

ANALYSIS OF TRIGGERS FOR THE PRELIMINARY PREFERRED TRAWL  
 INDIVIDUAL FISHING QUOTA (IFQ) GEAR-SWITCHING ALTERNATIVE

At its April 2024 meeting the Council will be selecting a final preferred alternative (FPA) on gear switching. In November 2023, when the Council selected its preliminary preferred alternative (PPA), it included a new element which had not been previously analyzed (a trigger mechanism). This information report was created to provide an early look at the preliminary analysis specific to that new element. The analysis provided here will be incorporated into the full analysis provided for the April meeting (with revisions as appropriate). Section references in the following are in reference to the November 2023 analysis ([Agenda Item E.4, REVISED Attachment 3, November 2023](#)), unless otherwise noted.

Under the PPA, gear-specific quota pounds (QP) will be issued as specified for Alternative 2<sup>1</sup> (for a full description see [Agenda Item E.4, Attachment 2, November 2023, p. 19](#)), except when certain criteria are met, in which case all northern sablefish will be issued as any-gear QP (i.e. status quo QP). The Council has specified the following criteria (trigger criteria) for consideration when it selects its final preferred alternative (FPA).

Annual Catch Limit (ACL) Criteria: When the northern sablefish ACL is at or above X (a single value between 5,000 to 10,000 mt to be determined by the Council when it selects an FPA), status quo QP will be issued.

Gear Switching (GS) Criteria Sub-Option (*not part of PPA but available for consideration for the FPA*): Additionally, status quo QP will be issued if the average gear-switching level for the previous three years is at or below 29 percent of the trawl allocation.

The intent would be to not restrict gear switching when there is a low probability that the use of sablefish QP by gear switchers might adversely impact the harvest of trawl complexes. The decision rules for the type of QP to be issued are laid out in Table 1 and conceptual schematics of the application of the criteria provided in Figure 1 and Figure 2.

Table 1. Gear-specific QP issuance decision rules if the sub-option is included (also see Figure 2).

Issue <i>status quo QP</i> when...	ACL ≥ X,XXX mt	OR	3-Yr Avg GS ≤ 29%
Issue <i>gear specific QP</i> when...	ACL < X,XXX mt	AND	3-Yr Avg GS > 29%

<sup>1</sup> In specifying its PPA, the Council also designated **QP Distribution Option 2 as part of the PPA**. Under this option, while the amount of gear-switching allowed (amount of any-gear QP issued) would start at 29 percent, as legacy participants divested themselves of their QP, the total amount of gear switching allowed would decline.

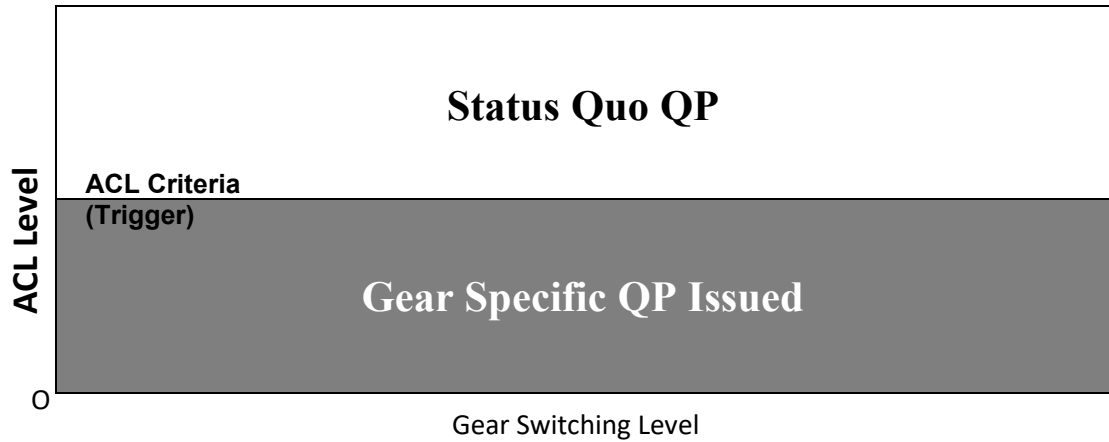


Figure 1. QP issuance based on ACL trigger only.

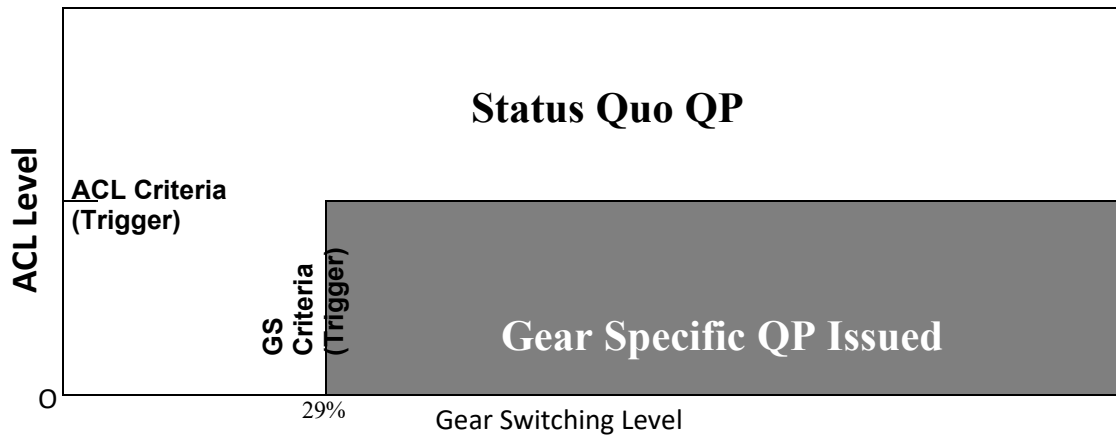


Figure 2. QP issuance based on ACL criteria and gear-specific QP criteria.

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## 1.0 IMPACTS OF SWITCHING TO STATUS QUO QP IN SOME YEARS

### *Summary*

- *Disadvantage of a trigger for the issuance of status quo QP: higher implementation costs, and some possibility of higher ongoing administrative costs and increased complexity in future deliberations, relative to Alternative 2 without the trigger.*
- *Gear-switching limitation has potential positive effects that might accrue even in a year in which there is no limitation because trigger criteria are met:*
  - *Encouragement of investment in processing equipment and marketing needed to facilitate greater trawl harvest.*
  - *Discouragement of investment in gear switching, including quota share (QS) purchase.*
- *For years in which there is no gear switching limitation and gear switchers are not likely to displace trawlers.*
  - *Potential positive effects identified include*
    - *Reduction in costs for gear switchers due to greater ease in finding QP and possibly lower costs for it.*
    - *Greater opportunity for QS owners to sell their QP to gear switchers.*
    - *Greater attainment of the sablefish trawl allocation and related optimum yields (OYs).*
  - *A potential negative effect for those selling to gear switchers would be lower prices for status quo QP, relative to more restricted amount of any-gear QP that would be available in gear-specific QP years. For many QS owners, this lower price might be offset by larger volumes of QP sales to gear switchers. For those QS owners that only sell a small portion of their QP to gear switchers (less than the amount that they would receive in years when gear-specific QP are issued), there would be not be an offsetting increase in total sales.*
  - *Those selling/buying QP for trawl vessels may see somewhat higher prices in years in which status quo QP are issued compared to trawl-only QPs.*
- *The actual effects of the trigger depend critically on whether the criteria suspend issuance of gear-specific QP only in years when gear switching activity would not displace trawlers. No criteria will perform perfectly. The triggers could be modified to improve performance at a later time.*

The potential costs and benefits of a limitation on gear switching, as compared to no action, are discussed in the general impact analysis (Section 7.0 of the November analysis) and summaries of that analysis (Section 4.0 of the November analysis). The PPA is basically Alternative 2 with a trigger such that its provisions would only be active in some years. Here, we consider the disadvantages and advantages of this trigger-based switch to the issuance of status quo QP as compared to having a limitation on gear switching every year.

