of the total available pounds in the IFQ fishery from 2011 to2019. South of 36° N. lat., catch of sablefish is dominated by fixed gear, with less than three trawlers participating in recent years.

As described in the SaMTAAC final report, over the last years, there have been a number of meetings at which concern has been expressed that the availability of northern sablefish QP may be constraining harvest of the trawl allocations and the alternatives developed by the SaMTAAC focus on this issue.

Sablefish is a coastwide stock that is managed north and south of 36° N. lat. While sablefish in the north is highly attained across all sectors, sablefish south attainment has averaged 44 percent since 2011, with 2017 and 2018 both seeing less than 25 percent attainment (Figure 2). For landings in the areas off Washington and Oregon (i.e., north of 42° N. lat.), non-IFQ landings, including at-sea whiting sector bycatch and tribal landings, have typically accounted for approximately 33 percent of the total coastwide landings (between 1,300 and 2,000 rd. wt. mt) and 50 percent of the total landings north of 42° N. lat. Northern California has historically seen more IFQ landings compared to non-IFQ landings, which is the opposite of the area from 36° to 40° 10' N. lat. South of 36° N. lat., non-IFQ landings are dominant, with 2018 seeing the lowest proportion of IFQ landings since the start of the program at 0.8 percent of the coastwide landings (or 9.5 percent of the total sablefish landings south of 36° N. lat.).



Notes: 68.6 mt of sablefish from 2011-2019 had no area identified and therefore is not included. For all areas south of 42° N. lat., due to confidentiality values could only be reported at the IFQ sector level, not at the IFQ and gear level.

Figure 2. Percentage of coastwide landings by area and sector (including tribal and nontribal fisheries). Source: Shoreside landings queried from PacFIN 02/20/2020, At-Sea catch queried from NPAC 03/25/2020.

The scope of the SaMTAAC's work was limited to solutions within the trawl sector (as opposed to considering modification of intersector allocations). In the IFQ sector specifically, northern sablefish has averaged 93.4 percent attainment of total available pounds (allocation plus surplus carryover) or 96.6 percent of the allocation from 2011-2019 with around 30 percent of the total available pounds being caught by gear switchers from 2011-2018 (Figure 3;Table 2). Southern sablefish harvest is dominated by gear-switching vessels, with fewer than three trawling vessels participating in the last two years. Attainment south of 36° N. lat. for sablefish has averaged less than 10 percent in the last three years.

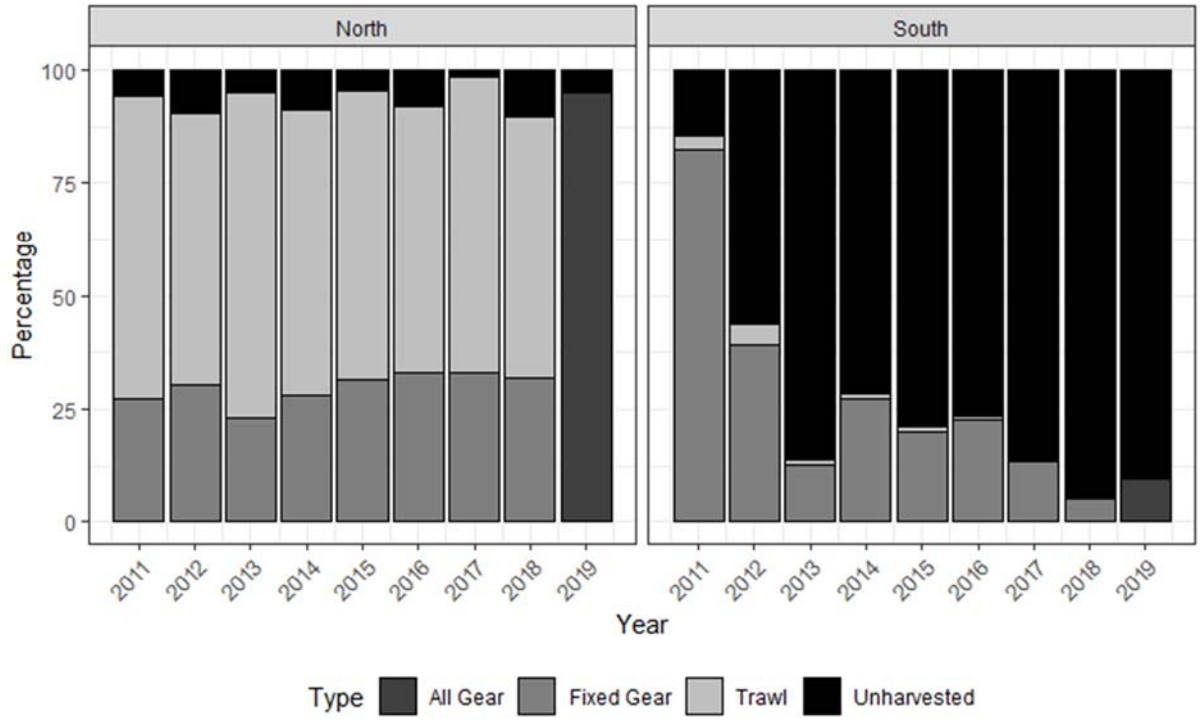


Figure 3. Percent utilization of the total available pounds of sablefish by management area, gear, and year. Source: 2011-2018 based on WCGOP GEMM; 2019 total harvest based on IFQ vessel account system.

Table 2. Sablefish north of 36° N. lat. total catch by year and gear type (millions of lbs) and total QPs utilized for 2019 compared to the allocation and total available pounds (allocation plus surplus carryover), 2011-2019. Source: 2011-2018 GEMM, 2019 IFQ Vessel Account System.

Landing Year		2011	2012	2013	2014	2015	2016	2017	2018	2019	2011-2018 Avg
Total Catch		5.29	4.92	4.07	4.13	4.82	5.02	5.56	5.08	5.64	4.86
Catch by Gear	**Trawl**	3.75	3.26	3.09	2.86	3.24	3.22	3.69	3.27		3.30
	Fixed Gear	1.54	1.66	0.98	1.27	1.58	1.80	1.87	1.81		1.56
Allocation Lbs		5.61	5.44	4.03	4.38	4.85	5.32	5.33	5.56	5.69	5.07
Percentage by Utilization	**Trawl**	66.8%	59.9%	76.7%	65.3%	66.8%	60.5%	69.2%	58.8%	99.1%	65.5%
	FG	27.4%	30.5%	24.3%	28.9%	32.6%	33.9%	35.1%	32.5%		30.6%[a/]
	Unharvested	5.8%	9.6%	-1.1%	5.7%	0.6%	5.6%	-4.4%	8.7%	0.9%	3.8%
Available Lbs		5.61	5.44	4.29	4.52	5.05	5.46	5.64	5.67	5.94	5.21
Percentage by Utilization	**Trawl**	66.8%	59.9%	72.1%	63.3%	64.2%	58.9%	65.4%	57.7%	94.9%	63.5%
	FG	27.4%	30.5%	22.9%	28.0%	31.3%	33.0%	33.2%	31.9%		29.8% [b/]
	Unharvested	5.8%	9.6%	5.0%	8.7%	4.5%	8.1%	2.4%	10.4%	5.1%	6.8%

a/ 2016-2018 average is 33.8%
b/ 2016-2018 average is 32.7%

Fixed gear harvest of IFQ sablefish (gear switching) is concentrated north of 42º N. lat. and has increased in that area during the course of the program, while decreasing in California (Figure 4). At the same time, the harvest of trawl caught sablefish has been shifting northward. Figure 4 shows the average landings by catch area and gear in the four areas presented above during 2011-2015 and 2016-2019. Note that during both time periods, fewer than three vessels used fixed gear to catch sablefish between 40° 10' N. lat. and 42° N. lat. and therefore fixed gear landings for that area were combined with landings from the area between 36° N. lat. and 40° 10' N. lat. Since the start of the shorebased IFQ program, only four vessels have fished trawl sablefish south of 36° N. lat.

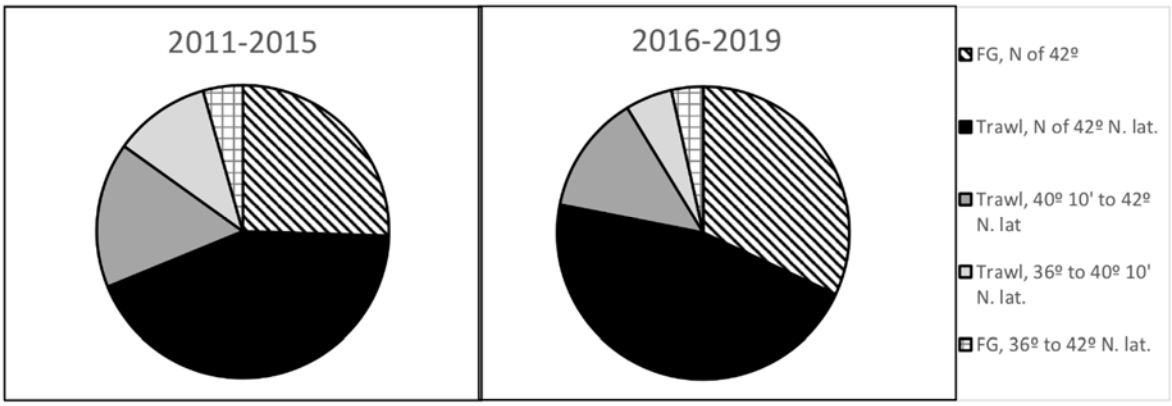


Figure 4. Average percentage of shorebased IFQ landings of sablefish north of 36° N. lat. taken by gear and area of catch.

2.0 Some Potential Causes of Under Attainment

2.1 Trawl Vessel Participation as a Limit on Attainment

Section Summary: The purpose and need statement proposed for this action identifies three factors that might be affecting attainment of trawl allocations. One of these factors is the number of trawl participants. This section evaluates the relationship between number of vessels and total trawl harvest. In general, it finds:

- *Trawl vessel participation declined after implementation of the program, however, the remaining fleet likely had the physical capacity to maintain pre-IFQ harvest levels.*
- *Economic data appears to show adequate profitability to support expansion of harvest.*
- *The general indication is that factors other than the capacity of participating trawl vessels remaining in the fishery led to under attainment of the trawl allocation*

When the IFQ program was implemented in 2011, the number of non-whiting trawl vessels dropped from a 2006-2010 average of 116 vessels down to an average of 67 in the first five years of the program and 65 in the last four years (Figure 5). There were 44 vessels that had non-whiting groundfish trawl history prior to the IFQ program and then had zero trawl landings history after that. An additional 22 vessels appear to have exited the fishery by 2015 (Figure 6). Twenty-five vessels entered (or re-entered the fishery) from 2011 to 2019. Note that some of the vessels transitioned into other fisheries—including whiting, crab, shrimp, and even gear switching.

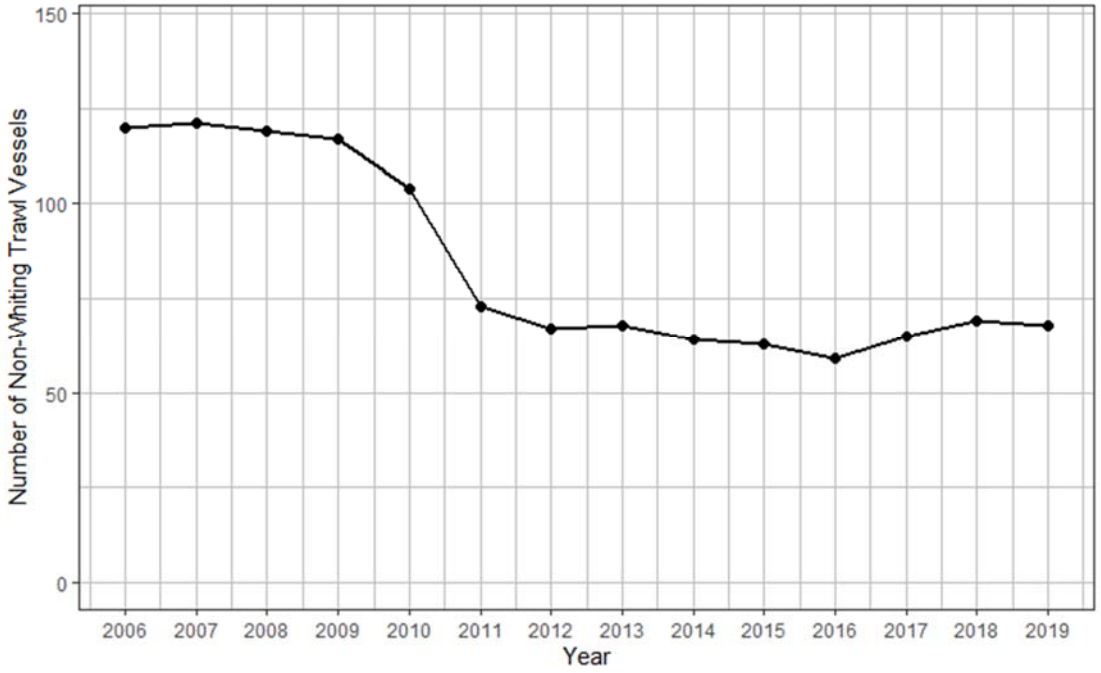


Figure 5. Number of non-whiting trawl vessels, 2006-2019

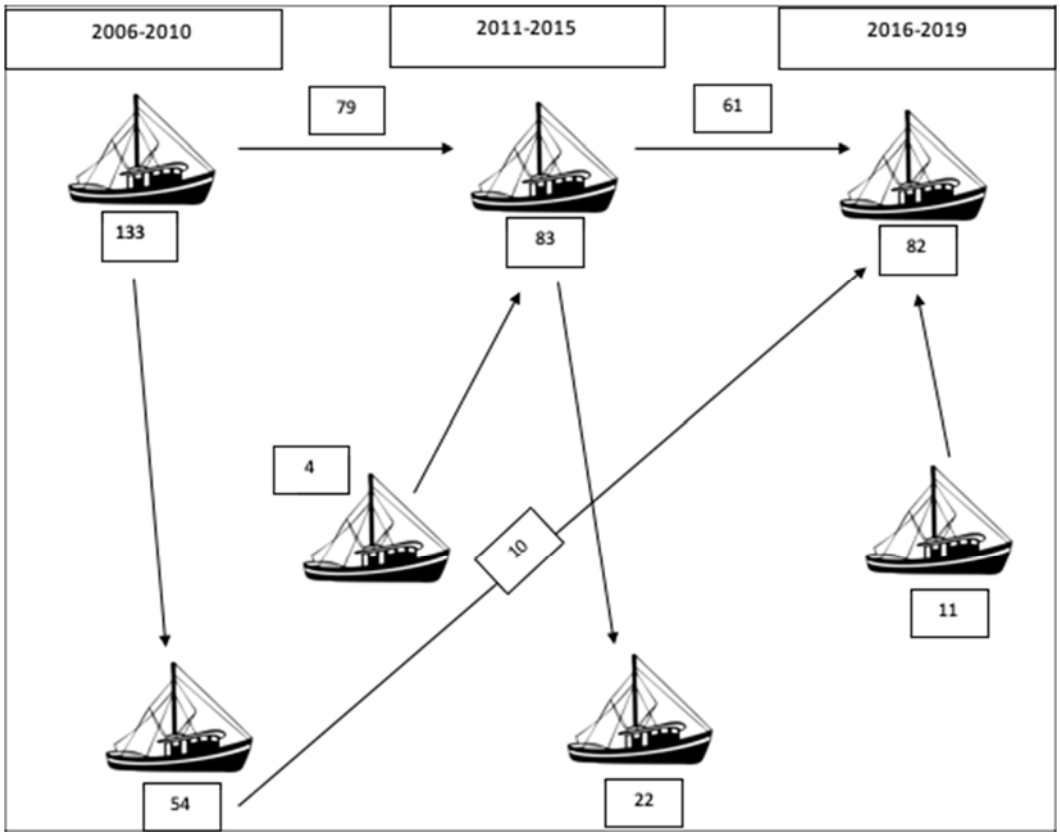


Figure 6. Diagram of the number of non-whiting trawl vessels that participated, entered, and exited the fishery in three periods (2006-2010, 2011-2015, and 2016-2019).

Given the vessel departures seen with the implementation of the trawl IFQ program, it is important to consider whether the loss in fishing vessels could be a cause of the current trawl under attainment. Figure 7 below shows the average landings per year in the three periods presented above: 2006-2010, 2011-2015, and 2016-2019 by four different groups:

Stable Participants—Vessels in this category had at least one non-whiting trawl landing in each period.

Re-entered—Vessels in this category participated in 2006-2010, were absent from 2011 to 2015 and re-entered in the latter years (2016-2019).

Entered—Vessels in this category did not participate in 2006-2010 and entered the non-whiting trawl fishery after 2010 (i.e., in the IFQ program).

Exited in Following Period—Vessels in this category that had landings in 2006-2010 and/or 2011-2015 but not after had (i.e., exited after the 2006-2010 period or after the 2011-2015 period).

On average, the vessels with participation across the periods have increased their landings with each period (shown in black)—likely due to increases in rebuilding species ACL and trawl allocations, particularly in 2016-2019 with the rebuilding of midwater rockfish. Increases by these vessels alone led to harvest levels that reached very near the total pre-catch share level. The vessels

that entered or re-entered the fishery after initial program implementation in 2011 (dark grey in the figure below) did not catch as much as the vessels that left the fishery in 2006-2010 or 2011-2015. However, together with the stable participants, their total catch in 2016-2019 exceeded that of the pre-catch share fleet. Thus, the 2016-2019 data on stable participants shows that the vessels likely had the capacity to make up for the departing vessels (coming very close to the 2006-2010 totals), indicating a likelihood that factors other than the amount of trawl vessel participation are likely the causes of under attainment.

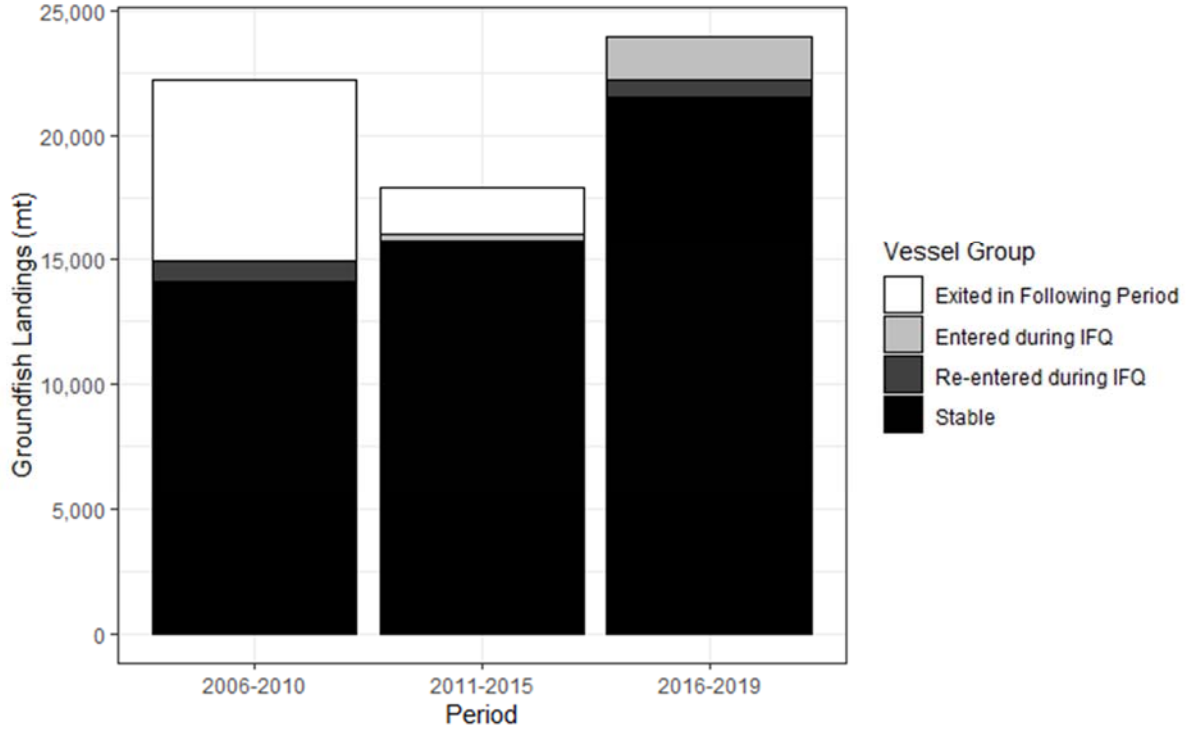
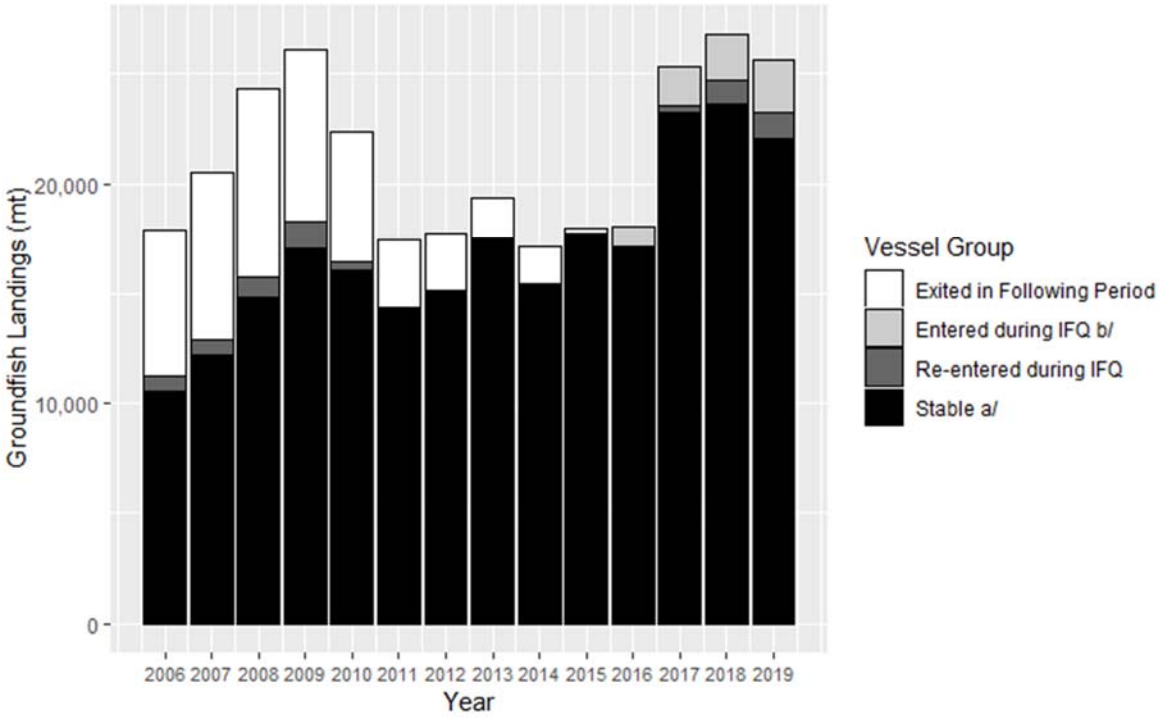


Figure 7. Average non-whiting trawl landings (mt) by period and vessel group (stable, re-entered fishery, entered fishery, or exited in following period).

