West Coast Groundfish Catch Shares:
Options for the Adaptive Management Program

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Graduate Student Capstone Project

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Executive Summary

A short executive summary intended for Pacific Fishery Management Council and Committee members will be developed in Spring 2019.

Abstract

Since 2011, the West Coast groundfish fishery has set aside 10% of non-whiting IFQ pounds through the Adaptive Management Program (AMP) to address five objectives: community stability, processor stability, facilitating new entrants, conservation, and mitigation of unintended consequences that could arise as a result of the catch share. The AMP quota pounds have yet to be used and have instead been passed through to quota share owners each year. In this report, we 1) synthesized the Pacific Fishery Management Council's five-year review of the catch share program to gain a better understanding of the current status of AMP objectives in the fishery; 2) conducted semi-structured, elite interviews to get stakeholder opinions on the AMP and how it should be used; and 3) conducted a systematic literature review of fisheries with set-aside programs to determine whether those programs addressed any of the same objectives. We present our results for each AMP objective and discuss how various mechanisms could be applied to these objectives. Our findings suggest that conservation is no longer an issue but that community stability, processor stability, and new entrants are all current concerns in the fishery. We also found that gear switching and the high cost of sablefish quota were often brought up as unintended consequences of the catch share. The benefits and drawbacks of one-time, yearly, and multi-year mechanisms are discussed. This report aims to better inform future reviews and decisions on the use of AMP.

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1. Introduction

1.1 Background

The Pacific Fishery Management Council manages over 90 species of groundfish under the Pacific Coast Groundfish Fishery Management Plan (FMP) for federal waters off the U.S. coast of Washington, Oregon, and California. The groundfish fishery was primarily managed using trip limits, and a limited entry system for the trawl sector that was implemented in 1994. Several species were declared overfished in the late 1990s-early 2000s which led to the declaration of a federal fishery disaster in 2000. After a 2003 federal permit buyback program that removed 35% of trawl permits, the fishery was still struggling economically. In 2011, and the trawl sector transitioned to a catch share management system under Amendment 20 to the FMP, formally called the West Coast Groundfish Trawl Rationalization (catch share program), with the goal to "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" (PFMC & NMFS 2010). Under the catch share program, the at-sea whiting trawl sector is managed using cooperatives while the shore-based trawl sector (whiting and non-whiting) are managed using individual fishing quotas (IFQs). For the shore-based non-whiting sector, 90% of the total allowable catch is allocated to individuals (based on historical catch history) and 10% of the quota is set aside for the Adaptive Management Program (AMP), which is the focus of this report (Figure 1).

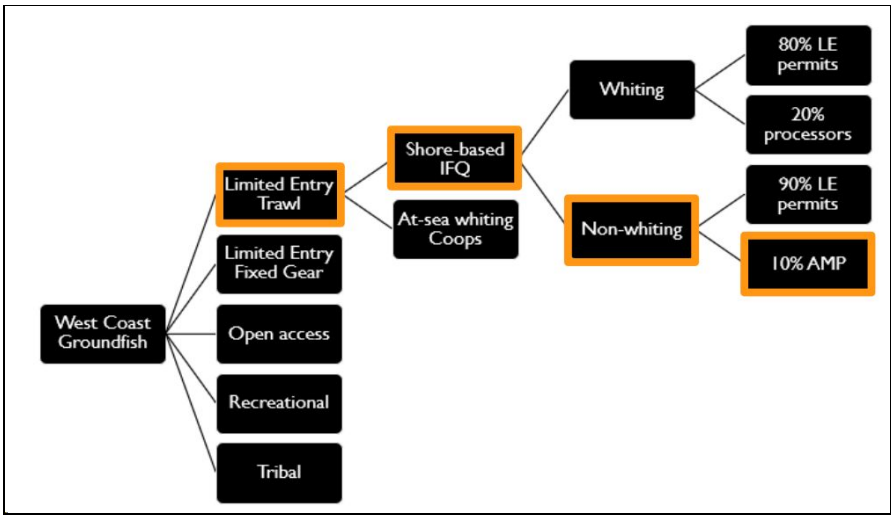

Figure 1. The Adaptive Management Program in the context of the overall West Coast Groundfish Fishery.

The AMP sets aside 10% of the shore-based, non-whiting trawl quota with the intention of addressing five objectives as needed: fishing community stability, processor stability, facilitating new entrants into the fishery, conservation, and any other unintended consequences from starting the catch share program. In the development of the catch share program, the Council and industry were concerned about potential adverse impacts from the transition to catch shares, which could result in disproportionate impacts on some communities. The Council envisioned the AMP as a flexible way to address potential adverse impacts of the catch share program that otherwise are difficult to address after permanent quota allocations (Nayani & Warlick 2018). Since the catch share program was implemented in 2011, the Pacific Fishery Management Council (Council) has voted to "pass through" the AMP quota to quota share (QS) owners in proportion to their quota share holdings. The pass-through for the first two years after implementation was intended to allow additional time for analysis and development of the AMP, but the program has still not been implemented as intended. The Council recently voted to continue this pass-through for the 2019-2020 groundfish fisheries.

This project builds on a policy analysis by Nayani and Warlick (2018) that was primarily conducted in 2014-15 and published earlier this year. That study evaluated policy options for how the AMP quota could be distributed and provide scores for each policy option based on specific criteria (effectiveness, flexibility, political viability, implementability). The study evaluated six policy options comprised of the combination of three possible mechanisms to distribute the AMP (allocation to current QS owners, application system, auction) and two timeframes over which to implement each mechanism including annual implementation or a one-time action (effectively ending the AMP). Although the options for annual allocation of AMP quota to QS owners (status quo) and annual distribution via open auction scored the highest, the authors emphasize the benefits of the evaluation process in highlighting tradeoffs among the criteria and among the AMP objectives. The authors also emphasize the challenge of considering new uses for the AMP quota after it has been passed through for several years.

1.2 Project Purpose

At the request of the NOAA West Coast Region, this research project was initiated to further explore how the AMP could be used to address its intended objectives: community stability, processor stability, new entrants, conservation, and any other unintended consequences. This project includes 1) a synthesis of the recent five-year review of the catch share program (PFMC & NMFS 2017) to understand the current status of the identified objectives; 2) a collection of stakeholder interviews to capture stakeholder perspectives about the original goals of the AMP and future use of the AMP; and 3) a literature review to identify other fisheries with similar programs to the AMP and outcomes from those fisheries.

This project, in conjunction with Nayani & Warlick's analysis of potential mechanisms, provide comprehensive analysis to inform future Council discussions on how to use the AMP quota, including options to end the AMP or designate a specific use for the AMP quota other than the current pass-through. Amendment 20 specifies that the Council will review the AMP and consider a range of sunset dates (including no sunset date) for the future (PFMC 2017); however, the program as originally implemented does not have a sunset provision.

The NOAA West Coast Region initiated this project to continue to explore and research options for the AMP to inform future Council discussions. Given the AMP's use in federal regulatory documents and legal proceedings, the Council must ensure that any action regarding the AMP has undergone thorough analysis. In the Final Environmental Impact Statement (FEIS) for the catch share program, the AMP is included in the explanation of how the catch share program is consistent with the Magnuson-Stevens Fishery Conservation and Management Act (MSA), specifically National Standard 6, which addresses unexpected contingencies in the fishery, and National Standard 8, which addresses minimizing adverse impacts on fishing communities (PFMC & NMFS 2010). A 2011 lawsuit against the National Marine Fisheries Service (NMFS) argued that the new catch share program violated MSA National Standard 8 by not protecting fishing communities from adverse effects from consolidation due to the catch share program. The court ruled in favor of NMFS, determining that NMFS met its obligations under the MSA by adopting measures such as the AMP to mitigate impacts of trawl rationalization on fishing communities (PFMC & NMFS 2017; *Pacific Coast Federation of Fishermen Associations v. Blank* 2012).

Due to these uses of the AMP in federal and legal proceedings, any action by the Council that would effectively end the AMP must be defensible in a court of law.

1.3 Report Structure

The remainder of this report is structured as follows. First, we summarize past Council discussion on the design and proposed uses of the AMP (section 2). We then present our three-part methodology (section 4): synthesis of the Trawl Rationalization Five-Year Review (PFMC & NMFS 2017), stakeholder interviews, and literature. We then present results and discussion from our three-part methodology organized by AMP objective (section 5.1) followed by a discussion of mechanisms for AMP distribution informed by our results (section 5.2) Finally, we present our conclusions (section 6).