Disadvantages of changing between issuing and not issuing gear-specific QP include:

- Some additional regulatory and administrative costs associated with initial implementation, including figuring out how to deal with issues like post season trading of unused QP to cover previous years catch.

- Increased complexity that would need to be taken into account in explaining the program, analyzing it, and making program modifications in the future.

For years in which the trigger is hit and all QP are issued as any-gear (i.e. status quo QP), the PPA may still have some impacts relative to status quo, particularly with respect to fishery investments. The current absence of a limit on the expansion of gear switching might be inhibiting investments in processing equipment and market development that would support trawl harvest (see Sections 2.4.2, 2.4.3, and 2.4.4(a) of the November analysis). The creation of a gear-switching limit that would be imposed for years in which gear switching is more likely to restrict trawl harvest, even if not applied in other years, may still increase confidence that investments will pay off.

Conversely, the expectation that there will be some years in which gear switching is limited (even if the limit is intermittent or not expected to be activated for a number of years) is likely to have some inhibitory impact on investment in gear-switching activities (e.g. the purchase of QS for the purpose of supporting gear-switching operations). To the degree that the issuance of gear-specific QP appears to be further into the future (based on stock assessment projections), this inhibitory effect will be diminished. There has been a general consensus among parties on different sides of this issue that unlimited gear switching is not desirable (see guiding principles adopted by Sablefish Management and Trawl Allocation Attainment Committee (SaMTAAC), Section 1.2 of the November analysis) and concern about the investment in gear switching that might occur and then have to be displaced if a limit were imposed at some time in the future. One route that has been suggested for discouraging additional investment is to maintain the control date indefinitely. However, using a control date in such a manner could not be done because control dates do not have regulatory effect.<sup>2</sup> Additionally, trying to use only a date to limit expanded gear switching would be somewhat like implementing a moratorium on new gear switching but without the parameters in place that let participants know where they stand (i.e., whether they are in or out). The PPA action would establish the qualifiers (like a moratorium on new gear switching) but, in contrast to a complete moratorium, provide flexibility for expansion of gear switching in years where it can likely be accommodated (e.g., years in which the ACL is at higher levels). The regulations in place would make it clear that opportunity would very likely be constrained in the future and each person would know their status when that constraint is imposed. This would give participants the opportunity to make an informed choice of the investment and risk level appropriate for them.

With respect to not limiting gear switching (i.e., not issuing gear-specific QP) in years when gear switchers are less likely to displace trawlers, the benefits include the following:

- A reduction in the costs to gear switchers including:
  - costs of searching for willing sellers of any-gear QP that are dispersed across many QP accounts; and
  - the possibility that status quo QP may be less expensive than any-gear QP issued under a gear-specific QP year.

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<sup>2</sup> Control dates are announced as advanced notice of proposed rule makings – i.e. they themselves are not rulemakings and not subject to the standard requirements for analysis and public comment until they are incorporated in a rule making.

- Greater volume opportunity for QS owners to sell their status quo QP to gear switchers (albeit possibly at a somewhat lower price than received for any-gear QP in years in which a limited amount is issued).
- For QS owners selling QP to trawlers, somewhat higher QP prices as compared to prices for trawl-only QP in gear-specific QP years.
- Greater attainment of the sablefish OY along with the attendant benefits to consumers, processors, suppliers, fishers, and communities, etc.
- Some possibility of lower administrative costs in the years gear-specific QP are not issued—though, once the system is set up to issue gear-specific QPs, it is not clear that the costs would be substantially less to issue and track non-gear-specific QP as compared to gear-specific QP.

The primary disadvantage of changing to status quo QPs in years in which the trigger is met would be for those who sell a small portion of their QP to gear switchers and trawlers buying QP. For example, with respect to selling to gear switchers, for years in which gear-specific QP are issued, individuals who typically sell small amounts<sup>3</sup> of their sablefish QP to gear-switching vessels and use the rest for trawling would be able to maintain their sales and benefit from higher any-gear QP prices, as compared to years in which there is no gear-switching limitation.

Overall, the impacts depend critically on the effectiveness of the criteria used to determine years in which trawlers would be less likely to be displaced by gear-switching activity and suspend the issuance of gear-specific QP only for those year. Any criteria chosen are unlikely to perfectly identify the years in which there would be an advantage to not issuing gear-specific QP. Once the system is in place, if the triggers chosen are not performing as expected, additional action might be taken to either adjust the levels or change the indicators used for the criteria.

## 2.0 ANALYSIS OF ACL TRIGGER

### *Summary:*

- *Use of a trigger related to the amount of northern sablefish QP available is based on the idea that when QP availability is high, there is enough to meet the needs of trawl vessels and allow gear switcher participation. The northern sablefish ACL was designated as the metric for indicating the availability of northern sablefish QP.*
- *The Council discussed a number of alternatives to using the northern sablefish ACL as a trigger. These included*
  - *the coastwide overfishing limit (OFL), which is determined by science but has less relation to the amount of sablefish QP available; and*
  - *trawl allocations of northern sablefish, which is closely related to the amount of QP available for the shoreside trawl individual fishing quota (IFQ) program but more subject to modification by other Council action.*
- *The Council could modify the trigger as experience is gained or conditions change.*
- *Assuming a policy objective of issuing gear-specific QP in years when gear switching is above 29 percent, and status quo QP when gear switching is below that, a retrospective analysis shows that for 2011-2023 this objective would have been achieved in*

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<sup>3</sup> Amounts equal to or less than the amount of any-gear QP they would receive when the standard any-gear to trawl-only QP ratio is applied to their QS

- 6 out of the 13 years at a 5,000 mt northern sablefish ACL trigger,
- 9 out of 13 years at a 6,000 mt level northern sablefish ACL trigger,
- 7 out of 13 years at an 8,000 mt level northern sablefish ACL trigger, and
- 6 out of 13 years at the 10,000 mt northern sablefish ACL trigger (Figure 4).
- *One indicator of the degree of competition for sablefish QP between trawlers and gear-switching vessels may be the overall level of trawl attainment for northern sablefish.*
  - *In most years there has not been a significant surplus of northern sablefish QP available (Table 4), but the question remains as to whether those high levels of attainment are reached in the context of such competition between the gears, or were trawl vessels selling unneeded QP to gear switchers.*
  - *In 2023, when the ACL jumped to above 8,000 mt, trawl allocation attainment dropped to just below 69 percent, indicating a surplus.*
  - *Two factors in particular might impact the level of ACL at which there is sufficient sablefish QP for trawlers and gear switchers: changes in the co-occurrence of sablefish in the trawl catch and changes in the price of sablefish. Prices may change for a variety of reasons relatively unrelated to West Coast ACL levels, including changes in consumer preferences, availability of close substitutes, and changes in supply from other regions, particularly Alaska.*
- *Evaluation of the ACL trigger criteria will use data (the ACL) for a coming year to determine the type of QP issued for that year. This contrasts with the gear-switching level trigger criteria, which will use data from previous years to evaluate the criteria and determine the type of QP issued for a coming year.*

## **2.1 Relation Between ACL Trigger Criteria and Amounts of Trawl IFQ QP Issued**

Use of the northern sablefish ACL trigger is based on the idea that when ACLs are at high levels, there is plenty of northern sablefish QP to meet the needs of trawl vessels and allow gear switcher participation, but that at low levels, the activity of gear switchers are more likely to constrain harvest of trawl complexes and attainment of OY. In November 2023, the Council discussed other harvest-volume related criteria that could be used, including OFLs and the trawl allocations. Here we discuss the relationship between OFLs, northern sablefish ACLs, and the amounts of QP available in the shoreside trawl fishery.

