Gulf of Alaska Trawl Bycatch Management
Preliminary Analysis

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Contents

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1 Economic Impacts (Regulatory Impact Review)

1.1 Introduction

This Regulatory Impact Review (RIR) examines the benefits and costs of a proposed regulatory amendment to enhance the ability of the GOA trawl fleet to viably prosecute groundfish fisheries under the constraints of halibut and Chinook salmon PSC limits, Steller sea lion protection measures, and variable annual catch limits. The Council's goals and objectives for the program (Sections 1.1.3 and 1.1.4) also include minimizing bycatch and regulatory discards, mitigating the derby-style nature of some fisheries, promoting stability in fishery-dependent communities, promoting active participation by fishery stakeholders, generating higher economic yields from the harvestable resource, and improving fishery monitoring and reporting.

The preparation of an RIR is required under Presidential Executive Order (E.O.) 12866 (58 FR 51735: October 4, 1993). The requirements for all regulatory actions specified in E.O. 12866 are summarized in the following Statement from the E.O.:

> *In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and Benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nonetheless essential to consider. Further, in choosing among alternative regulatory approaches agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.*

E.O. 12866 requires that the Office of Management and Budget review proposed regulatory programs that are considered to be "significant." A "significant regulatory action" is one that is likely to:

- Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, local or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

1.1.1 Statutory Authority

Under the Magnuson-Stevens Fishery and Conservation Act (Magnuson-Stevens Act) (16 USC 1801, *et seq*.), the United States has exclusive fishery management authority over all marine fishery resources found within the exclusive economic zone (EEZ). The management of these marine resources is vested in the Secretary of Commerce (Secretary) and in the regional fishery management councils. In the Alaska Region, the Council has the responsibility for preparing fishery management plans (FMPs) and FMP amendments for the marine fisheries that require conservation and management, and for submitting its recommendations to the Secretary. Upon approval by the Secretary, NMFS is charged with carrying out the federal mandates of the Department of Commerce with regard to marine and anadromous fish.

The GOA groundfish trawl fishery in the EEZ off Alaska is managed under the FMP for Groundfish of the GOA. The proposed action under consideration would amend this FMP and Federal regulations at 50 CFR 679. Actions taken to amend FMPs or implement other regulations governing these fisheries must meet the requirements of Federal law and regulations.

1.1.2 History of Action

In recent years, the Council has advanced a series of actions that established or reduced prohibited species catch (PSC) limits in Gulf of Alaska (GOA) fisheries. Chinook salmon and halibut PSC limits are established in Federal regulations and remain in effect until changed by a subsequent Council action to amend those regulations. In 2012, GOA Groundfish FMP Amendment 93 established Chinook salmon PSC limits for the Western and Central GOA directed pollock fisheries. In 2015, the Council implemented a Chinook salmon PSC limit for GOA non-pollock trawl fisheries, with separate limits for the catcher vessel (CV) and catcher/processor (CP) sectors (Amendment 97). For halibut, the Council reduced the GOA PSC limits for trawl and hook-and-line groundfish fisheries in 2012 through Amendment 95. That amendment reduced the GOA halibut PSC limit for the GOA groundfish trawl gear sector by 15 percent, phasing in the reduction over three years from 2014 to 2016.

In the course of deliberations on reducing PSC limits in the GOA fisheries, the Council acknowledged that broader revisions to management measures could aid fleets in achieving PSC reduction goals, while mitigating the potential for adverse social and economic impacts that might result from fishing seasons that are altered or curtailed by PSC hard caps. The Council began the process of considering potential management revisions at its October 2012 meeting. During that meeting the Council adopted a Purpose and Need statement identifying goals and objectives for an action that provides the trawl fleet and processors with tools for more effective management of PSC. At that time, the Council limited the action to the Central GOA groundfish trawl fishery. The original problem statement was expanded during the February 2013 meeting to include the Western GOA trawl fishery.

Council staff has provided a series of discussion papers outlining various catch share issues to inform the Council of options that could meet its objectives, and to interpret how the language of the Council's working alternatives might translate into regulation and practice. The first paper notes that the Magnuson-Stevens Act (MSA) prescribes certain aspects of the development of limited access privilege programs (LAPP), often referred to as catch share programs. Those aspects include: excessive share caps, which cap the percentage of a limited access privilege that an entity may hold; a directive that the Council consider current and historical harvests in making share allocations; and a further directive to consider "measures to assist, when necessary and appropriate, entry-level and small vessel owner-operators, captains, crew, and fishing communities through set-asides of harvesting allocations." These requirements do not dictate that the Council include (or exclude) specific provisions, but instead require that the Council examine various factors in determining how the elements of the program meet management objectives and MSA National Standards. With respect to these program elements, the Council need not include the provision or an alternative, provided that through its deliberations the Council has given the element due consideration and justified its exclusion from the program.

A February 2013 discussion paper focused on the need to create a management environment in which harvesters are better able to avoid PSC and more efficiently utilize the PSC that has been made available in order to harvest groundfish. This focus suggests that any catch share program would allocate PSC species to enable better management of such unintentional catch by participating vessels. The Council is also considering effects on target, non-target, and secondary species fisheries. In considering which managed species might be allocated under the program, the Council continues to examine the effect of including (or excluding) a species on the pace of the fishery, the amount of a TAC that is harvested, and whether allocation would cause more cooperative or strategic fishing behavior.

The Council intends for the program contribute to the stability of volume and timing of landings, in order to allow processors to better plan labor capacity and optimize production values. Processors' ability to tailor their production to market demand can increase utilization and wholesale revenues. The allocation of PSC could create

an individual incentive for each harvesting entity to obtain the greatest possible value from the use of available PSC. When total allowable catch (TAC) of target species is not a limiting factor on the fishery, PSC quotas may allow participants to respond to constraining PSC limits by managing their own usage. Without PSC allocations, an individual vessel's PSC affects everyone fishing under the shared PSC limit.

However, if target species TAC is a constraint, PSC allocations alone (without target species allocations, or other program elements that slow the fishery) are unlikely to result in a slower or more coordinated fishing behavior. When target species are limiting – i.e., when TAC is fully harvested in a typical year – a participant with PSC quota makes an individual determination about his or her own level of PSC avoidance. The participant must decide whether more rapidly harvesting the target species (using relatively more PSC quota in the process) will sufficiently increase his or her share of the total available target catch and justify forgoing other target fisheries in the event that PSC limits close those fisheries before their TACs are taken. Target allocations would allow vessels to determine when and where to fish within a season or year in order to achieve the greatest return from available PSC. Fishermen would determine their activity level and pattern based on a variety of factors: target species catch rates, availability of marketable incidental/secondary species, PSC rates, market conditions, and weather. A fisherman would not face the risk of other participants depleting the availability of the target species when he or she stands down in order to avoid PSC, or adopts some other mitigation strategy that would render the vessel less competitive in an open access fishery.

Secondary species may be retained up to a maximum retainable amount (MRA); retention of secondary species is limited to a percentage of the retained target species for that trip. In the current limited access derby fisheries, MRAs have proven to be an effective tool for managing harvests of valuable secondary species that are not open for directed fishing (such as sablefish and some rockfish species). Vessels balance their directed harvests with harvests of MRA-limited species. In a derby fishery, participants must trade the time spent targeting directed species for time to target MRA species. Participants in a catch share fishery would not experience the same time pressures, and thus would be better able to harvest up to the MRA for all valuable secondary species. If participants value an MRA species more highly than the allocated directed species, a race may result wherein participants seek to retain MRA catch before NMFS shifts the secondary species to non-retention (PSC) status.

The February 2013 discussion paper also described processor provisions, eligibility to hold quota shares, issues pertaining to Alaska state-waters fisheries, and referenced comparable programs that have considered and applied the MSA's LAPP provisions to meet similar objectives in other regions.

In June 2013, the Council received a paper that focused on four primary topics, and provided a "roadmap" of specific decisions that might be necessary in order to implement a catch share program. The first topic was a presentation of historic participation data in the Central and Western GOA trawl fisheries, including an accounting of groundfish LLPs that had a GOA trawl endorsement, the number of vessel that reported catch in each area of the GOA trawl fishery, the total metric tons of groundfish harvested by those vessels when using trawl gear, and the trawl gear PSC mortality attributed to those vessels. The second topic covered management of the State waters of Alaska, and how management of those areas might fit or interact with a Federal catch share program. State-waters topics included the interrelationship between Guideline Harvest Level (GHL), parallel, and Federal fisheries management programs; a description of the historical catch of GOA trawl pollock and Pacific cod fisheries in each area; the potential for establishing restrictions on Federal permits being held by persons who fish in State-waters; and the Alaska State Constitution's limitations on granting exclusive rights or special privileges to persons fishing in the natural waters of the State. The third topic was a discussion of the benefits and detriments of quota allocations that are limited in their duration. The fourth topic was a discussion of potential

community protection measures, including community fisheries associations (CFA), quota set-asides for adaptive management, port of landing requirements, and regionalization[2] of target species quota.

The Council received a third discussion paper in October 2013. That paper reviewed eight industry proposals for how the program might be structured, which the Council had received at its June 2013 meeting. The Council did not direct staff to rank or select options based on those proposals. The paper also included a review of recent scientific literature on LAPPs, as requested by the SSC. State-waters issues were discussed in terms of actions that Federal fisheries could take to help ensure the program would function as intended without creating conflicting regulations across State and Federal management boundaries. Additional work is ongoing to determine the best method of addressing interactions between State and Federal fisheries. Finally, the paper included a discussion of CFAs as a tool for community protections. The conclusion at that time was that until the Council defines the type of CFA it is considering, it is difficult to determine all of the issues that must be addressed. The Council held a CFA workshop in conjunction with its February 2014 meeting. The purpose of that workshop was to gain perspectives from other U.S. regions on community protection measures that have developed within or alongside allocative quota-based management programs. The Council further explored what action might be required to include CFA in a GOA Trawl Bycatch Program, and highlighted specific issues on which the Council's early development of explicit objectives could smooth the program implementation process[3]. From the NMFS perspective this included defining how CFAs are structured since the Council may not have access to the landings data of a single "entity." The Council and the Agency should also consider its time and budget capacity to oversee CFAs; roles and responsibilities should be predetermined. If quota transactions can be approved or disapproved by the NMFS, criteria for making such determinations should be explicit.

The Council received a fourth discussion paper in April 2014. That paper focused on observer coverage levels, permission to harvest trawl cooperative quota with pot gear (gear conversion), methods for allocating PSC between the CV and CP sectors, approaches to ensuring community stability, a summary of bycatch reductions in other programs, and updated participation, harvest, and PSC data summaries that might aid the Council and stakeholders in the ongoing decision process as more years of data had accumulated since the Council began scoping for this potential action.

The Council received two more discussion papers in October 2014. The first paper expanded on elements of the Council's proposal for a groundfish trawl fishery built around allocations of target and PSC species to voluntary cooperatives. The second paper reviewed a proposal for a CFA program element, highlighting issues that needed to be further defined, and recounted the west coast groundfish management program's experience with "adaptive management" quota. After approving a suite of alternatives at that meeting, the Council directed staff to begin an analysis of potential impacts. However, at the December 2015 Council meeting, the Council delayed analysis of the entire package so that it could re-evaluate the approach being considered for bycatch management in the GOA.

In October 2015 the Council again took up the process of scoping alternatives for a new management structure for the GOA groundfish trawl fisheries. A new alternative (Alternative 3) was added; it proposes the formation of harvester/processor cooperatives that are allocated an annual share of PSC. This stands in contrast to the other core action alternative (Alternative 2), which would allocate both PSC and groundfish quotas to cooperatives.

[2] "Regionalization of quota" means that groundfish harvested under quota shares that were issued based on historical catch that was delivered to processors in a given GOA region (e.g., Central GOA or Western GOA) must be delivered within that region in all future years under the implemented program.
[3] http://npfmc.legistar.com/gateway.aspx?M=F&ID=4dda52b9-ff6b-493e-a258-844359d6a893.pdf

In December 2015 the Council developed a Work Plan for the development of an Environmental Impact Statement (EIS) for the GOA Trawl Bycatch Management Program. The Council received a discussion paper in February 2016; that paper described the primary action alternatives, explored the relative benefits and management implications of several cooperative design strategies, and provided baseline information on the existing LLP licenses that are endorsed for trawl gear in the GOA. At that meeting, the Council made several amendments to the action alternatives.