2. Past Council Discussion of AMP Design

While the goal of this project is to help inform future Council discussion of the AMP, the Council, Council committees, and NMFS have already undergone years of discussion on goals, objectives, and some mechanisms for using the AMP. This research project acknowledges the past work that has been done on this topic and hopes to expand upon it with new ideas and perspectives several years after these initial Council discussions. This section is meant to summarize and highlight some of the key decision points that have already been discussed in past Council meetings.

Discussion of a quota set-aside option to address stability within the groundfish fishery began in 2005, and in 2008, the Council stated their intention to implement an Adaptive Management Program in the West Coast Groundfish non-whiting trawl fishery (Nayani & Warlick 2018). The Council elected to develop the details and plans for the AMP through a trailing action, with a final decision regarding the AMP in June 2009 (PFMC 2009c). The AMP goals and objectives were finalized in April 2009, but Council action was taken in June of that year to "pass through" AMP shares during the first two years of the trawl rationalization program.

During Council discussion of the AMP design, several key program features were identified. Two of these features were the process, or mechanism, for allocation of quota and the organizational structure for decision-making that would be used throughout the program. In discussion of how AMP quota could be allocated, the Council identified two main processes and left the option open for a potential new process that had not yet been considered. The first allocation process, a proposal-driven application process, would allow individuals, communities, or trusts to develop and submit a proposal to receive AMP quota. The primary issue with this process was the organizational structure, determining the roles the Council, NMFS, and the three West Coast states (Washington, Oregon and California) would have in design and implementation. This process would have the most administrative decision-making because either the states, Council, NMFS, or some combination of these decision-making bodies would have to review and assess each proposal individually. Proposals would then be weighed against one another to determine which one(s) would best address the objectives of the AMP.

The second allocation process discussed was a formulaic process in which certain criteria must be met to be eligible to receive AMP quota. The formulaic process could either give AMP quota to any entity that meets specified criteria, or entities could apply or meet criteria to be eligible for AMP quota and quota

would then be allocated formulaically. The formulaic option would have the least administrative decision-making because quota is either being allocated purely based off quantitative criteria or entities are evaluated based off predetermined criteria, not the subjective opinions of which proposal is the bes, as a proposal-driven process would be determined. The Council also discussed a hybrid option in which the pool of entities eligible to receive quota would be limited by specific criteria and then further evaluated based on additional standards. These formulaic options could mean that no application is necessary and AMP is allocated by a basic formula, some form of application or eligibility is necessary and those entities can receive quota if they meet additional criteria, or only entities who meet a specified quantitative criteria are allowed to apply and receive quota based on further review (PFMC 2009a, PFMC 2009b). The structure in which the Council could implement a formulaic process can vary, with nuances between mechanisms that are not covered within this report; for more detailed information on these processes, see the Council Staff White Paper on Adaptive Management Options (PFMC 2009a). All of these allocation options except a basic formulaic option require decision-makers to review and assess proposals to some degree, but the amount of review and decision-making would differ.

In past Council discussions, there was little discussion of how the review process would take place, particularly in the proposal-driven application process. However, the Council acknowledged that determining the decision-making structure would be a critical step in understanding the administrative requirements of any review process.

To address the number of governing bodies involved in the AMP process, in April 2009 the Council identified five possible ways for how the involved bodies could allocate AMP quota, with a sixth "other" option.[1] Although there are many decision-making bodies in the AMP process, in November 2008 the Council adopted a motion outlining the broad scope of the AMP, including that quota shares were to be divided in a "separate, but parallel processes in each of the three states" (PFMC 2009a). In this analysis we will only address some important considerations regarding structural options for decision-making, focusing instead on the differences between mechanisms and not the role of each entity.

Throughout discussion of the how AMP quota could be allocated, the Council identified standards that could be used to evaluate who receives AMP quota. These standards, or criteria, would allow the Council to use a formulaic approach to allocation. In initial discussions of standards, Council staff and groundfish committees identified vulnerable communities and principal ports as ways to address adverse impacts to communities and processors that could result from the trawl rationalization program. The GMT also briefly discussed standards that could be used to address processor stability, conservation, and new entrants (GMT 2009a). These ideas were brought up in 2009 but have not been discussed as extensively

[1] 1. States → Council → NMFS (proposal evaluation process); states would pre-screen applications before submitting them to the Council who would then make recommendations to NMFS
2. States → NMFS (proposal evaluation process); states would submit applications directly to NMFS with no direct Council role
3. NMFS (proposal evaluation process); applications submitted directly to NMFS
4. NMFS (formulaic allocation); any entity that meets specific criteria would be allocated quota
5. NMFS (formulaic proposal); applicants are selected but allocation of quota done formulaically
For additional information on these decision-making processes, see Council Staff White Paper Adaptive Management Options (2009).

as the concepts of vulnerable communities and principal ports, which we focus on here. In 2013, NMFS provided the Council with a report (NMFS 2013) on vulnerable communities and principal ports where they outlined goals, objectives, and formula components for both standards. NMFS focused on these two formulaic criteria for community/processor stability because the ideas had been discussed previously and NMFS acknowledged the early success of the catch share program in addressing conservation.

Vulnerable Communities
The goal of using a vulnerable communities allocation formula would be to incentivize vessels to land their catch in communities determined to be at risk of losing significant landings during the early years of the trawl rationalization program (NMFS 2013). In 2009, Council staff defined vulnerable communities as those "that can demonstrate harm resulting from trawl rationalization" (PFMC 2009a), while the GMT defined them as "those whose residents receive little or no initial allocation of quota share, are dependent on groundfish trawling, will likely see shifts in trawl landings, are adjacent to high bycatch areas for a particular species, and/or have limited port infrastructure" (GMT 2009a). In the catch share program FEIS (Ch 3), NMFS identified communities that would fall under their definition of vulnerable and could be included in the assessment and allocation of QP to vulnerable communities (PFMC & NMFS 2010).

Principal Ports
A principal port is determined for individual vessels, defined by where a vessel has made its largest overall tonnage of landings in a given timeframe. This timeframe would be specified so as to reward vessels that have continued to use the same principal port over time and incentivize vessels to land at the same port year after year, thereby reducing potential delivery shifts as a result of trawl rationalization and increasing stability in landings (GMT 2009b; NMFS 2013).

Given the extensive Council discussion of a proposal-driven or a formulaic application process, these processes are included with additional detail in our discussion of potential AMP allocation mechanisms. We also explore the concepts of vulnerable communities and principal ports further in our discussion of AMP mechanisms and formulaic approaches to allocation (section 5.2.4). For additional discussion of past Council decisions on the AMP, see Nayani & Warlick (2018).

3. AMP Objectives

In order to discuss how the AMP could address its intended objectives, we defined each objective based on past Council documents (GMT 2009a; GMT 2009b; PFMC 2009a; NMFS 2013; PFMC & NMFS 2017) and Nayani & Warlick's (2018) discussion.

- **Community stability:** having sufficient groundfish landings and/or allocated quota to support the fishing industry in communities with historical engagement in the groundfish trawl fishery.
- **Processor stability:** 1) receiving sufficient groundfish landings throughout the season and from year-to-year to support processor operations at existing plants and 2) having the ability to incentivize/attract fishermen and skilled employees.
- **New entrant:** An individual who has never directly owned or leased quota.
- **Conservation**: "harvesting techniques and technologies that reduce environmental impacts...Objectives could include reducing incidental catch of depleted species or reducing habitat impacts." (PFMC 2009a)

4. Methods

We structured our methods around three questions to inform our discussion of how the AMP could be used to address its intended objectives:

1. What is the status of the intended objectives for the AMP (community stability, processor stability, new entrants, conservation, unintended consequences) since implementation of the catch share program?
2. What are stakeholder preferences and ideas about how the AMP should be used?
3. Are there other fisheries that have used a set-aside program to address similar issues?

4.1 Five-Year Review Synthesis

We used the recently completed five-year review of the catch share program (PFMC & NMFS 2017) to inform Question #1. The Council and NMFS are required by the MSA to conduct a review of the catch share program, including how well the program is meeting its intended goals. We synthesized the review results in the context of the AMP objectives and our definitions to determine if the objectives have already been met or are in the process of being addressed by the catch share program. If an issue is already being sufficiently addressed by other aspects of the catch share program, then using the AMP to address that issue may not be necessary. The five-year review is based on data from the Economic Data Collection (EDC) with a baseline period of 2009-2010 and the Pacific Coast Groundfish Fishery Social Survey (PCGFSS) with a baseline period of 2010. More information on the five-year review can be found in Appendix A.