OFL levels are determined based on stock assessment results and are a scientific decision (i.e., not a policy choice). From the OFL, the acceptable biological catch (ABC) is set based on the sigma recommended by the Scientific and Statistical Committee to account for scientific uncertainty and a P\* selected by the Council to account for their risk tolerance. The Council can set ACLs at or below the ABC. Sablefish is defined as a coastwide stock and the OFL and ABC are set coastwide. However, the ACLs are divided between north and south of 36° N. lat. Because of the number of factors that can impact the difference between the OFL level and the northern sablefish ACL, the relationship has varied over the years. As an example, from 2011-2024, northern sablefish ACLs ran between 61 and 73 percent of the coastwide OFL and were at 73 percent from 2021 through 2024. When sablefish biomass is at precautionary or overfished levels, there may be greater differences between the OFL and the ACL.

As compared to the OFL, the ACL is more related to the amounts of northern sablefish available for fisheries, including the allocation to the trawl sector. The allocation for the trawl sector is divided between an at-sea set aside and the amount issued as northern sablefish QP to the shorebased IFQ program. From 2011 through 2024, the shorebased IFQ allocation, as a percentage of the northern sablefish ACL, has varied narrowly—between 45.5 and 46.7 percent of the total northern ACL, averaging 45.9 percent. Thus, there is a more direct correlation between the level of shoreside IFQ allocation (the direct amount issued to the fishery) and the northern sablefish ACL than between the shoreside IFQ allocation and the coastwide OFL. Over the period being considered here (2011-2024), the main cause of the fluctuation in the proportional relationship between the shoreside IFQ allocation and the northern sablefish ACL has to do with the amount set aside to cover bycatch in the at-sea whiting fishery.

Table 2 shows for some ACLs within the trigger criteria range being considered the corresponding trawl allocation and OFL levels, based on certain assumptions about the relationships between these values across recent years.

Table 2. Triggers within the range and corresponding trawl allocations.

Mt	Twl IFQ Alloc Equivalent (Based on 45.9%, 2011-2024 avg)			Coastwide OFL Equivalent (based on the most recent four years: 73%)
	Mt	Rounded (Mt)	Millions of Lbs	Mt
5,000	2,294	2,300	5.1	6,821
6,000	2,753	2,800	6.1	8,185
8,000	3,670	3,700	8.1	10,914
10,000	4,588	4,600	10.1	13,642

## 2.2 Retrospective Analysis

A retrospectively analysis applies the ACL trigger criteria to 2011 to 2023 in order to identify the years in which gear-specific QP or status quo QP would have been issued (Table 3) and how those outcomes compare to the actual level of gear switching in each year (Table 4 and Figure 3—Table 5 on the gear-switching level criteria is provided here for ease of comparison but will be discussed until Section 3.0 of this document). At the low end of the ACL trigger criteria range (5,000 mt), the trigger would have been hit and status quo QP would have been issued for 10 years—gear-specific QP issued for 3 years (2013-2015). In contrast, for an ACL trigger of 6,000, from 2011-2023 the trigger would have been hit and status quo QP issued for 3 years—gear-specific QP issued for 10 years.

Assuming that the policy objective is to issue gear-specific QP in years when gear switching is above 29 percent, and issue status quo QP when gear switching is below 29 percent, the results of a retrospective analysis can be summarized in terms of whether or not these objectives would have been met (Figure 4). For the 2011-2023 period, this objective would have been attained in 6 out of the 13 years at the 5,000 mt level, 9 out of 13 years at the 6,000 mt level, 7 out of 13 at the 8,000 mt level, and 6 out of 13 at the 10,000 mt level, at which there were no years in which status quo QP would be issued during the 2011-2013 period. At the 5,000 mt level gear

switching was above 29 percent in half of the years in which status quo QP would have been issued; and was above 29 percent in only one year in which gear-specific QP would have been issued. At the 6,000 mt level, gear switching was never above 29 percent in the years in which status quo QP would have been issued and was above 29 percent in six of the 10 years in which gear-specific QP would have been issued.

Prospectively, given the most recent stock assessment, northern sablefish ACLs are not expected to be below 10,000 mt until sometime after 2034 (Figure 3). However, stock assessments have fluctuated historically, as indicated by the projections of coastwide OFL levels for sablefish from past stock assessments (Figure 5).



Table 3. Retrospective evaluation of years in which gear specific QP would be issued using the ACL criteria alone (GSp QP = gear-specific QP would be issued, SQ QP indicates that QP would not be gear-specific, i.e. status quo).

Criteria	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025-2033
5,000	SQ QP	SQ QP	GSp QP	GSp QP	GSp QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP
6,000	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP
8,000	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	SQ QP	GSp QP	SQ QP
10,000	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	SQ QP

Table 4. Northern sablefish ACLs, gear-switching levels, and percent trawl attainment for 2023-2025. Source: 2011-2020 based on GEMM; 2021-2023 based on IFQ database

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
ACL	5,515	5,347	4,012	4,349	4,793	5,241	5,252	5,475	5,606	5,723	6,892	6,566	8,486	7,780	26,785
Gear Switching Level <sup>a/</sup>	27.4%	30.5%	24.3%	28.9%	32.6%	33.9%	35.1%	32.5%	35.3%	25.4%	19.0%	23.3%	22.2%	n/a	n/a
Avg Gear-Switching for Previous 3 Years <sup>b/</sup>					27.4%	27.9%	28.6%	31.8%	33.9%	33.8%	34.3%	31.1%	26.6%	22.6%	21.5%
Percent Trawl Attnmt <sup>c/</sup>	94%	90%	101%	94%	99%	94%	104%	91%	99%	70%	73%	98%	69%	n/a	n/a

a/ Value for 2023 is preliminary.

b/ Three year averages are displayed in the column for the year in which the criteria would have been applied—on year lag due to the need to wait for complete data.

Table 5. Retrospective evaluation of years in which gear specific QP would be issued using the ACL and gear-switching percentage criteria in combination (GSp QP = gear-specific QP would be issued, SQ QP indicates that QP would not be gear-specific, i.e. status quo underlined values are the results that changed when the criteria were combined).

Criteria	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
5,000					<u>SQ QP</u>	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP
6,000					<u>SQ QP</u>	<u>SQ QP</u>	<u>SQ QP</u>	GSp QP	GSp QP	GSp QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP
8,000					<u>SQ QP</u>	<u>SQ QP</u>	<u>SQ QP</u>	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	SQ QP	<u>SQ QP</u>	SQ QP
10,000					<u>SQ QP</u>	<u>SQ QP</u>	<u>SQ QP</u>	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	<u>SQ QP</u>	<u>SQ QP</u>	SQ QP