In June 2016, the Council received another discussion paper that complemented the information presented in February, and featured a specific focus on describing and clarifying the elements of Alternative 3. After reviewing that paper the Council again made changes to the alternatives. Many of those changes were in response to staff suggestions for clarity, while others added necessary detail to elements that were previously only sketched out as broad objectives; the core substance of the two main action alternatives (Alternatives 2 and 3) remained the same. The elements and options considered in this document reflect these changes.

At the June 2016 meeting the Council also added an "Overarching Goal and Objective" to the existing list of 14 Goals and Objectives for this program (see Section 1.1.4). No previous Council actions have included an Overarching Goal and Objective, so the Council engaged in a public discussion regarding the intent and effect of including such a term. The Council discussed the weight of the Overarching Goal relative to the other Goals and Objectives. The Council stated that the Overarching Goal should not necessarily have a greater weight than the other goals and objectives, but should be used to frame the overall decision process, which itself is an act of balancing the 14 specific goals. In other words, the Council would not be bound to an outcome that "limit[s] harvest privileges" to the greatest extent possible, but the Council should be able to justify that the ultimate preferred alternative uses available tools to maintain realistic opportunity new participants to enter the fishery.

1.1.3 Purpose and Need Statement

The Council has adopted the following Purpose and Need Statement:

> *Management of GOA groundfish trawl fisheries has grown increasingly complicated in recent years due to the implementation of measures to protect Steller sea lions and reduced Pacific halibut and Chinook salmon PSC limits under variable annual total allowable catch (TACs) limits for target groundfish species. These changes complicate effective management of target and non-target resources, and can have significant adverse social and economic impacts on harvesters, processors, and fishery-dependent GOA coastal communities.*
>
> *The current management tools in the GOA Groundfish Fishery Management Plan (FMP) do not provide the GOA trawl fleet with the ability to effectively address these challenges, especially with regard to the fleet's ability to best reduce and utilize PSC. As such, the Council has determined that consideration of a new management regime for the GOA trawl fisheries is warranted.*
>
> *The purpose of the proposed action is to create a new management structure which allocates prohibited species catch limits and/or allowable harvest to individuals, cooperatives, or other entities, which will mitigate the impacts of a derby-style race for fish. It is expected to improve stock conservation by creating vessel-level and/or cooperative-level incentives to eliminate wasteful fishing practices, provide mechanisms to control and reduce bycatch, and create accountability measures when utilizing PSC and/or target and secondary species. It will also increase at-sea monitoring in the GOA trawl fisheries, have the added benefit of reducing the incentive to fish during unsafe conditions, and improve operational efficiencies.*

The Council recognizes that GOA harvesters, processors, and communities all have a stake in the groundfish trawl fisheries. The new program shall be designed to provide tools for the effective management and reduction of PSC and bycatch, and promote increased utilization of both target and secondary species harvested in the GOA. The program is also expected to increase the flexibility and economic efficiency of the GOA groundfish trawl fisheries and support the continued direct and indirect participation of the coastal communities that are dependent upon those fisheries. These management measures could apply to those species, or groups of species, harvested by trawl gear in the GOA, and/or to PSC. This program will not modify the overall management of other sectors in the GOA, or the Central GOA rockfish program, which already operates under a catch share system.

1.1.4 Goals and Objectives

As stated in Section 1.1.2, the Council affirmed the following goals and objectives at its June 2016 meeting. The "Overarching Goal and Objective" was added, and the Council modified Goal/Objective #4 by the addition of the phrase, "and participation in […]." All other Goals and Objectives remain unchanged.

Overarching Goal and Objective:

The overarching goal of the Gulf of Alaska Trawl Bycatch Management program is to provide the fleet tools for the effective management and reduction of PSC and bycatch, and promote increased utilization of both target and secondary species while minimizing economic barriers for new participants by limiting harvest privileges that may be allocated (target species and/or prohibited species) in order to maintain opportunity for entry into the GOA trawl fisheries.

Goals and Objectives:

1. *Balance the requirements of the National Standards in the Magnuson Stevens Act*
2. *Increase the ability of the groundfish trawl sector to avoid PSC species and utilize available amounts of PSC more efficiently by allowing groundfish trawl vessels to fish more slowly, strategically, and cooperatively, both amongst the vessels themselves and with shore-based processors*
3. *Reduce bycatch and regulatory discards by groundfish trawl vessels*
4. *Authorize fair and equitable access privileges that take into consideration the value of assets and investments in the fishery and dependency on and participation in the fishery for harvesters, processors, and communities*
5. *Balance interests of all sectors and provide equitable distribution of benefits and similar opportunities for increased value*
6. *Promote community stability and minimize adverse economic impacts by limiting consolidation, providing employment and entry opportunities, and increasing the economic viability of the groundfish harvesters, processors, and support industries*
7. *Improve the ability of the groundfish trawl sector to achieve Optimum Yield, including increased product retention, utilization, landings, and value by allowing vessels to choose the time and location of fishing to optimize returns and generate higher yields*
8. *Increase stability relative to the volume and timing of groundfish trawl landings, allowing processors to better plan operational needs as well as identify and exploit new products and markets*
9. *Increase safety by allowing trawl vessels to prosecute groundfish fisheries at slower speeds and in better conditions*
10. *Include measures for improved monitoring and reporting*
11. *Increase the trawl sector's ability to adapt to applicable Federal law (i.e., Endangered Species Act)*
12. *Include methods to measure the success and impacts of all program elements*
13. *Minimize adverse impacts on sectors and areas not included in the program*
14. *Promote active participation by owners of harvest vessels and fishing privileges*

1.1.5 Alternatives

The Council's current set of alternatives for this action are posted as a separate document under Item C-10 on the December 2016 Council meeting agenda.[4] Excerpts from the Council's language are included in this document as they are discussed under the relevant sections. The Council instructed the analysts to develop this document as a "preliminary analysis" as opposed to a discussion paper. As such, where necessary, the analysts have interpreted the Council's publicly stated intent to elaborate on the specifics of the written language in the alternatives. These instances are identified in the document.

One issue of interpretation that bears mention, as it has not been explicitly addressed by the Council, is whether allocated groundfish target species taken in the Central GOA area may be delivered to a processing facility that is a member of a Western GOA cooperative (or vice versa). The analysts assume that this would be permitted, so long as it is done within the bounds of any regionalization or local delivery requirements that the Council might choose to select from amongst its state alternatives. Permitting catcher vessels to deliver fish to the processor of their choosing generally promotes economic competition and efficiency. Where that element of choice threatens historical dependence on and investment in the fishery, choice may be constrained by program elements or bylaws in the independently developed cooperative contracts. The analysts' assumption that such deliveries would otherwise be permitted should not conflict with "processor use caps," as those caps limit the amount of allocated fish that a plant can receive to a percentage of the catch that is taken from the waters of a certain area.

1.2 Methodology for analysis of impacts

The evaluation of impacts in this analysis is designed to meet the requirement of E.O. 12866, which dictates that an RIR evaluate the costs and benefits of the alternatives, to include both quantifiable and qualitative considerations. Additionally, the analysis should provide information for decision-makers "to maximize net benefits (including potential economic, environment, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach." The costs and benefits of this action with respect to these attributes are described in the sections that follow, comparing the No Action Alternative 1 with the action alternatives. The analysts then provide a qualitative assessment of the net benefit to the Nation of each alternative, compared to no action.

This analysis was prepared using data from the NMFS catch accounting system (CAS), which is the best available data to estimate total catch in the groundfish fisheries off Alaska. Total catch estimates are generated from information provided through a variety of required industry reports of harvest and at-sea discard, and data collected through an extensive fishery observer program. In 2003, NMFS changed the methodologies used to determine catch estimates from the NMFS blend database (1995 through 2002) to the CAS (2003 through present). As a result, the Council's options and information provided in this document is based on the CAS which provides data generated using a more consistent methodology over the entire time period.

The CAS was implemented to better meet the increasing information needs of fisheries scientists and managers. Currently, the CAS relies on data derived from a mixture of production and observer reports as the basis of the total catch estimates. The 2003 modifications in catch estimation included providing more frequent data summaries at finer spatial and fleet resolution, and the increased use of observer data. Redesigned observer program data collections were implemented in 2008, and include recording sample-specific information in lieu of pooled information, increased use of systematic sampling over simple random and opportunistic sampling, and decreased reliance on observer computations. As a result of these modifications, NMFS is unable to recreate blend database

[4] http://legistar2.granicus.com/npfmc/meetings/2016/12/950_A_North_Pacific_Council_16-12-06_Meeting_Agenda.pdf

estimates for total catch and retained catch after 2002. Therefore, NMFS is not able to reliably compare historical data from the blend database to the current CAS.

Past analyses of PSC limit changes have focused on quantitative estimates of the catch and value that would be forgone as a result of PSC limit reductions. The majority of these analyses employed a retrospective approach, estimating the point in previous years at which a lower PSC limit would have closed a fishery. For limited access fisheries with no individual or cooperative quota allocations, analysts have tentatively assumed that fleet behavior would be relatively unchanged under a reduced PSC limit, meaning that vessels would still have an incentive to race to harvest the available TAC and that the impact of a constraining hard cap would be felt at the end of the fishing season. Those analyses provided qualitative discussion of how fleet behavior might change under a reduced hard cap, and how that might affect the estimation of the revenues forgone at the end of the year. However, stakeholders have tended to focus on the projected fishery closure dates that were based on past years, as was the case in 2015 when NMFS took emergency action to allocate additional Chinook salmon PSC to a GOA trawl fishery that had closed under a reduced cap.

In June 2015, the Council received an analysis of alternatives to reduce BSAI halibut PSC limits. The overall BSAI PSC limit is apportioned among several fishing sectors, some of which are managed under limited access and some under LAPPs. The analysis assumed that stakeholders in LAPP fisheries could redistribute their fishing effort in time and space in order to balance halibut usage against a trip's expected economic benefit. It was assumed that, under a constraining hard cap, stakeholders would first eliminate trips that had the highest bycatch rates, whereas the expected response of a limited access participant would be to fish until the cap is met and forgo harvest that would have occurred after that point in the year. The analysts used relative bycatch rates to model which fishing trips in the LAPP fisheries would not have occurred under a reduced PSC limit, and estimated forgone revenue accordingly. This analysis does not model responses to PSC limit reductions in that manner, given that bycatch rates for rare species such as Chinook salmon are highly unpredictable, and it is unrealistic to presume that harvesters can reliably eliminate the trips with the highest rates. Harvesters might avoid fishing in a location or time of year when PSC rates are expected to be higher, but history shows that "lightning strike" PSC events cannot be completely avoided. Moreover, some expansion of PSC rates from one haul to another would still occur in a fishery that has 100% observer coverage at the trip level, but the extent and effect of that extrapolation will vary to an unknown degree.

The analytical methods used in past analyses rely on assumptions that may or may not hold in the real world. As a result, the quantitative estimates of forgone catch and revenue include levels of uncertainty that could be large, and error bounds cannot be estimated without layering numerous assumptions. In addition to those concerns, analysis of the proposed GOA trawl PSC limit reductions would have an additional layer of complexity compared to previous PSC limit reductions: the Council has proposed changing not only the PSC limits but also the underlying management structure of the fishery. Because GOA trawl fisheries have at times been constrained by the existing PSC limits, it is possible that lower limits would reduce the gross value of the fisheries in some future years. At the same time, the proposed action provides a cooperative structure that is expected to help stakeholders better avoid PSC by giving them more choice and more information about when and where to fish. These "tools" are anticipated to offset, in part or completely, the generally assumed reduction in gross revenue associated with the PSC reductions. The net effect of these two opposing forces – lower PSC limits vs. allocated groundfish quotas and cooperative management – cannot be assessed and projected using historical data, because those data reflect a fishery that operated in a fundamentally different setting than the one that is being proposed.