4.2 Interviews

We conducted semi-structured, elite interviews with stakeholders to understand stakeholder preferences and new ideas about how the AMP should be used. As opposed to structured interviews which follow a strict, survey-like format, semi-structured interviews combine "closed- and open-ended questions, often accompanied by follow-up why or how questions — and may delve into totally unforeseen issues" (Adams, 2015: 493). Elite interviewing means placing particular importance on the interviewee's definition and structure of the situation, and letting the interviewee determine what is relevant rather than the interviewer having predetermined notions of what is relevant (Dexter, 2012). This format allows us to address predetermined topics, such as the four main AMP objectives, while still being flexible and responsive to any new ideas or issues (such as unintended/unforeseen consequences) that the interviewee introduces throughout the process. We developed questions that would allow us to focus on three main areas:

1. AMP objectives and their relative importance
2. Necessity of AMP program and ability to address objectives
3. Impact of changes to current AMP use

After determining specific stakeholder categories — fishers, processors, nongovernment organization representatives (NGO) — that we felt would serve to represent a range of perspectives, we utilized a purposive snowball sampling method to select specific interview participants (Chambers et al., 2017, pg. 5; Bernard 2006). In addition to identifying these categories, we also sought to interview individuals with varying historical and current formal participation on the Council (Figure 2). Working with our NOAA

advisors we obtained our first round of contacts, and then obtained additional names from those first interviewees. The interviews were then transcribed and analyzed in Atlas.ti to identify recurring themes while looking for consensus on ideas and perspectives. For more details on interview methods, refer to Appendix B.

Group	Participants	Code
NGO + PFMC	2	NC
Fisher + PFMC	7	FC
Fisher	3	F
Processor + PFMC	3	PC

Figure 2: The four groups that our interview participants were a part of: NC-Non-Government Organization with formal participation on the Council, FC-fisher with formal participation on the Council, F-fisher with no formal participation on the Council, and PC-processor with formal participation on the Council.

4.3 Literature Review

We conducted a literature review to search for similar set-aside programs in other catch share fisheries to better understand mechanisms that could inform the Council's use of the AMP. First, we created a search term using words related to potential uses for the AMP (fisher* AND ("catch share*" OR "quota share*" OR quota) AND ("new entrant*" OR community* OR processor* OR stability OR adaptive OR equity OR permit*). The search term brought up 374 papers through Web of Science. We only retained publications that assessed case studies of quota allocation in specific fisheries, whose title, abstract or key words mentioned community stability, processor stability, new entrants, a set aside program, or if the content was unclear after only reading the abstract. After records were excluded based on abstracts, the search resulted in 48 articles to conduct full-text assessments on.

Ultimately, we identified 36 peer-reviewed articles to use in our analysis based on the criteria we used to assess the abstracts. We supplemented these articles with information from the Environmental Defense Fund (EDF) Fishery Solutions Center database (EDF n.d.) on fisheries utilizing rights-based management. This database includes case study reports for 15 fisheries, some of which did not come up in our search of the academic literature, so we added them to this literature review in the hopes of a more thorough analysis of catch shares with set-aside programs. The database added another 15 fisheries to our analysis. For each article, we extracted the same data taken from the academic literature. Refer to Appendix C for more detailed methods on the literature review.

5. Results and Discussion

Based on findings from the Council's five-year review, stakeholder interviews, and literature review, we discuss the current status of each AMP objective, associated stakeholder opinions, and relevant examples from other fisheries. We then discuss potential AMP quota distribution mechanisms that were included in past Council discussion and new ideas proposed by interview participants. This discussion can inform the Council's future consideration of how to focus the AMP program and how to distribute the AMP quota.

5.1 AMP Objectives

5.1.1 Community stability

Our definition of community stability includes having sufficient landings and/or quota to support historically engaged fishing communities. Regarding landings, the number of West Coast ports receiving directed groundfish landings has declined overall, and a higher proportional decline was seen for ports

receiving trawl deliveries (vs. non-trawl) with 33% of groundfish ports receiving trawl groundfish before the catch share program and 24% receiving after (PFMC & NMFS 2017). All three states have shown a 15-16% decline in average annual landings of non-whiting groundfish since the catch share program was implemented. Some ports have seen an increase in average annual ex-vessel value for non-whiting species, like Astoria's 21% increase, while other ports have seen a decrease in ex-vessel value, up to 81% decrease in Crescent City. Regarding movement of quota, 18.5% of non-whiting quota has been traded and 63% of that has moved from one port to another since implementation of the catch share program with net transfers of quota pounds out of California and Washington into Oregon. Fishing engagement in historically highly-engaged fishing communities has remained mostly stable, with some decreases in California communities (PFMC & NMFS 2017). These data indicate that there is some variability across geographic regions with relatively more adverse impacts seen in California communities

As a common theme across communities, the five-year review notes that high cost was very frequently identified as a major challenge for individuals and communities. Although some communities are perceived to be adapting to the catch share program, communities identified the high costs of both quota and observers associated with the catch share program affecting their profitability. These costs are higher relative to revenue for smaller vessels. The catch share program requires 100% observer monitoring coverage, including at-sea and at-dock. Prior to the catch share program, observer coverage was 19% in the non-whiting fishery (PFMC & NMFS 2017). NMFS partially subsidized the cost of observers until 2016, and now vessel owners are responsible for that cost (average $450 per day) (Russell et al 2018), which comprised up to 4% of revenue for non-whiting trawl vessels (PFMC & NMFS 2017). Concerns about the cost of observers were more prevalent for small vessels in smaller, remote communities, particularly in California, who have to cover travel cost and accommodation in those places that are more difficult to reach (PFMC & NMFS 2017, Russell et al 2018). In addition to the cost, remote communities also have a more difficult time finding available observers (Russell et al 2018). Daily observer costs are the same for all vessel sizes, and observer costs relative to revenue are higher for small and medium vessels than for larger vessels (PFMC & NMFS 2017).

The need to lease additional quota for constraining species throughout the season also impacts profitability. Harvesters have to lease additional quota to account for bycatch and other species overages, or they can try to avoid bycatch and overfished species at the cost of limiting their catch of target species. In some cases, quota leasing rates for constraining species such as canary and yelloweye rockfish can be greater than the ex-vessel prices for these species (Holland & Norman 2015). If considering fishing in an area with high prevalence of constraining or bycatch species, harvesters have to weigh the risk of quota overages (and having to lease additional quota) against having unharvested quota left (Russell et al. 2018).

To address some of these quota access/cost issues, community quota funds (CQF), which "secure fishing rights and retain sustainable commercial fishing in their respective communities", have formed to make quota available to community members at reasonable lease rates. Five community quota funds have

formed (or are being formed) in California[2] since the catch share program began, and they have acquired most of their quota from the Nature Conservancy (TNC), which was allocated quota in 2011 after purchasing permits during the federal buyback program (Russell et al. 2018).

As another way of maximizing profit and adapting to the catch share program, harvesters have increased efforts in other fisheries, such as pink shrimp and Dungeness crab. Communities with historically diverse fishery participation may be better poised to adapt. Overall, the five-year review indicates that community stability is an issue in the fishery, driven in part by the high cost of monitoring and high cost quota, which are costs that cannot be avoided. Individuals shifting effort to other fisheries and the formation of community quota organizations indicate some adaptation, but these issues will likely continue to persist.

Just as the results of the five-year review highlighted the importance of community stability, interview participants from all groups also noted community stability as one of the most important issues in the fishery. However, many of these participants also discussed the importance of community stability in connection with processor stability and new entrants, with community stability as a broader issue that is affected by new entrants and processor stability. For example:

"Well, the top two [issues] would be, you know, number one community stability and then secondly, new entrants. Although, for example, in the Monterey Fisheries Trust, you know, there are elements of the goals and objectives that are trying to develop new entrants for the fishery — that's a community need, an expression of community needs. So they're very closely reliant, I think. Closely." - FC5

"Processor stability and community stability are tied together and if you have a healthy fishery, you'll have new entrants. So, I think [the most important] would be community stability and processor stability. Cause once you have those, everything else takes care of itself. If you have a profitable, growing fishery then the benefits flow to the stakeholders." - F1

Additionally, some interviewees suggest that the creation of community quota funds, such as the Monterey Fisheries Trust, have sufficiently addressed community stability issues.