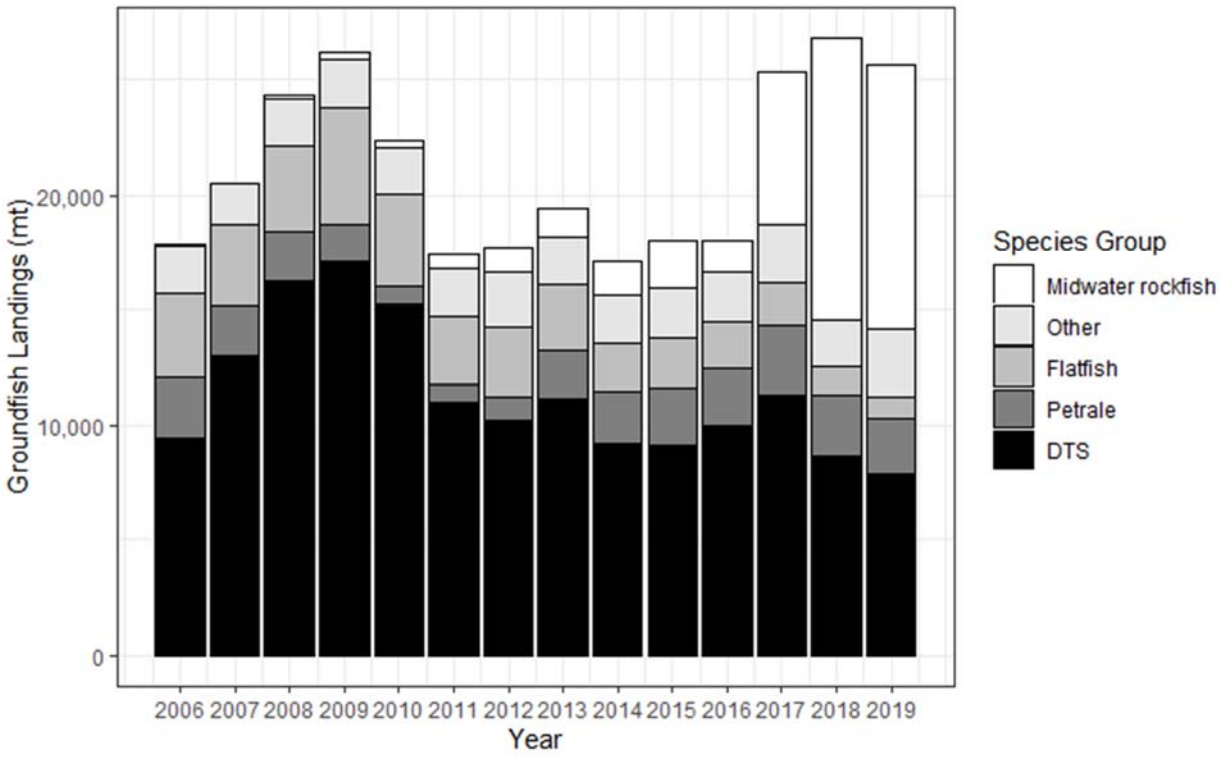
Taking a closer look at these vessels, Figure 8 below provides a similar view of landings, but at the individual year level. Due to confidentiality, certain vessel groups were combined (see footnotes). Stable participants' landings have generally increased over time, with a slight decrease at the start of the IFQ program. The largest increase appears between 2016 and 2017-which coincides with the re-emergence of the midwater rockfish fishery as shown in Figure 9. Those vessels that harvested non-whiting trawl prior to the IFQ program and re-entered after 2016 appear to harvest a similar tonnage during both periods. Overall, the vessels that entered the fishery during the IFQ program have landed less than those vessels that exited the fishery, especially those fishing prior to trawl rationalization. This implies that most of the decline in harvest resulting from those exiting is made up by existing participants.



a/ Fewer than 3 vessels entered the fishery between 2011-2015 and were included in the "stable" bar
b/ Fewer than 3 vessels re-entered the fishery in 2016 and were included in the "entered during IFQ" bar

Figure 8. Non-whiting trawl groundfish landings (mt) by year and vessel group, 2006-2010.

While the number of vessels that participated in the non-whiting trawl fishery varied across years, the species composition of their landings was fairly consistent in terms of proportions from 2006 to 2016, with Dover sole, thornyheads, and sablefish (DTS) being the main focus of the fishery (Figure 9). Dover sole landings were the driving force behind the spike in DTS landings from 2007 to 2010, followed by a decrease in 2011 (co-occurring with the start of the IFQ program). As will be discussed in following sections, that decline in harvest could be due to constraints from limited amounts of sablefish north, competition from imports, or a lack of markets. Catch of Petrale sole increased concurrently with increases in the ACL starting in 2013. The re-emergence of the midwater rockfish fishery (discussed in Section 1.2) for species such as canary, widow, yellowtail, and chilipepper rockfishes resulted in landings that exceeded those of DTS starting in 2018 and accounted for over 45 percent of total non-whiting trawl landings in 2018-2019.

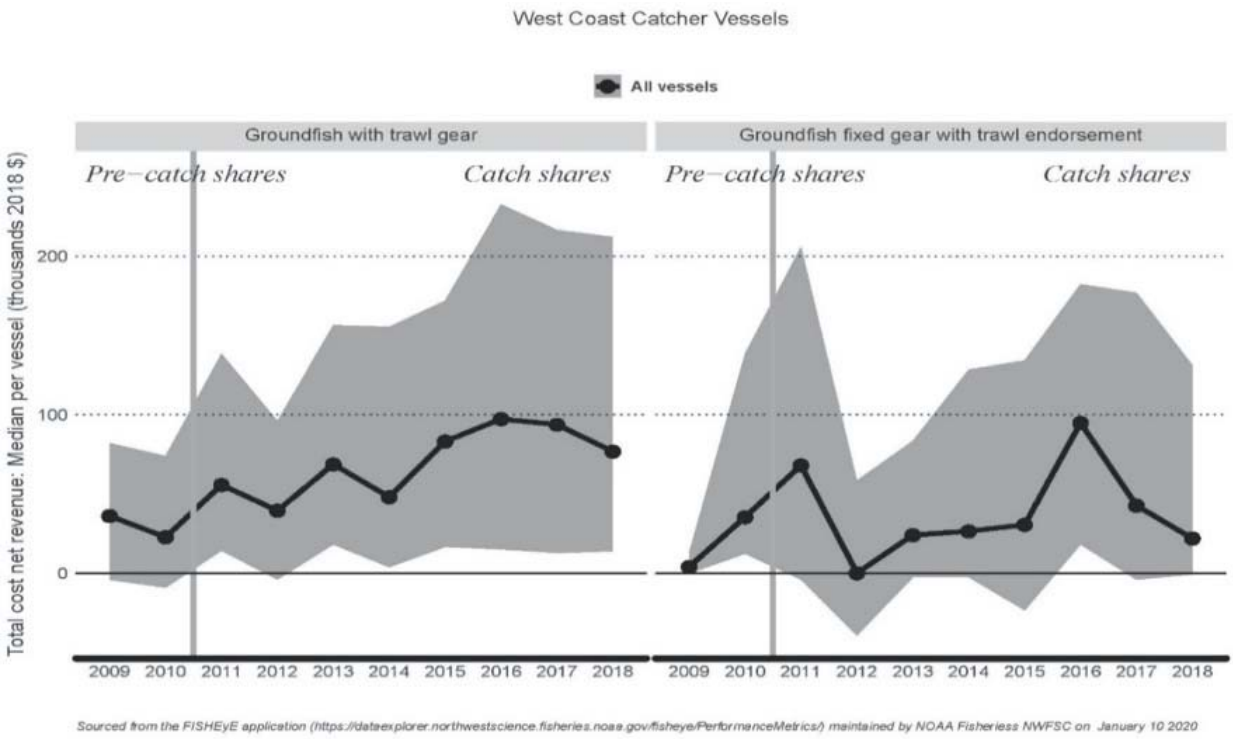


Note: Midwater rockfish= canary, widow, yellowtail north of 40° 10' N. lat., chilipepper, and bocaccio; flatfish=all flatfish species except for Petrale sole and Dover sole; DTS= Dover sole, shortspine thornyhead, longspine thornyhead, and sablefish.

Figure 9. Landings in the non-whiting trawl sector by species group, 2011-2019.

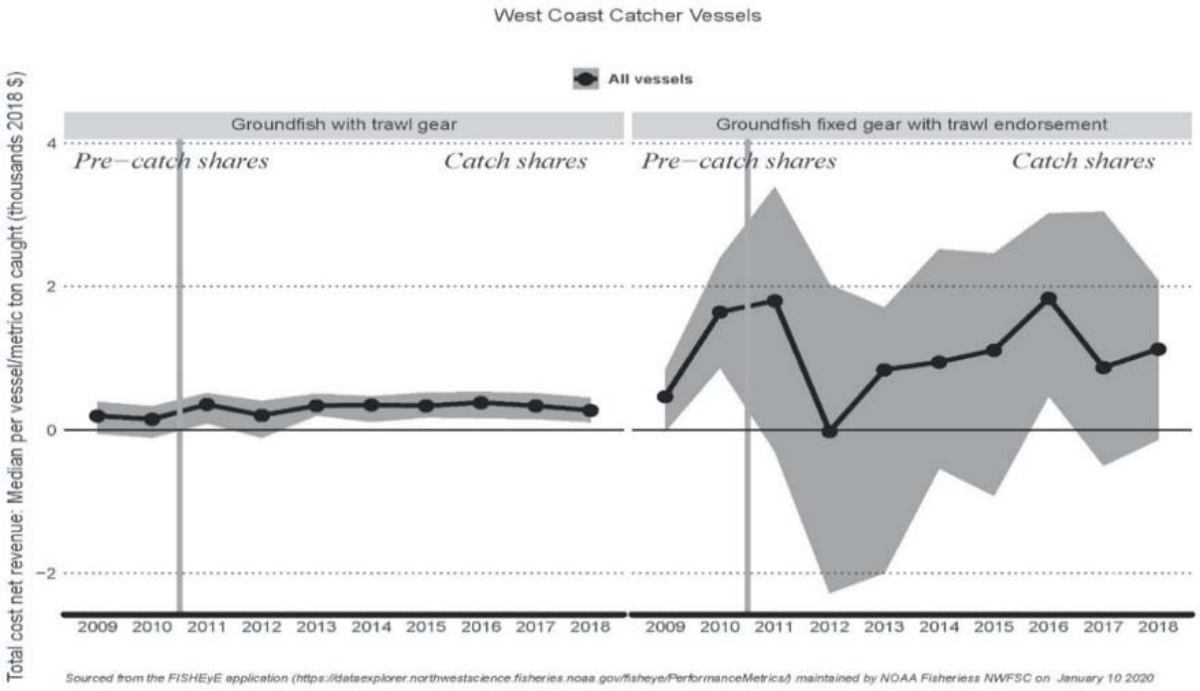
Data on vessels entering and exiting the fishery and the amount of their harvest levels indicate that after the start of program consolidation, the fleet still likely had sufficient capacity to harvest at pre-catch share levels. At the same time, attainment could still be constrained by a lower intensity of vessel participation levels, if low profitability caused the vessel exits and provided insufficient incentive for the expansion of harvest by remaining vessels. However, summaries from the National Marine Fisheries Service (NMFS) Economic Data Collection program generally show that non-whiting trawl gear vessels became more profitable after implementation of the catch share program, with trawl gear vessels generally showing somewhat higher median profitability than gear-switched fixed gear vessels (Figure 10). Over the last three years (2016-2018), the median vessel total cost net revenue (revenue after taking into account fixed and variable costs) has been over twice the pre-catch share levels. Median vessel total cost net revenue approached $100 thousand, while the 25th percentile vessel has been around $10 to $15 thousand and the 75th percentile vessel has been over $200 thousand. Increased total cost net revenue, including on a per mt (Figure 11) and per day (Figure 12) basis, seems to indicate that a constraint other than adequate profitability was likely constraining trawl allocation attainment. In considering these data, it should be noted that some of the apparent increases in profitability might be the result of less efficient vessels leaving the fishery rather than an increase in efficiency of remaining vessels.

However, the data still indicates that profitability does not appear to have constrained either the number of vessels participating or the level of participation for individual vessels.



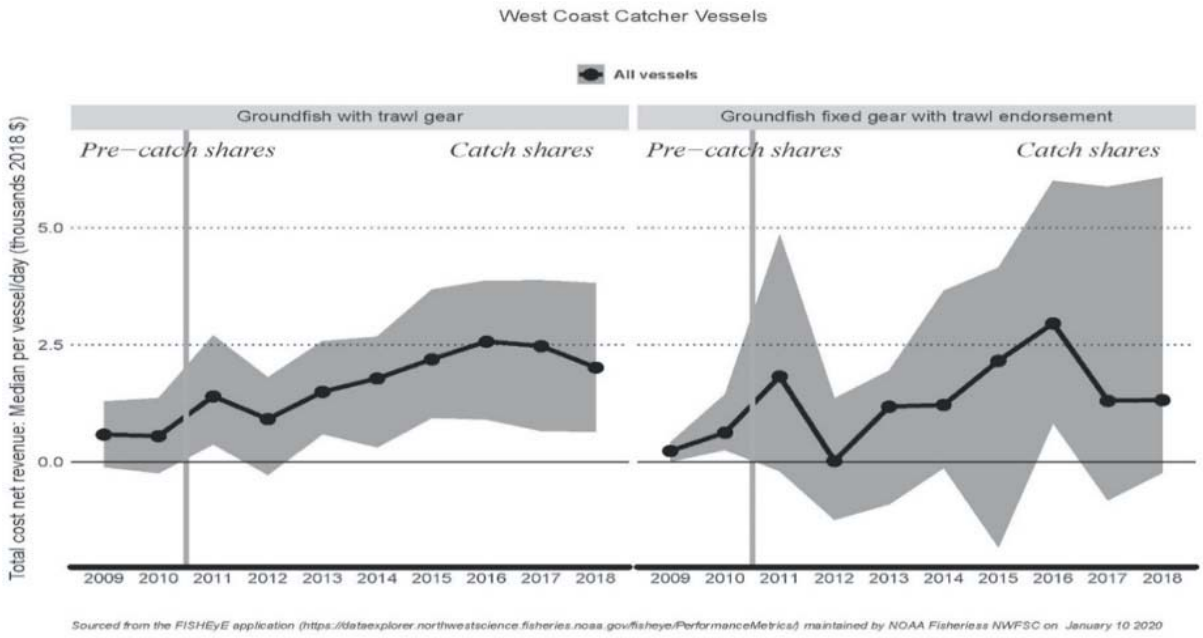
Note: Median vessel shown by the line, top of the gray area denotes the 75th percentile vessel, and the bottom the 25th percentile vessel.

Figure 10. Total cost net revenue for non-whiting trawl and fixed gear vessels, after taking into account variable and fixed costs, 2009 through 2018. Source: The FISHEyE application maintained by NOAA Fisheries, NWFSC on January 09, 2020.



Note: Median vessel shown by the line, top of the gray area denotes the 75th percentile vessel, and the bottom the 25th percentile vessel.

Figure 11. Non-whiting trawl and fixed gear vessel total cost net revenue per metric ton, after taking into account variable and fixed costs, 2009 through 2018. Source: The FISHEyE application maintained by NOAA Fisheries, NWFSC on January 09, 2020.



Note: Median vessel shown by the line, top of the gray area denotes the 75th percentile vessel, and the bottom the 25th percentile vessel.

Figure 12. Non-whiting trawl and fixed gear vessel total cost net revenue per day, after taking into account variable and fixed costs, 2009 through 2018. Source: The FISHEyE application maintained by NOAA Fisheries, NWFSC on January 09, 2020.

2.2 Market Limits—Domestic Markets and Competing Imports

Section Summary: Expansion of the attainment of trawl allocations for some species will likely require the development of markets. One challenge in developing markets may be competition from imports. Competition from imports may become an increasingly important factor in the expansion of West Coast fisheries as global markets have increasingly commodified whitefish. Market studies indicate that fresh tilapia imports may be competing in whitefish markets with some U.S. wild caught species, possibly including Dover sole. It has been argued in public comment that uncertainty about access to supply of sablefish could be dampening investments that might improve the competitiveness of West Coast products, and, as a general proposition, there is some support for this in academic literature and a discussion in the recently completed catch share review. As an alternative approach to deal with commodification, marketing efforts have been undertaken to distinguish West Coast wild caught fish from global whitefish commodities.

The proposed purpose and need statement identifies a lack of markets as another factor that could be constraining trawl allocation attainment, particularly with respect to Dover sole. Section 2.5 explores the potential for expansion of trawl catch assuming that sablefish is constraining and markets are able to absorb the additional production. However, if markets are not able to absorb

the additional production, that expansion might be thwarted or prices might decline in order to increase amounts demanded (if lower prices can still support profitable operations). Alternatively, enhanced domestic marketing efforts could expand market capacity while maintaining prices. For example, with the recent rebuilding of widow and canary rockfish, the midwater rockfish fishery has redeveloped, facilitated in part by a cooperative effort between vessels and processors to coordinate production and support marketing efforts to expand demand.

One challenge in developing markets may be competition from imports. Information provided here is not intended as a complete market analysis but rather an exploration of some data indicators and studies related to the possible interaction between the domestic market for fresh whitefish, in which a number of trawl species likely compete (including Dover sole), and competing imports. However, in considering the market studies cited here, it is important to take into account that the dynamics of international seafood markets are rapidly changing and therefore individual market studies may be difficult to apply to across time periods. (Bjørndal & Guillen, 2016).

Competition from farmed tilapia and catfish (*Ictalurus*, *Silurus*, and *Pangasius*, the latter also known as swai) in the whitefish market has been a focus of several studies over the last decade or so, and competition of those products with Dover sole has been a topic of public comment during deliberations on trawl allocation attainment issues. US imports of tilapia and catfish, fresh and frozen, have increased each year from 1994 to 2013 (Figure 13). Overall, the amount of tilapia and catfish imports far outstrips the amount of Dover sole production, with the volume of processed imports[5] exceeding the volume of round Dover sole landed on the West Coast by a ratio of over 40:1 over the last 10 years (note in Figure 13 that the axis for the imports, on the left, is 33 times the scale of the axis for Dover sole landings, on the right).

[5] Close to 80 percent are reported as fillets (weighted annual average)

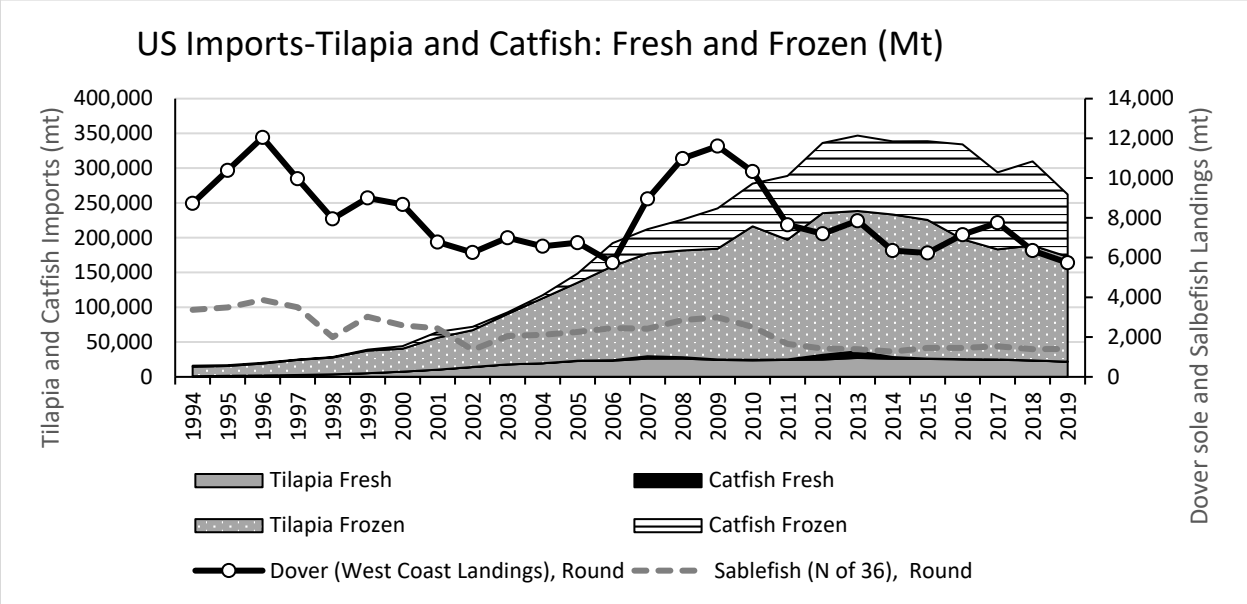


Figure 13. Import volume of processed fresh and frozen tilapia and catfish and limited entry trawl gear landings of Dover sole and northern sablefish (excluding gear switching). (Sources: NOAA Fisheries Foreign Trade Data and PacFIN Answers Database)

Since 1994, there have been two production peaks in West Coast landings of Dover sole, one in 1996 and the other in 2009, both at similar levels (Figure 13). The peak in 2009 was at about 11,000 mt, after which landings dropped 12 percent in 2010. Landings dropped another 24 percent in 2011, concurrent with both implementation of the catch share program and continued increases in imports of tilapia and catfish. Conditions in the seafood market in which the peaks occurred were likely quite different from one another due to shifting market conditions, including increased commodification of international seafood trade. When a number of fish species that are available in relatively large volumes are treated as raw products that have similar characteristics and can be substituted for one another they become a commodity.

Commodification of seafood is a more recent phenomena that has led to products that were previously sold in more isolated market channels with fewer substitutes competing with an increasing number of other fisheries products (Asche et al., 2009). This increasing commodification is likely to continue into the future as large volumes of similar products become available year-round (Anderson et al., 2018). Commodification is partly associated with the stabilization of wild fish supply, including innovations such as IFQ programs that have allowed more efficient supply chains to develop (Anderson et al., 2018).[6] Expansion and commodification of aquaculture products has also contributed to global commodification of seafood. While global wild fish production has stabilized, aquaculture production has increased about ten-fold from the

[6] Also contributing to commodification are improved processing and preservation technologies and improved transportation logistics that decreased the constraints of seasonality and further increase efficiency and profitability (Anderson 2018).

mid-1980s through 2017 (source: FAO data). In the past, only the same species of aquaculture and wild caught fish tended to compete with one another (e.g. salmon). Now, aquaculture-raised fish of one species compete with wild caught fish of other species, further contributing to commodification (Asche et al., 2009, Asche and Zhang, 2013). While 39 percent of the world's seafood is traded in global markets, around 75 percent of all seafood production is impacted by import/export trade competition (Tveteras et. al., 2012).

In U.S. markets, there appears to be a connection between fresh farmed tilapia and wild caught fish. Fresh tilapia imports (Figure 14) have grown rapidly without a price reduction (Figure 15), indicating that the tilapia market share has grown by displacement of other products rather than generating higher levels of demand through lower prices (Norman-López and Asche, 2008). In US markets, fresh tilapia fillet imports are competing to some degree with whitefish such as whole red snapper, wild fresh sea dab fillets, and blackback flounder, influencing the price of those species (Norman-López, 2009). Norman-López (2009) hypothesizes that tilapia may have filled in for declining availability of wild-caught species.