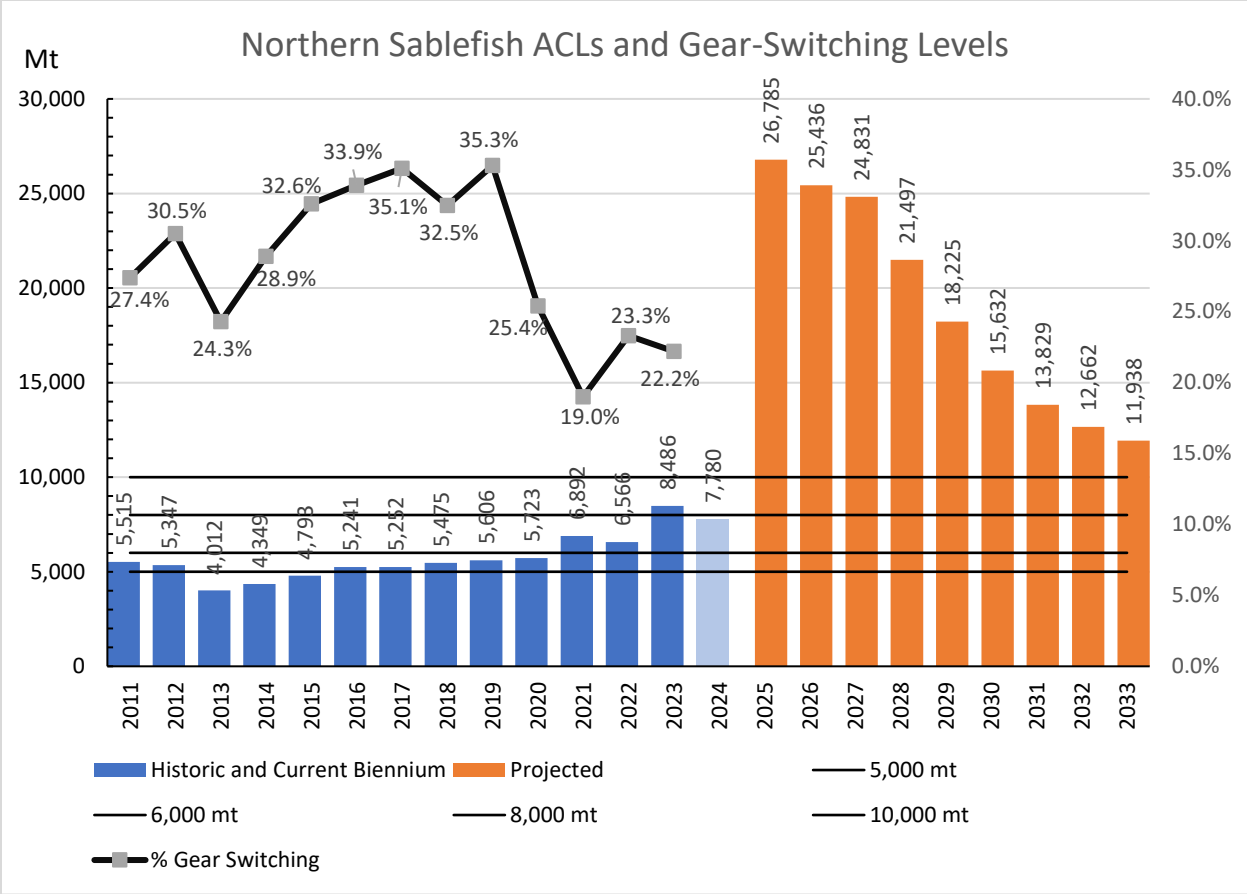


Figure 3. Historic, current, and projected (based on 2023 limited update assessment) northern sablefish ACLs, 2011-2033 (dark lines indicate some of the threshold values that have been discussed within the 5,000 – 10,000 mt range). (Internal Reference: PPA\_TriggerAnalysis.xlsx)

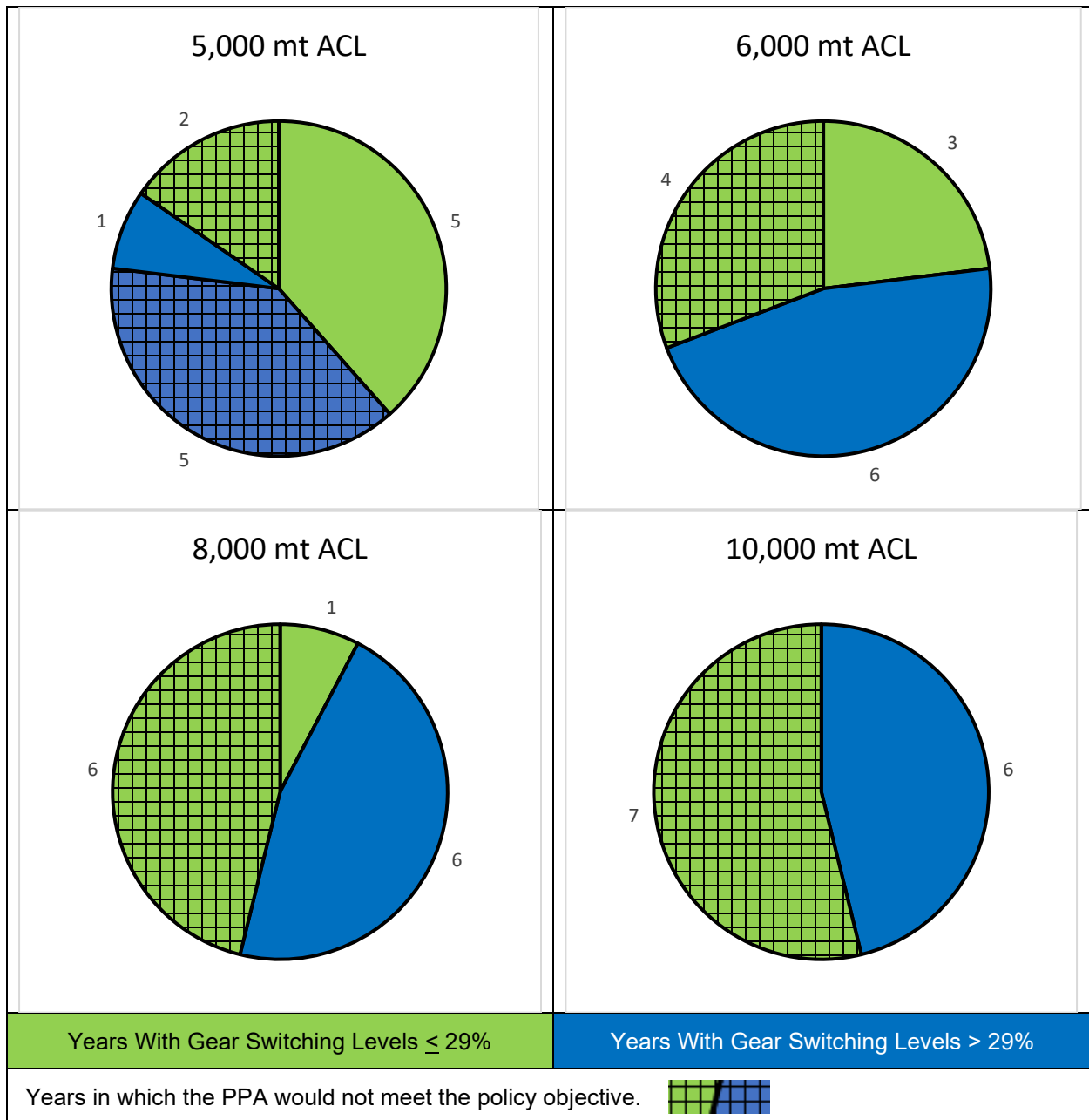


Figure 4. Numbers of years (2011-2023) in which the PPA would not have met the policy objective (gear-specific QP would have been issued when gear switching was below 29 percent or status quo QP issued when gear-switching was above 29 percent). (Internal Reference: PPA\_TriggerAnalysis.xlsx)