"They set up community quota funds down there right, in essence, in the area that was the hardest hit, that's already built in now – [The Nature Conservancy] is the largest quota holder on the West Coast. Those communities have been stabilized because they have fish to entice people, so I think the stability aspect has been pretty much taken care of in my mind." - FC3

As relatively new organizations, the role and impacts of community quota funds remain to be seen (Russell et al. 2018). They could be a possible mechanism for identifying community priorities and distributing AMP quota pounds to address community stability, but they may not be sufficient alone to

[2] The five community quota funds that have formed (all in California) are the Morro Bay Community Quota Fund, Monterey Bay Fisheries Trust, Half Moon Bay Commercial Fisheries Trust, Fort Bragg Groundfish Conservation Trust, and Commercial Fishermen of Santa Barbara, Inc. (Russell et al. 2018).

address these issues. For example, some social survey participants in the five-year review noted the importance of community quota funds in providing access to quota pounds at more affordable lease rates, but that they still could not afford to participate due to the high required observer costs. Some of these quota funds are in small, remote ports where the costs of observers can be higher due to additional travel costs (PFMC & NMFS 2017).

Ultimately, stakeholders appear to agree that community stability remains an important issue needing to be addressed in the West Coast groundfish fishery and that community stability is tightly linked to other the objectives, and when achieved it could potentially promote multiple objectives. However, there may still be some resistance to using AMP quota pounds to address community stability issues, as there is a sense that by giving that quota to communities in need, the Council may be harming those individuals or communities who previously had that quota:

"One thing that makes me somewhat concerned is that if you started to take some of the AMP away from some of the fishermen it would be kind of like a balloon effect. Like if you were doing it for a community, for example, that needed some more [quota] because those fishermen were struggling more, you might then tip the scales from the person you took it from." - FC6

Finally, through our literature review, we find that community stability was identified as a concern with the implementation of quota share programs worldwide. Of the ten set aside programs found in the literature, four of them mentioned community stability as an objective of the program. In the United States, we have seen the importance of community stability to fisheries managers with the creation of the Community Development Quotas (CDQs) in Alaskan fisheries. The CDQs are an effort to increase fisheries participation in communities, address vulnerability, and create transparency in allocation (Lyons et al 2016; Szymkowiak and Himes-Cornell 2018). Under the MSA, in order for a community to be eligible for CDQ quota they " (1) must be located 50-miles from shore, (2) must be certified under the Alaska Native Claims Settlement Act, (3) must comply with State of Alaska criteria approved by Secretary of Commerce, and (4) must consist of residents who conduct more than one-half of their commercial or subsistence fishing in the Bering Strait and Aleutian Islands (BSAI)" (NMFS 2018 p.11). Allocating quota in a manner similar to the CDQ may be able to address the community stability issues that face the West Coast groundfish fishery, but there are concerns about monitoring costs that may result (Tryon 1993). Interviewees already mentioned the increased costs of the fishery due to monitoring requirements, and more observers would be required if new communities are participating in the fishery.

The literature also provides evidence of successful ways to address community stability in other countries. In Sweden, for example, there are coastal quotas as part of their demersal and pelagic fisheries. This quota is allocated to coastal communities in an attempt to keep those small communities in the fishery. In this program the communities are given enough quota to guarantee that they can fish for the entire year, allowing sufficient landings and/or allocated quota to support the fishing industry in communities with historical engagement in the fishery. This is slightly different from the CDQs, as the percentage of quota given to the different communities can vary from year to year.

5.1.2 Processor stability

Our definition of processor stability refers to the ability of processors to maintain their operations and labor force. While revenue for non-whiting processors has increased since the catch share program was implemented, variable costs have increased by a greater proportion and fish input prices have also increased since 2011, leading to decreased profitability (Guldin et al. 2018, PFMC & NMFS 2017). The number of non-whiting processors on the West Coast has fluctuated with no clear trend since the catch share program was implemented, but most ports have seen a decrease in the number of buyers (processor facilities and first receiver offloading sites) purchasing trawl non-whiting groundfish (Guldin et al. 2018, PFMC & NMFS 2017). The largest overall decrease in buyers was seen in California, but varied by port, with some ports maintaining a stable or increasing number of buyers (PFMC & NMFS 2017, Guldin et al. 2018).

The greater flexibility and efficiency for harvesters has led to fewer days of non-whiting deliveries for processors. Due to this inconsistent supply and decreased consumer demand stemming from low groundfish availability in the 2000s, processors are not able to access premium markets and cannot maintain the highly-skilled labor force (e.g. filleters) necessary for the labor-intensive processing of non-whiting species (Guldin et al. 2018). This inconsistent supply of non-whiting species to processors contributes to a negative feedback loop of low supply to processors, low market demand and lack of market creation, low ex-vessel prices, and low utilization (PFMC & NMFS 2017, Guldin et al 2018, Errend et al 2018).

During our stakeholder interviews, it appeared that participants from multiple categories are concerned about processor stability in the West Coast groundfish fishery. Also, as addressed previously in the issue of processor stability is often brought up in connection with community stability which is another issue of concern.

"Processors… that's probably the single largest issue in my mind in the region. And it's surprising, at least to me…the two tend to be linked continuously, communities and processors." - F3

"The processor part because you're down to 2 processors that are just limping along…. everyone else has been shutting their doors. And I think without processors, you're gonna find this industry having a real tough time." - PC1

"I would say, under the program, maybe community stability and processor stability [are the most important] if they could be affected by anything, whether they can or not, I don't know, but maybe those would be the two I would think about." - F1

While there may be some consensus around the idea that processor stability is an important and pertinent issue in the fishery, how that issue should be addressed causes a split between stakeholder groups. Addressing processor stability, particularly through the mechanism of a processor quota allocation, would certainly benefit processors. Unsurprisingly, all three processors that we interviewed expressed support for processor stability as an important issue and expressed an interest in seeing processors receiving AMP

quota pounds. However, the lack of support for this idea from other stakeholder groups was recognized by the processors, and this perspective was reinforced through our interviews with fishers.

"I think they should just give it all to processors. And if that is a—which it is—a politically impossibility, I think it should just be once and for all given to the current quota owners." - PC3

"So if you are gonna take fish away from the fishermen, my first option would by give 10% to the processors on some basis that they can't lease it for a profit." - PC1

"The reason I don't think the processors — of course I'm biased — I don't want the processors [to get AMP quota]… they already control everything I do, I don't want to give them ten, twenty-percent of my fish also, and have that handed over to them and have them suck the profit off of that." - F2

As discussed previously, interview participants revealed a connection between processor and community stability. As a result, it is possible that communities could benefit from an AMP mechanism aimed at increasing processor stability.

"Processor stability… I still really feel strongly that we need processors in the community to keep other fisheries operating, to keep ice plants open, things like that. So, those are really so tied so closely together in some instances… processor stability and community stability are probably so intertwined in my perspective that it would be difficult to separate those out to which is the most important." - PC2

"So what happens to your community stability when you lay your employees off for three months, as a major employer in the town. Or what happens if you decide you're gonna stabilize the community with quota but your processor goes out of business? That's where, these things are all so interconnected, more so than they were back in the 1990s." - PC1

Our literature review did not suggest that processor stability has been addressed in other fisheries through set-aside programs. However, it is important to note that in the shore-based whiting trawl fishery on the West Coast, processors are allocated 20% of the total allowable catch, which was intended to help mitigate the transition from the derby whiting fishery to the catch share program. The non-whiting sector was not a derby fishery prior to the catch share program, and the Council originally decided not to have a non-whiting processor quota due to concerns about shifting too much market power to processors. The Council also noted that many large processors also held vessel permits and could acquire more quota after the initial allocation (App A p.64). The Council did note concern about impacts to small non-whiting processors in the transition to catch shares and identified the AMP as a potential mechanism to address this in the future.

5.1.3 New entrants

In the Five-Year Review, social survey participants most often referred to new entry regarding vessels, permits, and quota access and/or ownership (PFMC & NMFS 2017). We specifically defined a new entrant is someone who has never directly owned or leased quota. The high costs of buying or leasing

quota are seen as a barrier for new entrants into the fishery, including for current captains and crew to become quota owners (Russell et al. 2018). Since 2011, new permit and vessel sales have been "infrequent" and PCGFSS data show an increase in older participants in the non-whiting sector, in contrast with an increase of younger participants in the whiting sector (PFMC & NMFS 2017). The FEIS for the catch share program identified the opportunity for new entrants to work their way up" by investing in and accumulating quota each year, but the five-year review cites lack of upward mobility from crew to vessel/permit/quota owner as a barrier to entry (PFMC & NMFS 2010; PFMC & NMFS 2017). Furthermore, recent data show that over 90% of quota transactions were for large shares, with most for over 10,000 quota pounds. For species that are under-utilized, there is high uncertainty of the return on investment for that quota (PFMC & NMFS 2010; PFMC & NMFS 2017). For the few species that are fully utilized, and therefore highly demanded, the minimum size of a quota share transaction that included at least one fully utilized species was over 130,000 quota pounds (PFMC & NMFS 2017).