In addition to possible changes in the timing and pace of GOA trawl effort, the proposed action alternatives could also change the amount of economic value derived from the fishery. Value might be lower if productivity remains

the same, but the costs associated with cooperative management and higher observer coverage rates would likely offset a portion of net revenues. Value might be higher if the program is structured to increase harvesting efficiency by allowing more efficient vessels to harvest fish that were historically landed by less efficient vessels. Gross revenue might also increase if the fleet, as a whole, is able to harvest a greater percentage of the TAC by reducing PSC rates in fisheries that were previously constrained. Building on that effect, longer fishing seasons could improve the timing of deliveries to match processing capacity, allowing processors to pursue higher-value product forms and employ a more stable work force.

Changes in the factors that drive value would limit the analysts' ability to provide reliable quantitative estimates of impact based on historical data. The analysts submit that it is more useful to decision-makers to focus on detailed qualitative descriptions of how management and expected fleet behavior would affect revenues. The analysts discuss the direction of change in a given metric (e.g., higher or lower revenues or product prices), but would stop short of estimating a net change in the value of the fishery. These descriptions rely on historical catch and value data, but those data are not be used to model point estimates of forgone revenue under each alternative and option. As stated above, historical data on effort and markets is reflective of the limited access regime, and not the fishery as it would likely operate under a LAPP. Analysts are relying on information provided by fishery stakeholders (harvesters, processors, vessel crew, fleet managers, community representatives, and supporting business owners) to develop an understanding of directional changes in key indicators, such as production, employment, and gross revenue.

1.3 Description of Fisheries

Information provided in this section focuses on describing the existing management of the GOA trawl fisheries, historic participants in the fisheries, markets for the fish harvested, and inter-relations between the State fisheries and Federal trawl fisheries. The information is intended to provide a baseline for changes that may occur under the proposed actions.

1.3.1 Existing Management

This section describes the various management measures currently used to manage the GOA trawl groundfish fisheries. Each management measure is discussed individually, but it is recognized that the management measures together define how the fishery is managed.

1.3.1.1 License Limitation Program

The NMFS Alaska Region web site provides a summary of the License Limitation Program (LLP)[5]. Much of the information in this introduction is taken from that source. As of January 1, 2000 a Federal LLP license is required for vessels participating in directed fishing for LLP groundfish species in the GOA or BSAI. License Limitation groundfish in the GOA means "target species and the 'other species' category, specified annually pursuant to 679.20(a)(2). A vessel must be named on an original LLP license that is onboard the vessel. The LLP is authorized in Federal regulations at 50 CFR 679.4(k), definitions relevant to the program are at 679.2, and prohibitions are at 679.7.

The LLP license requirement is in addition to all other permits or licenses required by federal regulations. The LLP is a Federal program and LLP licenses are not required for participation in fisheries that occur in the waters of the State of Alaska. Vessels that do not exceed 26 feet in Length Overall (LOA) are exempt from the LLP in the GOA. Since all vessels that use trawl gear are greater than 26' LOA this exemption does not impact any outcomes of the proposed action.

[5] https://alaskafisheries.noaa.gov/fisheries/llp

In the GOA, beginning April 21, 2011, persons who wish to participate in the directed fishery for Pacific cod in the West or Central GOA with non-trawl gear must have a gear- and operation-type specific Pacific cod endorsement on the LLP license that names their vessel. Pacific cod endorsements were added to existing LLP licenses based on historical vessel participation under eligibility tests in the final rule's implementing regulations (76 FR 15826, March 22, 2011).

Permanent LLP licenses are transferable from the holder to another person, and/or for use on a different vessel. To be effective, an application for the transfer of a license must be submitted to and approved by NMFS. LLP licenses may:

- Only be transferred to U.S. citizens or businesses;
- Unless they are initially issued, no person may hold more than ten (10) groundfish licenses at any one time;
- An LLP license may be voluntarily transferred only once per calendar year;
- An LLP license may be transferred for use on a vessel of length overall no greater than the maximum length overall of the license;
- Licenses may transfer by "operation of law" (foreclosure, inheritance, court order, etc.); such transfers (which may or may not include a vessel) will not be considered a "voluntary transfer" for purposes of allowable transfers in a calendar year;
- Endorsements on licenses are not severable from the license; and,
- A person who receives both a groundfish license and a crab license derived from the qualifying history of one vessel may not transfer one without transferring both to the same recipient.

1.3.1.1.1 LLP GOA CV trawl groundfish license summary

A summary of the GOA LLP licenses with a trawl endorsement is provided in Table 1-1. Information presented shows that there are 152 GOA groundfish LLP licenses with a trawl endorsement. The majority of those licenses (124) have a CV endorsement. The remaining 28 licenses have a CP endorsement. The table further breaks down the licenses by whether the trawl endorsement is for the CG, WG, or both. The table also show whether the license is endorsed for trawl gear only or both trawl and non-trawl gear.

Table 1-1 CV and CP LLP Licenses issued with a GOA trawl endorsement

License	Area	Trawl only	Trawl and non/trawl	Total
CV	CG & WG	17	34	51
	CG only	14	32	46
	WG only	7	20	27
	Total	**38**	**86**	**124**
CP	CG & WG	11	2	13
	CG only	6	2	8
	WG only	7	0	7
	Total	**24**	**4**	**28**
All	CG & WG	28	36	64
	CG only	20	34	54
	WG only	14	20	34
	Total	**62**	**90**	**152**

Source: RAM LLP data (March 2, 2016)

Table 1-2 is a matrix of the endorsements associated with the 124 GOA CV trawl licenses. This table is presented to show the broader suite of endorsements associated with the CV licenses. For example, the table shows that the 97 licenses with a CG trawl endorsement also contain 37 Bering Sea trawl endorsements and four Aleutian Islands trawl endorsements. Six of those 97 licenses also have a CG Pacific cod pot endorsement and 17 are endorsed to fish Pacific cod with pot gear in the WG. Similar information is provided for the Pacific cod endorsed license for other areas and gear types.

Table 1-2 Endorsements associated with the 124 CV LLP licenses

	AI_TRW	BS_TRW	CG_TRW	WG_TRW	AI_CV_PCOD_HAL	AI_CV_PCOD_POT	BS_CV_PCOD_HAL	BS_CV_PCOD_POT	CG_CV_PCOD_HAL	CG_CV_PCOD_POT	CG_CV_PCOD_JIG	WG_CV_PCOD_HAL	WG_CV_PCOD_POT	WG_CV_PCOD_JIG
AI_TRW	8	7	4	5	1	0	0	0	1	0	0	0	0	0
BS_TRW	7	47	37	31	0	0	0	0	0	1	0	0	2	0
CG_TRW	4	37	97	51	0	0	0	0	0	6	0	0	17	0
WG_TRW	5	31	51	78	1	0	0	1	2	3	0	0	30	1
AI_CV_PCOD_HAL	1	0	0	1	1	0	0	0	1	0	0	0	0	0
AI_CV_PCOD_POT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BS_CV_PCOD_HAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BS_CV_PCOD_POT	0	0	0	1	0	0	0	1	0	0	0	0	1	0
CG_CV_PCOD_HAL	1	0	0	2	1	0	0	0	2	0	0	0	1	0
CG_CV_PCOD_POT	0	1	6	3	0	0	0	0	0	7	0	0	1	0
CG_CV_PCOD_JIG	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WG_CV_PCOD_HAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WG_CV_PCOD_POT	0	2	17	30	0	0	0	1	1	1	0	0	31	1
WG_CV_PCOD_JIG	0	0	0	1	0	0	0	0	0	0	0	0	1	1

Source: RAM LLP data (March 2, 2016)

1.3.1.1.2 LLP GOA CP trawl groundfish license summary

Table 1-3 is a summary of the 28 CP licenses with a GOA trawl endorsement. Information presented in the table shows whether the license was derived from an AFA or Amendment 80 vessel. The table also shows the endorsements attached the license as well as whether the license was assigned RP quota or is limited by RP sideboards.

The table shows all but one of the licenses are endorsed to trawl in the Bering Sea and 22 of the 28 licenses are endorsed to trawl in the Aleutian Islands. One of the licenses was issued RP CV quota and 11 were issued RP CP quota. Of the 11 licenses issued RP CP quota, only one was not derived from an Amendment 80 vessel. Finally, only one of the licenses is endorsed to fish GOA Pacific cod with pot gear (WG only). It is worth noting that three of the smaller vessels with CP licenses (non-Amendment 80 vessels) operated as CVs in the GOA since 2003. Such vessels would not lose their CP endorsement under the program, but those vessels' historical activity will be counted towards the CV sector for the purpose of apportioning halibut PSC between the two sectors.[6]

[6] The Council's motion for Alternative 2 defines the CP sector as the list of eligible Amendment 80 vessels that appear in regulation.

Table 1-3 Summary of CP groundfish Licenses with a GOA trawl endorsement

				Endorsements										
License #	Linked Crab License	AFA Derived License	MLOA	AI	BS	CG	WG	PCOD	Crab Sideboards	RP CV Sideboarded	RP CP Sideboarded	RP CV Quota	RP CP Quota	A80
LLG2082		N	238	Trawl	Trawl	N	Trawl	N	N	N	N	N	N	Y
LLG2429		N	186	Trawl	Trawl	N	Trawl	N	N	N	N	N	N	Y
LLG1147		N	166	Trawl	Trawl	N	Trawl	N	N	N	N	N	N	Y
LLG2138		N	219	Trawl	Trawl	N	Trawl	N	N	N	N	N	N	Y
LLG4692		N	296	Trawl	Trawl	N	Trawl	N	N	N	N	N	N	Y
LLG2084		N	228	Trawl	Trawl	N	Trawl	N	N	N	N	N	N	Y
LLG2118		N	203	Trawl	Trawl	N	Trawl	N	N	N	N	N	N	Y
LLG3957		N	185	Non-trawl; Trawl	Non-trawl; Trawl	Non-trawl; Trawl	N	N	N	N	Y	N	Y	Y
LLG3744		N	183	Non-trawl; Trawl	Non-trawl; Trawl	Non-trawl; Trawl	Non-trawl	WG CP Pot	N	N	N	N	N	Y
LLG1802		N	138	Non-trawl; Trawl	Non-trawl; Trawl	Non-trawl; Trawl	Non-trawl; Trawl	N	N	N	Y	N	Y	Y
LLG2554	LLC2555	Y	103	Non-trawl; Trawl	Non-trawl; Trawl	Non-trawl; Trawl	Non-trawl; Trawl	N	N	N	N	N	N	N
LLG3741		N	188	Trawl	Trawl	Trawl	N	N	N	N	N	N	N	N
LLG3838		N	132	Trawl	Trawl	Trawl	N	N	N	N	Y	N	Y	N
LLG4360		N	295	N	Trawl	Trawl	N	N	N	N	Y	N	Y	Y
LLG2524		N	124	N	Trawl	Trawl	N	N	N	N	N	N	N	Y
LLG4465		N	92	N	N	Trawl	N	CG CV Trawl	N	Y	Y	Y	N	N
LLG3740		Y	210	N	Trawl	Trawl	N	N	N	N	N	N	N	N
LLG3043		N	221	Trawl	Trawl	Trawl	Trawl	N	N	N	Y	N	Y	Y
LLG1402		N	124	Trawl	Trawl	Trawl	Trawl	N	N	N	N	N	N	Y
LLG2080		N	227	Trawl	Trawl	Trawl	Trawl	N	N	N	Y	N	Y	Y
LLG2014		N	230	Trawl	Trawl	Trawl	Trawl	N	N	N	Y	N	Y	Y
LLG2028		N	160	Trawl	Trawl	Trawl	Trawl	N	N	N	Y	N	Y	Y
LLG3217		N	124	N	Trawl	Trawl	Trawl	N	N	N	N	N	N	Y
LLG3958		N	140	Trawl	Trawl	Trawl	Trawl	N	N	N	N	N	N	Y
LLG1820		N	240	Trawl	Trawl	Trawl	Trawl	N	N	N	Y	N	N	N
LLG2905		N	295	N	Trawl	Trawl	Trawl	N	N	N	Y	N	Y	Y
LLG2083		N	215	Trawl	Trawl	Trawl	Trawl	N	N	N	Y	N	Y	Y
LLG3662		N	185	Trawl	Trawl	Trawl	Trawl	N	N	N	Y	N	Y	Y

Source: RAM LLP License data base 2016

1.3.1.2 Fishing Seasons and Areas

1.3.1.2.1 General Trawl Fishing Seasons

The general trawl fishing seasons in the GOA are defined at 50 CFR part 679.23(d). The trawl fishing season opens on January 20th for all trawl gear except directed fishing with trawl gear for rockfish. Directed fishing for rockfish with trawl gear is authorized on the first day of the third quarterly reporting period of a fishing year; this regulation applies to the Western GOA and West Yakutat areas, whereas the season for the Central GOA Rockfish Program opens on May 1. Trawl fisheries for all species except pollock and Pacific cod are open until December 31, but are subject to other provisions including closures resulting from the TAC or PSC limits being taken. Directed fishing for pollock in the Western and Central Regulatory Areas is authorized during the following four seasons[7]:

1. A season. - January 20 through March 10;
2. B season. - March 10 through May 31;
3. C season. - August 25 through October 1; and
4. D season. October 1 through November 1.