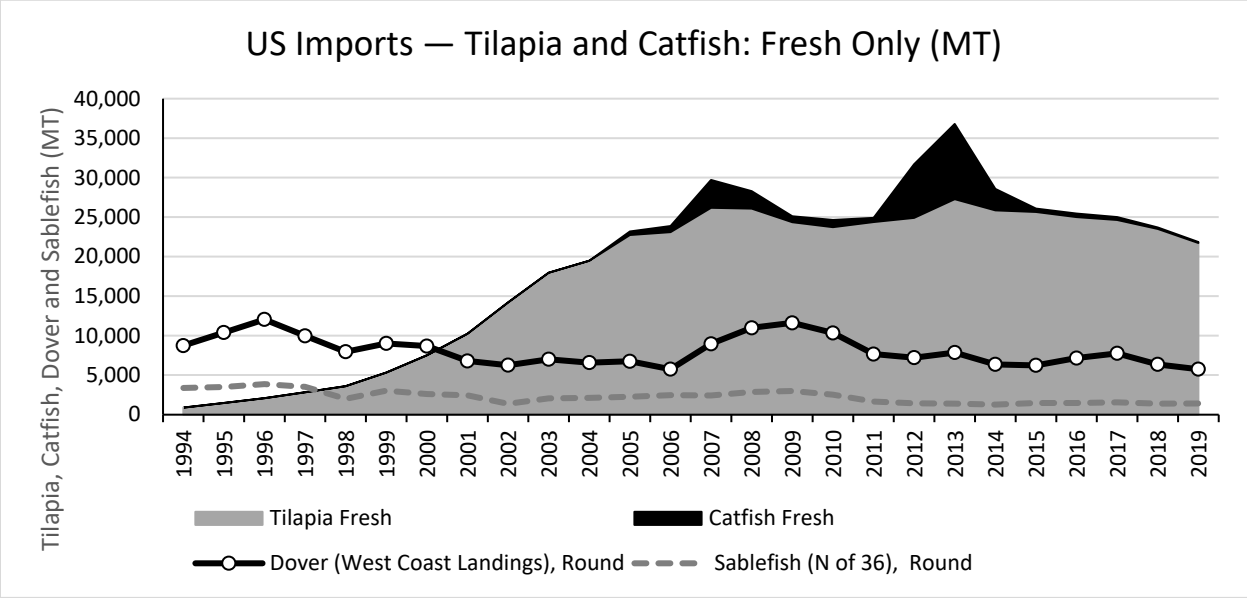


Figure 14. Import volume of processed fresh tilapia and catfish and limited entry trawl gear landings of Dover sole and northern sablefish (excluding gear switching). (Sources: NOAA Fisheries Foreign Trade Data and PacFIN Answers Database)

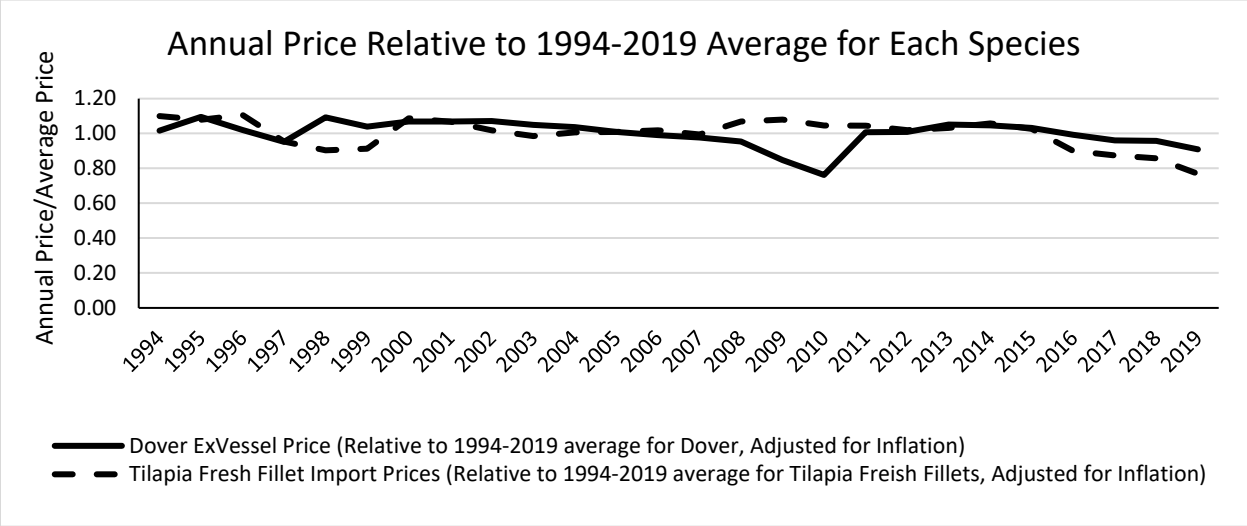


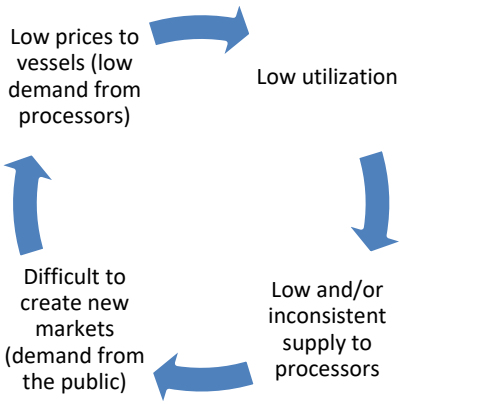
Figure 15. Index of annual prices for Dover sole (exvessel price) and fresh tilapia fillet import prices (customs value) relative to the 1994-2019 average for each species.

In 2007, when ACLs and trawl allocations increased dramatically (rising from less than 10,000 mt to 50,000 mt over nine years; SaMTAAC Agenda Item B.2, Supplemental Attachment 2, Figure 3), Dover sole landings also increased (Figure 14)—despite continuing increases in fresh tilapia imports. While ACLs have remained higher and increased even more, the Dover sole landings increase was short lived, beginning to decline in 2010 and declining more substantially thereafter. On the one hand, the years of high production in 2007 to 2010 could indicate that the market is able to absorb increased Dover landings but that other constraints restricted Dover sole landings causing the decline (e.g., constraints and consequences related to the new IFQ program in 2011). This expansion might have also been supported by a decrease in the ex-vessel price for Dover sole during that period, which might not have been sustainable (Figure 15). On the other hand, the rapid increase and decline could have been the result of an information lag within the market and imperfect information. Interactions between markets are often difficult to discern because of lagged effects (e.g., overproduction is sometimes not recognized until months later when excess inventory remains in cold storage) and factors such as full market saturation (defined here as the levels at which consumers do not absorb additional production without price reductions or additional investment in market development). The expanded landings/purchases of Dover sole came in the midst of a decade-long and ongoing ramp-up of imports of fresh tilapia. In some cases, it can take years for markets to stabilize as significant changes occur; for example, a U.S. market that included cod, haddock and pollock took six years to stabilize at a new equilibrium after the introduction of tilapia (Asche and Zhang, 2013).

It has been argued in public comment that uncertainty about availability of sablefish QP in the future may be dampening the investments needed to develop markets and efficient processing capacity capable of producing price competitive products (e.g. fillet machinery). Certainty about future supply can improve the competitiveness of an industry by helping to rationalize investment in cost reducing technologies. This is particularly true where large investments are needed to support price competitive production (Kvaløy and Tveteras, 2008). If fresh tilapia is competing

in US whitefish markets and lower farmed tilapia prices are a leading influencer of whitefish prices and consequently the demand for some wild fish (as is indicated by the work of Norman-López, 2009), conditions supportive of investments that improve efficiency may become increasingly important to the price competitiveness of US domestic wild fish production.

The recently completed catch share review also emphasized the importance of certainty of raw product supply to developing competitive products and potential interaction with other constraining factors.



[Figure 16.] Illustration of cycle of low demand and low utilization.

> Without a predictable supply, processors have a difficult time securing premium markets (fresh, for example) and, instead, may have to rely on less discriminating protein markets that offer lower prices. Increased flexibility for vessels and limited communication between vessels and processors about production plans can contribute to inconsistent supply to processors, making it difficult to employ a labor force ready to process groundfish year-round. Some processors impose trip limits on vessels that deliver to them to limit deliveries of species for which they lack processing or marketing capacity. Low demand and corresponding lower prices from processors, in turn, make fishing less profitable and result in fewer trips, lower landings, and ultimately, low utilization. It is difficult to quantify the effect of individual factors on utilization, as they are all related in an endogenous (cyclical) way [[Figure 16]. (PFMC and NMFS, 2017, page ES-22)

While competition in global whitefish markets is a challenge, another response is to distinguish West Coast products from general whitefish commodities. If this effort can be made on a sufficient scale, it may generate enough additional demand to expand attainment of the trawl allocations with less need for price competition with commodities. Such efforts have been undertaken through marketing tools such as certification programs (e.g., Marine Stewardship Council certification) and co-operative efforts such as that by Positively Groundfish (PositivelyGroundfish.Org).

2.3 Infrastructure Limitation (Physical and Skilled Labor)

Summary: It has been hypothesized that infrastructure limitations could be causing low quota attainment under the catch share program. There are two types of infrastructure addressed here: physical and human services and organization. Overall, there are no strong indications that physical infrastructure has declined substantially on a coastwide basis under the IFQ program, except with respect to a decline in the number of processing entities.

The number of processing companies is down in a number of ports and, since 2011, the number of IFQ first receivers has declined in five ports from Half Moon Bay south while declining in only two ports north of that. In addition, there are some signs of infrastructure investment in more northern ports (Oregon and Washington). Service and organizational infrastructure is more difficult to assess. An effort will continue to determine if there is quantitative information on skilled labor that might provide insight. One aspect of organizational infrastructure is the development of markets. Development of markets is discussed briefly here but in more detail in Section 2.2.

With implementation of the trawl catch share program, there has been a concern about declines in attainment of allocations and how it may be related to loss of infrastructure along some parts of the coast. Infrastructure includes all the underlying resources required to support an activity, including both physical assets and human services and organizational structures. There are many different types of physical infrastructure needed to support the fishing industry including harbors and adequate navigation channels, docks, offloading equipment, ice and cold storage, fish buying and processing capacity, trucking, hoists and cranes, dry docks, ship yards, and marine vessel suppliers. With respect to human services and organizational structure, a few keys are a labor force trained with the needed skills and established marketing channels.

Trawl allocations generally cover major expanses of the coast (e.g., coastwide, north and south of 40º 10' N. lat., north and south of 36º N. lat.). Therefore, a determination of whether infrastructure might be limiting attainment of the trawl allocation needs to be based on a broad geographic evaluation. At the same time, both the fishery resource and human communities are distributed along the coast such that inadequate or diminished infrastructure in some ports could diminish coastwide capacity to a degree that would be hard to compensate for through increased capacity in fewer centralized ports.

The recently completed five year review of the trawl catch share program (PFMC and NMFS, 2017, Appendix D) included a study that looked at changes in infrastructure after IFQ program implementation up through 2017. Infrastructure assessments were extracted from NMFS port assessments conducted prior to the catch share program and key informants were interviewed to try to determine how infrastructure may have changed after implementation of the catch share program. Results for a few of the infrastructure categories in the review are summarized in Table 3. For each of these categories, there is an indicator of whether the infrastructure element is present and whether it has been enhanced, not changed, or diminished in some notable fashion since implementation of the catch share program. Additionally, the presence of trawl landings in a port may be the best indicator of whether the minimum infrastructure needed is available in that port, though it does not indicate the degree to which infrastructure is adequate to support all the activity that might otherwise occur in a port. The last five columns of Table 3 are based on current first receiver (FR) license data and indicate the presence of an IFQ first receiver in a port, changes in the number of first receivers over the course of the catch share program, the current number of first receivers, and whether the FR are receiving from trawlers or gear-switched vessels (IFQ fixed gear).

With respect to the infrastructure information from the catch share program review, for the most part, north coast (Oregon and Washington) infrastructure elements have been stable or improving with the most notable declines coming in the reduction in the number of processors active in several ports. In particular, there are a number of ports that have made investments in ice plants and cold storage; boat hoists, lifts and cranes; and shipyards and drydocks. This investment may be in line with the increase in the proportion of trawl sector catch taken in the north, as reflected by the sablefish catch in Figure 4 and total non-whiting catch in Figure 25, although such investments are not driven just by the groundfish fishery. For California, there have been a few ports that have lost fuel docks (large vessels often have fuel trucked in) and, similar to the north, there has been a decline in processors. There are not as many instances of infrastructure improvements in California as there have been in Washington and Oregon. Again, this assessment is based on the catch share review published in 2017 and does not include changes that have occurred in the last few years.

As mentioned, one indicator of sufficient infrastructure is current activity. Over the course of the IFQ program, there has been some consolidation among first receivers, mainly in the more southern part California. The number of first receivers in Washington and Oregon has declined in two of nine ports (both the ports with declines were in Oregon) while the number in California has declined in five of 11 ports, all in the area from Half Moon Bay south. At the same time, there has been only one port in Washington and Oregon that has seen an increase in IFQ first receivers over the course of the IFQ program while there are three such ports in California, all in the area from San Francisco north.

Overall, excluding the numbers of processors and first receivers, there are more instances of improvement of an infrastructure category in a port (11) than losses of infrastructure (6), indicating that it does not appear likely that losses of infrastructure in these categories is affecting attainment of the trawl allocation. At the same time, with respect to the number of processing companies active in a port, there are seven instances of losses and only two of improvements. While total processing capacity is not necessarily related to the number of processing companies in a port, the number processing companies pursuing different contacts and marketing strategies might have some bearing on the capacity of market channels to absorb west coast product. The previous section (Section 2.2) discussed issues of market capacity and constraint on harvest of the trawl allocation and the following section (Section 2.4) discusses how quota share (QS) control limits might inhibit major capital investments in processing infrastructure.

While skilled labor is crucial to processing capacity and public comment has been received about the impacts of labor shortages on processing capacity, quantitative information has not been identified to help assess trends in capacity of labor infrastructure. This issue will continue to be investigated.

Table 3. Presence of infrastructure by port, current and change (as of 2017) since implementation of the catch share program, along with presence of first receivers, change over the course of the IFQ program and whether first receivers in the port are receiving trawl or fixed gear deliveries. (Source: Catch Share Program Review, 2017; PacFIN; and WCR Permit Data)

	Fuel Dock		Ice Plant/Cold Storage		Processors		Boat Hoists, Lifts, and		Shipyard/ Dry Dock		Marine Vessel Suppliers		Licensed First Receivers Sites			IFQ Deliveries 2016-2019[a/]	
	Current	Change	Current	Change	Current	Change	Current	Change	Current	Change	Current	Change	IFQ FR	Change During IFQ Program	Current FR Count (2019)	Trawl Deliveries	Fixed Gear Deliveries
Washington																	
Bellingham Bay, Whatcom County															2		
Neah Bay/N WA Coast																	
Westport															1		
Ilwaco/Chinook															2		
Oregon																	
Astoria (Includes Hammond & Warrenton) [b/]				?											6		
Garibaldi						?				?							
Newport (Includes South Beach & Toledo) [c/]												?			6		
Coos Bay (Includes Charleston & South Bend)		?		?						?					2		
Brookings (Includes Harbor)						?		?							3		
California																	
Crescent City		?						?		?					3		
Eureka (Includes Fields Landing)		?		?		?						?			3		
Fort Bragg												?			3		
Bodega Bay												?					
San Francisco (Including east bay)												?			5		
Half Moon Bay/Princeton				?				?		?		?			1		
Moss Landing				?													
Monterey															1		
Morro Bay		?						?		?					1		
Avila					?	?									0		
Santa Barbara						?						?					

KEY:
Present =
Absent =
Increased =
No Change =
Decreased =
Pre-IFQ Comparison Information Not Available = ?

a/ Some cells merged to preserve business operation confidentiality.
b/ Astoria has two site licenses owned by one company.
c/ Newport has three site licenses owned by one company.

2.4 Catch Share System Design

Section Summary: The topic covered in this section has not been the focus of analysis previously provided to the SaMTAAC. Quota share (QS) control limits are recognized as balancing concerns about distribution of opportunity among individuals and communities with the potential for some reduction in efficiency. When a business evaluates whether to make substantial and specialized capital investments that may improve efficiency and market competitiveness, its willingness to make those investments is partially dependent on an assessment of risk. One strategy for reducing risk is the acquisition of key inputs through vertical integration. Prior to catch shares, processors could acquire fish from any licensed

vessel, subject to the cumulative landing limits which constrained that vessel's catch. Under catch shares, a processor depends not only on the identification of an available vessel willing to fish but also on that vessel's ability to access QP, which are, in total, more limited relative to the pre-catch share trip limits. A processor could secure access to QP through QS acquisition but is limited in its ability to do so by the QS control limits. A limitation on the ability to secure access to QS as a key input could inhibit a processor from making efficiency-promoting capital investments that would improve the price competitiveness of trawl caught fish, potentially expanding attainment of the trawl allocation. This is not to say that the current QS control limits are not an appropriate policy, but rather to note that among the trade-offs associated with use of such limits there is a possible consequence for capital investments and allocation attainment.

The topic covered in this section has not been the focus of analysis previously provided to the SaMTAAC.

In general, catch share programs are intended to bring many of the economic advantages of private markets to fishery management systems. However, due to the public nature of the resource that is being managed and the consideration of a number of competing objectives mandated by the Magnuson Stevens Act (MSA), the catch share program does not completely emulate a private market-based system. For example, the trawl catch share program includes QS control limits because maximums on the ownership of quota are mandated by the MSA. In the general economy, limits on the degree to which an entity owns or controls economic assets are not usually imposed until levels of aggregation are great enough to raise antitrust concerns. Trawl QS control limits are set at levels lower than those needed for antitrust concerns. These lower limits are intended to encourage the dispersion of benefits across individuals and communities. However, the control limit might also prevent a company from reducing risk by acquiring additional QS.

QS control limits could be inhibiting market solutions that would normally come into play when additional security of access to key inputs (e.g., fish) is needed to reduce risk enough to justify major capital investments (e.g., expensive processing equipment). As described in Section 2.2, certainty about future input supplies can improve the competitiveness of an industry by helping justify large scale investments in cost reducing technologies (Kvaløy and Tveteras, 2008). For producers reliant on the availability of generic products (e.g., oil, paper, or grain), there is enough production from enough different sources that securing access to the source of a key input through acquisition of a supply (vertical integration) is not necessary to reduce capital investment risk. However, where alternative sources of a key input are limited, as is the case for fish plants located in a particular port and with equipment investments devoted to particular products, the financial risk associated with an interruption in supply is greater.

Prior to catch shares, processors could acquire fish from any licensed vessel, subject to the cumulative landing limits which constrained an individual vessel's catch. The total fish available under cumulative landing limits (number of vessels times the limits) was much greater than the trawl allocation as it was assumed that some vessels would catch less than the limit, which could be changed inseason to further control catch. Under catch shares, a processor depends not only on

the identification of an available vessel willing to fish but also on that vessel's ability to access QP, access to which is more uncertain compared with per-vessel cumulative landing limits. Processors can, and some do, secure access to QP through QS acquisition, but QS control limits constrain use of that strategy. Thus, the limitation that QS control limits impose might be inhibiting investments in seafood plants that would improve production efficiency, increase competitiveness of some West Coast seafood products in globalized markets, and foster expansion of market share for those products, increasing trawl allocation attainment.

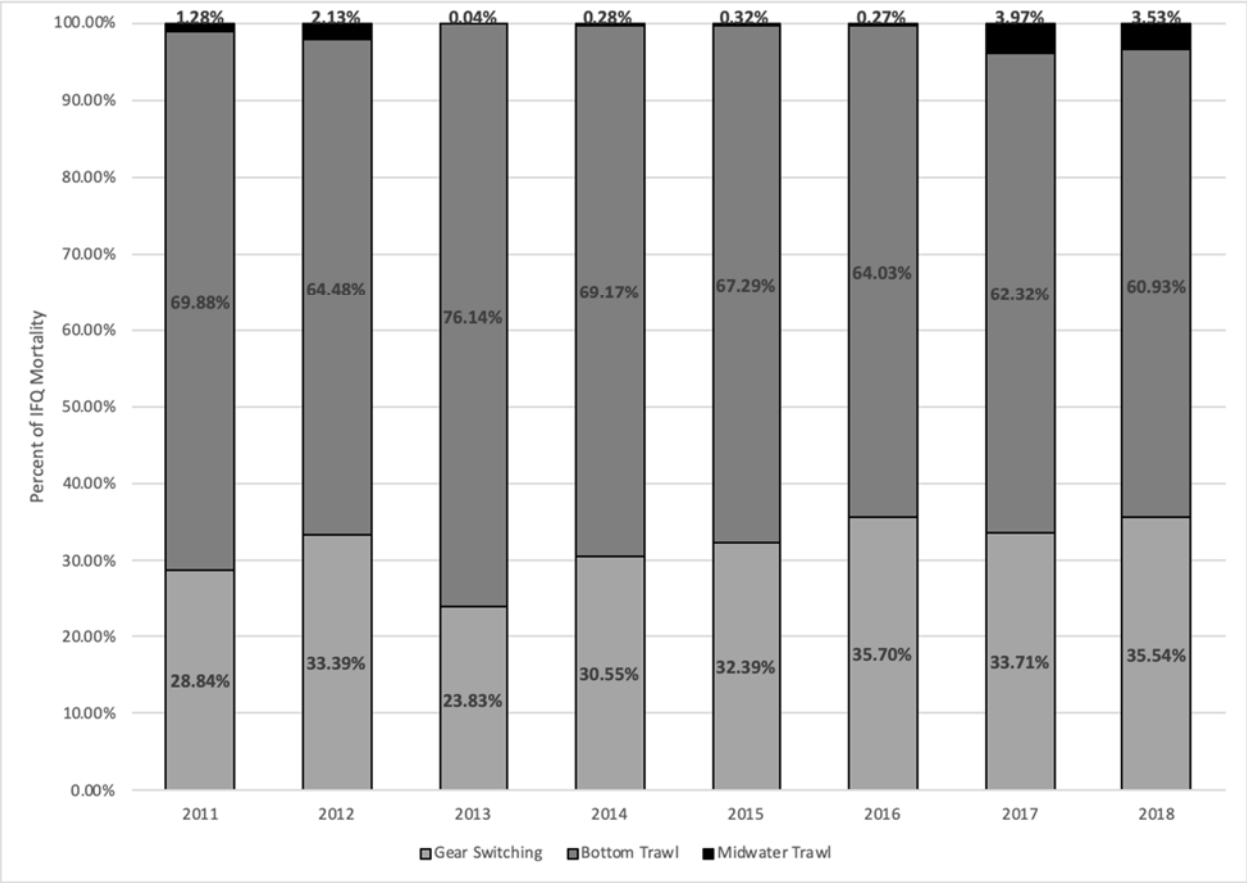
In summary, restricting activity in a system that might otherwise more closely mimic a fully privatized system may be leading to the need to consider other fishery management measures to mitigate risk and provide conditions more conducive to investment. This is not to say that the current QS control limits are not an appropriate policy but rather to note that among the trade-offs in the use of such limits there may be a potential consequence for capital investments.

2.5 Sablefish QP Availability

Section Summary: In the IFQ sector, sablefish north is taken across all gear types and fisheries in various amounts and therefore all participants need quota either for direct targeting or as bycatch. This section finds with respect to northern sablfish that:

- *Bottom trawl fisheries are the dominant source of mortality at* about *62 percent from 2016-2018 followed by gear-switching entities (*about *35 percent).*
- *In recent years, the shoreside whiting fisheries have seen an increase in their bycatch, taking over seven percent of the 2019 allocation, due to interactions with immature year classes.*
- *If all sablefish north that was used for gear switching were instead used in the DTS strategy, the hypothetical additional revenue, assuming markets could absorb the product and not impact prices, would be* about *$60 million.*

Sablefish is utilized by all IFQ sectors, from fixed gear to bottom trawl to whiting. Figure 17 shows the overall percent of total IFQ sablefish north mortality (including discard mortality) by sector from 2011 to 2018. The re-emerging midwater rockfish fishery is combined with the shoreside hake (whiting) fishery as there was limited sablefish bycatch by the midwater rockfish fishery overall. Gear-switching operations have grown from taking an average of 29.2 percent of the total IFQ mortality in the first four years of the IFQ program to over 34 percent in 2015-2018. (Note: Other sections of this document report gear switching as a percentage of the total allocation rather than as a percentage of total fishing mortality.)



Note: Midwater trawl includes both midwater rockfish and shoreside whiting.

Figure 17. Percent of total IFQ mortality of sablefish north of 36° N. lat. by sub-sector, 2011-2018. Source: GEMM

In recent years, sablefish mortality in shoreside whiting fisheries has grown from less than 0.3 percent in 2013-2016 to almost 4 percent in 2017-2018 due to increased bycatch of recruitment classes. An unquantified 2019 year class entering the fishery contributes to bycatch rate uncertainty for future years. The amount of sablefish that can be taken as bycatch is extremely variable (ranging from 0.3 mt in 2008 to 186 mt in 2019) with high years likely representing the fishery interacting with large recruitment classes. In 2017-2018, the fishery saw the highest levels of bycatch since 2004, which had a total mortality of 129.4 mt. Preliminary 2019 data (queried on January 3, 2020) shows that the whiting fishery landed approximately 186 mt of sablefish north—over 50 mt more than in 2002 (highest bycatch on record). This amount is approximately seven percent of the 2019 trawl allocation. If these trends continue, whiting participants could potentially need increased access to sablefish north quota causing greater competition for sablefish QP among all participants.

To the degree that the opportunity to take sablefish north QP with fixed gear is exercised, it reduces the overall portion of the trawl allocation that can be used to harvest other IFQ species that are trawl gear dominant, such as Dover sole and thornyheads. In recent years, gear-switching vessels

have been harvesting approximately 800 to 900 mt of sablefish north and earning between 4.1 and 6.5 million dollars in ex-vessel revenue (Table 4) with 85 to 95 percent of revenue from gear switching coming from northern IFQ sablefish landings.