In summary, barriers to entry are an issue in the fishery and, although quota is transferable and able to be purchased by new entrants, the high costs of the quota itself and the high costs associated with harvesting (e.g. observer costs), this new entrants issue will likely persist.

While some interview participants did recognize the barriers to entry discussed in the five year review, many indicated that they did not prioritize new entrants over processor or community stability because they did not perceive quota prices to be the main barrier to entry. Interviewees expressed the sentiment that instead, the high cost of participating in the fishery, such as observer costs, is the main barrier to entry and if the fishery becomes more profitable, new entrants will follow. Additionally, echoing stakeholder concerns regarding other objectives, there is a feeling amongst some participants that it would be unfair to use AMP quota pounds for new entrants, when current participants in the fishery are struggling with high costs and profitability issues.

"Some people say the catch share program created a huge new barrier to new entry. I think that's partly true but you always needed a permit and a boat to be able to participate in the fishery so it's not like it was cheap before. You know, this isn't the first fishery a guy starts out in. So I think given that, I really do think there is something to the argument, and it's pretty prevalent out there, but I think it's largely true that the biggest barrier to new entry right now is the fact that there is not a lot of profit in this fishery and if that starts to turn, you'll see a lot of new folks start to get in the game." - NC1

"If the fishery is going to be profitable you'll always have new entrants one way or another. Profitability usually takes care of new entrants..." - F1

"It doesn't make sense to me that you would take quota away from existing fishermen and give it to new entrants or something like that to get them involved. I mean, it costs millions of dollars to get involved in the trawl fishery." - FC2

"So now we come to new entrants, and who are these new entrants? How do you take care of them? How would you work it out? It's just a tough one because you haven't really taken care of

the old entrants yet." - FC3

However, quota in the West Coast groundfish fishery is allocated to quota holders indefinitely, so there is some concern that if the fishery stabilizes and the issue of profitability in the fishery is resolved, the lack of quota being sold or leased to new entrants could then become the main barrier to entry.

"We have structured it as where, you know, you can hold on to your quota indefinitely. And so it creates, I think, a higher burden for new entrants when there are a lot of people that are just leasing it out. So that would be my first choice so, you know, if we end up doing something with it other than passing it though or letting it lapse." - FC6

If quota owners decide to hold on to their quota, that quota could be leased out indefinitely and never made available for new entrants to purchase. If quota owers pass it down to relatives who have never owned or leased quota, that relative would be considered a new entrant by our definition. However, others may not consider that a new entrant, so defining this term in future Council discussions will be important.

One important note to consider is that our interview sample did not include any individuals who are recent new entrants or individuals hoping to enter the fishery in the future, so the results of our interviews may not accurately portray the preferences and perceptions of this stakeholder group.

Of the ten set aside programs found through the literature review, two of them mention facilitation of new entrants as a main objective. In response to the concerns over the ability of new entrants to access a catch-share fishery, fisheries managers have established programs to alleviate the challenges that new entrants face, such as the Danish Pelagic and Demersal ITQ Programs identified in the literature review and noted by Nayani & Warlick (2018). The Danish ITQ programs address new entrants by (1) having quota shares are transferable and therefore can be bought by new entrants (which is also true of this West Coast groundfish fishery), (2) establishing the Fishfund to set aside shares for new entrants who make an investment in the fishery, and (3) allowing new entrants to join a Fishpool, which is a privately established community quota, and access pooled quota for a fixed fee (Schou 2010). The AMP could also be used to address the issue of new entrants in the West Coast Groundfish Fishery by creating a mechanism for new entrants to affordably acquire quota pounds. The catch share program FEIS states that the adaptive management program could help address new entrants if quota is allocated to new entrants at no cost or a relatively low cost (PFMC & NMFS 2010). Although the results of the five-year review and stakeholder interviews indicate that, in the West Coast groundfish fishery, the cost of quota is a significant barrier to entry, lack of profitability and uncertainty may be the biggest factors preventing new entrants from pursuing participation in the fishery.

5.1.4 Conservation

Reducing bycatch and discard rates was a primary factor in the development of the catch share program. The vessel monitoring and accountability requirements, including at-sea observers and shoreside sampling, of the catch share program were designed to reduce the incentive to discard and has resulted in historically low discard rates for both target and non-target species (Somers et al. 2018). For overfished rockfish species specifically, discards of six out of seven species have dropped by over 90% (PFMC &

NMFS 2017). One way to reduce bycatch and limit overages has been community risk pools, which manage quota for overfished species and distribute to group members as needed (Russell et al. 2018). Harvesters have also made gear modifications to help avoid limited/overfished species.

Similar to the results of the five-year review, conservation of groundfish species is no longer a pressing issue in the minds of our interview participants due to the success of the program in reducing bycatch and discards. As such, there is not a clear need to use AMP quota pounds to address conservation issues. Additionally, using the AMP in this way would be an unpopular decision among stakeholders, who perceive other issues such as community stability, processor stability, and the high costs of the fishery to be more pressing.

"A few years on into the implementation of the program here, it's clear that the conservation benefits across the board have really been pretty exceptional." - NC1

"Conservation is probably the least important regarding AMP because our council does such a good job of managing stocks. We're always very precautionary and, you know, that's been one of the hallmarks of the Pacific council for years. We've done a really good job at rebuilding stocks. So I think conservation, at this point, is probably not the most important..." - PC2

The literature review identified the Mid-Atlantic tilefish fishery as a catch share program with a set-aside quota, including a research set-aside (RSA) component. While the tilefish RSA is not active and has not been used for research thus far, RSA programs for Atlantic herring, Sea scallops, and monkfish along the East Coast are active and award set-aside quota for research each year. This set-aside quota through these RSA programs have supported several projects focused on bycatch reduction and avoidance, reducing discards, and gear modifications for these species.

5.1.5 Unforeseen/Unintended Consequences

Several interviewees identified sablefish gear-switching as a major consequence of the catch share program. The program includes a provision allowing participants with a trawl permit to fish their trawl quota with any legal gear, which allows more flexibility for vessels. Since 2011, this provision has been utilized by harvesters using fixed gear (pots and longlines) to target sablefish and get a higher ex-vessel price than sablefish caught with trawl gear. Although some level of gear-switching was anticipated with this provision of the catch share program, the high incidence of gear-switching has significantly affected the value and availability of sablefish trawl quota. Since sablefish is a constraining species (primarily for Dover sole and thornyheads), this has caused the value of sablefish quota to increase dramatically, making it less accessible to the trawl sector, which many interview participants mentioned as a pertinent issue. To address the issue the Council established the Sablefish Management and Trawl Allocation Attainment Committee (SaMTAAC).

"I do think there are some issues there with trawlers being able to access their traditional fisheries. They need sablefish as bycatch and I don't know if it was an unintended consequence of the program to have the value of sablefish be so high. Because in some ways, that's a good thing but in other ways, those

fishermen that are not able to prosecute their fisheries without that expensive black cod as bycatch are kind of put in a crunch." - FC1

Other unintended or unforeseen consequences of the catch-share program that were covered in the five-year review and discussed by interview participants include the high cost of the fishery, underutilization of multiple species, and lack of markets, which have limited the fishery's profitability. The costs of the fishery have been higher than anticipated, partially due to high observer costs, which on average have been about 5% of harvester revenue. The catch-share program was expected to increase revenue to compensate for these higher costs, but revenues have been lower than expected due to an overall decrease in landings and to the continued underutilization of many species (many non-whiting quota are below 20% utilization). One of the goals of the catch share program was to increase quota utilization rates, but rates have remained low, partly due to decreased landings, increased catch limits for some species, and the continued challenge of constraining species in such a complex, multispecies fishery.

While underutilization and lack of markets have been issues in the fishery since before the catch share program, as they are partially a result of the early 2000s fishery collapse, they are also magnified by the high cost of the fishery and of sablefish quota (see section 5.2.2). Also, as mentioned in section 5.1.2, low utilization and lack of markets are part of a negative feedback loop of low supply to processors, low market demand and lack of market creation, low ex-vessel prices, and low utilization.