Directed fishing for Pacific cod is authorized during the following two seasons with trawl gear in the Western and Central Regulatory Areas of the GOA, subject to other provisions:

1. A season. - January 20 through June 10; and
2. B season. - September 1 through November 1.

The seasonal apportionment of pollock and Pacific cod harvest is currently considered to be necessary to ensure the groundfish fisheries are not likely to cause jeopardy of extinction or adverse modification of critical habitat for Steller sea lions. Regulations at §679.20(a)(5)(iv) specify how the pollock TAC will be apportioned. Regulations

[7] All season start and end at 1200 hours, A.l.t., except those that end on December 31 and those end at 2400 hours, A.l.t.

at §679.20(a)(6)(ii) and §679.20(a)(12)(i) specify how the Pacific cod TAC will be apportioned. Pursuant to §679.20(a)(5)(iv), the final harvest specifications for groundfish in the GOA, seasonal pollock TACs are established by §679.23(d)(2)(i) through (iv).

1.3.1.2.2 General Trawl Fishing Areas

Figure 1-1 shows the GOA groundfish fishing areas. Pollock is managed by three-digit number area. So, it has TAC's set for areas 610, 620, 630, and 640. All other species are managed by Western GOA (Area 610), Central GOA (620 and 630), or Eastern GOA (640 – the West Yakutat District, is the only area open to fishing with trawl gear).

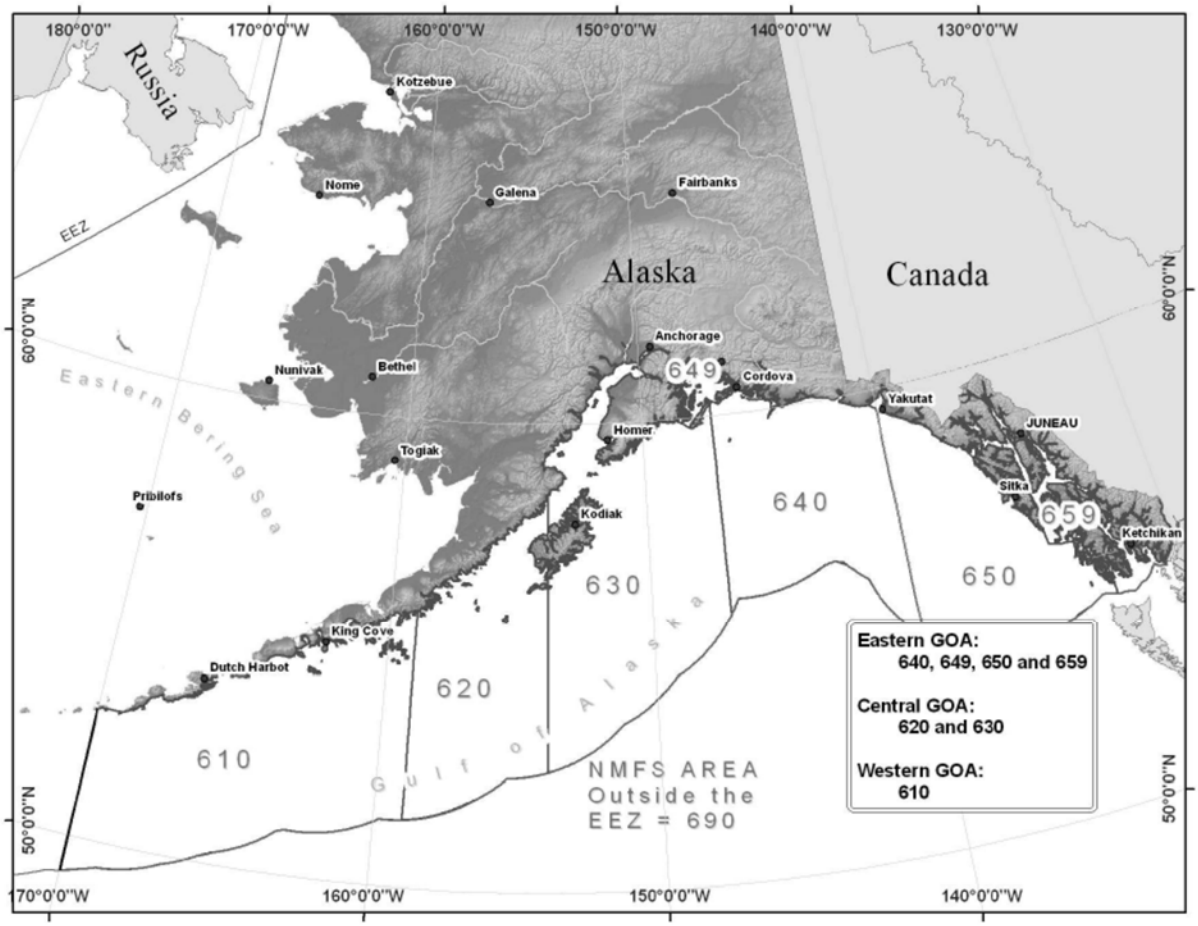


Figure 1-1 GOA groundfish management areas

1.3.1.3 Species Open to Directed Fishing

GOA fisheries that were open to directed fishing with trawl gear during 2016 are reported in Table 1-4. The Pacific cod fishery is primarily available to directed fishing for the inshore sector. However, 50 CFR 679.20(a-c) define when a portion of the available TAC will be made available to CPs in the Western and Central GOA. Inshore/offshore regulations apportion Pacific cod, in the Eastern GOA Regulatory Area, 90% to vessels harvesting Pacific cod for processing by the inshore component and 10% to vessels harvesting Pacific cod for processing by the offshore component.

Pollock is only open to directed fishing by vessels delivering their catch to the inshore sector. Vessels that deliver their catch to the offshore sector have an incidental catch amount (ICA) set at the beginning of the year based on their estimated bycatch needs for other directed fisheries, and a maximum retainable amount (MRA) for pollock is set that may not be exceeded.

Pacific Ocean perch, pelagic shelf rockfish, and Northern rockfish are open to directed fishing by all trawl vessels in the Western GOA. Pacific Ocean perch and pelagic shelf rockfish are open to directed fishing by trawl vessels in the West Yakutat district. The other listed rockfish species and sablefish are only open to directed fishing in the Central GOA by vessels participating the Rockfish Program.

All other species listed in the table are open to directed fishing with trawl gear by all vessels with a GOA trawl endorsement on their LLP for that area. Closures are issued through a Federal Register Notice when the TAC is projected to be taken or the PSC limit is reached.

Table 1-4 GOA species that were open to directed fishing in 2016

Species	GOA - Central 620/630	GOA - Western 610	West Yakutat - 640
Pacific Cod	CV & CP	CV & CP	All
Pollock	Inshore	Inshore	Inshore
Arrowtooth Flounder	All	All	All
Deep Water Flatfish	All	All	All
Flathead Sole	All	All	All
Northern Rockfish	Rockfish Program	All	
Pacific Ocean Perch	Rockfish Program	All	All
Pelagic Shelf Rockfish (Dusky Rockfish)	Rockfish Program	All	All
Rougheye Rockfish	Rockfish Program		
Sablefish	Rockfish Program		
Shortraker Rockfish	Rockfish Program		
Thornyhead Rockfish	Rockfish Program		
Rex Sole	All	All	All
Shallow Water Flatfish	All	All	All

Note: Blanks mean that area was not open to directed fishing for that species or species group. “All” means it was open to all trawl vessels. “Rockfish Program” means it was open to vessels in Rockfish Program Cooperatives. “Inshore” means it was open to Inshore vessels (but the Pacific cod fishery is also open to offshore vessels with restrictions based on inshore/offshore regulations).

1.3.1.4 Maximum Retainable Amounts

Regulations at 50 CFR 679.20(e) defines the MRAs that are set for the Non-Rockfish Program GOA trawl fisheries. Those MRA percentages are presented in Table 10 of that section for the GOA species categories, excluding the Rockfish Program fisheries. The MRA of an incidental catch species is calculated as a proportion of the basis species retained on board the vessel. The calculation for a specific incidental catch species is made with respect to each basis species that is retained on board that vessel. Individual retainable amounts are determined by multiplying the appropriate retainable percentage for the incidental catch species/basis species combination by the amount of that basis species, in round-weight equivalents. The maximum retainable amount for that specific incidental catch species is the sum of the individual retainable amounts.

For catcher vessels, the maximum retainable amount is the lowest maximum retainable amount. The MRA is applied at any time and to all areas for the duration of the fishing trip. For catcher/processors the maximum retainable amount applies at any time for the duration of the fishing trip.

Table 1-5 GOA MRAs for Non-Rockfish Program

BASIS SPECIES		INCIDENTAL CATCH SPECIES (for DSR caught on catcher vessels in the SEO, see § 679.20 (j)[6])															
Code	Species	Pollock	Pacific cod	DW Flat [2]	Rex sole	Flathead sole	SW Flat [3]	Arrow-tooth	Sablefish	Aggregated rockfish[7]	SR/RE ERA [1]	DSR SEO (C/Ps only) [5]	Atka mackerel	Aggregated forage fish[9]	Skates [10]	Other species [6]	Grenadiers [12]
110	Pacific cod	20	n/a[9]	20	20	20	20	35	1	5	[1]	10	20	2	5	20	8
121	Arrowtooth	5	5	20	20	20	20	n/a	1	5	0	0	20	2	5	20	8
122	Flathead sole	20	20	20	20	n/a	20	35	7	15	7	1	20	2	5	20	8
125	Rex sole	20	20	20	n/a	20	20	35	7	15	7	1	20	2	5	20	8
136	Northern rockfish	20	20	20	20	20	20	35	7	15	7	1	20	2	5	20	8
141	Pacific ocean perch	20	20	20	20	20	20	35	7	15	7	1	20	2	5	20	8
143	Thornyhead	20	20	20	20	20	20	35	7	15	7	1	20	2	5	20	8
152/ 151	Shortraker/ rougheye [1]	20	20	20	20	20	20	35	7	15	n/a	1	20	2	5	20	8
193	Atka mackerel	20	20	20	20	20	20	35	1	5	[1]	10	n/a	2	5	20	8
270	Pollock	n/a	20	20	20	20	20	35	1	5	[1]	10	20	2	5	20	8
710	Sablefish	20	20	20	20	20	20	35	n/a	15	7	1	20	2	5	20	8
Flatfish, deep-water[2]		20	20	n/a	20	20	20	35	7	15	7	1	20	2	5	20	8
Flatfish, shallow-water[3]		20	20	20	20	20	n/a	35	1	5	[1]	10	20	2	5	20	8
Rockfish, other [4]		20	20	20	20	20	20	35	7	15	7	1	20	2	5	20	8
172	Dusky rockfish	20	20	20	20	20	20	35	7	15	7	1	20	2	5	20	8
Rockfish, DSR-SEO [5]		20	20	20	20	20	20	35	7	15	7	n/a	20	2	5	20	8
Skates[10]		20	20	20	20	20	20	35	1	5	[1]	10	20	2	n/a	20	8
Other species [6]		20	20	20	20	20	20	35	1	5	[1]	10	20	2	5	n/a	8
Aggregated amount of non-groundfish species[11]		20	20	20	20	20	20	35	1	5	[1]	10	20	2	5	20	8

Source: Table 10 of 50 CFR 679.