Table 4. Total gear-switched revenue from all species (millions) and sablefish north landings (mt) and percentage of total revenue, 2016-2019. Source: PacFIN

Year	Total Revenue from All Species ($million)	Sablefish North	
		Landings (mt)	Percent of Total Revenue
2016	6.45	810.9	85.1%
2017	6.28	845.5	90.9%
2018	4.26	805.7	94.7%
2019	4.10	905.5	91.3%

Internal Reference: 6 Trawl Analysis

If the Council were to limit or eliminate gear switching of sablefish north in the IFQ sector, then there would be additional sablefish available to trawl vessels to harvest other complexes in which sablefish occur. Here we focus on the DTS complex, which has been a major concern with respect to under-attainment issues. Table 5 below shows the actual landings (millions of pounds) and revenue (millions of dollars) from DTS for 2016 to 2019 and the hypothetical landings and revenue if trawl vessels had targeted DTS using all the sablefish QP that were actually harvested with fixed gear. The hypothetical landings of DTS are based on each year's bottom trawl ratio of Dover sole and thornyheads landings to sablefish landings. That ratio is then applied to the assumption that all sablefish caught in that year by gear-switching vessels would instead have been caught by bottom trawl vessels targeting DTS. For example, if the ratio were 100 pounds of Dover sole and thornyheads to 10 pounds of sablefish (for a total of 110 pounds), and if an additional five pounds of sablefish would have been made available from the prohibition of fixed gear, then the prohibition's hypothetical result for DTS overall would be 165 pounds (15 pounds of sablefish plus 150 pounds of Dover sole and thornyheads). Note that a hypothetical such as this is likely an overestimate as it assumes all bottom trawl caught sablefish north would be used in the prosecution of the DTS fishery. While DTS trips (with and without other flatfish) account for the overwhelming majority of sablefish caught in the bottom trawl fishery, as shown in the analysis provided for the May 2019 SaMTAAC meeting, sablefish can be used in accessing other flatfish stocks or shelf rockfish and therefore it is likely that some sablefish would be used for other target strategies. In addition, this hypothetical holds constant any bycatch of sablefish by midwater gear, which as described above, has been increasing in recent years in the whiting fishery.

If sablefish gear switching were prohibited, and the additional 1.8 to 1.9 million pounds of sablefish north from fixed gear were used entirely for DTS, it could result in over 90 million additional pounds of DTS complex compared to actual landings, if the market were able to absorb the additional catch (Table 5). Assuming the additional catch could be absorbed without altering market prices and applying the average revenue per metric ton displayed in Table 5, this hypothetical would result in additional annual revenue of $55.7 million to $64.9 million. This amount would be greater than total ex-vessel revenue from the fixed gear sablefish fishery from 2016 to 2019 (Table 4). This shift might also be accompanied by some geographic redistribution of economic activity. Some ports that have historically focused on gear switching may not be able to handle the increase in trawl caught groundfish, which requires more processing capacity.

Table 5: Actual landings (millions of pounds) and revenue (millions of dollars) of DTS complex landed in 2016-2019 and the hypothetical landings and revenue assuming that all sablefish previously taken by gear switching were instead taken with trawl gear. Ratios of Dover sole and thornyheads and the revenue per mt of complex species landed were assumed to remain the actual values in that year. Source: PacFIN.

Year	Dover sole and Thornyhead to Sablefish Landings Ratio	Revenue per metric ton	Actual (Gear Switched)		Hypothetical (DTS)	
			Landings	Revenue	Landings	Revenue
Hypothetical Results Assume that the Market can Absorb Additional Production at Current Exvessel Prices. See Section 2.2 for a Discussion of Market Limits						
2016	22.0	1,539	22.0	15.3	114.9	80.2
2017	20.8	1,503	24.8	17.0	114.6	78.1
2018	23.2	1,303	19.0	11.2	116.6	68.9
2019	22.8	1,184	17.4	9.4	121.2	65.1

Internal Reference:6 Trawl Analysis

3.0 Trawl Sector Participants

Section Summary: The SaMTAAC alternatives focus on gear switching as a possible current or potential future limit on attainment of the trawl allocation. The purpose of this section is to provide some general characterization of the participants that would be impacted by a limitation on gear switching for northern sablefish (both trawl and fixed gear). A few highlights of this section include:

- *An average of 97 percent of all IFQ participants land sablefish north.*
- *41 distinct vessels and permits have harvested sablefish north with fixed gear, with an average of two permits and vessels utilizing both trawl and fixed gear in a single year (2011-2019).*
- *Gear-switching vessels lease approximately 50 percent of their permits while trawl vessels tend to own their permits.*
- *Only eight vessels have used more than one permit to gear switch from 2011 to 2019, with ten permits being used on more than two vessels.*
- *There is no permit-vessel combination that has been used in all nine years for gear switching.*

- *The majority of gear-switching vessels and permits have landed more than 10,000 lbs of sablefish from 2011 to 2019.*
- *Oregon residents own the majority of the permits and vessels that have been used for harvesting sablefish north from 2016 to 2019 and the landings they bring to Oregon constitute approximately half of the coastwide total.*

As described in Section 2.5, sablefish north is used across numerous strategies. Table 6 below shows the number of vessels and permits that harvested sablefish north with fixed gear and trawl gear from 2011 to 2019. On average, approximately 97 percent of all vessels and permits with IFQ landings landed sablefish north. Over the time series, there were 105 distinct vessels and 104 permits that harvested sablefish north with trawl gear compared to 41 vessels and permits associated with gear switching. Within these gear-switching totals are also a subset of vessels and permits that harvested sablefish north with fixed gear and trawl gear in the same year. In the last nine years, there have been 11 distinct vessels and 13 permits that used both fixed gear and trawl gear in the same year to land sablefish north, with an average of about 2 vessels and permits per year. Due to confidentiality, no yearly totals can be provided for those vessels.

Table 6. Number of vessels and permits associated with IFQ sablefish north landings by year and gear, 2011-2019.

Year	Vessels		Permits	
	Trawl	FG	Trawl	FG
2011	83	17	84	17
2012	79	20	79	21
2013	80	11	80	11
2014	77	15	78	14
2015	75	14	74	14
2016	69	16	70	16
2017	77	16	78	16
2018	77	16	79	16
2019	75	15	77	15
Total Unique Participants	105	41	104	41

To indicate the fluctuations and levels of the participation in the fishery, Figure 18 and Figure 19 show the number of vessels and permits (respectively) that landed sablefish north with fixed gear by amount and number of years from 2011 to 2019 that they caught that fish. Of the 41 vessels with associated catch of sablefish north, 37 had landings in excess of 10,000 lbs for at least one year. Only 12 vessels have had at least five years of landings in excess of 10,000 lbs, with five of those twelve having more than 120,000 lbs landed in each of those five years (or more). 38 of the 41 permits associated with gear switching between 2011and 2019 had landings of greater than 10,000 lbs in a single year. Similar to vessels, there were 12 permits with at least five years of landings greater than 10,000 lbs, but only three permits had more than 120,000 lbs in each of those years.

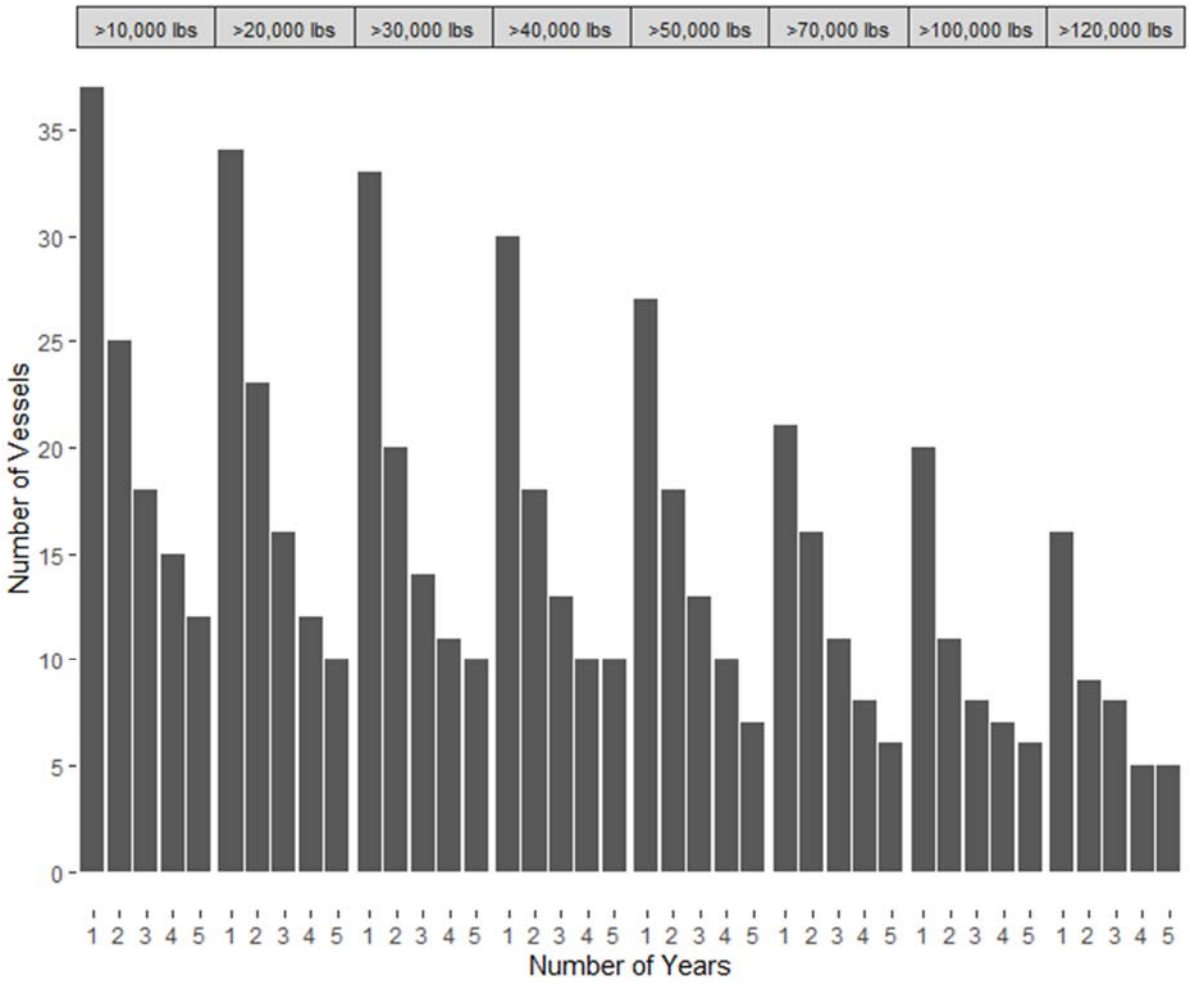


Figure 18. Number of vessels with gear-switched landings of sablefish north at specified sablefish landings amounts (rd. wt. lbs) and number of years, 2011-2019.

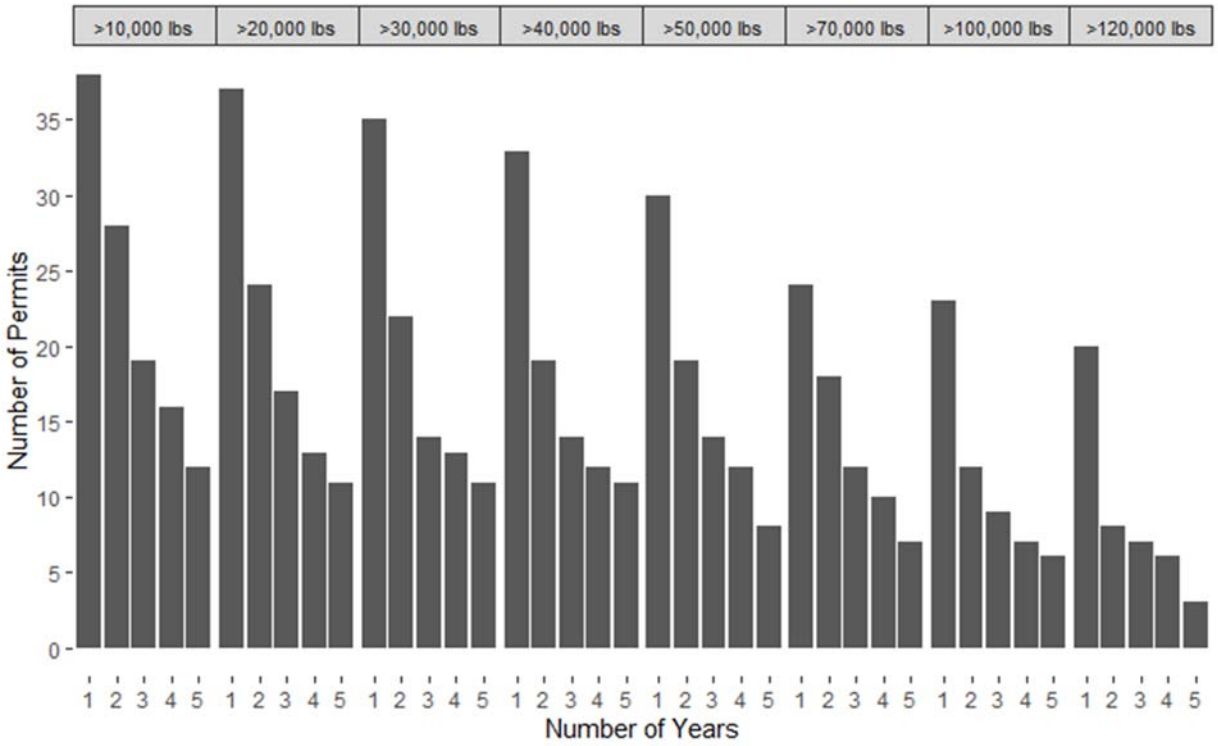


Figure 19. Number of permits with gear-switched landings of sablefish north at specified sablefish landings amounts (rd. wt. lbs) and number of years, 2011-2019.

The vessels and permits that participate in the trawl IFQ program are owned by entities across all three West Coast states. Benefits from landings accrue to the state in which the vessel and permit owners reside, through their expenditures and profits, as well as to the communities in which the fish are landed and processed, through associated processing jobs, local crew labor, fuel and supply purchases, as well as other avenues.

Figure 20 provides a comparison of the permit (left panel) and vessel (right panel) ownership by state between gear-switching and trawl entities (top and bottom panels respectively) from 2016 to 2019. As in Table 6, those vessels that used both trawl and fixed gear in the same year are included in the gear-switching category for consistency within this section. Oregon residents owned a greater proportion of permits and vessels used in both trawl and gear-switched harvest of sablefish north. The difference between state residents' contribution to the gear-switching fleet (as measured by the percentage of coastwide permits and vessels involved in gear switching) and state residents' contribution to the trawl fleet, was greater for Washington than the other states. Washington resident-owned vessels and permits used in gear switching, as a proportion of the coastwide total, is almost 15 and 20 percent higher, respectively, than its proportion of coastwide trawl vessels and permits harvesting sablefish. Conversely, Oregon residents tend to contribute more heavily to the coastwide trawl fleet than the fixed gear fleet, but not with as great a differential as for Washington. California residents hold a similar percentage of coastwide permits across both gear types, but a greater percentage of trawl vessels than of gear-switching vessels.

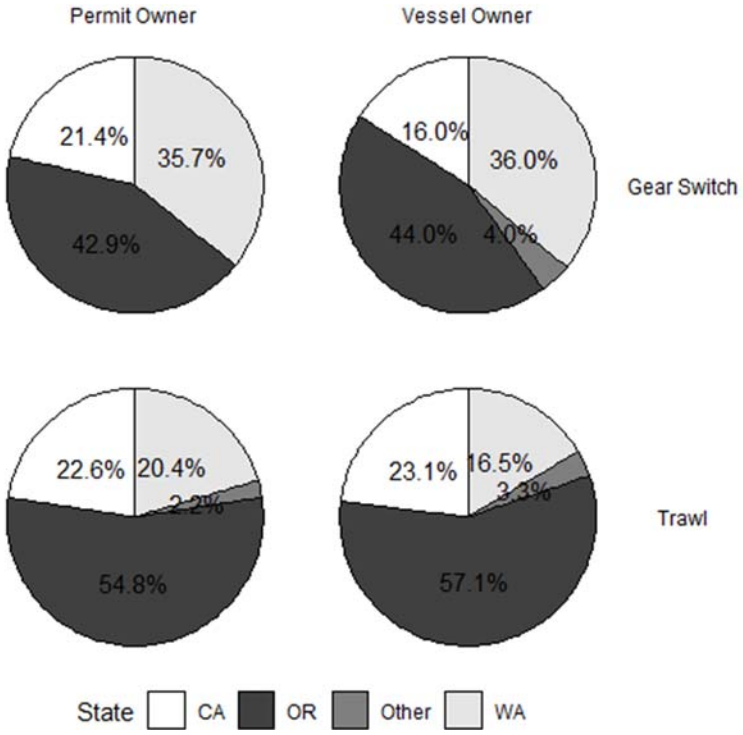
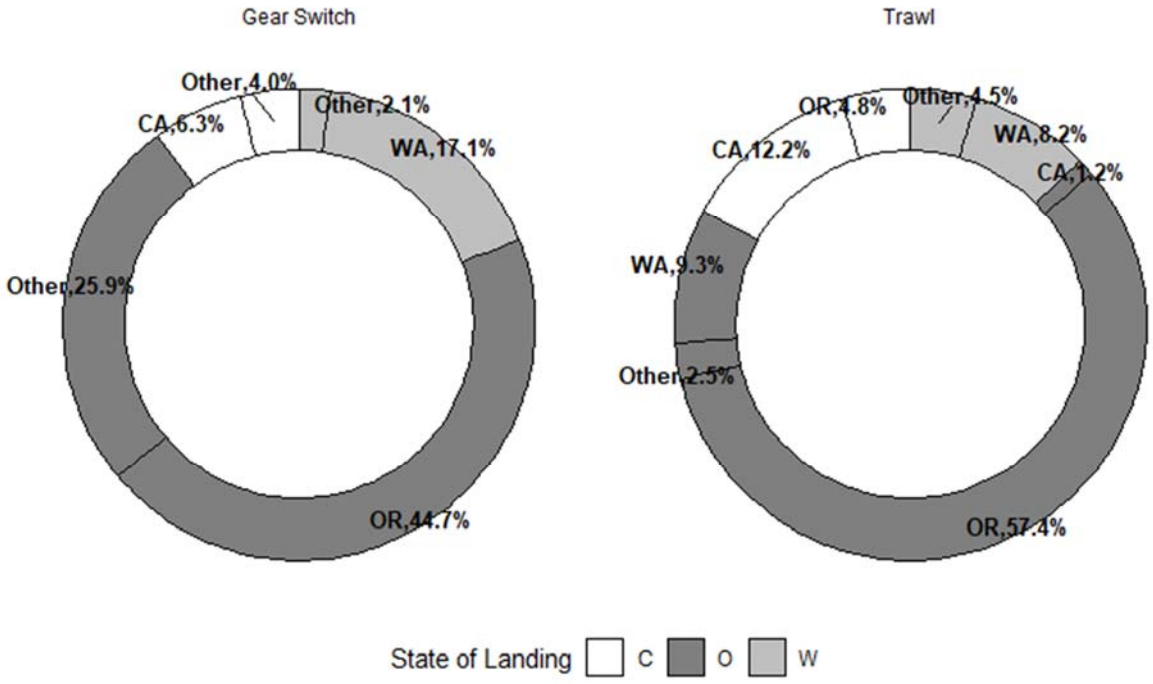


Figure 20. Percent of permits (left panel) and vessels (right panel) used for harvesting sablefish north with fixed gear (top row) and trawl gear (bottom row) by state of ownership.

Looking at those trawl sector vessels that harvested sablefish north from 2016 to 2019, Figure 21 below shows the total percentage of revenue (all fisheries) landed into each state, by state of ownership for the permit or vessel. Due to confidentiality, certain ownership groups were combined (described in footnote). Oregon has received more revenue that the other states for both types of vessel activity, with Washington seeing a higher revenue from gear switchers than California (and vice versa for trawl vessels). Washington had no records of landings of gear-switched sablefish made by California owned vessels. The majority of Oregon landings of sablefish by both gear types were made up of Oregon-owned vessels, followed by Washington-owned vessels.



Note: "Other" in this figure denotes landings from vessels owned by other states not shown. For gear-switched landings into a specific state, all landings from vessels owned by non-residents were combined. Additionally, for trawl landings into Washington, non-Washington owned vessels were combined.

Figure 21. Percentage of coastwide revenue from sablefish north from 2016 to 2019 by gear by state of landing (color of donut chart) and state of vessel ownership (noted by labels).

4.0 First Receivers (Buyers of IFQ Landings)

Section summary: In order to purchase IFQ fish, a business must have a first receiver (FR) license for each receiving site. Historically, close to half of all first receivers of northern sablefish have also received fixed gear sablefish. There has been a declining trend in the number of first receiver licenses and in 2019, the number of fixed gear receivers declined by a substantially more than the decline in all receivers of northern sablefish. Most IFQ fixed gear sablefish purchases are made by FRs that also purchase from trawl vessels in at least some years.

In order to purchase IFQ fish, a business must have a first receiver (FR) license. FRs include both businesses that purchase and process and also those that purchase and transfer fish to others for processing. Over the first eight years of the IFQ Program (through 2018) there have been a total of 81 FR licenses issues to 54 different first receivers. Businesses that act as first receivers often have multiple licenses when they have different sites. Even as catch has increased in recent years, there has been a declining trend in the number of FRs.

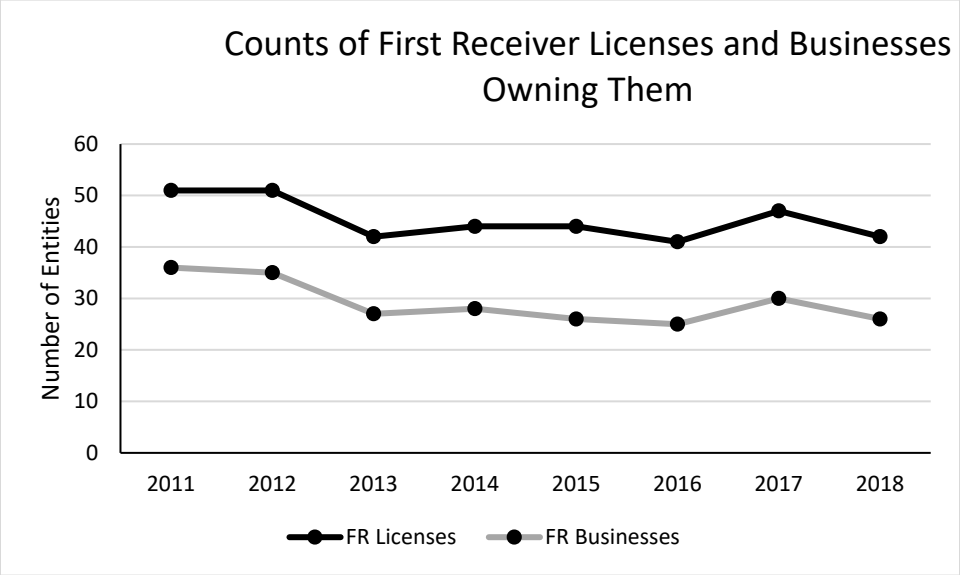


Figure 22. Number of FR licenses and businesses holding those licenses (2011-2012). Source: NMFS WCR Permit Data. (Internal Reference: Permits_Public_Jan 25 2019_R.xlsx)

Of these first receivers, most FRs that receive groundfish also receive northern sablefish (61 of the 81 that were active in the 2011-2019 period). Of the 61 FRs that purchased northern sablefish, there were 39 FR licenses owned by 31 entities (based on license owner name) that purchased IFQ fixed gear sablefish north. That represents almost 64 percent of all FR licenses that purchased sablefish north from any IFQ vessel (whiting or non-whiting) in the same time frame. An average of 27 of those purchased northern sablefish (Table 7). Even though 2019 is estimated to have the highest proportion of the allocation taken with fixed gear (about 34 percent), it appears as though the purchasing channels are consolidating. In the previous four years, fixed gear sablefish was purchased by over half of the non-whiting first receivers that purchase sablefish north; in 2019, that dropped to 35 percent.

Table 7: Number of first receivers that purchased that northern sablefish from 2011 to 2019.

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number of First Receivers Receiving Gear-Switched Sablefish	14	15	11	13	14	13	15	12	9
Number of Entities Receiving Gear-Switched Sablefish	12	14	10	11	12	12	13	10	6
Total non-whiting FR Purchasing N. Sabl.[a/]	30	27	29	30	24	22	29	23	26
Percent of Total	47%	56%	38%	43%	58%	59%	52%	52%	35%

a/ Includes FRs that received both non-whiting and whiting deliveries.
Internal Reference: 4 Gear Switching Analysis

Given that there has been a decline in the total number of first receivers purchasing fixed gear sablefish north in the last three years, it begged the question of did the fixed gear buyers change their buying strategy to focus on trawl in recent years.