"Well, you know, I think the whole program is suffering mildly from a low attainment rate. You're probably aware that a few species, very few, are reaching, you know, ninety percent or even maybe one hundred percent attainment. But most of them are way down and the overall average in 2017 I think was twenty-three percent attainment. And so, you know, the question of how you increase attainment is one that blends into how that ten percent [AMP quota] is used." - FC5

The AMP is created to specifically address issues that result from the implementation of a catch-share program, so in order to utilize AMP quota for any of these unintended or unforeseen issues, a clear and causal connection would need to be drawn between the issue and the catch share program.

5.2 Mechanisms

If the Council decides to use the AMP quota to address any of the objectives discussed, or for another purpose, a mechanism for how the AMP quota would be allocated must be determined. In this section, we discuss the time period of quota allocation and we use our results to build on Nayani & Warlick's discussion of three mechanisms: allocation to current QS owners (including status quo), an application process, or an auction. For any action using the AMP quota other than the status quo pass-through, the Council would need to go through the full rule-making process requiring Council time and resources, including Committee/Council discussion, recommendations, public comment, and the final decision. The administrative burden associated with each option should be considered in discussion of mechanisms.

5.2.1 Time period/scale

In choosing to use the AMP, there are several considerations in determining the time period over which the allocation would be used. AMP quota could be distributed once, effectively ending the AMP, annually, or over a multi-year fixed time period. Lastly, we add the option of a phased-in approach that allocates larger portions of AMP quota over time instead of the entire 10% in one process. Here, discussion focuses on the multi-year and phased approach options; for more information on the advantages and disadvantages of a one-time or annual option, see Nayani & Warlick (2018).

One time

A one-time option would allocate the AMP quota once, effectively ending the AMP. This option is less flexible than options that allocate quota in subsequent years because it cannot be used to address issues that may come up in the future. However, a one-time action could reduce uncertainty for quota owners. The Council decision to extend the pass-through specifically noted that if the pass-through continues long-term, there could be later resistance if the Council decided to use the AMP to address any of its objectives. With the pass-through, current quota owners cannot plan for the future because there is uncertainty in if the AMP quota will actually be used to address one of its intended objectives. By taking a one-time action, the Council would be reducing uncertainty for current quota share owners because they would not have to worry about the amount of quota shares they will have in the future.

Annual

The Council could choose to implement a yearly policy option that would allocate quota on an annual basis. This option is the most flexible time period mechanism because it allows the Council to respond to changes in the fishery and use the AMP to address these changing needs. A disadvantage to a yearly policy option is administrative burden on the Council (Nayani & Warlick 2018). An advantage to an annual or multi-year policy option is that it avoids completely ending the AMP, which has been identified as an important flexibility mechanism to address community needs in the FEIS for the catch share program as well as in a 2011 lawsuit brought against NMFS (section 1.1).

Multi-year

Alternatively, the Council could choose to implement a multi-year, fixed-term allocation of AMP quota (PFMC 2009a). In a fixed-term scenario, AMP quota would be allocated for a set timeframe (e.g. three years) and upon termination of that period, the Council would re-allocate quota for the next term. An advantage of a fixed-term mechanism is a reduction in administrative burden because the Council and decision-makers would only have to go through the allocation process every few years as opposed to every year. Additionally, this mechanism would maintain flexibility because AMP quota could be used to address different needs in different terms, but would also provide more certainty for AMP recipients since they would be receiving quota for longer than one-year. The longer timeframe could also allow those who received quota to effectively use their allocation to build stability in their operation, but with the understanding that the AMP quota is not permanent. This would give also communities and the Council time to make a more accurate assessment on if AMP objectives and goals of quota allocation are being met. Given the more recent establishment of community quota funds, having a longer time frame for community funds to have and use AMP quota could allow the Council to track effectiveness of these funds and give communities time to find the best use of the quota. One interviewee expressed the need for

a policy option that's short-term as a way to help individuals or communities that were adversely impacted by the catch share program without allowing them to rely on the quota long-term:

"Because if there is an unintended consequence and you wanted to help somebody, a permanent crutch wouldn't be a solution, it would be a temporary "this will get this on their feet". So I think whether it's short term or long term, that the ten percent should go back to the owners. If there's any positive use for the ten percent, I would think it would be short term in nature." - F1

Phased-in approach

Using AMP quota in its entirety was seen by some interviewees as taking quota away from current QS holders, despite the understanding that the 10% set-aside was meant to be used and not passed through to current owners forever. As an alternative to using the entire 10% at once and being seen as taking quota away from QS holders, the Council could consider using a phased approach. A phased approach would use a smaller portion of the AMP to address the specified need and continue to pass-through the remaining percentage. Over time the percentage of AMP quota that is used to address specific needs can be increased to the entire 10%. This approach which would ease into using AMP quota and not initially take the entire amount from current QS owners who have been receiving AMP quota through the pass-through for the past ten years. A disadvantage of this approach would be the necessary time and discussion of the Council to determine how much of the quota would be used in a given time frame, or phased-in, and how much would continue to be passed through.

5.2.2 Allocation

Status Quo Allocation

The pass-through of AMP quota to current QS owners increases the amount of available quota in the market, but the quota is being allocated only to those who are already involved in the fishery. Since the pass-though has continued for several years, current QS holders have come to rely on the additional quota from the AMP, and the decision to take this quota away may meet more resistance as time progresses (Nayani & Warlick 2018).

Recent Catch History

The pass-through of the AMP quota distributes the quota proportionally based on current QS holdings, which were initially allocated based on landings from 1994-2003. Multiple interviewees suggested that the AMP could instead be allocated to active quota owners based on more recent catch history (2011-present).

"The best thing they could do with the ten percent AMP is pass it through only to the permits that have been fishing the last seven years.... Your current participants are being rewarded. Don't give the ten percent to the latent permits and the rationalization chasers...the moment this fishery was rationalized they took their quota and just started leasing it… So give that ten percent to the vessels that have fished in the last seven years… that'll actually reward those that are participating in the fishery, not those that are hanging out in Arizona, collecting money from the mailbox" - PC3

If allocating based on recent catch history, the AMP quota would reward quota owners who are currently participating and would not reward latent permits. If allocating the AMP based on being active, the quota would support quota owners who are active in the fishery and not those who are absentee quota holders that lease portions of their quota to others. Active quota owners are those who participate onboard vessels to catch their quota. The five-year review social survey data revealed three definitions of "absentee quota owner". The first is an absentee virtual owner who has "little or no active involvement in the fishery beyond leasing out [quota pounds] or having hired a captain and crew to fish the quota-allotted fish" (PFMC & NMFS p.310). The second type of absentee owners are more actively involved, but do not spend time on the harvesting vessel. This type may be a processing company, for example, that hired several vessels to fish their quota (PFMC & NMFS 2017). The third type of absentee owner leases out their entire quota and shifts their effort to other fisheries. In this case, the owner may not fish their quota due to lack of profitability with the quota they have (PFMC & NMFS 2017). An AMP allocation based recent catch history of active quota owners would take away quota from all three types of absentee owners described here. The interviewee above alludes to still including the second and third types of absentee owners in this type of AMP allocation, but excluding virtual owners.

This mechanism of recent catch history could also potentially address a few of the unforeseen and unintended consequences of the catch share program. Multiple interviewees addressed the issue of gear-switching within the catch share program, and how this has led to the dramatic increase in the value of sablefish (also known as black cod) quota, which is also a constraining species. One interviewee suggested using the AMP to reward those who are actively targeting those underutilized species by giving them additional quota. There is also some belief that by addressing the issues of underutilization and lack of markets, benefits could flow to communities and processors as landings increase and markets for new species increase profits. This would likely be an unpopular option among those who do lease their quota to make a profit from sablefish quota.

"Say fine, ten percent goes to the guys that are benefitting the communities, the processors, and all this stuff by bringing in this product that's more than just a single species (sablefish). So you say OK, you get ten percent adaptive management — it goes to the people, the vessel or pound or however you get it — to the people that are trying to catch these underutilized species, which is in turn helping the processors, the canneries, and all the stuff that we want to do. And that would help. It doesn't solve any problems completely but it gives the guy that's fishing a little bit more of the different species, it helps his bottom line a little bit. It might give him a cushion if he runs into the small black cod part of it. And the profit part of it, it would help… he'd get ten percent of the fish, the petrale even, that you can actually get the profit out of not and not pay the owner the profit." - F2

Allocating the AMP quota based on recent catch history could help address these issues by putting quota that has otherwise gone unused due to absentee quota holders in the hands of those who are actively fishing for both sablefish and other underutilized species. This high value of sablefish is tied in to a couple of other issues that interview participants discussed. As has been noted in the five-year review and the results of the interviews, the cost of participating in the West Coast groundfish fishery has increased, in large part due to observer costs, making participation in the fishery less profitable. In response to this, there is a feeling that many quota holders have left the fishery but have held onto their quota, only leasing out the valuable sablefish quota while leaving quota for other species unused. Additionally, sablefish is a

constraining species, so with the value of sablefish quota so high, it can be difficult for fishermen to fish for other species without running into limits on sablefish or having to buy additional sablefish quota. This and other constraining species contribute to the significant underutilization of many fish stocks and contributes to the lack of a market for a number of groundfish species noted in the five-year review and in interviews.