Note: Blue text is used to show recent amendments to the table.

MRAs are also set for the Rockfish Program. Those MRAs are defined in Table 30 of 50 CFR 679 and are provided in Table 1-6. The primary difference between the MRAs is for the incidental catch of Pacific cod and Shortraker/Rougheye.

Table 1-6 Rockfish Program MRAs

Fishery	Incidental catch species	Sector	MRA as a percentage of total retained rockfish primary species and rockfish
Rockfish Cooperative Vessels fishing under a CQ permit.	Pacific cod	Catcher/Processor	4
	Shortraker/Rougheye	Catcher Vessel	2
	See rockfish non-allocated species for "other species"		
Rockfish non-allocated Species for Rockfish Cooperative vessels fishing under a Rockfish CQ permit.	Pollock	Catcher/Processor and Catcher Vessel	20
	Deep-water flatfish	Catcher/Processor and Catcher Vessel	20
	Rex sole	Catcher/Processor and Catcher Vessel	20
	Flathead sole	Catcher/Processor and Catcher Vessel	20
	Shallow-water flatfish	Catcher/Processor and Catcher Vessel	20
	Arrowtooth flounder	Catcher/Processor and Catcher Vessel	35
	Other rockfish	Catcher/Processor and Catcher Vessel	15
	Atka mackerel	Catcher/Processor and Catcher Vessel	20
	Aggregated forage fish	Catcher/Processor and Catcher Vessel	2
	Skates	Catcher/Processor and Catcher Vessel	5
	Other species	Catcher/Processor and Catcher Vessel	20
	Grenadiers	Catcher/Processor and Catcher	8
Longline gear Rockfish Entry Level Fishery.	Use MRAs listed non-Rockfish Program MRA table		
Opt-out vessels	Use MRAs listed non-Rockfish Program MRA table		
Rockfish Cooperative Vessels not fishing under a CQ permit.	Use MRAs listed non-Rockfish Program MRA table		

Source: Table 30 of 50 CFR 679.

1.3.1.5 Prohibited Species Catch Limits

Halibut and Chinook salmon prohibited species catch limits are set for vessels using trawl gear in the GOA. Each of those overall PSC limits may be further divided by season, area, target fishery groups, and/or vessel type. The overall limits and their divisions, as of 2016, are presented in the next sections.

1.3.1.5.1 Chinook Salmon Limits

Regulations at 50 CFR 679.21(h) define the trawl Chinook salmon PSC limits for the GOA pollock fishery, and 50 CFR 679.21(i) defines the trawl Chinook salmon PSC limits for the non-pollock fisheries. In the GOA trawl pollock fishery Chinook salmon PSC limits are set for the Western and Central reporting areas of the GOA. A PSC limit of 18,316 Chinook salmon is set for vessels engaged in directed fishing for pollock in the Central GOA. In the Western GOA, a limit of 6,684 Chinook salmon is set. Salmon retention is required until offload to a processing facility that takes the delivery. Because the pollock fishery is only open to directed fishing by the inshore sector, this PSC limit is available to catcher vessels.

GOA non-pollock trawl Chinook salmon PSC limits are established for the trawl CP sector, the non-Rockfish Program CV sector, and the Rockfish Program CV sector (Table 1-7). The non-pollock PSC limit covers fishing

in both the Central and Western GOA.[8] As a result, when the PSC limit is reached it closes both areas to directed fishing for the groundfish species subject to the limit. The CV PSC limit is also set for the entire calendar year. Therefore, when the PSC limit is taken and the fisheries are closed, the fisheries are not reopened until additional Chinook salmon are available. Those fish could be made available through the reapportionment process established under GOA Amendment 103 or not until the next year when a new annual apportionment is available.

Table 1-7 GOA non-pollock Chinook salmon PSC limits for combined Western and Central GOA (number of fish)

Sector	Baseline Annual Limit	If the previous year's annual use is less than:	The next year's limit will be:
Trawl CP	3,600	3,120	4,080
Rockfish Program CV	1,200	N/A	
Non-Rockfish Program CV	2,700	2,340	3,060

The reapportionment amendment provides NMFS the authority to roll-over limited amounts of the Chinook salmon that is projected to be unused to the catcher vessel sectors. The action prohibited the reapportionment of Chinook salmon PSC from catcher vessel sectors to the catcher/processor sector. In summary the provision:

1. Rollover of Chinook salmon PSC from the Rockfish Program CV sector to the non-Rockfish Program CV sector would be made at the discretion of the NMFS Regional Administrator, and not prescribed by regulation. This changed the obligation of the Regional Administrator from being required to roll-over any unused Rockfish Program CV Chinook salmon PSC, in excess of 150, on October 1. The amendment gives the Administrator authority to determine if a rollover is appropriate at that time. A rollover to the non-Rockfish Program CV sector could also be made after October 1.
2. Limit the amount of roll-over PSC that a CV sector may receive such that the annual total does not exceed 50% of the sector's initial Chinook salmon PSC limit during a calendar year (excluding any uncertainty buffer that may have been added as a result of the previous year's performance per Amendment 97, as described in Table 1-7).

The Chinook salmon PSC limit for the CP sector is established so that no more than 66% of the annual limit may be taken prior to June 1 (2,376 out of 3,600 fish). If the trawl CP sector has an annual Chinook salmon PSC limit of 4,080 Chinook salmon, then the sector's seasonal limit prior to June 1 is 2,693 Chinook salmon. The number of Chinook salmon available to the trawl CP sector as a PSC limit on June 1 through the remainder of the calendar year is equal to the annual limit minus the number of Chinook salmon PSC used by that sector prior to June 1.

1.3.1.5.2 Halibut Mortality Limits

The GOA trawl halibut PSC mortality limit of 1,705 mt is specified at 50 CFR 679.21(d)(3). That limit accounts for the 15 percent reduction that was recently phased-in over three years (7% in 2014, 5% in 2015, and 3% in 2016). The overall limit is further apportioned to sets of target fisheries (species complexes), seasons, and vessel types (Table 1-8).

The fishery for the shallow-water complex of species is defined as vessels fishing with trawl gear during any weekly reporting period that results in a retained aggregate catch of pollock, Pacific cod, shallow-water flatfish,

[8] Chinook salmon taken in the West Yakutat district does not currently accrue to a PSC limit. Only a small number of Chinook are taken in WY non-pollock trawling, as trawl activity in that area is historically low. The EA/RIR produced to support GOA FMP Amendment 97 noted that less than 2% of GOA Chinook salmon PSC occurred in WY.

flathead sole, Atka mackerel, and "other species"[9] that is greater than the retained aggregate amount of other GOA groundfish species or species group. The halibut PSC limit for the deep-water species complex fishery is set for vessels fishing with trawl gear during any weekly reporting period that results in a retained catch of groundfish and is not a shallow-water species fishery. In addition to the fishery apportionments the GOA halibut PSC limit is also divided into the following five seasonal apportionments:

1. January 20 - April 1
2. April 1 to July 1
3. July1 to September 1
4. September 1 to October 1
5. October 1 through December 31 (5th Season - combined deep and shallow water limit)

As part of Amendment 95, NMFS combined management of the deep-water and shallow-water species complexes during the second season into a single halibut PSC limit *during the May 15 through June 30 period* (§679.21(d)(4)(iii)(D)).[10] Within that window, flatfish trawl fisheries that would previously have closed due to halibut PSC limits might be able to remain open. Under the regulation, NMFS will account for actual halibut PSC usage during the May 15 through June 30 period by reapportioning PSC between the sectors for the third halibut season. Since the implementation of Amendment 95 in 2014, 2016 was the first time that the GOA trawl fishery was closed on halibut PSC during the second season. The procedure for reapportioning halibut is described in the Federal Register notice for the 2016 reapportionment.[11] In some years, the ability to combine PSC management across the two species complexes could increase the amount of flatfish trawling that occurs in the late spring relative to what was observed prior to 2014.

The third seasonal apportionment is reduced by 191.4 mt of halibut mortality that is assigned to vessels fishing under the Central GOA Rockfish Program, which reduces the annual limit for other GOA trawl fisheries to 1,515 mt. That amount of halibut is assigned for exclusive use by vessels in the CG Rockfish Program. After the end of the Rockfish Program fishing season (November 15), or when all of the vessels in a RP cooperative check out of the fishery, an amount not greater than 55% of the unused halibut PSC limit may be added to the fifth seasonal apportionment. Any unused amount of the Rockfish Program halibut PSC limit that is not reapportioned to the fifth season (a minimum of 45%) will not be available for use by any person for the remainder of that calendar year. The proposed actions would not modify the CG Rockfish Program PSC limits.

Regulations allow halibut PSC to be apportioned among regulatory areas and districts, but that is not currently done for trawl fisheries. Alternatives considered in this action would further divide PSC limits by FMP sub-area.

The non-pelagic pollock trawl gear fishery has been allowed to remain open when the shallow-water halibut PSC limit has been reached. Regulations allow NMFS to make this determination; the Regional Administrator must notify the public in the Federal Register when the shallow-water limit is reached.

[9] The Other Species group is made up of sculpins, sharks, squids, and octopuses.
[10] This neither applies to nor affects sideboards for Amendment 80 or AFA vessels.
[11] https://alaskafisheries.noaa.gov/sites/default/files/81fr45423.pdf

Table 1-8 GOA halibut PSC limits for 2016

Trawl Gear Halibut PSC Limits (BTL in metric tons)	1,705	Calculation	Notes
Shallow-water limit	767	45.0% of baseline trawl limit (BTL)	
January 20 - April 1 (1st Season)	384	50% of shallow-water limit	
Amendment 80 Sideboard	8	0.48% of BTL	
Non-exempt AFA CV Sideboard	130	34.0% of 1st season limit	
April 1 to July 1 (2nd Season)	85	11.1% of shallow-water limit	Plus any roll-overs from previous season
Amendment 80 Sideboard	32	1.89% of BTL	No roll-overs from previous season allowed
Non-exempt AFA CV Sideboard	29	34.0% of 2nd season limit	Plus any roll-overs from previous season
July1 to September 1 (3rd Season)	170	22.2% of shallow-water limit	Plus any roll-overs from previous seasons
Amendment 80 Sideboard	25	1.46% of BTL	No roll-overs from previous season allowed
Non-exempt AFA CV Sideboard	58	34.0% 3rd season limit	Plus any roll-overs from previous season
Rockfish CP Sideboard	2	0.1% of BTL	
Rockfish CV Sideboards	-		No Sideboard Limits
September 1 to October 1 (4th Season)	128	16.7% of shallow-water limit	Plus any roll-overs from previous season
Amendment 80 Sideboard	13	0.74% of BTL	No roll-overs from previous season allowed
Non-exempt AFA CV Sideboard	44	34.0% of 4th season limit	Plus any roll-overs from previous season
Deep-water limit	682	40.0% of BTL	
January 20 - April 1 (1st Season)	85	12.5% of deep-water limit	
Amendment 80 Sideboard	20	1.15% of BTL	
Non-exempt AFA CV Sideboard	6	7.0% of 1st season limit	
April 1 to July 1 (2nd Season)	256	37.5% of deep-water limit	Plus any roll-overs from previous season
Amendment 80 Sideboard	183	10.72% of BTL	No roll-overs from previous season allowed
Non-exempt AFA CV Sideboard	18	7.0% of 2nd season limit	Plus any roll-overs from previous season
July1 to September 1 (3rd Season)	341	50.0% of deep-water limit	Plus any roll-overs from previous seasons
Allocation to Rockfish Program C/Ps	74.1	87.5% of 84.7 mt	Deduction from 3rd season allocated to rockfish program
Allocation to Rockfish Program CVs	117.3	87.5% of 134.1 mt	Deduction from 3rd season allocated to rockfish program
Rockfish C/P Sideboards	43	2.5% of BTL	
Amendment 80 Sideboard	89	5.21% of BTL	No roll-overs from previous season allowed
Non-exempt AFA CV Sideboard	24	7.0% of 3rd season limit	Plus any roll-overs from previous season
September 1 to October 1 (4th Season)	0	No deep-water allowance	Plus any roll-overs from previous season
Amendment 80 Sideboard	2	0.14% of BLL	No roll-overs from previous season allowed
Non-exempt AFA CV Sideboard	0	7.0% of 4th season limit	Plus any roll-overs from previous season
October 1 through December 31 (5th Season - combined deep and shallow water limit)	256	15.0% of BTL	Plus any roll-overs from previous season (including 55% of unused PSC from Rockfish Program
Amendment 80 Sideboard	102	sum of deep and shallow-water	May be used in any target fishery that is open
Shallow-water*	39	2.27% of BTL	
Deep-water*	63	3.71% of BTL	
Non-exempt AFA CV Sideboard	52	20.5% of 5th season limit	Plus roll-overs

Note: * Managed as combined shallow-water and deep-water PSC limits

A detailed justification for the fishery and seasonal apportionments of these halibut PSC limits that were originally established in 1994 is described in the EA prepared for that action. In summary, the apportionments reflect the recommendations presented to the Council at its September and December 1993 meetings by an ad hoc industry working group responsible for developing this management measure. These apportionments are intended to accommodate seasonal PSC requirements in a manner that optimizes the 1994 halibut PSC limit established for trawl gear relative to anticipated trawl fishing patterns and 1994 groundfish TACs.