Of the 61 FR licenses that purchased sablefish north, 11 FRs purchased only from IFQ fixed gear and were responsible for 6.5 percent of the total northern sablefish purchases (Figure 23), which would constitute around 20 percent of the total IFQ fixed gear purchases, on average (using a 31.74 percent average 2011-2019 mortality as a proxy for the total IFQ fixed gear purchases). Thus, most IFQ fixed gear purchases came from FRs that either consistently purchased both trawl and IFQ fixed gear sablefish or change strategies over time. Five FRs purchased consistently from both trawl and fixed gear and were responsible for 22.9 percent of the northern sablefish purchases. There were 23 first receivers that changed their purchasing strategy during this period. A first receiver was determined to have changed strategy if they went from purchasing from only trawl or only fixed gear or both fixed gear and trawl to a different classification (e.g. purchasing from both fixed gear and trawl during the 2011-2014 period and then only purchasing from trawl vessels in 2015 and beyond would be a "change"). Of the 23 FRs that changed strategies during the period the majority went from purchasing both fixed gear and trawl sablefish to just purchasing trawl sablefish north (8) or switched back and forth at least twice between these two purchasing strategies (8). Four dealers originally purchased trawl only sablefish but then added fixed gear or switched entirely to fixed gear in terms of their trawl sector purchases. The remaining three dealers shifted from fixed gear only to adding trawl or shifting to trawl only entirely. Also included in the 23 FRs that changed strategy were six first receivers that purchased IFQ sablefish north in all nine years. The 6 FRs always maintained some trawl purchasing activity, i.e. moved between buying trawl-only and both trawl and fixed gear sablefish.

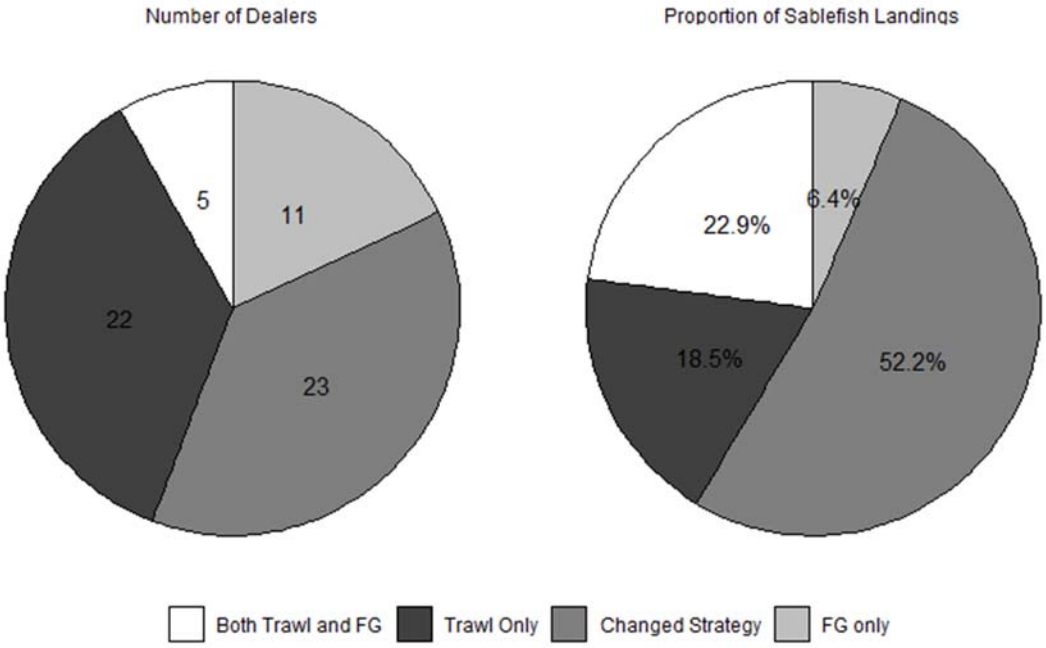


Figure 23: Number of first receivers and corresponding percentage of total sablefish north purchased by purchasing strategy, 2011-2019

5.0 Communities

Section Summary: This section looks at the importance of sablefish north to West Coast communities and how limitations or elimination of gear switching may impact certain communities. From 2011 to 2019,

- *Newport has seen the greatest overall amount of sablefish north landed with fixed gear with Astoria seeing the largest amount of trawl caught sablefish.*
- *Some ports, such as Newport and Astoria, may have the infrastructure to process trawl caught groundfish while others, like those south of San Francisco, primarily buy fixed gear and might be more impacted with no gear switching.*

While changes to the gear-switching provisions may directly affect individual vessels, permit holders, or QS owners, there would be additional effects to the communities in which those participants port their vessels and deliver fish. Community related information is provided both here and in Section 2.3 on port infrastructure. Figure 24 below shows the relative amount of landings of sablefish north by IOPAC port group and by sector (IFQ-trawl, IFQ-fixed gear, and non-IFQ) for 2011 to 2019. Note that all non-groundfish sector and tribal landings of sablefish are included in the "non-IFQ" sector, but retained at-sea bycatch is not included. The size of the bubble shows the relative amount of landings in that port group and sector compared to the other port groups and sectors. As examples, south and central Washington, Astoria, Newport and Brookings have seen the large relative landings across each of the sectors over the last eight years. The farther south the port is (y-axis oriented north to south) there are fewer overall relative landings of sablefish north into those ports.

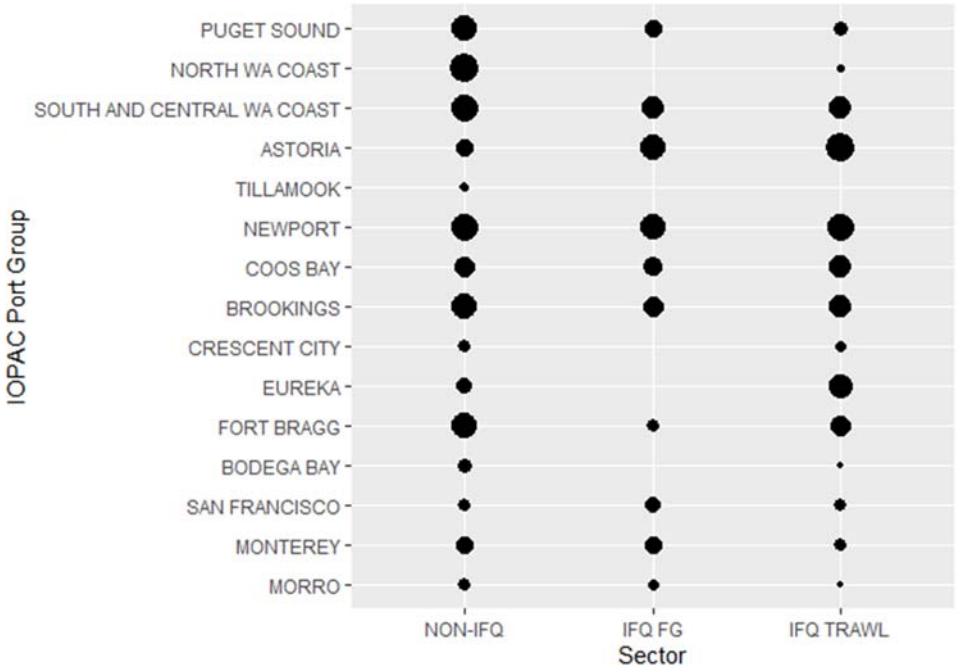


Figure 24. Relative landings of sablefish north by IOPAC port group and sector, 2011-2019.

The alternatives under consideration may limit the amount of gear switching for sablefish north of 36° N. lat.; the degree to which gear switching would be reduced is dependent on the alternative and the options selected within that alternative. Additionally, communities that may lose economic activity as a result of a reduction in gear switching could gain some compensating increases in trawl landings if sablefish QP availability is constraining harvest of other species and trawl gear vessels that benefit from the reduction are active in the community. To provide a sense of the fixed gear related economic reductions that elimination of gear switching might cause for affected communities (to act as a bookend for the analysis), the following table shows the percent reduction in groundfish revenue in 2011-2019 by year if gear-switched sablefish north was not landed into those ports and there were not compensating increases in trawl activity (Table 8).

The percentage of revenue that IFQ fixed gear sablefish north brings in varies by port and year. Some port groups, like Newport and the South/Central Washington Coast, have seen IFQ fixed gear landings across all nine years at different levels. Others, like Brookings, have only seen gear-switched sablefish north landings in a few years. Depending on the markets and other fishing opportunities, the reduction or elimination of fixed gear sablefish landings in the IFQ sector could be important to a port group. While additional availability of sablefish QP could provide additional opportunities for trawl for sablefish and other co-occurring species, some of these ports may not have the infrastructure to process larger amounts of trawl caught groundfish. Figure 24 may be instructive in that regard. Note that for Washington and Oregon, the port areas that predominate with respect to IFQ fixed gear landings are the same ones that predominate with respect to IFQ trawl gear landings. Therefore, there is some probability that reductions from restrictions on IFQ fixed gear landings might be offset by increases for the trawl sector in those ports. Similarly, if a

reduction in gear switching were to enhance trawl gear landings overall, northern California ports such as Eureka and possibly Crescent City might experience a net benefit, since those ports are stronger trawl ports than they are for IFQ fixed gear. On the other hand, from San Francisco south, the ports with history of sablefish north landings appear to be more predominate in IFQ fixed gear landings than they are trawl landings.

Table 8. Percent reduction in total groundfish ex-vessel revenue by IOPAC port group if fixed gear IFQ sablefish north was not landed and there is no compensating increase in trawl vessel landings of sablefish and other co-occurring species, 2011-2019

IOPAC Port Group	2011	2012	2013	2014	2015	2016	2017	2018	2019
Puget Sound	8.35%	10.04%	-	7.80%	20.21%	10.62%	12.86%	5.93%	10.09%
North WA Coast	-	-	-	-	-	-	-	-	-
South and Central WA Coast	11.40%	7.97%	5.11%	11.16%	5.20%	5.57%	6.50%	4.45%	4.25%
Astoria	1.97%	9.33%	3.24%	2.57%	10.18%	10.29%	6.83%	8.11%	5.09%
Tillamook	-	-	-	-	-	-	-	-	-
Newport	16.05%	9.11%	5.30%	0.41%	12.21%	14.78%	10.69%	8.78%	9.25%
Coos Bay	2.19%	1.31%	3.49%	-	1.39%	17.40%	12.98%	3.46%	-
Brookings	-	-	-	18.63%	6.31%	-	-	0.35%	-
Crescent City	-	-	-	-	-	-	-	-	-
Eureka	-	-	-	-	-	-	-	-	-
Fort Bragg	4.36%	2.15%	0.77%	1.95%	1.51%	1.55%	1.72%	-	-
Bodega Bay	-	-	-	-	-	-	-	-	-
San Francisco	15.94%	4.30%	4.03%	34.96%	12.53%	4.86%	9.27%	-	6.07%
Monterey	7.20%	4.19%	-	-	0.30%	-	3.20%	6.66%	-
Morro	0.50%	0.09%	-	1.02%	2.11%	1.84%	1.69%	-	-

As the effort and participant levels of the non-whiting trawl fishery have varied over time (Section 2.1), along with changing management measures (i.e. implementation of the IFQ fishery) and allocations, there have been impacts to various communities dependent on the fleets. Figure 25 below shows the relative landings of groundfish in the non-whiting trawl sector from 2006 to 2019 (including gear-switched landings during the IFQ era). Some communities have been able to maintain the amount of groundfish coming across the docks while other communities have lost or gained landings. Astoria has been the dominant non-whiting port across the entire series. Other ports have seen decreases in the relative amount of landings, such as Crescent City and Fort Bragg, while others have ceased to see any non-whiting trawl (or gear-switched landings) during the IFQ era (Santa Barbara, Bodega Bay, and Tillamook).

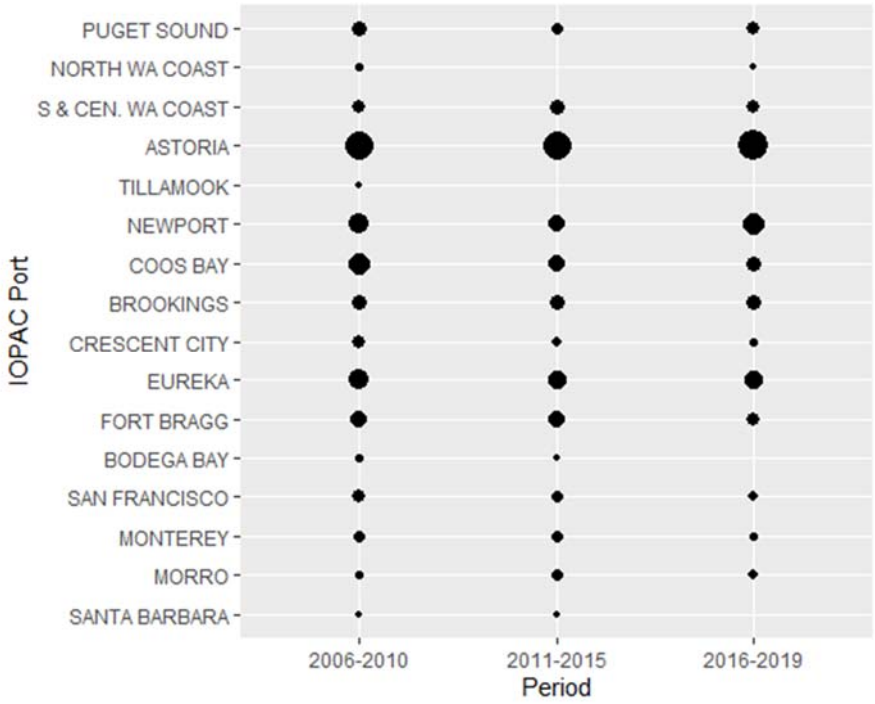


Figure 25. Relative landings of groundfish in the non-whiting trawl/IFQ sector (including gear-switched landings from 2011-2019) by IOPAC port group and period.

6.0 Future Sablefish Constraints and Potential Gear Switching

Section 2.0 focuses on possible causes of under attainment including the current state of sablefish QP usage and whether usage by fixed gear might be constraining trawl harvest. The SaMTAAC alternatives focus on limiting gear switching for the purpose of ensuring that fixed gear vessels competing with trawl vessels for sablefish QP does not constrain trawl harvest. This section discusses some factors that might influence future demand for sablefish QP both within the trawl fleet and by gear-switching vessels.

6.1 Sablefish Biomass and Trawl Allocation

Section Summary: Based on the recent stock assessment and the Council's preferred new default harvest control rule, sablefish north ACLs are expected to be the highest since the start of the IFQ program by an average of 1,000 mt and be at the same magnitude as pre-catch shares levels. As sablefish biomass changes in concert with management changes, the degree to which sablefish north is available and needed by various fisheries may change.

Based on the 2019 stock assessment and under the Council's preferred alternative of P* of 0.45 for the 2021-22 biennium selected in April 2020, the coastwide sablefish stock is expected to remain above target B_{msy} levels in the ten year projection period. Figure 26 below shows the historical sablefish north ACLs from 1995 to 2020 shown in the black dots with solid connecting

line. Based on the ten year ABCs and removal assumptions described in Haltuch, et.al, 2019, the black dots with the dotted line show the proposed ACLs for 2021-22 and beyond based on the Council preferred ACL apportionment method which allocates 78.4 percent to north of 36º N. lat. based on a rolling 5 year average from the bottom trawl survey. Note that if the Council continues using this apportionment methodology, this percentage will likely vary (although to what degree is unknown) as new trawl survey data become available in the future; and, therefore, these ACLs should be viewed with that in mind. Furthermore, it is highly likely that the Council will mandate another sablefish stock assessment, either full or an update, in the next couple of bienniums, which would use actual catches (rather than full assumed removals coastwide) and may see a different trend in the biomass levels or determine the stock biomass is at a different scale. Based on the data available, the ACLs likely to be seen in the next few biennium are on average 1,000 mt higher than the ACLs seen since 2011. In the few preceeding years prior to the IFQ program being implemented, ACLs were on the same magnitude as expected in the next few years.

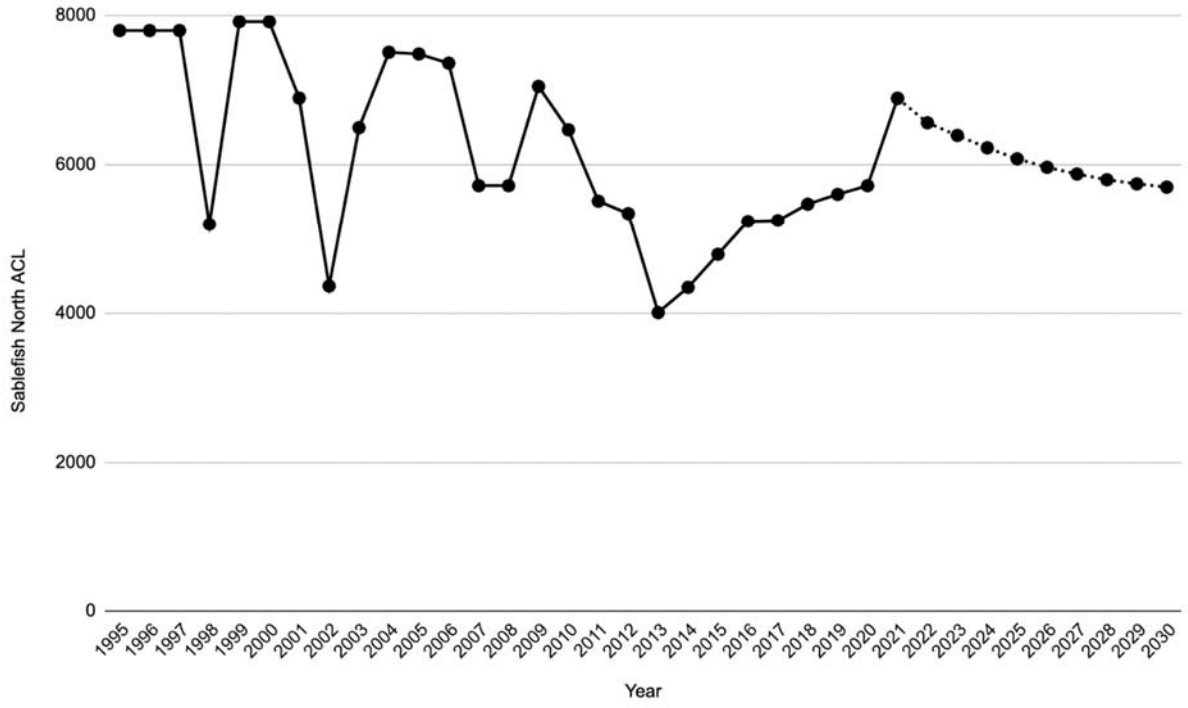


Figure 26. Sablefish north ACLs 1995-2030. ACLs from 1995-2020 based on regulation; 2021-22 based on Council's PPA selected in April 2020. 2023 and beyond based on PPA apportionment method applied to ten-year ABC projections from 2019 stock assessment.

As sablefish biomass changes, in concert with changes in apportionment and health of the population (i.e. depletion), the degree to which sablefish is available and needed for the harvest of other stocks or complexes co-occurring with sablefish may change. On the one hand, if sablefish is constraining and increases in biomass are correlated with increases in rates of catch in the bottom trawl complexes (or strategies such as whiting), increased ACLs might not result in increased

opportunity to take these other complexes. Changes in bycatch rates resulting from strong recruitment events and biomass changes may also shift relative sablefish bycatch rates between different strategies. For example, as discussed in Section 2.5, large year classes taken as bycatch in the whiting fishery may increase the amount of sablefish QP needed for that fishery and decrease the amount available for other trawl gear strategies. Alternatively, if vessels are able to maintain similar bycatch rates as biomass increases, then increases in allocations could alleviate the constraint in accessing co-occurring complexes and allow greater trawl attainment of other species. On the other hand, if sablefish is not constraining but rather the catch of some of the trawl complexes that take sablefish, such as DTS, is being constrained by market limits, then as the available QP increase, there may be an increase in surplus sablefish QP available for other uses. Depending on sablefish markets, this may increase the opportunity for gear-switching vessels to take sablefish that might otherwise go unused.

6.2 Sablefish Market Prices

Section Summary: If gear switching is limiting the attainment of trawl allocations, then changes in the price differential between fixed gear caught sablefish and trawl caught sablefish may influence future levels of gear switching.

- *Despite declines in sablefish ex-vessel prices, the amount of gear switching has increased in recent years.*
- *The price differential between fixed gear and trawl caught sablefish is 46 percent greater over the last three years as compared to the previous three years.*
- *While this information indicates the possibility of a relationship between these price differentials and the amount of gear switching, it is not a definitive study.*

Sablefish market prices likely influence the amount of gear switching through at least two interdependent mechanisms. First, the higher the prices, the greater the incentive for fixed gear vessels. However, this is also true for trawl vessels; though for trawlers, sablefish is only one component of their catch, albeit a valuable one relative to many of the other species that co-occur in trawl catch. Second, the differential between prices for sablefish delivered by fixed gear vessels and sablefish delivered by trawl vessels influences the relative willingness of each group to buy QP (or the opportunity cost of holding QP rather than selling to someone else). In recent years, sablefish prices have been declining dramatically (Table 9). At the same time, the total amount of sablefish used by gear-switching vessels has increased from about 27.4 percent in 2011 to 31.9 percent of total available pounds in 2018 (Table 2). While prices have declined, the price differential between fixed gear and trawl caught sablefish has increased. Fixed gear prices have ranged between $0.70 and $1.13 more than trawl prices from 2011 through 2018 and have averaged $1.04 more than trawl over the last three years (Figure 27). The price differential between fixed gear and trawl caught sablefish is 46 percent greater over the last three years as compared to the previous three years.

While this information indicates the possibility of a relationship between these price differentials and the amount of gear switching, it is not a definitive study. To the degree that the indication is accurate, if the low prices are adequate to maintain interest in gear-switching sablefish and there

is a sufficient market for fixed gear caught sablefish, the price differential between fixed gear and trawl caught sablefish could be a factor that will continue to contribute to gear switching. However, if other factors are constraining trawl harvest, and relatively cheaper sablefish are leveraging relatively more valuable co-occurring trawl caught species, the price differential may have a less important influence on total gear switching.

Table 9. Average price per round weight pound for sablefish by area and gear type (2011-2019). (Source: PacFIN).

Gear	2011	2012	2013	2014	2015	2016	2017	2018	2019
Trawl	2.51	1.78	1.59	1.98	2.02	2.05	1.93	1.30	0.93
Fixed Gear	3.53	2.49	2.31	2.68	2.74	3.07	3.06	2.28	1.88
Difference	1.02	0.71	0.72	0.70	0.72	1.02	1.13	0.98	0.95
Percent Difference	40.6%	39.9%	45.3%	35.4%	35.6%	49.8%	58.5%	75.4%	102.2%

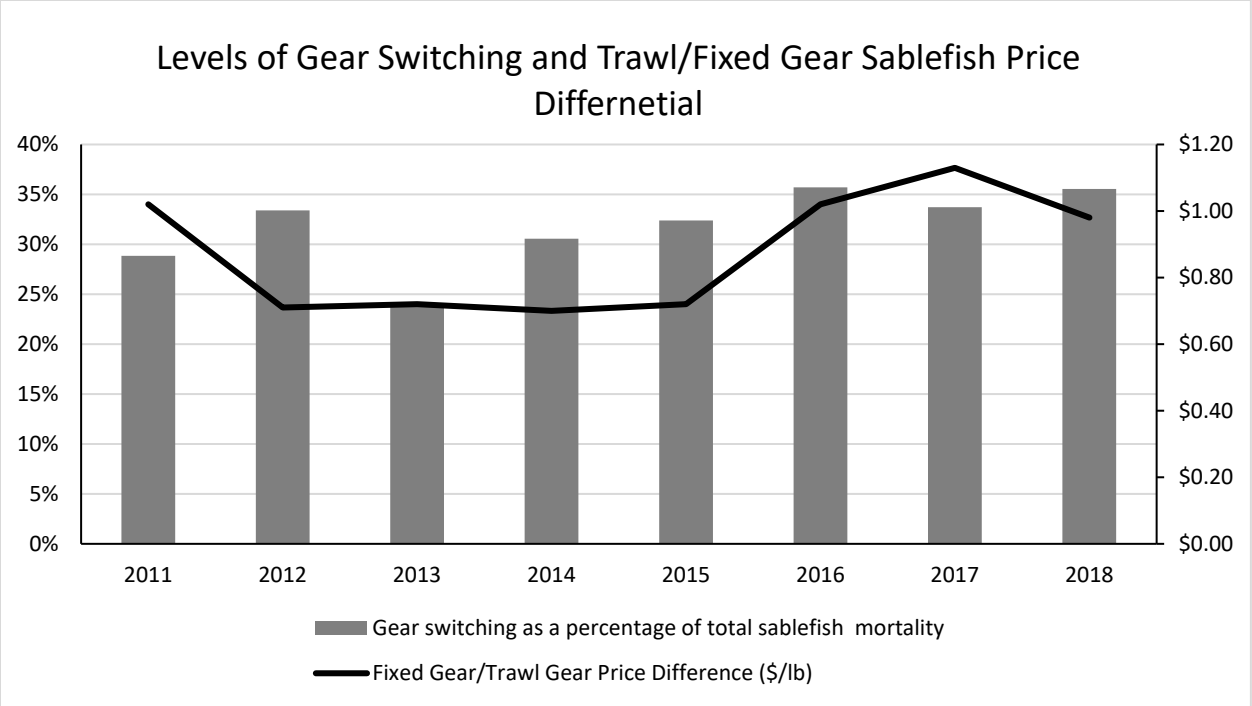


Figure 27. Difference between fixed gear and trawl caught northern sablefish ex-vessel price per pound and amount of gear switching. (Source: PacFIN and GEMM) Internal Reference: PriceDifFig.xlsx

6.3 Latent and Unutilized Permits

Section Summary: One of the concerns that has been noted is the potential for gear switching to expand, further constraining non-whiting trawl operations within the trawl program (or if it is not currently a constraint becoming one through such expansion). This section looks

at the potential for vessels to enter the fishery by accessing limited entry trawl permits that are latent or inactive. A few of the highlights are:

- *There have been 54 trawl permits that have been unregistered to a vessel ("latent") for an entire year from 2011-2019, with five being latent the entire period.*
- *There have been 90 trawl permits that have been registered to a vessel but not used for IFQ landings for an entire year ("inactive") from 2011-2019, with six being inactive the entire period.*

While the total number of gear-switching entities per year has stabilized to around 16 units (see Table 6), new vessels interesting in gear switching in the trawl fishery can enter through acquisition of a trawl permit by purchase or lease. Figure 28 shows the number of permits that were used for IFQ landings compared to those that were inactive (i.e. registered to a vessel but had no associated IFQ landings) or latent (i.e. were unregistered to a vessel) for the entirety of the fishing year from 2011 to 2018. Over 60 permits of the 165 trawl endorsed permits were latent or inactive in the last four years. These permits therefore could be seen as "available" to interested entities without impacting current operations.