Allocation to Harvesters plus fee
One interviewee suggested that if the status quo allocation (or some other AMP allocation scheme) continued, those that received and used AMP quota could pay some fee (potentially a % of AMP quota ex-vessel value) to the Council which could then be used to address AMP objectives. In particular, the revenue from the fee could be used to temporarily address the monitoring costs. However, it is unclear if the Council is legally able to collect and distribute such a fee.

"...maybe there could be some sort of percentage of value of the AMP not appointed to any of the existing users but a percentage of that AMP could be used and applied towards some sort of assistance to accountability in high cost areas and low cost operations, low value operations...I do think that subsidy that may come from AMP fish back to some of these high cost areas for accountability would be temporary. And once some of these new technologies are in place and costs have come down, that subsidy ...would be reduced or go away." -FC7

Processor Quota
Several interviewees from the processing sector suggested allocating the AMP quota to processors, echoing past comments supporting a processing quota (see section 5.1.2). One idea in particular that was suggested by an interview participant was giving quota to processors under the condition that they would then give harvesters that quota for no additional fee, in exchange for those harvesters returning to that port for processing. As was discussed previously, some processor stability and community stability issues are connected so it may be possible to address both through this mechanism or something similar.

5.2.3 Auction
Using an auction to distribute the AMP quota, whether one time or yearly, would generate funds that the Council could then use to address AMP objectives. In theory, auction revenue could be invested and the principal amount could generate funds for the foreseeable future. However, the Council's ability to do this with public funds is not likely.

Revenue from an auction would provide financial resources that could result in additional flexibility for the Council to address issues that could not be directly addressed with quota pounds (Nayani & Warlick 2018). For example, many stakeholders have identified the high cost of observers and catch monitoring that is required under the catch share program as major limitation to their profitability. Funds generated from an auction could be distributed to individuals or communities to offset those costs, particularly to small vessels and remote communities where this cost is more significant. This use of the AMP would address community stability by directly offsetting some costs to harvesters that impact their profitability.

Nayani & Warlick (2018) introduce and discuss the distinction between conducting an open vs. a closed auction. If the auction were open to all bidders, it would generate higher revenue than if the auction were open to only a subset of bidders based on predetermined criteria, such as new entrants vulnerable communities (Nayani & Warlick 2018). However, in the case of a limited pool of bidders, the quota would be distributed to those demonstrating a priority need as determined by the Council, but this pool of bidders may be limited in their ability to pay for the quota. For example, the Alaska halibut and sablefish fishery includes a Community Quota Entity Program (separate from the CDQ program) that allows small rural communities in the Gulf of Alaska to form community entities to purchase quota (NMFS 2016). However, there has only been one purchase and the program has had "negligible impact" due to communities' financial constraints to make the initial investment (Carothers 2013, Criddle 2012). On the other hand, the CDQ program, which distributes quota to communities at no cost, has led to improved social and economic outcomes in western Alaska communities (Criddle 2012). If the pool of bidders is limited for an AMP quota auction, the financing ability of that pool will determine the revenue generated from the auction.

The catch share program included a provision that "the Council shall consider the use of an auction or other nonhistory based methods when distributing quota share that may become available after initial allocation", including quota not used from the AMP (PFMC 2017 p.E-16). Regarding operation and administration, the Council would need to design the auction system and have a specific plan for how the generated funds would be used, which would carry high administrative burden (Nayani & Warlick 2018). In Washington, the commercial geoduck fishery is managed via multiple public auctions held throughout the year for quota to be used during discrete harvest periods. While the structure of the geoduck auction could be a good starting point for the Council to develop an AMP auction, there are key differences between the geoduck fishery and the West Coast groundfish fishery that would complicate the AMP being allocated through an auction in a similar structure, which are discussed below.

The commercial geoduck fishery and its auction is managed by the Washington Department of Natural Resources (DNR) and the Washington Department of Fish and Wildlife, both state agencies that work only within the state of Washington. If the Council decided to model an auction after the geoduck auction, the auction would span three states and likely see a significantly higher number of bidders than the geoduck auction, resulting in greater administrative requirements. Additionally, much of the structure of the geoduck auction is mandated in the Revised Code of Washington; an AMP auction would not have the same legal structure because it is part of a federal fishery spanning multiple states. While auctions are a viable source of revenue, as evidenced by the Washington geoduck auction which generates nearly $22 million annually (WA DNR, n.d.), the federal and interstate aspects of the AMP may make it more difficult to effectively use auction revenue to address AMP objectives. The revenue from the geoduck auction is placed in two state-run accounts that are obligated under Washington law to fund specific projects (WA DNR, 2008).

None of the interviewees raised the topic of an auction for AMP quota, however, many expressed doubt over whether or not quota pounds could be effectively used to alleviate the issues within the fishery. That is, there are questions as to whether giving a group more quota, which therefore takes it away from others, can really address the AMP's intended objectives. For example, an auction would create the opportunity

to use monetary resources to address these issues, rather than being constrained to only using quota pounds. If the Council intends to address issues that could be solved with money (i.e. monitoring costs), an auction would be an efficient way to generate revenue.

"Now that we're getting a clearer signal on what the problems are, I think there needs to be an assessment of whether this is the right type of mechanism to solve them. Whether they can be solved by moving quota around at all, I think is an open question." - NC2

5.2.4 Application

Open Proposal Process

A second mechanism the Council could use to allocate AMP quota is an application. If using an application process, the Council would need to determine which type of application mechanism they would employ. One option is allowing an open proposal process in which individuals or community trusts submit a proposal to the decision-making body to receive AMP quota. This type of application is the most flexible option because it allows the decision-makers to choose a proposal that best addresses the most important need for AMP quota for a given year. Additionally, an open proposal process could allow the Council to hear new ideas on how to use the AMP that they had not previously considered. To ensure consistency in evaluation of proposals, the Council would need to standardize the contents applicants must include in a proposal. For example, the Council could require that at a minimum all proposals state the goals for using AMP quota and metrics for assessing if intended goals are being met.

If creating an application process that is open to everyone, both individuals and communities could apply and be evaluated against one another. In this type of proposal, the Council would choose the proposal(s) that they determine to be the best use for AMP quota in a given year. This open proposal process would allow greatest flexibility in using AMP quota because it would not limit the issues the AMP could be used to address. Alternatively, the Council could decide that they wanted to limit applications from only individuals or only from community groups, such as community quota funds as described above in *Community Stability*. These community quota funds could be effective mechanisms for distributing quota as needed to address specific community needs. The Council could choose to implement an application process in which only existing community quota funds can apply to receive AMP quota, which they could then lease within their community to best meet their own needs. Limiting applications to only community groups would give the Council less flexibility than allowing an application process open to everyone because individual fishers or processors would not be eligible to receive quota. However, limiting to community groups would ensure that AMP quota is being used to address needs specific to a community, assuming any community group that applies best understands their community's needs and how those needs change over time. The open proposal would allow groups to highlight how they would use AMP quota for their community, as this application would not evaluated based on any specified use of AMP, but the best use of quota, as identified by the decision-making bodies. However, the flexibility of an open proposal could cause contention among stakeholders because the decision of who receives AMP quota is subjective, based on the Council and decision-makers' opinions of whose application would best address AMP objectives (Nayani & Warlick 2018).

The research-set-aside programs on the East Coast award research quota using a competitive application process each year that is managed by the NOAA Northeast Fisheries Science Center and relies on proposal review panels comprised of Council members, industry representatives, and NOAA staff to inform project selections. This application review process could serve as a model for an AMP review panel/process.

Formula-driven Process

Alternatively, as discussed in section 2, the Council could follow a formulaic process to accept and review applications. In a formulaic process, the Council would determine standards that must be met for an applicant to be eligible to receive AMP quota. These qualifying standards would limit who is eligible to apply for AMP quota and eligibility could be based on what the Council determines is most important to address at that time. Applications would then be evaluated based on qualitative criteria, as determined by the Council. For example, the Council could decide that in order to apply for AMP quota an individual or community must have been in the fishery a certain number of years, have landed a certain amount of groundfish in the previous year, or must meet another quantitative standard. The Council and decision-making bodies would then review applications based on predetermined criteria. Eligibility could also be chosen to specifically address a program goal (e.g. community stability; new entrants). As mentioned in section 2, vulnerable communities and principal ports are two standards that the Council could use to evaluate applications in a formulaic application process. However, a formulaic approach to an application process would be less flexible than an open proposal process because the Council would be predetermining who can receive AMP quota and which issue(s) to address when allocating AMP quota.