Regulations that limited Pacific halibut PSC in the GOA groundfish trawl fisheries resulted in conflict among, and preemption of, groundfish trawling operations in the GOA. Trawl fishery components competed for shares of the available halibut PSC limit. This occurred due to seasonal variations in halibut PSC rates and mortality levels reached in the different trawl fisheries, and the lack of trawl fishery categories in regulations that could receive separate apportionments of the halibut PSC limit.

Under previous regulations, it was possible for the activities of one group of trawl vessels that fish for a particular groundfish species or species complex to take a disproportionate amount of the halibut PSC limit. This could have caused the premature attainment of the halibut PSC limit and closure of all trawling operations in the GOA, except for trawling for pollock with pelagic trawl gear. Such closures could have left significant amounts of

economically valuable TAC unharvested, idling vessels and crew, and disrupting processing and fishing support sectors, fishery dependent communities, and intermediate and final markets. Even if the total trawl PSC limit is not reached prematurely, the threat that the fishery might close at any point during the year could force user groups to incur unnecessary costs, to alter fishing plans, or to make inefficient or undesirable operational decisions.

1.3.1.6 North Pacific Groundfish and Halibut Observer Program

The restructured observer program was implemented in 2013 (NPFMC, 2011). The restructured program applies to all Federal fisheries (including halibut) in the GOA and BSAI, and to shoreside processors with observer coverage of less than 100 percent (the partial coverage category). Vessels in the restructured program are required to pay a fee based on the ex-vessel value of their catch to cover the cost of monitoring. Vessels and processors with at least 100 percent coverage remained under their existing service delivery model. Based on the stratification scheme to determine the proportion of deployments that will occur in each sampling pool, estimates of anticipated fishing effort are used to determine sample size, and the budget of available fee revenues, then NMFS determines observer deployment. That annual observer deployment plan (ADP) describes the science-driven method for observer deployment (NMFS, 2015).

The GOA trawl CV fleet is in the partial observer coverage category. In the partial coverage category, NMFS has the flexibility to deploy observers when and where they are needed based on an ADP developed in consultation with the Council. The draft ADP for the upcoming year is typically presented to the Council at the October meeting, and describes how NMFS plans to deploy observers to vessels in order to meet scientifically based catch estimation needs, while accommodating the realities of a dynamic fiscal environment; the ADP is finalized in December of each year. NMFS's goal is to achieve a representative sample of fishing events. The annual planning and reporting process is described in Section 1.2 of the 2015 Observer Program Annual Report. At-sea monitoring within the partial coverage category is governed by random selection of fishing trips. The probability of a trip being selected for at-sea monitoring depends on the selection pool (stratum) to which a vessel is assigned. Vessels log their planned fishing trips into the Observer Declare and Deploy System (ODDS) prior to embarking. If selected, the trip must carry an observer. The 2016 ADP defines selection strata by gear type. There are different strata for trawl, hook-and-line, and pot gear. The 2016 selection probabilities are 28% for trawl vessels, 15% for hook-and-line vessels, and 15% for pot vessels. For 2016, it is projected, based on that plan, that the GOA trawl CV fleet will have 28% coverage. This is an increase from the lower observer coverage rates that were realized before the observer program was restructured. This 28% coverage rate goal results in allocation weightings between the trip-selection pools as: 0.51 for trawl, 0.34 for hook-and-line, and 0.15 for pot. Allocation weightings are not the same as deployment rates, since allocation weightings sum to 1.00 and are the proportion of the total number of observed trips (e.g. observer deployments) that are expected to occur in each trip-selection stratum. Prior to 2016, strata were defined according to a combination of factors including both vessel size and gear. Any vessel of less than 40' LOA is in the "No Selection Pool", meaning that it will not be selected to carry an observer but will pay the required monitoring fees.

The 2017 Draft ADP[12] was presented to the Council in October 2016, and will be finalized in December 2016. In addition to the "no selection" stratum, the ADP defines six other selection strata for the three gear types subject to coverage (trawl, hook-and-line, and pot). Each gear type has a stratum for vessels delivering to shoreside processors and one for vessels delivering to tenders. For vessel delivering shoreside, the Draft ADP proposes to select trawl vessels at an 18% rate, select hook-and-line vessels at an 11% rate, and select pot vessels at a 3% rate. These target deployment rates are lower than they have been in recent years, in part due to the loss of

[12] http://npfmc.legistar.com/gateway.aspx?M=F&ID=e818d3bb-a22f-4830-ac79-5fe5e01f502f.pdf

supplementary Federal funds that had been used during past years to augment observer fees in the purchase of observer sea-days. Lower selection probabilities do not affect the level or amount of the fees paid by vessels fishing in the partial coverage category.

Observers will continue to collect genetic samples from salmon taken as bycatch in groundfish fisheries to support efforts to identify stock of origin. The same sampling protocol established in the 2014 ADP (also used in 2015) will again be used in 2016. These samples are analyzed and a report is presented to the NPFMC, typically at the April Council meeting each year.

The fee that NMFS assesses to partial coverage participants is set at 1.25% of the ex-vessel value of the landings of groundfish and halibut subject to the fee (§679.55). The fee applies regardless of whether a vessel or processor is selected to carry an observer. An ex-vessel-based fee is commensurate to each operator's ability to pay, and to the benefits he or she received from the fishery. Ex-vessel values are expected to fluctuate, as are annual harvest limits. The fee liability is intended to be split evenly between the harvesting vessel (0.625 percent) and the processor that receives the landing (0.625 percent).[13] The Council determined that the same fee percentage should apply to all sectors, as they all benefit from resulting observer data that is essential for conservation and management of the fisheries in which they participate.

The ex-vessel value of a vessel's catch, and thus the fee liability, is based on a standard measure. The value subject to the fee is determined by multiplying a standard price for groundfish by the round weight equivalent for each species and gear combination. Ex-vessel value is based on standard prices from prior years. The standard prices that will be used to determine 2016 liabilities are based on volume and value from 2012 through 2014. NMFS is not able to use a basis of actual ex-vessel prices at the time of the landing because (1) they are not always known or accurately reported on landings reports, (2) some prices are adjusted later in the season, (3) some processors and CVs do not have an independent relationship, and (4) it would be costly for NMFS to audit or investigate incidences of suspected inaccurate price reporting. In order to apply the most appropriate price to a landing, NMFS uses the standard price that reflects the location of the landing with the highest degree of precision. NMFS collects data at the port-level (e.g., Kodiak, Homer, or King Cove) and aggregates up to regulatory area, BSAI/GOA, state-level, or all ports including those outside Alaska, as is necessary to comply with confidentiality regulations. The standard groundfish prices for 2015 are listed on the Region's website, by species, gear type, and port/area group.[14]

1.3.1.7 Central GOA Rockfish Program

The Central GOA Rockfish Program was implemented in 2012. The current program replaced the Central GOA Rockfish Pilot Program, which was in effect from 2007 through 2011. The rockfish fisheries are conducted by trawl and longline vessels in Federal waters near Kodiak, Alaska. The Rockfish Program allocates harvest privileges to holders of LLP groundfish licenses. Quota shares (QS) are allocated for primary and secondary rockfish species. Primary rockfish species are northern rockfish, Pacific ocean perch, and dusky rockfish. Secondary species in the program include Pacific cod, rougheye rockfish, shortraker rockfish, sablefish, and thornyhead rockfish.

[13] While this analysis assumes a 50/50 split of the partial coverage fee liability between harvesters and the processor, that arrangement cannot be confirmed through publicly available data. One might assume that processors are in a position to impose a greater share of the cost on harvesters, either through negotiated direct payment or through reduced ex-vessel payments, due to the inelastic nature of groundfish supply. On the other hand, one must also consider the fact that harvesters and processors develop relationships that span multiple years, and that onerous deals could drive deliveries to another plant.

[14] http://alaskafisheries.noaa.gov/sustainablefisheries/observers/2015standardprices.xlsx. Those standard prices are also noticed in the Federal Register at 78 FR 73842.

An LLP license holder may assign the LLP license with rockfish QS to a rockfish cooperative of their choice each year. The rockfish cooperative then receives annual cooperative fishing quota (CQ) for the primary and secondary species that are associated with the member's LLP license. The rockfish cooperative fishing season is authorized May 1 through November 15 of each year. Halibut PSC is also allocated to participants based on historic halibut mortality rates in the primary rockfish species fisheries. Shore-based processors receiving landings of rockfish CQ must be located within the boundaries of the City of Kodiak. Members of the Rockfish Program are also subject to sideboard limits that restrict their activity in fisheries outside the program.

1.3.1.7.1 Cooperatives

As of 2016, two CP Rockfish Program cooperatives and seven CV Rockfish Program cooperatives are participating in the program (Table 1-9). The two CP Rockfish Program cooperatives had a total of 11 LLP groundfish licenses associated with the cooperative and 10 member vessels. The seven CV Rockfish Program cooperatives had a total of 47 member licenses and 43 member vessels. The CV Rockfish Program cooperatives ranged in size from two member vessels to 11 member vessels and from two licenses to 12.

Membership in the Rockfish Program cooperatives is stable. Between 2015 and 2016 only one vessel and its associated license changed its cooperative affiliation. That vessel moved from the OBSI Rockfish Cooperative to the I.S.A. Rockfish Cooperative.

Table 1-9 GOA Rockfish Program Cooperatives in 2016

Rockfish Program Cooperative	Member Licenses	Member Vessels
CP Total	**11**	**10**
FCA COOPERATIVE	3	3
GULF OF ALASKA ROCKFISH BEST USE COOPERATIVE	8	7
CV Total	**47**	**43**
GLOBAL ROCKFISH COOPERATIVE	3	3
I.S.A. ROCKFISH COOPERATIVE	6	6
NORTH PACIFIC ROCKFISH COOPERATIVE	12	11
OBSI ROCKFISH COOPERATIVE	7	5
PACIFIC ROCKFISH COOP	2	2
STAR OF KODIAK ROCKFISH COOPERATIVE	11	10
WESTERN ALASKA FISHERIES ROCKFISH COOP	6	6
All Cooperatives Total	**58**	**53**

Source: NOAA Fisheries Service, Alaska Region, Restricted Access Management, March 16, 2016

The vessels and license associated with each CP Rockfish Program cooperative in 2016 are listed in Table 1-10. The table is a list of vessels and licenses; it is not meant to imply that the license that is on the same row as the vessel is actually attached to that vessel, because the RP quota is assigned to the license and licenses may be to a different vessel through a transfer request submitted to and approved by NMFS.

Table 1-11 provides the list of vessels and LLP groundfish licenses associated with each CV Rockfish Program cooperative in 2016. This information in presented in the same manner as the CP table, above.