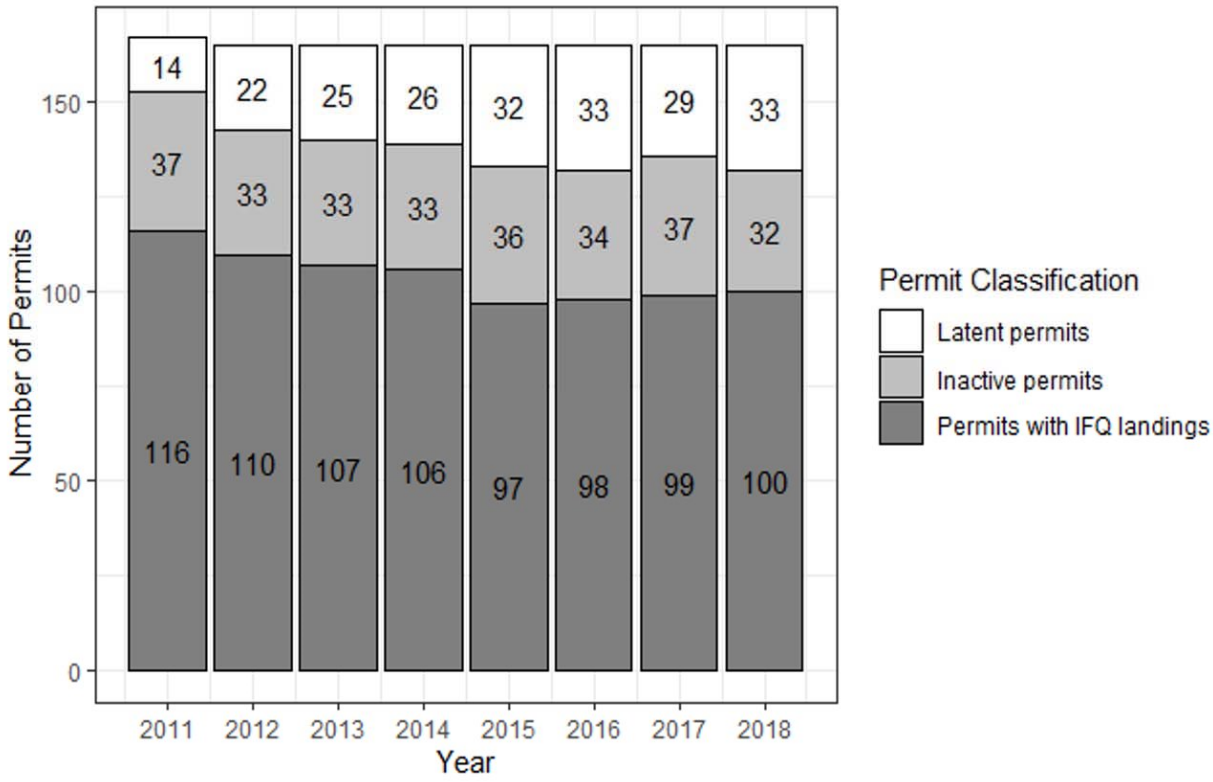


Figure 28. Number of trawl endorsed permits with associated IFQ landings and number of permits that were inactive (assigned to vessel but no IFQ landings recorded) or latent (unregistered to a vessel) for the entirety of the year.

6.4 Cross-Over Fisheries

Section Summary: The previous section establishes that there are latent and inactive permits that may be available for new entrants. This section looks at the fisheries that may potentially contribute new entrants to gear switching.

- *Based on existing cross-over patterns, the two primary sources of new participants appear to be existing fixed gear fisheries: the LEFG fishery and the Dungeness crab fishery.*
- *Approximately half of the IFQ gear-switching vessels in a given year also participate in the LEFG fishery.*
- *Of those that crossover to the LEFG sector, 56 percent of their total groundfish revenue comes from IFQ sablefish north compared to 77 percent for those vessels that only gear switch in the IFQ program.*
- *One motivation for crossing over from the LEFG fishery may be the constraints imposed by the three-permit stacking limit. From 2016 to 2019, all but one vessel that crossed over from the LEFG fishery (an average of six) had stacked their maximum number of LEFG permits. At the same time, there were an average of 20 LEFG vessels with three stacked permits that did not crossover.*
- *The highest crossover rate from the Dungeness crab fishery is to the fixed gear fisheries (IFQ, LEFG and OA, 21.2 percent) followed by trawl IFQ (five percent) and for the fixed gear IFQ fishery alone only (2 percent).*
- *No significant levels of cross over into the existing gear-switching fishery were found among other fisheries (e.g. pink shrimp).*

Prior to the implementation of the trawl IFQ program, while trawl permitted vessels were allowed to use fixed gear to fish against trawl allocations, virtually all vessels using fixed gear did so in the LEFG and OA fisheries against the respective allocations for each of these sectors. The LEFG allocation is available to those vessels participating in the primary/tier fishery and the LE daily trip limit (DTL) fishery. Vessels must have a sablefish endorsed fixed gear (longline or pot) LE permit to fish in the primary/tier program and/or LE DTL fishery or can fish in the LE DTL sector with a fixed gear permit without a sablefish endorsement.

While total gear-switching numbers have leveled off in recent years (16 permits/vessels a year taking about 33 percentage of the total available pounds from 2016 to 2018), at the same time, there have been nine new entrants, replacing vessels standing down from the fishery. And, while the number of participants has been flat, the overall amount of gear switching has increased since 2011. One concern motivating consideration of gear switching is that new entrants could further expand the gear-switching fleet, leading to a greater proportion of the sablefish north allocation being taken with fixed gear. Based on current cross-fishery participation patterns, the most likely source for potential crossover into the trawl fishery as gear switchers would be those vessels that currently participate in the LEFG fishery. There have been 14 distinct vessels that have participated in both the fixed gear IFQ and LEFG fisheries since 2011. In most years, approximately half of

the IFQ gear-switching vessels also participate in the LEFG fishery. Note that these vessels used only fixed gear within the IFQ fishery and do not have a record of trawling for sablefish north.

Table 10. Number of vessels that landed in the LEFG primary fishery, participated in both the IFQ and LEFG fishery, number of gear-switching vessels, percent of total gear-switched landings and total groundfish revenue from gear-switched sablefish taken by vessels that participate in both LEFG and IFQ fisheries, and total IFQ vessels landing northern sablefish, 2011-2019.

Year	Primary Sablefish Fishery LEFG Vessels		Total Number of Gear-Switching Vessels b/	For the Primary Sablefish Fishery LEFG Vessels that Also Gear Switch		Total IFQ Vessels Landing Northern Sablefish
	Total Number	Number Also Gear Switching a/		Their Share of All Gear-Switching Vessels' Landings	Avg. Percent of Their Groundfish Revenue from Gear Switching	
2011	98	5	17	41.1%	59.0%	100
2012	95	8	20	57.5%	58.8%	99
2013	89	5	11	58.9%	64.2%	91
2014	84	7	15	63.6%	50.2%	92
2015	86	6	14	59.7%	57.0%	88
2016	85	7	16	57.9%	53.9%	85
2017	85	5	16	43.4%	56.4%	93
2018	83	7	16	53.8%	49.6%	93
2019	83	10	15	73.0%	53.6%	90
Avg.	88	7	16	56.5%	55.9%	92

a/ Includes fewer than three vessels that participated only in the LEFG DTL fishery.
b/ Gear-switching vessels include those vessels that used only fixed gear to land sablefish north and those that used both trawl and fixed gear in a given year to land sablefish north.

Figure 29 below shows a graphic representation of the average amount of participation and crossover between the primary tier and IFQ fleet. There are 93 vessels on average that harvest sablefish north in the IFQ fishery, with 16 using fixed gear and 79 using trawl gear. Two vessels on average fish the IFQ fishery with both fixed and trawl gear. The primary sablefish fishery typically has 88 vessels participating, with seven also participating with fixed gear in the IFQ fishery. Of the 16 gear-switching vessels, seven strictly harvesting sablefish north with fixed gear in the IFQ fishery.

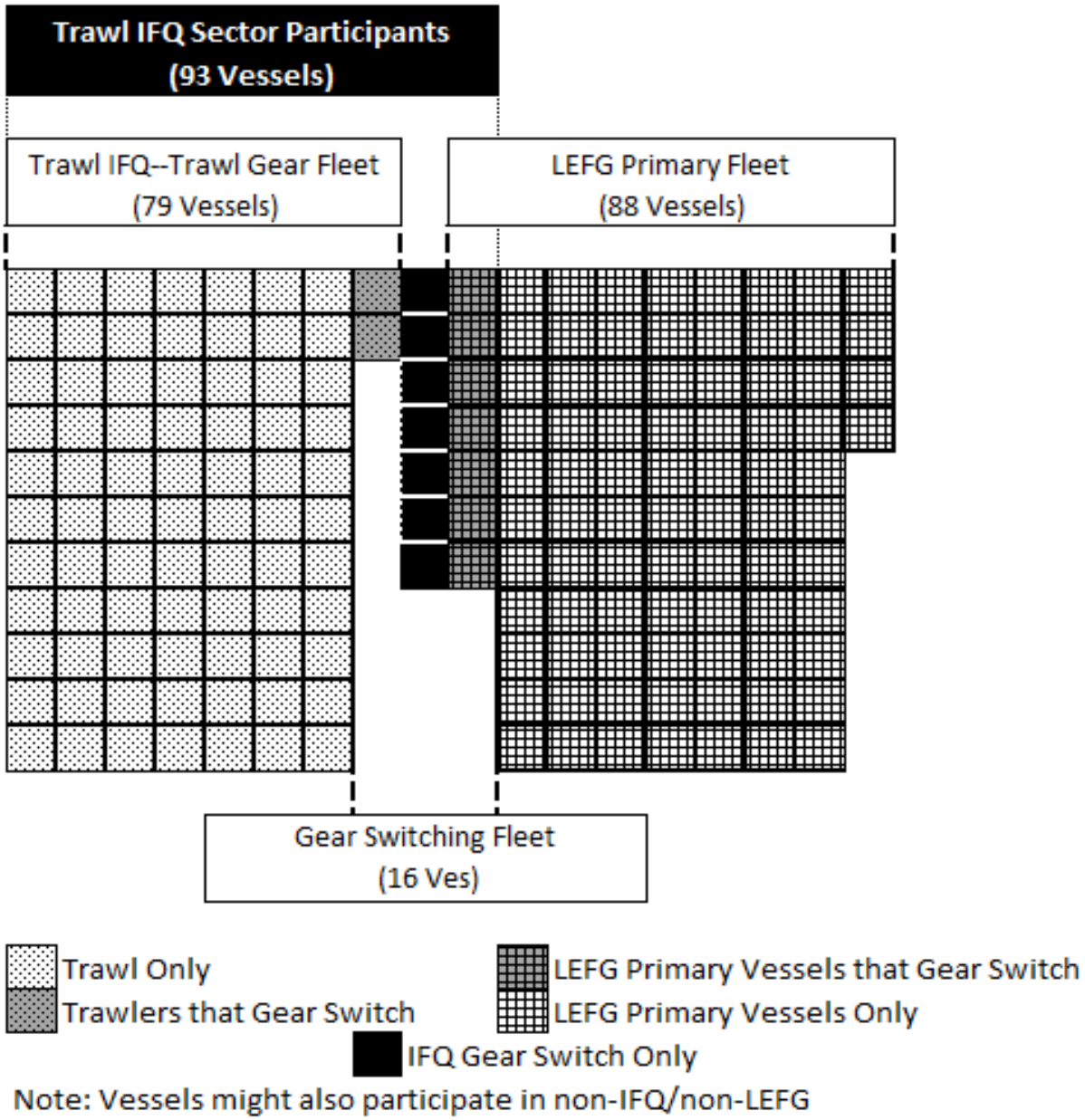


Figure 29. Waffle plot of the average number of IFQ vessels harvesting sablefish north with trawl gear (left panel) and average number of vessels participating in the LEFG primary fishery (right panel) with the numbers of vessels that "crossover" from both fisheries into gear switching compared to those that only gear switch (middle panel). Internal Reference: Waffle Diagram & InfraStructure.xlsx

In terms of dependence, on average, those LEFG vessels that participate in the IFQ sector get at least half of their groundfish revenue from gear switching, as shown above in Table 10. Comparatively, those vessels that only gear switch and do not also participate in the LEFG fishery receive an even higher percentage from sablefish north gear-switched landings (77 percent; Figure 30). If the Council were to adopt an alternative that restricted gear switching in the IFQ fishery,

those vessels might be noticeably impacted given their reliance on that revenue. At the same time, with potential revenue available in the IFQ fishery for those vessels currently participating in the LEFG fishery, there is the risk of having additional participants join in gear switching.

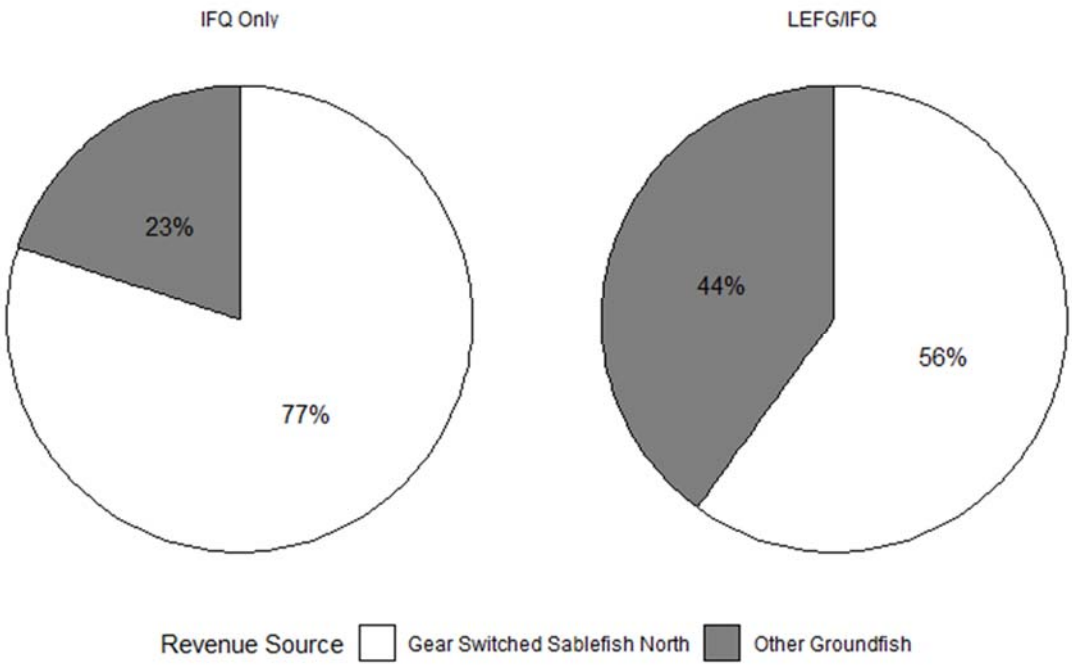


Figure 30. Average percent of groundfish revenue from gear-switched sablefish north and all other groundfish, 2011-2019, for those gear-switching vessels that also participated in the LEFG fishery compared to those that only participated in IFQ.

Vessels cross over into the trawl IFQ fishery despite the greater costs for participating in the IFQ fishery (at sea monitoring, cost recovery, and quota required to cover catch rather than landings). One motivation for crossing over from the LEFG to the gear switching in the IFQ fishery may be the permit stacking limits imposed on the LEFG sector, which impede individual vessels from further expanding business operations, possibly to more efficient levels.

In the LEFG primary fishery, each permit is assigned to one of three cumulative limit levels (Tiers 1, 2 or 3). The cumulative limits are poundages that can be landed during the primary season (April through October). The ratio of the cumulative limits among tiers is 3.85:1.75:1, for Tiers 1, 2 and 3, respectively. Vessels are permitted to stack up to three LEFG permits at a time. Under the tier program in 2020, the maximum cumulative limit a vessel can harvest is 145,929 lbs (three Tier 1 permits at 48,643 lbs each). Comparatively, in the IFQ fishery the 4.5 percent annual vessel limit for sablefish north comes out to 261,592 lbs for 2020. At the 2016-2019 average fixed gear sablefish price, a vessel participating in both fisheries could take up to a maximum of over 407,000 pounds of northern area sablefish worth $1.13 million in ex-vessel revenue, 180 percent more than the maximum opportunity provided in the LEFG fishery alone.

All but one vessel that participated in both the primary fishery and the IFQ fishery between 2016 and 2019 stacked their maximum (three LEFG tier permits), and all but two had at least 1 Tier 1 permit (Table 11). Only one or two vessels had three Tier 1 permits stacked in a given year, while others had various combinations of three Tier 1, 2, and 3 permits.

Table 11. LEFG permit sablefish tier combinations held by vessels that also participated in the trawl IFQ fishery, 2016-2019.

Tier Combination (Number of Permits by Tier for: Tier 1, Tier 2, Tier 3, Respectively)	**Year**	**Number of Vessels**
3,0,0	2016	2
	2017	1
	2018	2
	2019	2
2,1,0	2016	3
	2017	2
	2018	2
	2019	3
1,2,0	2016	1
	2017	1
	2018	1
	2019	1
1,1,1	2016	1
	2017	1
	2018	1
	2019	2
0,2,1	2018	1
	2019	1
0,0,2	2019	1

LEFG/trawl IFQ fixed gear vessels have taken an average of 92.8 percent of their tier limits for the last three years. In the IFQ sector, these vessels have taken 146,777 lbs on average from 2016 to 2019, slightly more than could be harvested using three tier-1 permits in the tier fishery alone in 2020.

While all but one vessels that used fixed gear in both the LEFG and IFQ fishery from 2016 to 2019 stacked three permits (Table 11), during that period there have been 19 to 23 vessels that stacked three LEFG tier permits and did not cross over into the IFQ program. Table 12 shows the number of LEFG vessels that did not switch gear in the IFQ program, by year and number of stacked permits. If any of these vessels desire to expand their fixed gear harvest of sablefish, their choices are to try to acquire a higher tier permit or acquire a trawl permit to gear switch in the IFQ fishery.

Table 12. Number of tier vessels that did not cross over into the IFQ program, by year and number of stacked permits.

Number of Permits Stacked by Vessel	Number of Vessels by Year			
	2016	2017	2018	2019
1	33	35	36	36
2	26	22	18	19
3	19	23	22[a/]	18

a/ Fewer than three vessels were registered to four tier permits over the course of the year and were included in this category.

While all but two of the LEFG vessels that participated in the trawl IFQ fishery from 2016 to 2019 had at least one Tier 1 permit, depending on the year there were between 8 and 12 vessels that had at least one Tier 1 permit that did not cross over into the IFQ program from 2016 to 2019. Table 13 below shows for vessels that did not cross into the IFQ fishery the number of Tier 1 permits on a vessel and the number of other permits (none to two) stacked on that vessel from 2016 to 2019. For example, the bottom set of three rows the right hand column shows the number of vessel/year combinations with zero tier-1 permit (a total of 100 combinations representing 80 vessels). Of these, 20 vessels had three other permits (Tier 2 or Tier 3) in a year, 32 had two other permits (Tier 2 or Tier 3) in a year, and 48 had one permit (Tier 2 or Tier 3) in a year. Seven of these vessels had trawl permits but did not gear switch during this period. For 2016 to 2019, there was only one vessel with three stacked Tier 1 permits that in one year did not participate in the IFQ fishery.

Table 13: Number of Tier 1 permits on vessels that did not participate in the IFQ fishery from 2016-2019 and the number of other permits on those vessels.

Tier Level and Number of Stacked LEFG Permits		Number of Vessel/Year Combinations
Tier 1 Permits	**Tier 2 or 3 Permits**	
3	0	1
2	1	4
	0	2
1	2	4
	1	2
	0	1
0	3	20
	2	32
	1	48

Outside of the trawl and fixed gear sectors, the largest West Coast fishery from which vessels already crossover to the IFQ gear-switched sablefish fishery is the Dungeness crab fishery. Between 31 and 38 vessels participate in the crab fishery and participate in the IFQ fishery (Table 14). The cross-over rate from the crab fishery to trawling in the IFQ fishery (an average of five percent) is between the cross-over rates from Dungeness crab to the fixed gear fisheries (21.1 percent) and from Dungeness crab to gear switching in the IFQ fisheries (two percent). At the same time, approximately a quarter of trawl vessels that participate in the IFQ fishery also participate in the Dungeness crab fishery, a lesser amount of cross-over from trawl to Dungeness crab than from gear switching to Dungeness crab. The small proportion of crab vessels that gear switch (two percent) compared to the large number of gear-switching vessels that crab (about 55

percent in recent years) might indicate that a decline in opportunities in the crab fishery could lead to more gear switching.

Table 14. Crossover between the Dungeness crab fishery and fisheries that harvest sablefish north, 2011-2019.

Season	Total Crab Vessels	Vessels that Harvested Only Dungeness Crab[a/]	Vessels that Harvested Dungeness Crab and...			
			Landed IFQ Sablefish	Gear-Switched Sablefish North	Landed Sablefish North with Trawl Gear	Landed Sablefish North with Fixed Gear[b/]
2010-2011	523	490	33	9	24	134
2011-2012	486	448	38	12	26	124
2012-2013	481	447	34	7	27	89
2013-2014	478	444	34	8	26	82
2014-2015	479	447	32	8	24	88
2015-2016	468	437	31	11	20	98
2016-2017	491	455	36	10	26	111
2017-2018	492	459	33	11	22	107
2018-2019	500	467	33	10	23	98

a/ Harvested Dungeness crab but not northern sablefish in the limited entry or open access sectors.
b/ Includes IFQ gear switching, LEFG and open access fisheries.

6.5 Trends in Northern Sablefish QS Acquisition by Gear-Switching Vessels

Summary: Regular gear-switching participants have acquired an additional 3.0 percentage points of QS since the start of QS trading in 2014, bringing their total holdings to 11.5 percent as of the end of 2018. Gear switchers are probably acquiring about 20 percent of the trawl QP through leasing each year. Entities that have had some involvement in gear switching in at least one year (have owned a vessel that gear switched on at least one occasion or leased a trawl permit to a gear-switching vessel on at least one occasion from 2011 through 2018) own about 32 percent of the northern sablefish QS.