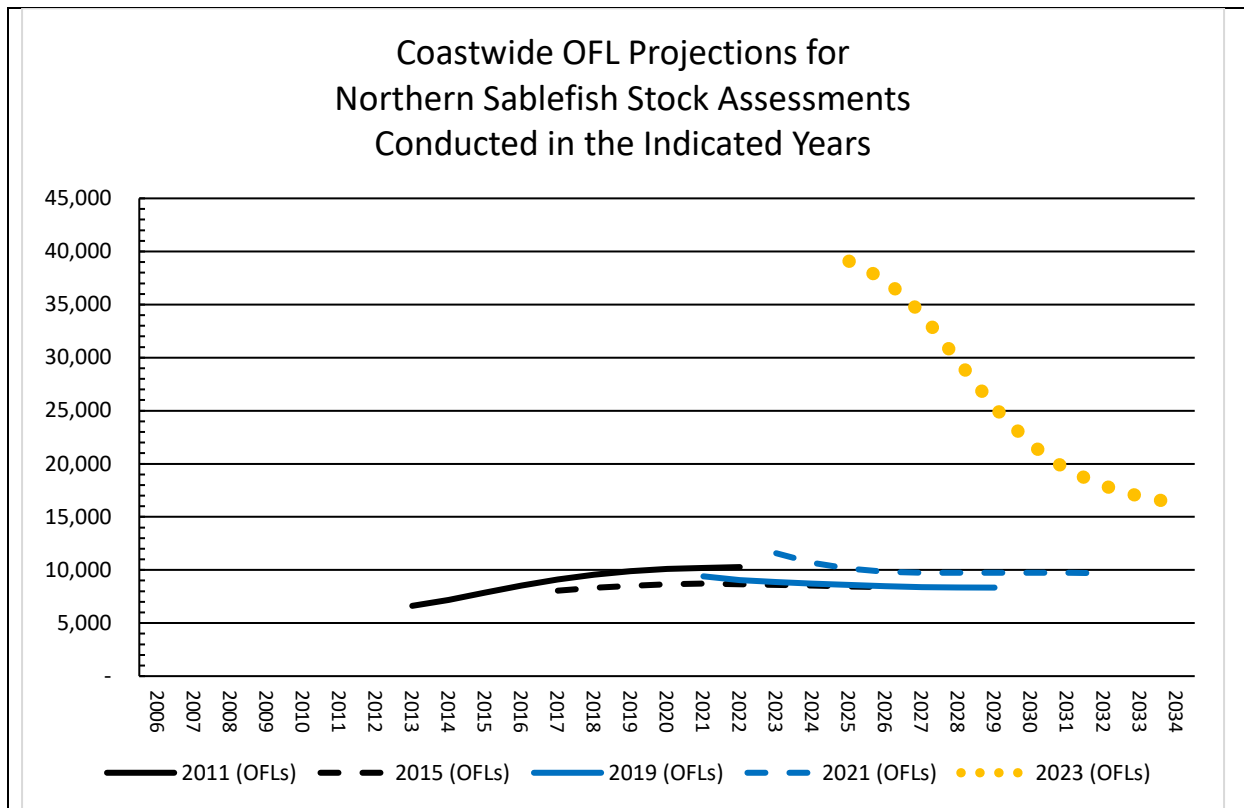


Figure 5. Historical changes in stock assessment projections for coastwide sablefish OFL. (Internal Reference: PPA\_TriggerAnalysis.xlsx)

### 2.3 ACLs as an Indicator of Likelihood of Surplus Trawl QP

One indicator of the degree of competition for sablefish QP between trawlers and gear-switching vessels may be the overall level of trawl attainment for northern sablefish. In most years, when the ACL has been below 6,000 mt, the trawl allocation has been attained at a 90 percent or higher level, making it more likely that there could be competition between trawl and gear-switching vessels for northern sablefish QP, regardless of the actual level of gear switching (Table 4). However, the question still remains as to whether those high levels of attainment are reached in the context of such competition between the gears or were trawl vessels selling unneeded QP to gear switchers. The one exception to the high level of attainment at ACLs below 6,000 mt was 2020, which was impacted by COVID and low exvessel prices (Section 2.5.3 of the November analysis). The allocation attainment level in that year was 70 percent. In 2021, the ACL level was above 6,000 mt and trawl attainment was low, but this year may still have been impacted by COVID and exvessel prices were still relatively low. In 2022, the ACL was again above 6,000 mt and the attainment level was up to 98 percent, even though gear switching only accounted for 23.3 percent. Then, for 2023, the ACL jumped to above 8,000 mt and the trawl allocation attainment dropped to just below 69 percent, indicating a surplus of northern sablefish QP that could not be absorbed by gear switchers. While gear switching as a percent of the trawl allocation declined in 2023, the volume of gear switcher harvest (estimated at 864 mt) increased by 24 percent over the previous year (about 694 mt) and was exceeded only in one year historically (2019, just prior to COVID, Section 2.2 of the November analysis). At

the same time, limited entry fixed gear and gear-switched sablefish prices declined to levels below those seen during the time of the trawl catch share program (Section 2.5.3 of the November analysis).

Under recent harvest and market conditions, it appears that at high ACLs there might be sufficient sablefish to allow harvest of trawl complexes and meet the demand from gear-switching vessels. However, this is based on a very small amount of historic data that was confounded by COVID and over time these conditions could change. During its discussion, the Council recognized the uncertainty about the appropriate level for the trigger and Council members discussed that there would be opportunities to adjust the trigger level in the future.

Two factors in particular might impact the level of ACL at which there is sufficient sablefish QP for trawlers and gear switchers: changes in the co-occurrence of sablefish in the trawl catch and changes in the price of sablefish. For example, with respect to co-occurrence, the percentage of sablefish taken by three of the strategies with low sablefish bycatch levels (whiting, mixed shelf, and midwater rockfish, Section 2.4.5(b) of the November analysis) went from an average of 7.7 percent for 2016 to 2019, to 16.4 percent in 2020, and 16.1 percent in 2023. The share of catch in another strategy (other flatfish, including Petrale sole), went from 11.8 percent for the 2016-2019 average to 7.2 percent in 2020 and 16.0 percent in 2023. Further as the amount of sablefish co-occurring in trawl strategies increases, the total revenue trawlers generate per pound of sablefish decreases, making it more difficult for trawlers to compete with gear switchers. As long as fixed gear prices are also down, this tends to be less of a problem because demand for sablefish QP by gear switchers is substantially reduced. However, if prices for sablefish improve, gear switcher ability to compete with trawlers for sablefish QP would improve. Because gear-switching vessels taking sablefish catch very low amounts of non-sablefish species (particularly compared to trawl vessels), for a given sablefish price increase their revenue will increase more substantially than for trawlers. Despite high West Coast northern sablefish volumes (which may tend to depress prices), increases in sablefish prices could still occur due to

- an increase in consumer preference for sablefish (domestically or internationally),
- a decrease in availability of other protein sources for which sablefish is a substitute (e.g. sockeye, chum, and Chilean seabass, or other meats; Huppert and Best, 2004, Warpinski, 2015), or
- a decrease in the availability of sablefish produced in other regions (primarily Alaska which provided 63 percent of the global supply from 2012-2016, see Section 7.13 of the November analysis).

### 3.0 ANALYSIS PERCENT GEAR-SWITCHING TRIGGER

*Summary:*

- ***This discussion applies to periods in which the ACL is below its trigger level.***
- *When gear-switching levels are below 29 percent, the trigger would work relatively smoothly with no oscillation between the issuance of status quo and any-gear QP.*
- *When gear-switching levels are generally above 29 percent, there would be oscillation between the issuance of status quo and gear-specific QP. When the issuance of gear-specific QP is triggered, then gear switching levels would be forced below 29 percent. As soon as the three-year average caught up with the years of gear-specific QP issuance,*

*then status quo QP would be issued and gear-switching levels would go back up until the average caught up with those higher gear-switching levels.*

- *When gear switching is above 29 percent but at moderate levels such as those seen in the previous decade, there would be a slower oscillation between the issuance of gear-specific and status quo QP.*
- *When gear switching levels are substantially above 29 percent, gear-specific QP would be issued for a number of years followed by just a few years of issuance of status quo QP before a return to the issuance of gear-specific QP for a number of additional years.*
- *Oscillation frequency will increase as legacy participants divest of QS, causing a decline in the amount of any-gear QP issued each year.*
- *Using a three-year average as the metric for evaluating the percentage gear-switching criteria results in less oscillation than would use of a single year metric.*
- *The metric used to evaluate the percent gear-switching criteria would be influenced by data from as many as four years earlier.*
  - *There may be some ways to reduce this delay by at least a year.*

The actual percentage of gear switching occurring is another indicator of the degree to which gear switchers may be competing with trawl vessels for northern sablefish. The option proposed would combine the gear-switching level criteria (three-year average below 29 percent) with the ACL criteria (ACLs above a level to be determined) such that meeting either would trigger the issuance of northern sablefish QP without gear designations (i.e., status quo QP, see Figure 2). ***The following discussion applies with respect to periods in which the ACL is below the trigger level (i.e. the lower half of Figure 2).***

### **3.1 Hypothetical Time Series Analysis**

Use of a gear-switching level as a trigger could result in the issuance of status quo QP for many years in a row or oscillations between the issuance of status quo and gear-specific QP. The oscillations would be caused more by the specification of the provision than conditions in the fishery. The frequency and duration of the oscillations would vary with conditions in the fishery.