Table 1-12 provides a count of the number of vessels that actively fished Rockfish Program cooperative quota in each year since the inception of the Rockfish Pilot Program. The table reflects the fact that not every license/vessel that holds quota and is enrolled in a cooperative participates in the fishery. This stands as an

example of how a cooperative, quota-based program might lead to fewer vessels fishing. However, the issuance of Rockfish Program quota was based on historical years that reflected a derby-style fishery that featured some over-capacity. The cooperatives' decision to fish quota on a subset of the eligible vessels creates harvest efficiency and generates economic rents, which may be shared amongst all cooperative members. The effect of reduced fleet size on captains and crew depends on what the inactive Rockfish Program vessels decide to do in lieu of fishing for Central GOA rockfish, as they could redirect effort into other GOA, BSAI, or west coast fisheries. All cooperative members that share in the fishery's rents benefit on a per-unit-of-catch basis as the value of rockfish catch has increased under the program.

Table 1-10 Vessels and Licenses in CG Rockfish Program catcher/processor cooperatives, 2016

Vessels		Licenses	
FCA COOPERATIVE			
ALASKA SPIRIT	3819	ALASKA SPIRIT, INC.	3043
ALASKA VICTORY	4093	ALASKA VICTORY, INC.	2080
ALASKA WARRIOR	3423	THE FISHING COMPANY OF ALASKA, II	2083
GULF OF ALASKA ROCKFISH BEST USE COOPERATIVE			
AMERICAN NO I	1879	U.S. FISHING, L.L.C.	3662
CAPE FLATTERY	4053	UNIMAK VESSEL, LLC	3957
UNIMAK	3369	ALASKA LEGACY, LLC	1802
LEGACY	3367	AMERICAN SEAFOODS CO LLC.	3838
SEAFISHER	3835	CAPE FLATTERY WASHINGTON LLC	4360
SEAFREEZE AMERICA	34249	M/V SAVAGE, INC.	2014
US INTREPID	2800	NORTH PACIFIC FISHING, INC.	2028
		SEAFREEZE AMERICA LLC.	2905

Source: NOAA Fisheries Service, Alaska Region, Restricted Access Management, March 16, 2016

Table 1-11 Vessels and Licenses in CG Rockfish Program catcher vessel cooperatives, 2016

Vessels		Licenses	
GLOBAL ROCKFISH COOPERATIVE			
LESLIE LEE	1234	FUTURA FISHERIES, INC.	2565
PACIFIC STORM	32645	LESLIE LEE, INC.	1183
VANGUARD	519	PACIFIC STORM FISHERIES, LLC	2882
I.S.A. ROCKFISH COOPERATIVE			
CHELLISSA	6222	CHELLISSA FISHERIES, LLC	1554
GREEN HOPE	685	GREEN HOPE LLC	2188
LAURA	1571	LAURA FISHERIES JOINT VENTURE	3665
MAR DEL NORTE	435	MAR PACIFICO, INC.	2696
MAR PACIFICO	1674	MARTIN FISHERIES, INC	2683
OCEAN HOPE 3	1623	NORTHERN SEA FISHERIES, LLC	1841
NORTH PACIFIC ROCKFISH COOPERATIVE			
ANTHEM	32761	ALASKA BEAUTY LLC	1590
TOPAZ	405	ALASKA WIND, LLC	2653
ALASKA BEAUTY	2046	CHANDLER FISHERIES, INC.	2535
ALASKA WIND	2076	GOLDEN WEST FISHERIES, INC.	2973
ALASKAN	2010	MAGIC FISH CO.	1541
CAPT'N ART	1945	NICOLE FISHERIES, LLC	2487
CARAVELLE	3402	DAWN FISHERIES, LLC	2165
DAWN	5	ENTERPRISE FISHERIES, LLC	1755
ENTERPRISE	2579	M/V DEFIANT, INC.	3496
NICOLE	4037	PELAGIC RESOURCES, INC.	3764
SEA MAC	1043	SEA MAC SEAFOODS, LLC	3785
		THOMAS A TORMALA	2148
OBSI ROCKFISH COOPERATIVE			
TAASINGE	912	BAY ISLANDER FISHERIES, INC	3504
BAY ISLANDER	1193	MARATHON FISHERIES, INC.	4465
MARATHON	1191	NEW LIFE FISHERIES, INC	1367
NEW LIFE	6182	NEW LIFE FISHERIES, INC	5201
PACIFIC STAR	2781	DEFIANT FISHERIES, INC.	2603
		HERMAN HAGGREN, INC.	2603
		PAC STAR, INC.	4852
PACIFIC ROCKFISH COOP			
PACIFIC FUTURE	13589	LOUGHBEG FISHERIES, INC	1619
STELLA	7079	PACIFIC FUTURE, LLC	4851
STAR OF KODIAK ROCKFISH COOPERATIVE			
CAPE KIWANDA	1235	OCEAN STORM FISHERIES, INC.	3658
PACIFIC RAM	4305	TRAVELER FISHERIES LLC	3463
ARCTIC RAM	523	TRIDENT SEAFOODS CORPORATION	2567
EXCALIBUR II	410	B & N FISHERIES COMPANY	3594
MARCY J	2142	BLACK SEA FISHERIES, INC.	2550
MICHELLE RENEE	4131	DAVID DAHL	2319
OCEAN STORM	5000	EXCALIBUR II, LLC	3521
PEGGY JO	979	JJL FISHERIES LLC	2278
ROSELLA	2861	ROSELLA INC	2364
TRAVELER	3404	ROYAL VIKING, INC.	2636
		TRIDENT SEAFOODS CORPORATION	3144
WESTERN ALASKA FISHERIES ROCKFISH COOP			
ELIZABETH F	823	COLLIER BROTHERS, LLC	1523
COLLIER BROTHERS	2791	ELIZABETH F, INC.	1271
GOLD RUSH	1868	ELIZABETH F, INC.	1273
HICKORY WIND	993	EVENING STAR, INC.	3600
PROGRESS	512	F/V GOLD RUSH FISHERIES LLC	3987
WALTER N	825	PROGRESS FISHING, LLC	3896

Source: NOAA Fisheries Service, Alaska Region, Restricted Access Management, March 16, 2016

Table 1-12 Number of active vessels in the Central GOA Rockfish Program

	CV	CP
2007	27	0
2008	27	7
2009	26	8
2010	27	4
2011	25	4
2012	28	5
2013	29	5
2014	28	5
2015	28	4

Source: AKFIN summary of NMFS CAS data.
Note: CPs were eligible for the Rockfish Pilot Program in 2007, but chose to fish in the Limited Access sector of the program, thus vessels were not flagged in CAS data as occurring under the program. The owners of CP vessels were concerned that the small quantity of secondary species allocated to the sector under the program as a hard cap would close entire sector if it were under a jointly liable cooperative. Relatively high levels of CP participation in the Limited Access portion of the RP fishery during the early years of the program spurred the sector to form cooperatives to manage catch under the allocated quota amounts and ensure that the fishery remain open.

1.3.1.7.2 Primary Species Quota Allocations

Table 1-13 shows the percentage of each Rockfish Program primary species that was allocated to a cooperative. The percentages were calculated based on the initial amount of quota shares allocated to a LLP groundfish license and the cooperative those LLP licenses were assigned to in 2016. The information in the table indicates that approximately 40% of each primary species was assigned to CP cooperatives and 60% was assigned to CV cooperatives. The FCA CP cooperatives was more dependent on Pacific Ocean perch and the GOA Rockfish Best Use Cooperative was more dependent on Northern rockfish and pelagic shelf rockfish. CV cooperatives, in general, were issued similar percentages of each of the primary species.

Table 1-13 Rockfish Program initial allocations of primary species by license associated with a cooperative in 2016

Rockfish Program Cooperative	Northern Rockfish	Pacific Ocean Perch	Pelagic Shelf Rockfish
CP	**40.83%**	**40.03%**	**38.43%**
FCA COOPERATIVE	13.27%	25.24%	7.67%
GULF OF ALASKA ROCKFISH BEST USE COOPERATIVE	27.56%	14.79%	30.76%
CV	**59.17%**	**59.97%**	**61.57%**
GLOBAL ROCKFISH COOPERATIVE	0.75%	4.10%	1.08%
I.S.A. ROCKFISH COOPERATIVE	9.02%	9.39%	8.92%
NORTH PACIFIC ROCKFISH COOPERATIVE	10.71%	10.50%	12.98%
OBSI ROCKFISH COOPERATIVE	10.71%	8.02%	11.31%
PACIFIC ROCKFISH COOP	2.82%	2.63%	2.35%
STAR OF KODIAK ROCKFISH COOPERATIVE	19.06%	15.18%	19.31%
WESTERN ALASKA FISHERIES ROCKFISH COOP	6.10%	10.14%	5.61%
Total	**100.00%**	**100.00%**	**100.00%**

Note: Pelagic Shelf Rockfish is almost exclusively Dusky Rockfish
Source: NOAA Fisheries Service, Alaska Region, Restricted Access Management, March 16, 2016

1.3.1.7.3 PSC Rollovers

The regulations and structure for PSC rollovers to and from the Rockfish Program are described in Section 1.3.1.5.1 for Chinook salmon and Section 1.3.1.5.2 for halibut.

1.3.1.8 Pollock Trip Limits

Regulations at §679.7(b)(2) establish trip limits for pollock in the Western and Central GOA. Pollock trip limits were established in order to protect Steller sea lions by temporally dispersing the GOA pollock fishery, thus reducing competition for prey species between the fishery and the marine mammals. Trip limits reduced daily

pollock catch in areas that were in close proximity to foraging Steller sea lions. The Final Rule, published in 2009, prohibits a CV from landing more than 300,000 lb. (136 mt) of unprocessed pollock during a calendar day, and from landing a cumulative amount of unprocessed pollock in any GOA reporting area that exceeds 300,000 lb. multiplied by the number of calendar days that the pollock fishery was open to directed fishing. Tender vessels are not allowed to carry more than 600,000 lbs. of unprocessed pollock.

1.3.1.9 Sideboard limits

As the Council has developed Limited Access Privilege Programs throughout the Alaska region, it has established sideboard limitations on vessels or license holders who benefit from those programs. Sideboards limit the ability of vessels that participate in rationalized fisheries to exceed their historical level of participation in other non-rationalized fisheries. Without such limits, a vessel operator could expand his or her participation in a limited access fishery while suffering no lost opportunity in the LAPP fishery, thus exacerbating the race for fish in those non-rationalized fisheries. To date, sideboards have been established for participants in the AFA, Amendment 80, and Central GOA Rockfish Program fisheries. This section describes those sideboard limits in the context of the GOA trawl groundfish fisheries.

1.3.1.9.1 American Fisheries Act (AFA)

Regulations prohibit AFA CPs from harvesting or processing groundfish in the GOA. AFA CVs that possess a GOA trawl endorsement on their LLP license fall into two categories: (1) those exempted from AFA GOA sideboard limits and (2) those subject to AFA GOA groundfish sideboard limits.

AFA CVs that are less than 125 ft. (38.1 m) LOA and that harvested fewer than 5,100 mt of BSAI pollock and made 40 or more landings of GOA groundfish from 1995 through 1997 are exempt from GOA groundfish CV sideboard directed fishing closures.

In aggregate, sideboarded AFA CVs cannot harvest a larger proportion of GOA groundfish, by species or species group, than the amount that was retained by non-exempt AFA CVs from 1995 through 1997. The Regional Administrator manages groundfish harvest limits[15] and PSC bycatch limits[16] for non-exempt AFA catcher vessels using directed fishing closures.

Table 1-14 shows the total number of AFA-derived CV LLP licenses by GOA area endorsement and GOA sideboard exemption status. The information in the table indicates that there are 38 AFA-derived licenses endorsed to fish at least one GOA area with trawl gear. A little less than half of the licenses (18) are exempt from the GOA sideboard limits based on their 1995 through 1997 catch history.

[15] https://alaskafisheries.noaa.gov/sites/default/files/16_17goatable18.pdf
[16] https://alaskafisheries.noaa.gov/sites/default/files/16_17goatable20.pdf

Table 1-14 AFA derived CV LLP licenses, based on 2016 data

		GOA AFA Sideboard		
WG Endorsements	CG Endorsememts	Non-Exempt	Exempt	Total
None	None	54		54
None	Non-trawl	1		1
Non-Trawl	None	5		5
Non-Trawl	Non-trawl	3		3
Total: No GOA trawl Endorsement		63	0	63
None	Non-trawl; Trawl	3	5	8
None	Trawl	6	1	7
Non-Trawl	Non-trawl; Trawl	1		1
Non-Trawl & Trawl	None	2		2
Non-Trawl & Trawl	Non-trawl	2		2
Non-Trawl & Trawl	Non-trawl; Trawl	1	6	7
Trawl	None	4		4
Trawl	Trawl	1	6	7
Total: GOA Trawl Endorsed		20	18	38
Total		83	18	101

Source: 2016 RAM LLP data and 2016 AFA permit data.