The annual average amount of northern sablefish QS owned by vessel owners engaged in gear switching is about 10 percent (Table 15). Ownership determinations for this analysis were based on an examination of names, addresses and a review of publicly available business records to identify businesses with common ownership interest. The amounts shown in Table 15 are affected by which vessels participate in a given year and acquisition of quota over time by individual owners. Just as the number of participants has stabilized in recent years so too has the amount of northern sablefish QS owned by the vessels that gear switch in a particular year. At the same time, an examination of individual business QS holdings shows that three gear-switching participants, active since before 2015, have increased their holdings of northern sablefish QS. The increase for those three participants since QS trading first started in 2014 was 3.0 percentage points. Only one gear-switching entity has divested itself of its northern sablefish QS. Those who acquired

additional QS were regular participants (gear switching in at least four out of the eight-year period ending in 2018). As of the end of 2018, the total QS holdings by regular participants was 11.5 percent.

Because 10 percent of the QS is set aside for the Adaptive Management Program, the QS owned by gear switchers represent about 11 percent more QP than the nominal QS percentage. Thus, the average amount of QS owned by all gear-switching participants from 2016-2018, 12.3 percent, translates to about 13.6 percent in terms of the QP equivalent. Given that for 2016-2018 the total amount of gear switching has averaged 34 percent of the allocation, gear switchers acquire roughly 20 percent of the trawl allocation through the lease of QP gear each year (34 percent (amount taken by gear switchers)—13.6 percent owned by gear switchers = 19.4 percent leased).

The group of those vessel and permit owners with at least some passing involvement in gear switching own about 32 percent of the northern QS (Table 16). This includes entities that have owned a vessel that gear switched on at least one occasion or leased a trawl permit to a gear-switching vessel on at least one occasion from 2011 through 2018. Note that the group of QS owners included in this table does not vary from year to year, therefore for the first years of the program, before QS trading started, the value does not change from year to year.

Table 15. Amount of northern sablefish QS owned by owners of vessels active in gear switching at the end of the indicated year. Source: WCR IFQ Data and PacFIN.

Year	2011	2012	2013	2014	2015	2016	2017	2018	Average
Northern Sablefish QS	4.4%	13.7%	7.7%	9.4%	10.8%	12.0%	12.1%	12.9%	10.4%

Internal reference: Permits_Public_Jan 25 2019R:QS_Ownership_Update

Table 16. End of year amount of northern sablefish QS owned by owners of vessels gear switching in at least one year during the period or that leased a permit to a gear-switching vessel in at least one year during the period (2011-2018). Source: WCR IFQ Accounts Data and PacFIN.

Year	2011	2012	2013	2014	2015	2016	2017	2018	Average
Northern Sablefish QS	32.4%	32.4%	32.4%	33.4%	31.0%	30.7%	30.8%	31.2%	31.8%

Internal reference: Permits_Public_Jan 25 2019R:QS_Ownership_Update

7.0 Qualifiers and non-Qualifiers: Dependence, Historic, and Recent Participation

This section is intended to provide the Council with the preliminary results on the number of entities that would qualify for gear-switching privileges based on the range of alternatives recommended by the SaMTAAC for consideration and, for those entities, their past levels of

participation. Additionally, there is a preliminary impact analysis on those entities that would not qualify for gear-switching privileges. A comprehensive analysis will be provided at a later date.

7.1 Who Receives the Gear-Switching Privilege: the Permit or Vessel Owner

One of the central decisions for any allocation based on historic participation is determination of the entity for which the history will be evaluated in making the allocation. The history of the Council's deliberations for other programs and SaMTAAC rationale for considering vessel or permit history is provided in Section B.2.1 of the SaMTAAC report. Alternatives 1 and 2 would allocate gear-switching privileges based on gear-switching history of the permit, while Alternative 3 would allocate based on the vessel. Where the permit and vessel remain continuously together under the common ownership (including being transferred together to new owners), there would not be an effective difference between the two with respect to which received the allocation. Where a permit is leased or where the permit and vessel are transferred separately from each other, different individuals will benefit from the initial allocations depending on whether the allocation is given to the permit owner or vessel owner. This section provides information related to these issues.

Gear-switching vessels tend to rely more heavily on leasing permits than vessels using trawl gear. For 2011 to 2019, roughly half of gear-switching vessels (including those that both gear switched and trawled in the same year) leased their trawl permits (Table 17). Comparatively, trawl vessels that landed sablefish north had an average lease rate of 5.9 percent with 2016-2019 seeing the highest proportion of leased permits at an average of 9.3 percent, ranging from 7 percent in 2016 to 12 percent in 2017.

Table 17. Percentage[a/] of gear-switched [b/] and trawl vessels by year that used leased permits versus those that owned permits.

Gear	Permit Used	2011	2012	2013	2014	2015	2016	2017	2018	2019
Gear Switched	Leased	53%	55%	36%	60%	50%	44%	44%	56%	67%
	Owned	47%	50%	64%	40%	50%	56%	56%	44%	33%
Trawl	Leased	4%	1%	2%	3%	5%	7%	12%	8%	11%
	Owned	98%	99%	98%	97%	97%	97%	91%	92%	87%

a/ Values can add up to greater than 100% based on a vessels using more than one permit type in a year.
b/ Vessels that used both trawl and fixed gear in a single year are in the "gear switched" category.

There have been 41 distinct vessels and permits associated with making landings of gear-switched sablefish north between 2011 and 2019. For most of these vessels, only one LE permit was used to gear switch during this nine-year period (Table 18). Eight of the 41 vessels used more than one permit to harvest sablefish north with fixed gear, with fewer than three vessels using multiple LE permits within a single year.

Table 18. Number of vessels by number of LE trawl permits they have been registered to while using fixed gear in the IFQ fishery, 2011-2019

Number of Vessels Using Only 1 Permit	33
Number of Vessels Using 2 Permits	5
Number of Vessels Using 3 Permits	3

While the table above shows that 33 vessels used only one permit, in a few cases, it was the same permit that was used with more than one vessel. Of the trawl endorsed permits used for gear switching since 2011, 31 have been used on only one vessel while ten have been used on more than one (Table 19). This implies that two of the 33 vessels that used only one permit shared those permits with at least one other vessel.

Table 19. Number of LE Permits by number of vessels they have been used with to land fixed gear sablefish north in the IFQ fishery, 2011-2019

Number of Permits Registered to only 1 Vessel	31
Number of Permits Registered to 2-3 Vessels	10

Overall, there have been 52 distinct combinations of vessels and permits landing sablefish north with fixed gear from 2011-2019. Of those combinations, there have been zero used to land sablefish north with fixed gear in all nine years (2011-2019; Table 20). There are six combinations that were used for seven or eight years. Of those six vessels and permits, fewer than three of each have landed sablefish north in all nine years.

Table 20. Number of distinct permit-vessel combinations and duration of use in gear-switched landings, 2011-2019.

	Number of Years								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Permit-Vessel Combination	24	10	5	3		4	6		0

7.2 Alternative 1

Section Summary: Alternative 1 would create gear specific QPs in which each QS account would receive a specific portion of trawl only and unrestricted (i.e. status quo) QPs. Under one option, the Council could choose to allow permit owners with a history of gear-switched sablefish landings to "opt out" a QS account which would then receive all of its QPs as unrestricted. In summary:

- *The average vessel in 2018-2019 with some gear-switched landings would not be able to cover its average landings under either gear-specific QP option in terms of initial QP distribution (without leasing QP or an opt-out option provided by the Council).*
- *Between 26 and 39 permits would qualify for an opt-out under the current options, with 21 qualifying under all four options.*

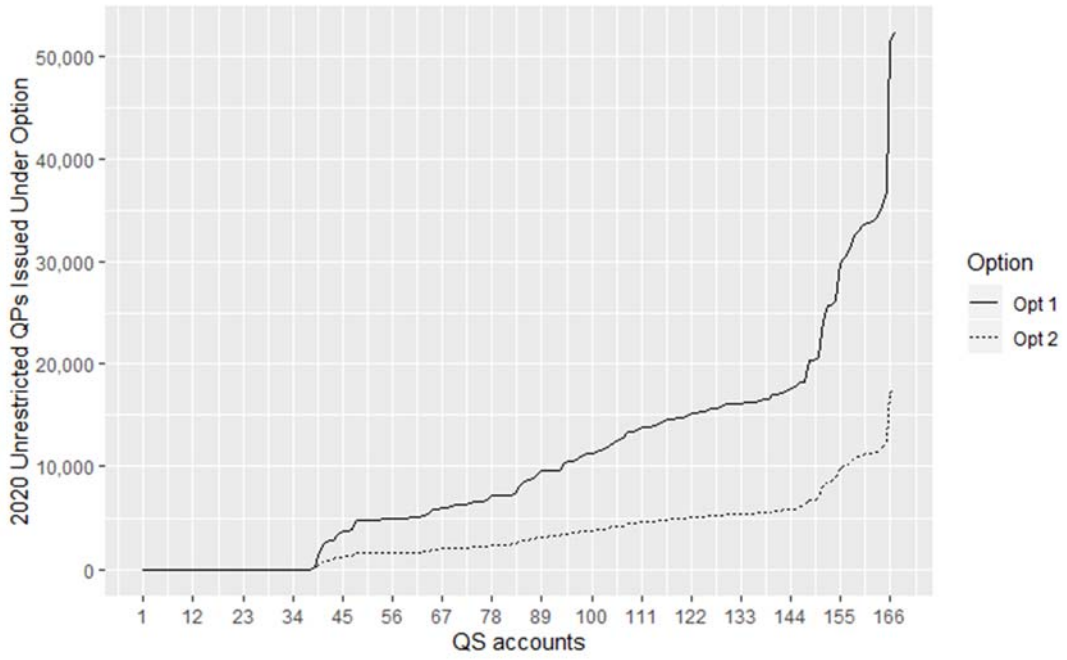
Alternative 1 would create gear specific QPs. Each QS account would receive a specific percentage of QPs as trawl-only, with the remainder as unrestricted (the proportions determined based on the options selected, as show in Table 21). If the Council chooses, there would be an option for qualified permit holders with a history of gear switching to "opt-out" a QS account which could receive all of its QPs as unrestricted. Alternative 1 requires that if Gear Specific QP Percentage Option 2 (90 percent trawl/10 any gear) is selected that the opt-out option also be provided because 10 percent was not viewed as providing an adequate amount for gear switching. If Option 1 is selected (70 percent trawl/30 any gear), then a choice is provided on whether or not the opt-out option would be included as part of the alternative.

Table 21. Alternative 1 gear specific percentage options and if an opt-out option is provided.

	Percentage of QP Issued	
Gear Specific QP Percentage Options	**Trawl Percentage**	**Any Gear**
Option 1	70	30
Option 2 **(Option 2 is only available if the opt-out provision is selected)**	90	10

Using current 2020 QS ownership information, Figure 31 below shows the distribution of the amount of any gear QPs each QS account would receive under each Gear Specific QP Percentage option, assuming no-opt out (i.e. all QS accounts receive their QPs at the designated proportions). Thirty-eight QS accounts, or approximately 25 percent of QS owners, own no sablefish north of 36° N. lat. QS as of February 18, 2020. Under Option 1, approximately 2/3^{rds} of the permits would receive more than 5,000 pounds (more than approximately 0.1 percent of the QP). Under Option 2, only 46 QS accounts (about 25 percent of all accounts) would receive more than 5,000 pounds, potentially requiring harvesters interested in gear switching larger amounts to engage in contracts with a greater number of individuals in order to accumulate an adequate amount of unrestricted QP. This is one reason the SaMTAAC recommended that the 90/10 option not be selected unless there is also an opt-out provision. Note that the average vessel with some fixed gear sablefish landings caught 113,870 lbs in 2018-2019, therefore suggesting that initial distribution of QPs without an opt-out will likely not cover an average vessel's catch without leasing QP. Additionally, given that in recent years gear switchers have taken more than 30 percent of the trawl QP, unless an opt-out or a mid-year conversion of trawl-only QP to unrestricted QP,[7] neither of the Gear Specific QP Percentage Options are likely to allow gear switching to continue at recent levels.

[7] Options are provided that would allow mid-year conversions to occur on August 1 or September 1.



Note: QS accounts are ordered on the x-axis from least (left) to most (right) sablefish north QS owned as of February 18, 2020.

Figure 31. Amount of 2020 QPs that would be issued under the Alternative 1 Gear Specific QP Percentage Options assuming no opt-out is provided.

Qualifiers

If the opt-out provision is included under this alternative, qualification for the opt-out would need to be determined. Table 22 shows the four options for permit qualification, the number of permits that would qualify under each option and across all options, and the percentage of permits with gear-switching history from 2011-2018 that would qualify. As shown, between 26 and 39 permits would qualify under the different options with the same 21 permits qualifying under all four options. Of the 39 permits with some gear-switched landings from 2011-2018, there are three that would not qualify under Sub-Options B, C, or D, as they had less than 10,000 total fixed gear sablefish north landings over the entire 2011-2018 period. There are 23 permits that would qualify under Sub-Option B or C with 10,000 lbs landed either between 2011 and the control date or between 2014-2018. However, there are 10 permits that would only qualify under Sub-Option B, the early period, while three other permits would qualify only under the later period (Sub-Option C). Two permits would qualify under Sub-Option C (one of which would also qualify under Sub-Option B) but would not meet Sub-Option D's higher qualifying poundage.

Table 22 also provides the percent of the 2020 trawl allocation harvested by qualifying permits based on the average poundage of catch for the qualified permits from 2011-2018. Note that this is not a projection, but rather a metric to provide a sense of their historical participation relative to the total amount of gear switching, which has averaged 34 percent of the allocation from 2016-2018.

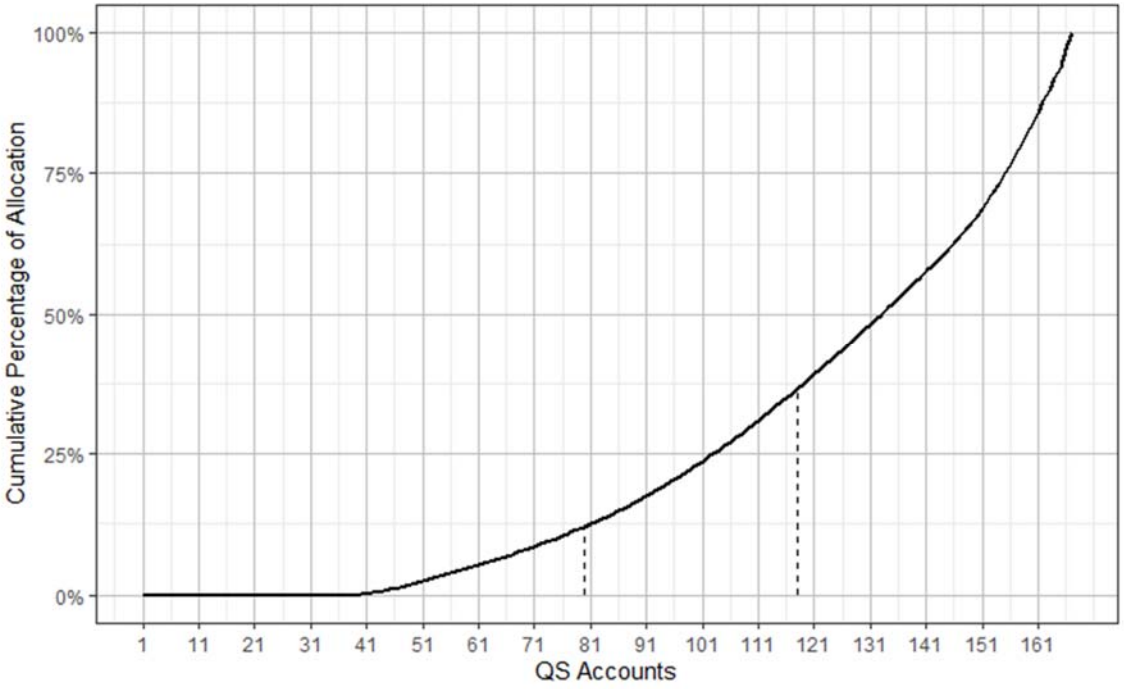
Under this alternative's opt-out provision, all permit owners that qualify under one of the sub-options described above would select a QS account to be designated as opted out. Qualifiers could select their own account (either one that already has QS in it or a newly created account) or an account that is not under their ownership. Many gear switchers lease at least a portion of the QP they gear switch and so, even with an opt-out, may not have enough QS in their own account to support their past levels of gear switching. However, once an opt-out account is designated, additional northern sablefish QS can be added to it, up to the three percent control cap, and all the QS added will also have opt-out status. If a qualified permit owner does not opt-out their own account (or does not own or create an account), it is likely that they would select a QS account that they have a business relationship with that could provide the necessary QPs for fishing. To maintain past gear-switching levels and fulfill their business strategy (particularly levels that are greater than three percent), permits (and the corresponding vessels) may also need to find additional QPs from non-opt-out QS accounts that would receive their QPs as unrestricted, 10 or 30 percent depending on the option.

Table 22. Number of limited entry trawl permits that would qualify to opt-out under the qualification period and criteria sub-options for Alternative 1, the percentage of permits with gear-switching landing history from 2011-2018 that would qualify, and percent of the 2020 allocation based on average catch (2011-2018; all years).

Sub-Option	Qualification	Number of Qualifying Permits	Number Qualifying Under All Options	Qualifying Permit as a Percentage of Permits with Gear-Switching History	Qualifiers' Percent of 2020 Allocation based on Average Gear-Switched Catch 2011-2018
A	Between 1/1/11 and 12/31/18, one fixed gear sablefish landing	39	21	100%	27.18%
B	Between 1/1/11-9/15/17, a minimum of 10,000 lbs of fixed gear sablefish landings	33[a/]		84.6%	26.87%
C	Between 1/1/14-12/31/18, a minimum of 10,000 lbs of fixed gear sablefish landings	26 [a/]		66.7%	24.19%
D	Between 1/1/11-9/15/17 or between 1/1/14-12/31/18, a minimum of 30,000 lbs of fixed gear sablefish landings	34 (21 under either period, 10 only under the early Period and 3 only under the later period)		87.2%	27.06%

a/ 23 permits would qualify under both Sub-option B and Sub-option C.

While it is impossible to determine which QS account a permit holder without a QS account may choose (or if they would create a QS account instead), Figure 32 below shows the distribution of the percentage of allocation that each QS account at the start of 2020 received. As described above, about 25 percent of all QS accounts have no sablefish north quota. Of the remaining QS accounts, the corresponding percentage of allocation they would receive would range from 0.01 to 2.99 percent. The top 39 QS accounts own approximately 54.5 percent of the quota. It seems unlikely that all of the top 39 accounts would be designated for opt-out, particularly given the opportunity to add more QS to the account and receive the associated QP as unrestricted. As an example, to give a further feel for possible initial outcomes, one can pick 39 permits from the middle of the range (say QS accounts 80 to 118 as shown by the dashed lines in the figure below) and see that the permits in that range accounted for around 25 percent of the allocation.



Note: QS accounts are ordered on the x-axis from least (left) to most (right) sablefish north QS owned as of February 18, 2020.

Figure 32. Cumulative percentage of sablefish north allocation issued across QS accounts.

Non-Qualifiers

Under Sub-Options A-D presented above, up to 33 percent of permits with some gear-switching history between 2011-2018 would not qualify depending on the option. Sub-Option A would provide the greatest number of qualifiers as it would only require a single landing; however, beyond the time series, there have been two additional permits enter the gear-switching fishery in 2019 which would not qualify. For Sub-Options B and C (and therefore D), there are three permits that would not qualify under any of these options (Table 23). For the 2011-2018 period, each of

these permits landed less than 10,000 pounds of sablefish north with fixed gear and had fixed gear landings in only a single year. Two of the permits have historically been associated with the use of trawl gear consistently throughout the IFQ program while the third had only one year of participation in the IFQ program overall.

Table 23. Number of permits that would not qualify under Alternative 1 sub-options, corresponding percentage of all permits with gear-switching history from 2011-2018, and percent of 2020 allocation based on average catch from 2011-2018

Sub-Option	Qualification	Number of Non-Qualifying Permits	Number Not Qualifying Under All Options Except A	Non-Qualifying Permit as a Percentage of Permits with Gear-Switching History (2011-2018)	Percent of 2020 Allocation based on Average Catch 2011-2018
A	Between 1/1/11 and 12/31/18, one fixed gear sablefish landing	0	3	0%	0%
B	Between 1/1/11-9/15/17, a minimum of 10,000 lbs of fixed gear sablefish landings	6		15.4%	0.32%
C	Between 1/1/14-12/31/18, a minimum of 10,000 lbs of fixed gear sablefish landings	13		33.3%	3.00%
D	Between 1/1/11-9/15/17 or between 1/1/14-12/31/18, a minimum of 30,000 lbs of fixed gear sablefish landings	5		12.8%	0.12%

Sub-Option C, which focuses solely on the more recent 2014-2018 period in which total participation has stabilized, would qualify the least number of permits and therefore may have the most impact in terms of non-qualifiers (13 total nonqualifying permits). Focusing on the 10 permits that are screened out by Sub-Option C that would qualify under Sub-Option B or D, five have not been used with any gear in the IFQ fishery since the first three years of the program while the other five appear to have tested out fixed gear in a single year early in the program and switched to only making trawl gear landings for some or all of the rest of the time series. Therefore, for permits screened out by Sub-Option C, the actual impacts of not being able to opt-out may be low, since their fishing operations have either changed in that they switched to fishing only trawl gear or the permit became latent. For the three permits that would qualify under the latter period (Sub-Option C) with 10,000 pounds, these permits have only entered the gear-switching fishery in 2017 or 2018 and therefore while they could be considered active participants, there is consideration of

the notice of the control date and understanding that activity after that point may not be used in determining privileges.

Finally, Sub-Option D increases the landings levels by 20,000 pounds compared to Sub-Options B and C. Two permits that would qualify under either Sub-Options B and C would not qualify under Sub-Option D as they did not have 30,000 pounds in either of the Sub-Option D qualifying periods.

If a permit was unable to qualify for an opt-out, in order to gear switch, they would be reliant on the QPs issued as unrestricted at the start of the year to their QS account (if they have one), or reliant on other non-opt accounts and opt-out accounts willing to sell QP. Or, if a mid-year conversion date is included, then any sablefish QPs could be used for gear switching later in the year.

7.3 Alternative 2

Section summary: Alternative 2 would establish a gear-switching endorsement for trawl permits (as opposed to vessels) that would have separate limits for endorsed and non-endorsed permits. Overall,

- *Between 10 and 15 permits would qualify under the current options, with 10 permits qualifying under all options.*
- *Under Endorsement Limit Option 1 (average of active gear-switching years percentage of trawl allocation), three of the 10-15 permits would receive a limit of above three percent.*
- *With respect to Endorsement Limit Option 2 (4.5 percent of the trawl allocation, i.e., the vessel annual vessel limit), a permit would not be constrained to fish below its past gear-switching levels unless it was sharing a permit with another gear-switching vessel. Only six permits that would qualify under all options have caught more than four percent of the trawl allocation between 2011-2018.*
- *For the permits with some gear-switching history that would not qualify for an endorsement under any option, approximately 2/3^{rds} of those permit's average active gear-switching catch would exceed the proposed 0.5 percent limit.*

Alternative 2 would establish a gear-switching endorsement for qualified limited entry trawl permits. Endorsed permits would provide a sablefish north gear-switching limit for the vessel(s) attached to the permit. Non-endorsed permits would have a smaller gear-switching limit (0.5 percent).

Qualifiers

Table 24 below shows the three options for permit qualification (including two recent participation sub-options), the number of permits that would qualify under each option and across all options, and the percentage of permits with gear-switching history from 2011-2018 that would qualify. As shown, between 10 and 15 permits would qualify under the different options with the same 10

permits qualifying under all three options. Again, the percent of the 2020 allocation presented in Table 24 is provided as a reference of historical participation by these qualifiers.

Table 24. Number of limited entry trawl permits that would qualify under each qualification option for Alternative 2, the percentage of permits with gear-switching landing history from 2011-2018 that would qualify, and percent of the 2020 allocation based on average catch (2011-2018; all years).