As with an open proposal process, a formulaic approach could be open to anyone or be limited to only individuals or only community groups. If open to anyone, the evaluation of applicants would be consistent across both individuals and communities and quota would be given to whichever applicants best meet the application standards. A formula-driven process open to anyone would be more lenient in eligibility criteria and would have stronger criteria for evaluating the content of an application. In a formulaic application that is limited to individuals or community groups, the standards used to determine eligibility and the criteria to evaluate applications would be specified with the limited applicant pool in mind. For example, the Council could decide that only community groups can apply to receive AMP quota and one of the eligibility requirements for applying could be that they must be from a community that meets the definition of a "vulnerable" community. In the evaluation of applications that meet this eligibility requirement, one criterion could be that the intended use for AMP quota is for facilitating new entrants. It would then be up to the Council and decision-making bodies to evaluate which applications best meet the criterion of addressing the issue of new entrants.

While a formula-driven process would be less flexible than an open proposal process, it could reduce the time and resources required for reviewing applications. It would also be more objective than an open proposal because the Council would decide which issues they wanted to address and who would be allowed to receive AMP quota before implementing the process.

Decision-making structure

An important consideration in using an application process to allocate AMP quota is the decision-making structure. The three West Coast states included in the West Coast groundfish fishery have different regional and cultural histories of groundfish fishing. These differences between states may change which issue is most important to a given region. If using the vulnerable communities standard in a formulaic application and not differentiating between the three states, it could be possible that more communities in one state meet the criteria for a "vulnerable community" and no communities in another meet the criteria, resulting in all of the AMP quota being allocated to one state. While this could meet the goal of addressing community needs, it is important to consider how AMP is spread across the three states. Maintaining the "separate, but parallel" structure (section 2), it could be possible for the AMP to be evenly split across the three states and each state could choose which method they wanted to use to evaluate applications (e.g. open proposal vs. formulaic) to best meet the needs of their state. For a more detailed description of the roles states, the Council, and NMFS could play in an application process, see Council Staff White Paper Adaptive Management Options (PFMC 2009a).

Advantages and Disadvantages of an Application

Another consideration in an application process is the time and resources required to review applications. Regardless of the structural organization, the Council is likely to play a role in the final decision-making or the oversight of allocation. The West Coast groundfish fishery currently has an application process for exempted fishing permits (EFP). That is, for vessels wishing to engage in an experimental, data collection activity otherwise prohibited by the Magnuson-Stevens Fishery Conservation and Management Act or other regulation, a vessel can apply for an EFP (Council Operating Procedures 2019). In the current EFP organizational structure, a vessel submits an application to the GMT, GAP, and SSC for initial review. The GMT, GAP, and SSC then recommend applications to the Council for preliminary action. At the time the Council was originally discussing the AMP, review of EFP application proposals constituted "a substantial amount of agenda time" (PFMC 2009a). The Council further noted that "if the AMP review process is zero sum (the amount of quota requested exceeds the amount available), Council involvement could add substantially to work load and agenda time." (PFMC 2009a).

While an application process has flexibility in what issues AMP quota could address, one interviewee expressed concern about potential inefficiencies in such a process and cited the Dogfish Development Quota (DDQ) in the Pacific Region Canadian Groundfish fishery as an example. The DDQ is a portion of dogfish total allowable catch that is set aside annually and made available to eligible individuals to access through an application process. In the DDQ process, vessel owners must join with a dogfish processor to apply for a portion of the DDQ. The applications are first assessed by the Dogfish Development Committee who then provide allocation recommendations to Fisheries and Oceans Canada (DFO) (FN0490). As this interviewee stated in regard to the DDQ process:

"Ten percent was taken away from everybody but everybody got it back and they were made whole again. It was kind of stupid. I mean, talk about inefficiency. Because they do this every year. Everybody's got to submit their proposals and they go through a review process but in the end, everybody gets back what was taken away from them. In which case, why have [the program]?" - FC4

Using the EFP and DDQ application processes as examples, there are existing programs that the Council can reference in determining if an application would be the most efficient or effective mechanism for distributing AMP quota.

6. Conclusion

Based on these results and discussion, we have identified the following considerations for the Council's future discussion on the AMP. Of the original objectives of the AMP, conservation has been identified as no longer a priority issue. Therefore, using AMP quota to address conservation is the least viable option. Community stability, processor stability, and new entrants are all objectives that have been identified by interviewees and the five-year review as persistent issues in the fishery. Additionally, issues surrounding sablefish gear-switching and quota utilization were brought up in half of the interviews as being major issues in the fishery today. While a Council committee exists to address sablefish gear-switching, the Council could still consider using AMP quota to address this issue in conjunction with the recommendations of that Council committee.

Recognizing that using AMP quota to address any of these objectives is likely to receive some level of resistance from stakeholders, from a political viability perspective it may be in the Council's best interest to use AMP to address community stability, if using the AMP at all. The AMP quota could be allocated to focus on one or more issues identified by communities, such as the high costs in the fishery. Community quota funds could also be useful as they already have the institutional infrastructure for distributing quota, but the Council may want to track the effectiveness of these organizations over time given their more recent establishment. Interview results suggest that addressing community stability would be supported by stakeholders, given that the Council identifies a mechanisms that could effectively address that issue.

The Council can look to fisheries identified through the literature review and case studies for examples of addressing similar objectives. Specifically, the coastal quotas of Sweden are a model for addressing community stability, or the Danish Fishpools and Fishfunds to facilitate new entrants. Although there is not a lot of information about how successful these programs have been thus far, they were still able to create and implement these set-aside programs with support from stakeholders.

In decisions regarding mechanisms to use AMP quota, there are several factors the Council could consider. If the Council chose to implement an application, it would be important to make the application criteria as objective as possible and be clear on who would be making the ultimate decision (i.e. the decision-making structure). By being transparent in how the decision-making bodies would be selecting applicants, the Council could likely avoid stakeholder pushback on how applications were chosen and prevent the decisions being seen as unfair and subjective. Additionally, the Council would need to consider the amount of work required for an application process. Not only would the Council have to decide on criteria, but they would also have to go through an extensive review and decision process. Choosing an application mechanism that is formulaic would require less input from the decision-makers in reviewing applications, which could ease the administrative burden. Lastly, it would be important for the Council to consider actions that generate revenue versus actions that allocate quota. For revenue-generating options (e.g. an auction), the revenue could be used to address issues brought up by

stakeholders, such as the high costs of observers and monitoring. Allocating quota would be a way for the Council to use the AMP without having to come up with a new mechanism. The downside of this, however, is that some interviewees expressed their uncertainty over whether providing quota to struggling communities or processors will solve the problems they are facing, especially since the amount of quota is relatively small.

The literature review conducted for this report was primarily focused on determining whether or not other catch share fisheries use set-asides to focus on similar objectives to the AMP. However, there are fisheries without set asides that use some of the mechanisms discussed in this report. A second literature review could be conducted to find more information about these mechanisms and how they could potentially be implemented within a set-aside program such as the AMP.

While the AMP could certainly be used to address needs of the fishery, it is also important to consider that the AMP could be ended altogether. In the view of some stakeholders, the AMP is not necessary and many think it should be ended because it has not yet been used for its original purpose. However, some still do see it as an important fall-back option if a need arises in the future. One consideration in keeping the AMP and continuing to pass it through until a need arises is the political viability of making such a decision. The longer the AMP gets passed through and people come to expect it, the harder it will be to take it away from QS owners once a need arises. The AMP has also been validated as an important flexibility mechanism to address impacts of the catch share program (see section 1). If the Council decides to end the AMP, it is necessary to consider the larger implications of doing so and the associated costs of undergoing sufficient research to validate the decision. If deciding to use the AMP, the Council could consider a phased approach for implementation, in order to ease current quota recipients out of their reliance on the AMP quota pounds.

Regardless of which mechanism or approach the Council decides on for using or ending the AMP, there are associated monetary and time costs. In deciding to use the AMP in any manner other than the status quo (continuing pass-through), the decision has to go through the full NMFS rule-making process.

This report is intended to help inform future Council discussions on the AMP.

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