The gear-switching level criteria work without oscillations in periods when gear-switching levels are relatively low. This is illustrated by the hypothetical time series of gear-switching levels provided in Figure 6. The average for this hypothetical time series is 25 percent. Note that the three-year average (grey line) never reaches 29 percent (hashed line) and therefore in each year status quo QP are issued. It should also be noted here that the metric used to evaluate gear switching is a three-year rolling average, applied to the coming fishing year (indicated by the bracket and arrow showing the average of years 1-3 applying to year 5). The one-year lag between the years used for the three-year average and the year to which the metric is applied to determine the type of QP to be issued (status quo QP or gear-specific QP) is due to the need for the data to be complete before it can be used to determine the type of QP to be issued for the coming year.

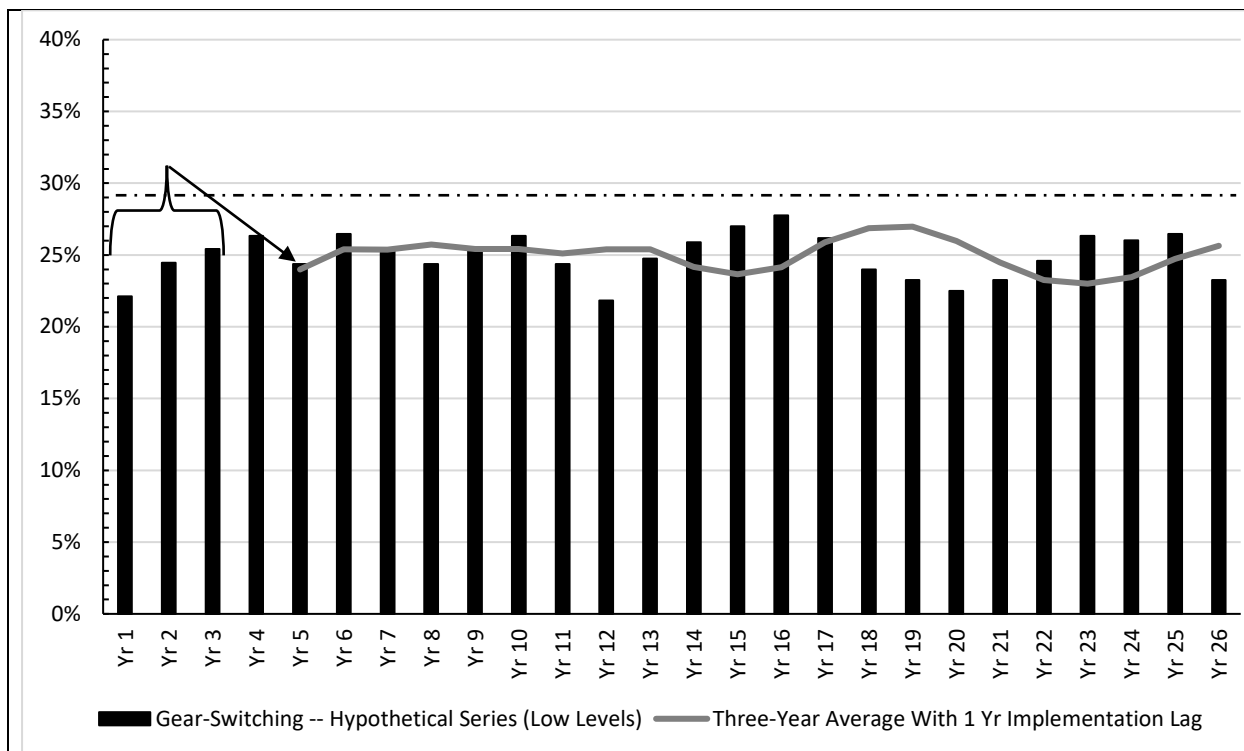


Figure 6. Hypothetical time series of gear switching at relatively **low levels** (averaging 25 percent, about 25 percent less than values seen from 2014-2019) and the previous three-year average, lagged one year—because the average starts and remains below 29 percent, all QP issued would be status quo.

When gear-switching levels are at moderate levels above 29 percent, there would be oscillation between the issuance of status quo and gear-specific QP (reminder: assuming that ACLs are at levels lower than the trigger level). Figure 7 provides another hypothetical time series in which the values are generally similar to those observed from 2014-2019. The average for this hypothetical time series is about 33 percent attainment by gear switchers. The three-year average (grey line) shown in that figure is also lagged one year (as in Figure 6). Figure 8 shows how the gear-switching levels would be affected by applying the PPA, along with the gear-switching level criteria contained in the suboption, starting in year 5 of the time series. The PPA is applied assuming that 29 percent of the QP would be issued as any-gear but that 10 percent<sup>4</sup> of those QP would go unused (i.e. approximately a 26 percent level of gear switching). In the figure it can be seen that for the hypothetical time series, in years one to three, the gear-switching levels were above 29 percent so the average (lagged one year) results in gear-specific QP being issued for years 5 through 8. Because the issuance of gear-specific QP necessarily drives the three-year average to below 29 percent, there is a reversion back to the issuance of status quo QP within four years (year 9 based on average of years 5-7), regardless of whether incentives for gear-switching are low or high for year 9. For this hypothetical series and level of issuance of any-gear QP (29 percent), gear-specific QP are issued for three or four years in a row, followed by two or three years of issuance of status quo QP. Overall, gear-specific QP would be issued in 14 out of the 22 years in which the criteria is applied in this hypothetical example (years 5 to 26 in Figure 8). Based on the assumptions used in this analysis, average gear-switching levels would drop from 33 percent to 29 percent.

<sup>4</sup> Due to trawler use of some any-gear QP and difficulty aggregating any-gear QP spread across many QS accounts.

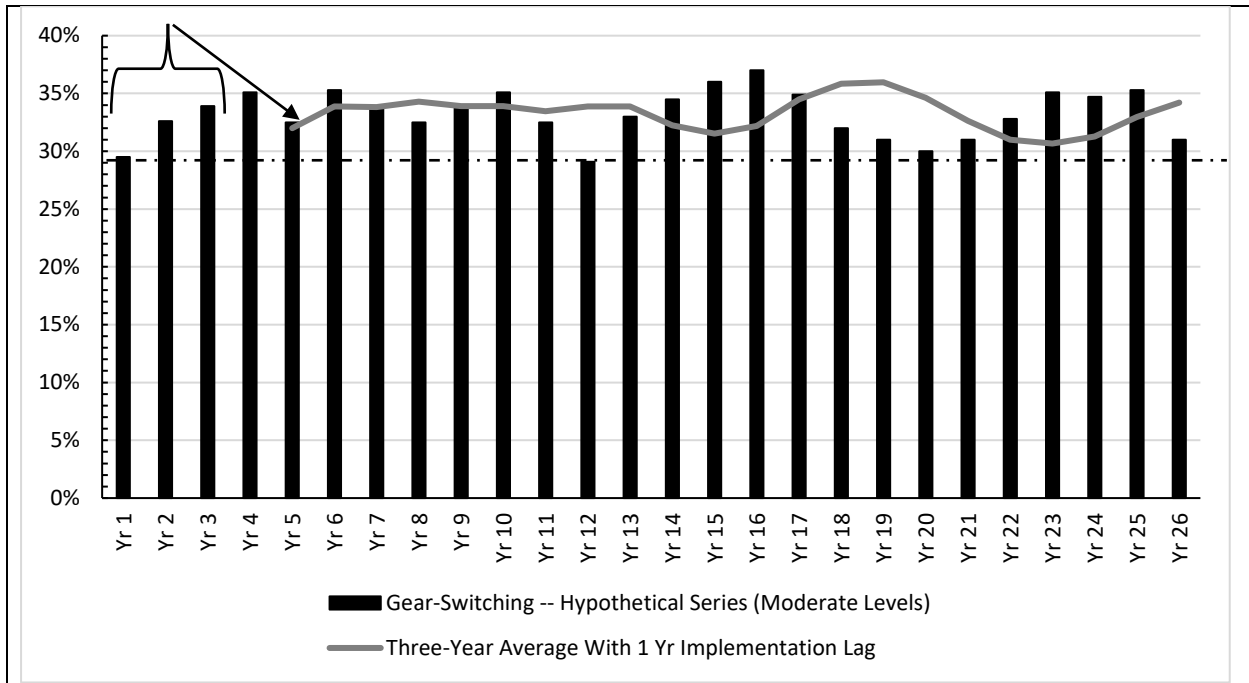


Figure 7. Hypothetical time series of gear-switching at relatively **moderate levels** (similar to those seen from 2014-2019— averaging 33 percent) and the previous three-year average, lagged one year.