Option	Qualification	Number of Qualifying Permits	Number Qualifying Under All Options	Qualifying Permit as a Percentage of Permits with Gear-Switching History	Percent of 2020 Allocation based on Average Catch 2011-2018
1	10,000 lbs per year in at least three years between January 1, 2011 and September 15, 2017	15	10	38.5%	19.22%
	… and participated in at least one year between 2016 through 2018	14		35.9%	18.42%
2	30,000 lbs per year in at least three years between January 1, 2011 and September 15, 2017	11		28.2%	17.85%
	… and participated in at least one year between 2016 through 2018	10		25.6%	17.05%
3	30,000 lbs per year in at least three years between January 1, 2011 and September 15, 2017 and participated in at least one year between 2016 through 2018 or caught 90,000 lbs of north sablefish cumulatively across three years from 2014 to 2018, with at least one gear-switched landing in each of those three years.	13		33.3%	18.78%

Table 25 shows the number of permits that qualify under each Qualification Option compared to the other Qualification Options, without the recent participation sub-option for Options 1 and 2. There are three permits that qualify only under Option 1, none that qualify only under Option 2, and two that qualify only under Option 3 (italicized numbers in the table). There are 11 permits that would qualify under both Qualification Options 1 and 3. The three permits that would only qualify under Option 1 are screened out by the higher 30,000 pound requirement of the other options. And, while these three permits have recent history, it is not enough to qualify under the

90,000 pound recent history landings bar of Qualification Option 3. One permit would not qualify under Qualification Option 2 but would qualify under Qualification Options 1 and 3 due to insufficient landings in multiple years. Two permits would qualify under Qualification Option 3 but not Qualification Options 1 or 2 as they did not have sufficient landings prior to the control date to qualify. The single permit that would only qualify under Option 1 or 2 but not Option 3 (shown with an *) would not meet the Option 1 and 2 recent participation requirement. Thus, if those sub-options were included, it would not meet the criteria for any of the options.

Table 25. Number of permits that qualify under each qualification option for Alternative 2 in comparison to other options. Black cells are where there are zero permits in that combination.

		Qualified Under Option 1				**Option 3 Total Qualified**
		Yes		**No**		
		Qualified Under Option 2		**Qualified Under Option 2**		
		Yes	**No**	**Yes**	**No**	
Qualified Under Option 3	**Yes**	10	1		*2*	13
	No	1*	*3*			
Option 2 Total Qualified		11				
Option 1 Total Qualified		15				

*Note that this permit would not qualify with the recent participation sub-option under either Option 1 or 2.

For each of the permits that would qualify, there are two endorsement limit options under consideration: Endorsement Limit Option 1, which would grant each qualifying permit the average percent of the sablefish north trawl allocation caught with fixed gear for years fished through the control date (i.e., does not include years with zero activity in gear switching) and Endorsement Limit Option 2, which would be 4.5 percent of the trawl allocation (i.e. same as the current vessel limit). Since Endorsement Limit Option 2 is the maximum amount of QP a vessel is able to land, any vessel fishing under an endorsed permit should be able to gear switch in amounts equal to or above its gear-switching history, unless that permit is being shared with another vessel (if such sharing is allowed under the final alternative). Since Endorsement Limit Option 1 is individualized to each permit based on an average, vessels will not be able to maintain their previous gear-switching levels since their average will be lowered by the elimination of the opportunity to harvest at levels comparable to their historic above average years.

Figure 33 shows the number of permits that would qualify under each Qualification Option by the approximate size of the gear-switching limit that each would be granted under Endorsement Limit Option 1 (grouped to preserve confidentiality). All five Qualification Options (three main options with two recent participation sub-options) would have three permits receiving more than a three percent gear-switching limit. Option 1 (with and without the sub-option) would qualify the most number of permits at an endorsement limit of less than 1.5 percent.

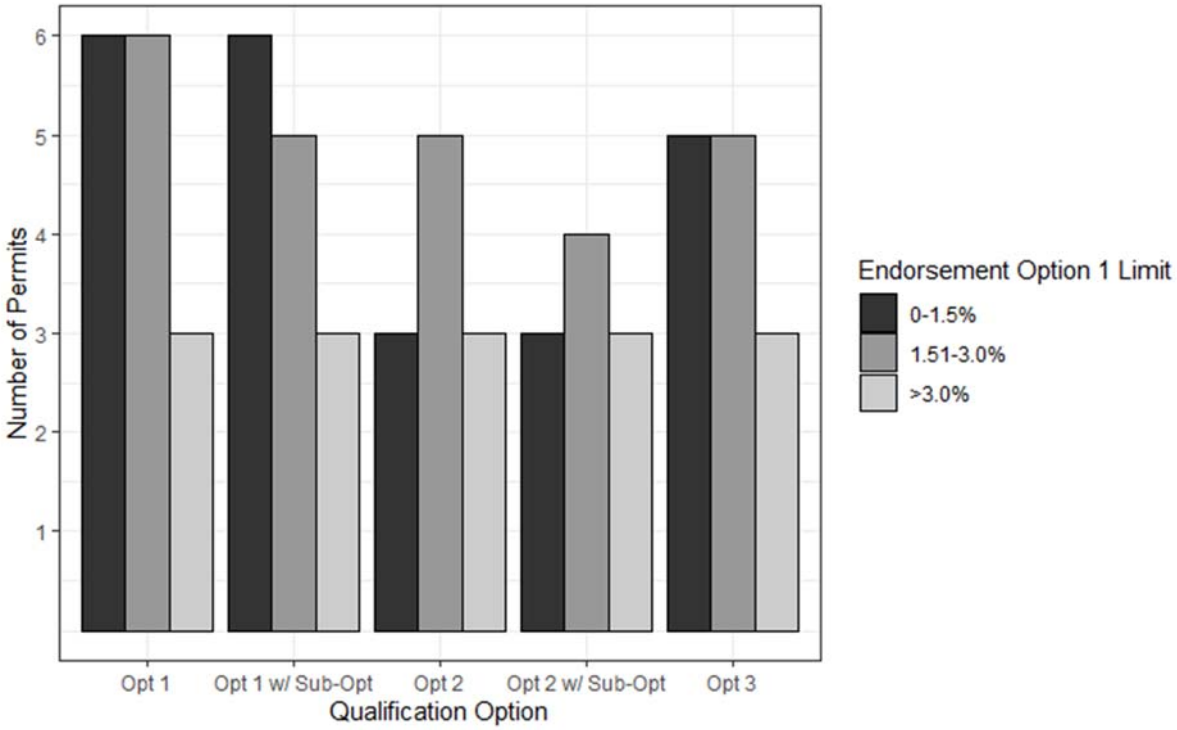


Figure 33. Number of permits by Qualification Option and the range of gear-switching limits that would be granted under Endorsement Option 1 (average of active gear-switching years)

Looking historically, Table 26 below hindcasts the number of permit/year combinations, by qualifying option (and sub-option), for which permits would have exceeded or been within the Endorsement Limit Option 1 limit for each permit, compared to the total number of permit/year combinations that the endorsed permits have fished. It appears that some very low permit/year combinations pull down the averages on which the endorsement limits would be based, such that the median trips are above the average and there are more permit/year combinations that would be constrained by the Option 1 limit than accommodated by it. Between 52 and 59 percent of the permit/year combinations would not be fully accommodated and, generally, the more vessels that qualify the greater number of permit/year combinations that would not be accommodated by Option 1 limit.

Table 26. Hindcast of the number of permit/year combinations that would be above Endorsement Limit Option 1 (average gear-switching amount for years fished), (2011-2018).

Option	Qualification	Total Qualifiers	Number of Permit/Year Combinations from 2011-2018…		
			Total (2011-2018)	Within the Endorsement Limit Option 1 Gear-Switching Limit	Exceeding the Option 1 limit per vessel
1	10,000 lbs per year in at least three years between January 1, 2011 and September 15, 2017	15	120	49	71
	… and participated in at least one year between 2016 through 2018	14	112	47	65
2	30,000 lbs per year in at least three years between January 1, 2011 and September 15, 2017	11	88	40	48
	… and participated in at least one year between 2016 through 2018	10	80	38	42
3	30,000 lbs per year in at least three years between January 1, 2011 and September 15, 2017 and participated in at least one year between 2016 through 2018 or caught 90,000 lbs of north sablefish cumulatively across three years from 2014 to 2018, with at least one gear-switched landing in each of those three years.	13	104	43	61

While Option 2 would allow a permit to be used to catch up to 4.5 percent of the trawl allocation (the same as the current vessel limit), there have actually been few permits historically that have been used to catch more than four percent of the trawl allocation in any year with trawl or fixed gear. Overall, there have been 15 instances from seven permits that have caught more than four percent of the trawl allocation between 2011-2018. Of these seven permits, all but one would qualify for an endorsement under all four qualification options shown in Table 24. The permit that would not qualify has been mostly latent from 2011-2019. Figure 34 below shows a histogram of the number of permit/year combinations of those permits that would qualify under at least one of the options above (total of 17 permits) by percentage of the trawl allocation caught with fixed gear in any year.

Based on these trends, while there are some permits that would qualify for an endorsement that may catch close to 4.5 percent, it is likely that each permit would catch less than the full 4.5 percent of the trawl allocation proposed under Option 2. However, if the gear-switching limits apply to the endorsed permits (rather than the vessel) and permits can be transferred between vessels, some vessels that want to do more gear switching than can be accommodated by the limit for non-endorsed vessels (0.5 percent) might be able to lease an endorsed permit from a vessel that is not fully utilizing it. Whether a vessel would be able to expand its gear-switching opportunity by sequentially fishing under multiple gear-switching endorsed permits is a question the SaMTAAC left open for further deliberation. Related to that determination is whether a single endorsed permit might be fished sequentially on several vessels.

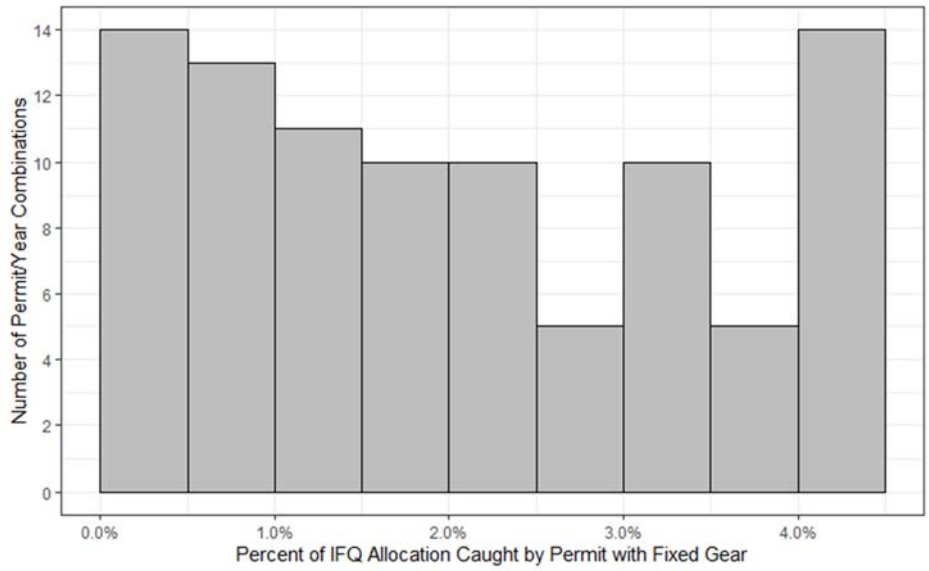


Figure 34. For permits that would qualify under any options (or sub-option), number of permit/year combinations by the percent of sablefish north IFQ allocation caught with fixed gear, 2011-2018.

Non-Qualifiers

For those permits that would not qualify for an endorsement, each would have a gear-switching limit of 0.5 percent of the trawl allocation. Of those permits with some history of gear switching that would not qualify for an endorsement, Table 27 below shows the number of vessels by option and sub-option whose average active catch (i.e. does not include years without activity) would be above or below the 0.5 percent limit of the 2020 allocation (29,066 lbs).

Table 27. Number of permits that would not qualify by Option and sub-option for Alternative 2 and the corresponding percentage of permits with gear-switching history, the percent of the 2020 allocation based on the average catch, and the number of permits whose average catch in active gear-switching years would be within the 0.5 percent proposed limit (29,066 lbs for 2020) for non-endorsed permits.

Option	Qualification	Number of Non-Qualifying Permits of those with Gear-Switching History 2011-2018	Non-Qualifying Permit as a Percentage of Permits with Gear-Switching History (2011-2018)	Percent of 2020 Allocation based on Average Catch 2011-2018	Number of Permits whose Active Average Catch is…	
					Within 0.5 Percent Limit	Exceeds 0.5 percent limit
1	10,000 lbs per year in at least three years between January 1, 2011 and September 15, 2017	24	62%	7.97%	5	19
	… and participated in at least one year between 2016 through 2018	25	64%	8.8%	5	20
2	30,000 lbs per year in at least three years between January 1, 2011 and September 15, 2017	28	72%	9.33%	8	20
	… and participated in at least one year between 2016 through 2018	29	74%	10.13%	8	21
3	30,000 lbs per year in at least three years between January 1, 2011 and September 15, 2017 and participated in at least one year between 2016 through 2018 or caught 90,000 lbs of north sablefish cumulatively across three years from 2014 to 2018, with at least one gear-switched landing in each of those three years.	26	67%	8.40%	7	19

7.4 Alternative 3

Section Summary: Alternative 3 would allow gear-switched landings of sablefish north through the active trawler designation or an exemption attached to permits but based on a vessel's gear-switching history. Vessels fishing under a permit exempted from the active trawl requirement could gear switch the greater of 0.6 percent of the trawl allocation or the amount of QS owned as of and since the control date. The following summarizes a few highlights from this section:

- *86 percent of vessels using trawl gear to make IFQ landings north of 36° N. lat. would have received an active trawler designation from 2011-2019.*
- *Between 11-12 vessels have gear-switching history that would qualify them for an exemption.*
- *Of the owners of vessels receiving an exemption for their permit, four would meet the QS account ownership criteria and so be able to gear switch their own northern sablefish QS.*
- *Based on the proposed limits, the allowed gear-switching amount for vessels exempted from the active trawl requirement would be between 8.85-9.45 percent depending on the option selected.*
- *Of those vessels with some gear-switching history that would not receive an exemption, few have historically trawled and so would not likely qualify as an active trawler, unless they shifted more strongly into the fishery with trawl gear.*

Under Alternative 3, vessels could harvest sablefish north with fixed gear by meeting the criteria for the active trawler designation or by receiving an exemption for a permit based on vessel gear-switching history.

Qualifiers for Active Trawler Designation

For the active trawler designation, vessels could receive the designation mid-year, as soon as they met the landings requirement, and the designation would last for the remainder of that year and the entirety of the following year. To qualify a vessel would have to use trawl gear to land at least six catch share landings that meet at least one of the two qualifying criteria (based on area of catch):

a. In the area north of 40° 10' N. lat., 18,000 lbs of any IFQ species
b. In the area between 36° N. lat. and 40° 10' N. lat., 9,000 lbs of any IFQ species.

Based on those qualifications, the vast majority of vessels with shorebased IFQ trawl landings would qualify each year as shown in Figure 35 below. On average, 86 percent of vessels with an IFQ landings from north of 36° N. lat. would qualify in a given year (making them also eligible in the following year).

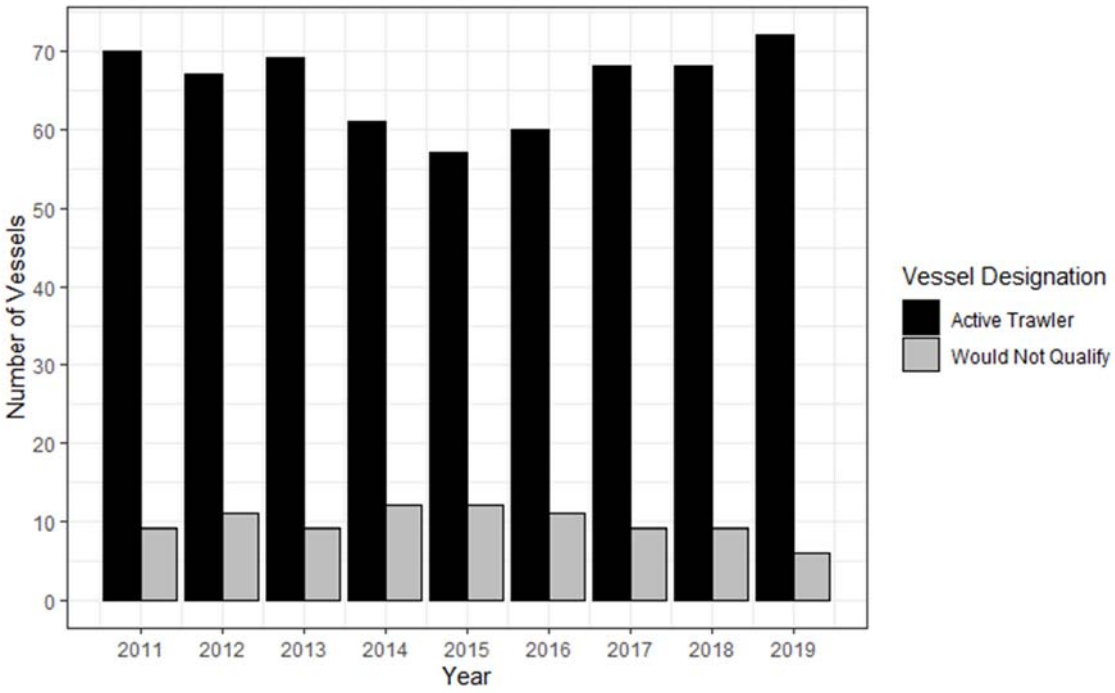


Figure 35. Number of vessels that would or would not have qualified as an active trawler in a year, 2011-2019.

Qualifiers for Exemption to Active Trawler Requirement

Vessels with gear-switching history could qualify for an exemption from the active trawler requirement. Table 28 below shows the number of vessels that would qualify under each option. Eleven vessels would qualify under both proposed options. However, under Option 2, which includes Option 1 but would add an opportunity to qualify based on more recent cumulative catch, one additional vessel would qualify. Similar to the tables provided for qualifiers under the other alternatives, the average catch as a percentage of the 2020 allocation is provided to show historical participation levels.

Under the exemption, vessels could use fixed gear to take the greater of 0.6 percent of the northern sablefish allocation or the percent of northern sablefish QS the vessel owner has owned as of and since the control date (there must be 50 percent common ownership between the vessel and the account). Using 2019 vessel account information for each vessel, under both qualification options, there are four vessel owners that own QS; however, in some cases, the amount they own would not allow them to gear switch at levels above 0.6 percent. The total amount of QS owned by the owners of all four of those vessels is 4.65 percent.

Under Alternative 3, there is a "backstop percentage" of 10 percent, which is the greatest amount of the IFQ sablefish north allocation that could be taken with fixed gear by vessels with an exemption. In this case, the 0.6 percent limit, combined with the 4.65 percent for vessel owners that would be limited by the amount in their QS account, would keep the group of exempted vessels

under the 10 percent cap. The 0.6 percent value may be adjusted downward if, prior to finalization of this alternative, it appears that exempted vessel landings with fixed gear will greater than 10 percent.

Table 28: Number of vessels that qualify under each exemption option for Alternative 3, the percentage of vessels with gear-switching landing history from 2011-2018 that would qualify, and percent of the 2020 allocation based on average catch (2011-2018; all years).

Option	Qualification	Number of Vessels that qualify under Option	Number Qualifying Under All Options	Qualifying Vessels as a Percentage of Vessels with Gear-Switching History	Percent of 2020 Allocation based on Average Catch 2011-2018
1	30,000 lbs of northern sablefish trawl QPs per year in at least three years between January 1, 2011 and September 15, 2017.	11	11	28.2%	20.3%
2	30,000 lbs of northern sablefish trawl QPs per year in at least three years between January 1, 2011 and September 15, 2017 or 90,000 lbs cumulatively across three years from 2014 to 2018, with at least one gear-switched landing in each of the three years.	12		30.8%	20.5%

While there would be an impact to the exempted vessels overall with the proposed limit (for qualifying vessels, the exempted vessel limits are expected to total 8.85 percent for Option 1 and 9.45 percent for Option 2) compared to what these vessels averaged historically, the impact to each individual vessel would vary. Of the 79 distinct combinations of landing year and exempt vessels fishing IFQ sablefish north, there are only nine vessel-year combinations where the actual take (i.e. total mortality) of fixed gear sablefish was below the proposed limit for the exempted vessel (either 0.6 percent or the QS limit). Six of the 12 vessels that could receive an exemption under at least one of the options would have exceeded the proposed limit (the 0.6 percent limit or the QS based limit applying to the vessel) in each year that they participated in gear switching. Of the remaining six vessels, three had one year of participation where the total would have been covered by the proposed limit while the other three had two years, accounting for all nine instances of harvest that would be accommodated by the proposed limit. Overall, there is only one qualifying vessel whose average gear-switching activity in active gear-switching years between 2011-2018 would be covered by the proposed limit (the 0.6 percent limit or the QS based limit applying to the vessel). All of the other vessels' averages exceed the proposed limit by 0.32 to 3.4 percentage points. Based on the 2020 allocation, on a per vessel basis, the proposed limits would result in landings between 18,000 and almost 200,000 pounds lower than the vessel's average gear-switched landings and an associated ex-vessel revenue of between $51,000 and over $553,000 lower (using average fixed gear price for sablefish north from 2011-2018).

Non-Qualifier

Table 29 shows the number of vessels that would not qualify for an exemption under Alternative 3 out of the 39 vessels with gear-switched landings from 2011-2018. Similar to the gear-switching qualification discussion above under Alternatives 1 and 2, there were two additional vessels that entered the fishery in 2019 that would not qualify for an exemption.

Table 29. Number of vessels with gear-switching history from 2011-2018 that would not qualify under each exemption option for Alternative 3 and corresponding percentage of vessels with gear-switching landing history from 2011-2018, and percent of the 2020 allocation based on average catch (2011-2018; all years).

Option	Qualification	Number of Vessels that would not qualify under Option	Number Not Qualifying Under All Options	Non-Qualifying Vessels as a Percentage of Vessels with Gear-Switching History	Percent of 2020 Allocation based on Average Catch 2011-2018
1	30,000 lbs of northern sablefish trawl QPs per year in at least three years between January 1, 2011 and September 15, 2017.	28	27	71.8%	6.92%
2	30,000 lbs of northern sablefish trawl QPs per year in at least three years between January 1, 2011 and September 15, 2017 or 90,000 lbs cumulatively across three years from 2014 to 2018, with at least one gear-switched landing in each of the three years.	27		69.2%	6.66%

For those vessels that would not qualify for an exemption, the only avenue for gear switching would be to lease an exempted permit or qualify as an active trawler. Only eleven vessels between 2011-2019 have historically used fixed gear and trawl gear to harvest sablefish north in the same year with only three gear switching in multiple years. These eleven vessels have had nineteen instances (year/vessel combination) of fixed gear harvest of sablefish north from 2011-2019. Of those nineteen occurrences, eleven vessel/year combinations (from five vessels) would have been in excess of the one percent limit provided for exempted trawlers.

Eight of those eleven vessels would have qualified as an active trawler in at least one year between 2011-2018, with three qualifying as an active trawler in each year. However, only five have used fixed gear to catch sablefish in the year they would have qualified as an active trawler. Four of the five would have qualified in the previous year and thus have been eligible to gear switch in the entirety of the year in which they did gear switch (vessels which qualify as an active trawler are able to gear switch through the remainder of the year in which they qualify and all of the following

year). Of those five, two landed more than the one percent gear-switching allowance proposed for active trawlers under Alternative 3 in the year they gear switched. Of the remaining three of the eight vessels that would have qualified as an active trawler in at least one year, the two vessels that would have qualified as an active trawler in at least one year but not in the same year in which they gear switched would not have qualified in the previous year either. Both of these vessels gear switched early in the program and then trawled in multiple years later. The third vessel would have qualified as an active trawler in the year prior to gear switching, and would have been well within the one percent gear-switching limit.

For those 18 vessels that did not have any history of trawling from 2011-2019 (i.e. only gear switched) and would not receive an exemption, each would need to purchase and re-outfit their vessel with trawl gear or most likely would be forced out of gear switching in the IFQ fishery. Table 30 below shows the number of vessels that would not qualify for an exemption under either option and have never historically trawled by average amount of fixed gear sablefish landings and number of years of participation from 2011-2019.

Table 30. Average pounds landed (and corresponding percentage of the 2020 allocation) and number of years of participation for those vessels that would not qualify for an exemption under Alternative 3 (either option).

Years Participating	**Average Lbs Landed (Corresponding % of 2020 allocation)**	
	0-34,879 lbs (0-0.6%)	**+34,880 lbs (+0.6%)**
1	5	3
2	3	3
3+	3	

8.0 References

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