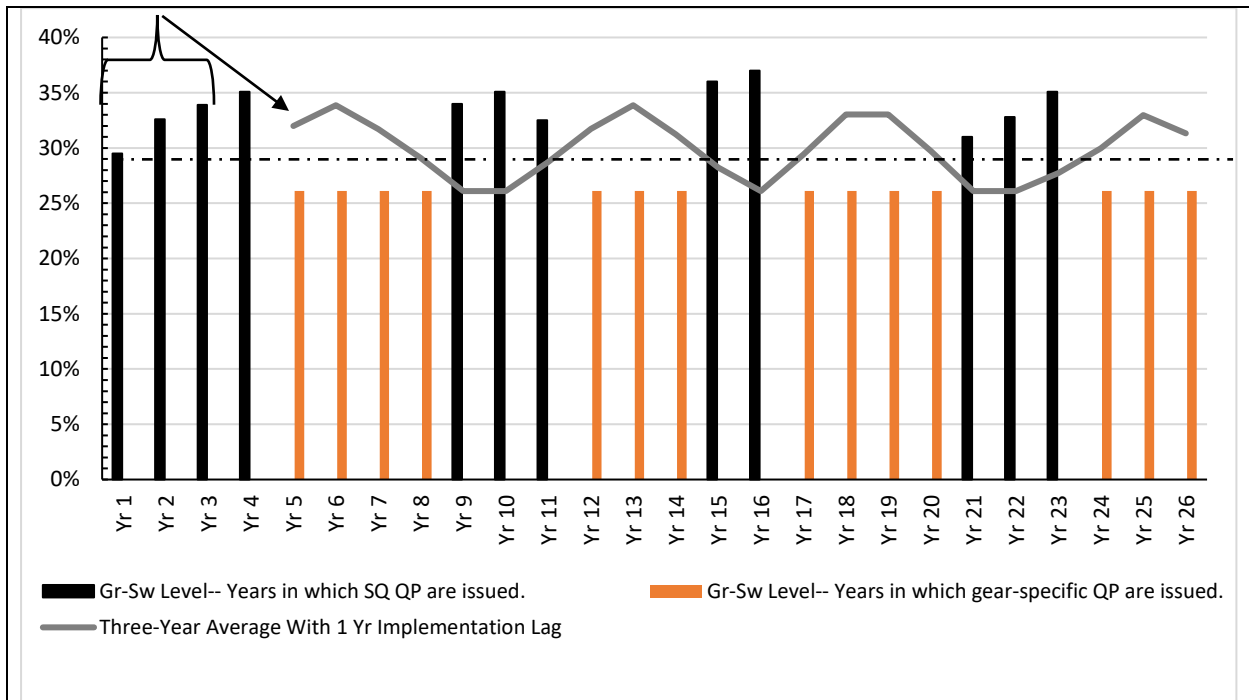


Figure 8. Hypothetical time series of gear switching at relatively **moderate levels** (averaging 33 percent, from Figure 7), as modified based on applying the PPA and 29 percent gear-switching criteria (i.e. issue status quo QP when the three year average is below 29 percent)—assumptions: ACLs are below the trigger level and when gear-specific QP are issued 10 percent of the any-gear QP issued (**29 percent**) is not used for gear-switching.



Over time legacy participants are expected to divest themselves of their QP, and, based on the option selected for the PPA, the amount of any-gear QP issued would decline from 29 percent (at the time of implementation) to a lower amount. As the proportion of QP issued as any-gear declines, the three-year average will drop more quickly and to lower levels. This would result in gear-specific QP being issued in fewer years and more years in which status quo QP are issued. For the hypothetical time series used in Figure 7 and Figure 8 and gear-specific QP issued at the 20 percent level (assuming that legacy participants have divested of most all their QS), the type of QP issued would cycle between two to three years of gear-specific QP and three to five years of status quo QP (Figure 9). Overall, gear-specific QP would be issued in 9 out of the 22 years in which the criteria is applied in this hypothetical example (years 5 to 26 in Figure 10). Based on the assumptions used in this analysis, average gear-switching levels would drop from 33 percent to 26 percent. One approach for reducing the effect of declines in the amount of any-gear QP issued would be to tie the gear-switching level trigger to the total amount of any-gear QP issued. In this example, the trigger would instead be 20 percent.

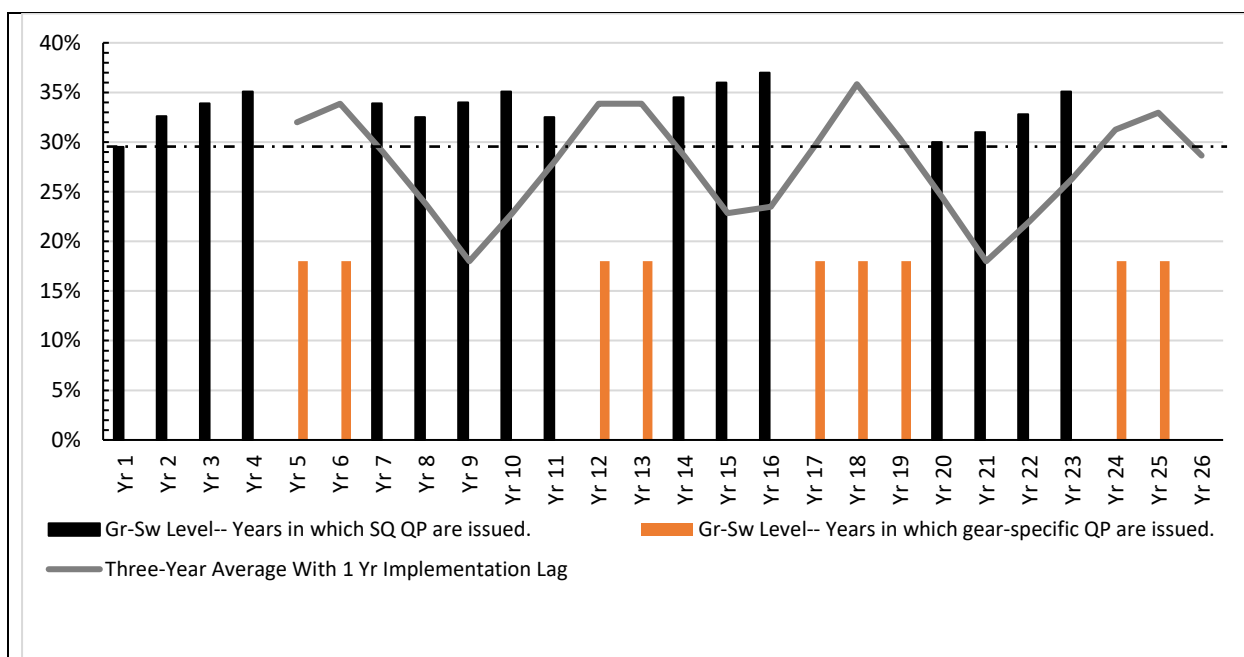


Figure 9. The same as Figure 8, except when gear-specific QP are issued, only 20 percent of the QP are issued as any-gear because of the departure of most legacy participants.

The trigger would also result in fewer oscillations and more consistently issue gear-specific QP if the unconstrained gear-switching levels tended to be higher. For example, if each year in the hypothetical time series were 25 percent higher than that used for Figure 6 (i.e., averaging about 42 percent as compared to 33 percent for the Figure 6 series) and 29 percent of the QP are issued as any-gear in gear-specific years, status quo QP would only be issued for two years at a time, followed by around four years of issuance of gear-specific QP (gear-specific QP would have been issued in 16 of 22 years, Figure 10). Based on the assumptions used in this analysis, average gear-switching levels for years 5 to 26 would drop from 42 percent to 33 percent<sup>5</sup>.

<sup>5</sup> The fact that the time series with moderate gear switching averaged 33 percent and the higher time series dropped to 33 percent is a coincidence.

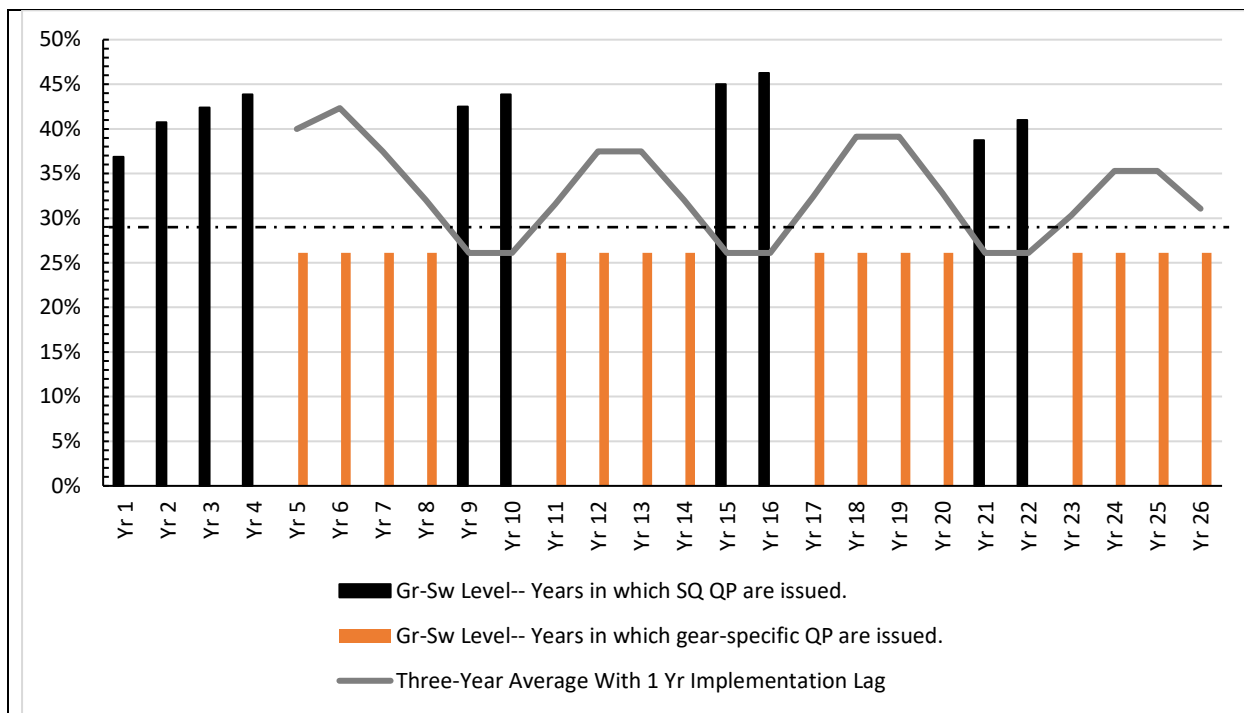


Figure 10. Hypothetical time series of gear switching at relatively **high** levels (averaging 42% gear switching), as modified based on applying the PPA and 29 percent gear-switching criteria (i.e. issue status quo QP when the three year average is below 29 percent)—assumptions: ACLs are below the trigger level and when gear-specific QP are issued 10 percent of the any-gear QP issued (**29 percent**) is not used for gear-switching.

### 3.2 Retrospective Analysis

The impact of the management response to hitting the gear-switching trigger is also illustrated in the retrospective application of the gear-switching percentage trigger criteria provided in Table 5 (for ease of reference, duplicated here and provided as Table 6). In this table, based on the actual conditions that occurred, there would have been no changes under the ACL triggers of 5,000 and 6,000 mt. However, applying the ACL triggers of 8,000 and 10,000, gear-specific QP would have been issued in 2022 (Table 6). However, if gear switching had been constrained to 29 percent in 2018-2020, as would likely have occurred if the PPA and gear-switching criteria suboption had been applied for the entire time series, status quo QP would have been issued for 2022 (based on ACL < 8,000 mt and gear-switching average being forced below 29 percent due to gear-specific QPs being issued in 2018-2020). Status quo QP may also have been issued for 2021, depending on how close gear switchers would have come to the 29 percent limit if gear-specific QP had been issued in 2018 and 2019 (Table 5). If the gear-switching level declined to just below 26 percent in 2018 and 2019, then status quo QP would also have been issued for 2021.

Table 6. Retrospective evaluation of years in which gear specific QP would be issued using the ACL and gear-switching percentage criteria in combination (GSp QP = gear specific QP would be issued, SQ QP indicates that QP would not be gear-specific, i.e. status quo underlined values are the results that changed when the criteria were combined).

Criteria	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
5,000					<u>SQ QP</u>	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	
6,000		Avg gear switching data for 2011-2013 apply to 2015			<u>SQ QP</u>	<u>SQ QP</u>	<u>SQ QP</u>	GSp QP	GSp QP	GSp QP	SQ QP	SQ QP	SQ QP	SQ QP	SQ QP	
8,000			<u>SQ QP</u>	<u>SQ QP</u>	<u>SQ QP</u>	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP <sup>a/</sup>	SQ QP	<u>SQ QP</u>	SQ QP	
10,000			<u>SQ QP</u>	<u>SQ QP</u>	<u>SQ QP</u>	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP	GSp QP <sup>a/</sup>	<u>SQ QP</u>	<u>SQ QP</u>	SQ QP

a/ If gear specific QP were issued in 2018-2020, gear-switching would have been held to below 29 percent in those years and it is unlikely that gear-specific QP would have been issued in 2022. This would not likely have affected the results for 2023-2025, since gear-switching under status quo QP was low in those years.

### 3.3 Time Lag in Data Used to Evaluate the Criteria

The gear-switching criteria uses a three-year rolling average which is intended to reduce oscillation between issuing status quo and gear-specific QP and is effective in that regard. For example, if instead of applying a three-year rolling average, the issuance of status quo or any-gear QP were determined based on a single-year criteria, then for the scenario displayed in Figure 8, QP issuance would switch between status quo and gear-specific QP every two years.

At the same time, the three-year rolling average results in a potentially substantial difference in time between the years in which gear-switching activity occurred and application of that information to determine the type of QP to be issued for a specific year. For example, in preparation for QP issuance for any upcoming particular fishing year (2025), the trigger would be evaluated in the current year (2024) based on an average of fishing from three years prior to the current year (2021-2023). Thus, whether the criteria were met for 2025 would be influenced by gear-switching levels from as much as four years prior (2021). For particular circumstances, there might be ways to reduce that delay to three years. For example, in the current year (2024), it might be that data is available part way through the year that is sufficient to determine whether the 29 percent threshold will be exceeded for the 2022-2024 average, allowing 2022-2024 data to be used in determining the type of QP to be issued for 2025. Another possibility might be to issue gear-specific QP at the start of a year but then revert to status quo QP part way into the year (and retroactively to the start of the year<sup>6</sup>), if it is determined that the threshold had been met with the previous year's final gear switching estimate. Continuing with our example years, gear-specific QP would be issued at the start of 2025 and, if with upon finalization of the 2024 data it was determined that the 2022-2024 average was below 29 percent, all 2025 QPs would be changed to status quo any-gear QPs. This latter approach could have benefits in reducing the time delay, making it more likely that the type of QP issued would be more in line with the gear-switching levels. Those benefits would have to be weighed against administrative and communication feasibility/cost/complexity issues. It is also the type of complexity that compounds the development of other separate but related policies in the future and makes it more difficult to fully explain the catch share program. As a reminder, this issue has practical effect only when the ACLs are below the ACL trigger.

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<sup>6</sup> To simplify the system, this could be done retroactively to the start of the year, so that all QP issued for the year would become any-gear, including that already used.