1.3.1.9.2 Amendment 80 (Am 80)

Table 31 to Part 679 of Alaska's Federal fisheries regulations lists 28 vessels and groundfish LLP licenses that were originally assigned to an Amendment 80 vessel. The July 13, 2016 RAM data base lists 26 Amendment 80 LLP licenses that are currently assigned to a vessel, and three were not assigned to a vessel. The two licenses that are not listed as derived from Amendment 80 are LLG3741 and LLG3714. These licenses are assigned to vessels, but are not eligible for the CP sector allocations under the proposed program since they are not attached to a vessel that is eligible for the Amendment 80 fishery. The 26 LLP license that are listed as Amendment 80 derived licenses are reported in Table 1-15. A total of 22 licenses have a GOA trawl endorsement and nine of the licenses are assigned to vessels that are GOA flatfish eligible. In recent years, roughly four of these vessels are used to fish flatfish in the GOA.

Table 1-15 Amendment 80 LLP licenses as reported in 2016 RAM LLP license data

		GOA Flatfish Eligible		
WG Endorsements	CG Endorsememts	No	Yes	Total
No GOA Endorsement		4	0	4
None	Non-trawl; Trawl		1	1
None	Trawl	1	1	2
Non-Trawl	Non-trawl; Trawl	1		1
Non-Trawl & Trawl	Non-trawl; Trawl		1	1
Trawl	None	5	2	7
Trawl	Trawl	6	4	10
Total: GOA Trawl Endorsed		13	9	22
Total		17	9	26

Note Two vessels were listed as flatfish eligible but were not assigned a LLP license at the time the license data were queried.
Source: RAM LLP licenses file dated July 13, 2016 and Table 39 to Part 679.

Amendment 80 vessels are also subject to halibut PSC sideboard limits in the GOA. Those PSC limits are shown in Table 1-8, and are based on the overall 2016 GOA trawl halibut PSC limits.

1.3.1.9.3 Central GOA Rockfish Program (RP)

Sideboards limits were established for CPs that participate in the Rockfish Program, but not for RP CVs. The purpose of the sideboards is to prevent RP CPs from gaining a competitive advantage in other GOA trawl fisheries by expanding beyond their historical participation in non-rationalized fisheries. In the absence of sideboards, RP CPs would be able to focus effort in non-rationalized fisheries until they are closed – thereby dissipating rents from other participants in those fisheries – and would not give up any opportunity to catch their Central GOA rockfish allocation. The CP sideboards restrict the amount of halibut PSC that RP CPs may use in other GOA trawl fisheries[17], and the amount of primary rockfish species that CPs may harvest in GOA areas outside of the Central GOA (Western GOA and West Yakutat)[18]. A summary of those sideboard limits for 2016 are presented in Table 1-16. 2016 sideboard limits for RP CPs are presented at the cooperative level, because that is how the limits are applied.

Table 1-16 CP 2016 Rockfish Program sideboard limits

Group Name	Species Group	Area	Sideboard Percentage	Total CP Sideboard Limit (mt)[1]	Sideboard Limit (mt)
FCA Cooperative	Deep-Water Halibut PSC[2]	GOA	21.91	43	9.343
	Shallow-Water Halibut PSC[3]	GOA	0.00	2	0.000
	Pacific Ocean Perch	WY	0.00	Confidential	0.000
	Pacific Ocean Perch	WG	61.49	1,385	851.602
	Dusky Rockfish	WY	0.00	Confidential	0.000
	Dusky Rockfish	WG	92.31	125	115.464
	Northern Rockfish	WG	87.89	340	298.414
Gulf of Alaska Rockfish Best Use Cooperative	Deep-Water Halibut PSC[2]	GOA	78.09	43	33.307
	Shallow-Water Halibut PSC[3]	GOA	100.00	2	1.706
	Pacific Ocean Perch	WY	100.00	Confidential	Confidential
	Pacific Ocean Perch	WG	38.51	1,385	533.320
	Dusky Rockfish	WY	100.00	Confidential	Confidential
	Dusky Rockfish	WG	7.69	125	9.615
	Northern Rockfish	WG	12.12	340	41.137

[1]https://alaskafisheries.noaa.gov/sites/default/files/16_17goatable23.pdf; and
https://alaskafisheries.noaa.gov/sites/default/files/16_17goatable25.pdf

[2]The deep-water halibut PSC sideboard limit includes all halibut PSC used: (1) during July in the WG and WY District when fishing flatfish OR rockfish in the deep-water complex; (2) by cooperatives in the Central GOA ONLY when vessels are fishing flatfish in the deep-water complex and are checked-out and not fishing under their cooperative quota permit.

[3]The shallow-water halibut PSC sideboard limit includes all halibut PSC used during July in the Central GOA, WG, and WY district when fishing flatfish in the shallow-water complex.

1.3.1.9.4 Crab Rationalization

The Crab Rationalization Program implemented GOA groundfish sideboard limits for non-AFA Crab Rationalization Program vessels. Sideboard limits for 2016 are presented in Table 21 of the GOA groundfish

[17] https://alaskafisheries.noaa.gov/sites/default/files/16_17goatable25.pdf
[18] https://alaskafisheries.noaa.gov/sites/default/files/16_17goatable23.pdf

specifications[19]. These limitations do not apply to AFA CVs since that program had already implemented GOA sideboards for those vessels.

1.3.1.10 Stand-downs for Vessels Moving Between Areas

The final rule for the following stand down requirements was implemented on September 8, 1998. In September 1998, NMFS implemented a final rule establishing stand-down requirements for vessels leaving the BSAI to fish in the GOA, and vice versa. Vessels transiting from the Western Regulatory Area to the BSAI are subject to a 3-day stand down requirement. Vessels transiting from the Central Regulatory Area to the BSAI are subject to a 2-day stand down. In addition, vessels are required to offload all fish caught in one GOA area before deploying trawl gear in another GOA regulatory area. Vessels may not deploy trawl gear until the third day after the date on which offloading was completed. The stand down requirement is not applied to vessels engaged in Community Development Quota (CDQ) fishing in the BSAI.

Stand down regulations were initially implemented to better manage the fisheries, so TACs were not exceeded. The difficulty of managing the pollock fishery in the Western Regulatory Area was demonstrated in 1997 during the September 1 opening of the C season. On September 4, 1997, NMFS announced a closure of the fishery effective September 7, 1997, based on the observed level of effort in the Western Regulatory Area. Once the closure date was announced, a large number of Bering Sea-based vessels entered the GOA to participate in the final 2 days of the fishery. NMFS inseason managers did not anticipate this increase in effort because the Bering Sea pollock fishery was still open at that time and NMFS expected that Bering Sea-based vessels would continue to fish in the Bering Sea. Nevertheless, these Bering Sea-based vessels harvested approximately 7,000 mt of pollock from the Western regulatory Area in the final 2 days of the fishery. As a consequence of this unanticipated effort, the 1997 annual TAC of 18,600 mt for this area was exceeded by 8,017 mt – a 43 percent overage. In response to the difficulties associated with managing the pollock and Pacific cod fisheries of the Western and Central GOA Regulatory Areas, the Council developed the stand down requirement for CVs transiting between the two areas.

At the time, NMFS lacked a preseason vessel registration program to gauge potential effort in these fisheries prior to openings. During the 1990s, inseason catch information in these fisheries was neither timely nor accurate enough to allow adequate management. NMFS has since developed a vessel registration program, and the catch accounting system has been improved to be both timely and more accurate.

1.3.1.11 Exclusive CV Pollock Fishing Seasons

The Council recommended and NMFS implemented Steller sea lion management measures for the BSAI and GOA in 2001. That action included a variety of measures to slow the pace of the pollock fishery. One measure prohibits catcher vessels from fishing in both the GOA and BS during the same fishing season. Current regulations at 50 CFR §679.23(i) define prohibitions against CVs participating in certain directed pollock fisheries. These regulations do not pertain to catcher vessels that are less than 125 feet LOA when fishing east of 157° West longitude.

Vessels engaged in a BSAI pollock fishery during the A season (January 20 through June 10) are prohibited from fishing in a GOA pollock fishery until the C season (August 25 to October 1). CVs that participate in the BSAI pollock B season (June 10 through November 1) are prohibited from fishing in a GOA pollock fishery until the A season (January 20 through March 10) of the following year. CVs that fish in the GOA pollock A or B seasons

[19] https://alaskafisheries.noaa.gov/sites/default/files/16_17goatable21.pdf

(inclusive of January 20 through May 31) are prohibited from fishing in the BSAI pollock fishery until the following B season. CVs that fish during the GOA pollock C or D seasons (August 25 through November 1) are prohibited from fishing in the BSAI pollock fishery until the BSAI A season of the following year.

These regulations were implemented because management of the inshore pollock and Pacific cod fisheries had become increasingly difficult. The risk of harvest overruns had grown due to TAC amounts that are small relative to the potential fishing effort. The problem has been most acute in the Western Regulatory Area of the GOA, due to the constant potential that numerous large catcher vessels based in the Bering Sea could cross into the GOA to participate in pollock and Pacific cod openings that have relatively small TACs. GOA CVs were also concerned that the AFA program would provide greater opportunity for BSAI pollock vessels to participate in GOA fisheries.

1.3.1.12 Tendering Limitations

(NPFMC, 2013) described the tendering restrictions that are in place in the GOA (50 CFR §679.7(b)(3)). To slow the pace of the pollock fishery for Steller sea lion conservation, the tendering of pollock was restricted east of 157° W longitude. Tendering is allowed west of 157°W longitude because small CVs delivering to Sand Point and King Cove were dependent on tenders. Larger vessels that operated east of 157° W longitude deliver primarily to Kodiak shoreside processors, and they historically had not used tender vessels to deliver pollock. The restriction prohibited tender vessels from retaining more than 600,000 lbs. (272 mt) of unprocessed pollock that was harvested in the GOA. The intent of this limitation was to prevent large-scale use of tender vessels to circumvent the vessel trip limit.

1.3.1.13 No Chinook Salmon Retention Requirement in West Yakutat

Trawl vessels are not currently required to retain Chinook salmon PSC when fishing in the West Yakutat District. The Council's alternatives would add a requirement retain Chinook salmon harvested in that area. The additional retention could improve information on the quantity and origin of the Chinook salmon being taken as PSC in this area. The requirement would mirror regulations that were established for the Central and Western GOA under GOA FMP Amendments 93 and 97.

1.3.1.14 Prohibition on Targeting Pollock between November 1 and December 31

Since 1992, the GOA pollock TAC has been apportioned spatially and temporally to reduce potential impacts on Steller sea lions. When the Final Recovery Plan for Steller Sea Lions[20] was published in 1992, little was known about the location of Steller sea lions during the late fall and winter. Prior to the ESA listing of Steller sea lions (1977 through 1992), the pollock fishery was increasingly harvested by the US domestic fleet. The US fleet was in the process of replacing foreign/joint venture fleets, and was harvesting a greater percentage of the pollock fishery in the fall and winter to take advantage of the roe value.[21] GOA pollock seasons were established to disperse harvests over time. The details of the apportionment scheme have evolved over time, but the general objective is to allocate the TAC to management areas based on the distribution of surveyed biomass, and to establish three or four seasons between mid-January and autumn, during which a specified fraction of the TAC may be taken.

1.3.1.15 January 20th Trawl Fishery Start Date

NMFS published a rule in 1992 that implemented Amendment 24 to the GOA Groundfish FMP. One of the actions in that amendment package delayed the season opening date of the BSAI and GOA groundfish trawl fisheries to January 20 of each fishing year. The intent of the BSAI trawl season delay was to avoid the high PSC

[20] http://www.nmfs.noaa.gov/pr/pdfs/recovery/stellersealion1992.pdf
[21] http://courses.washington.edu/alisonta/pbaf590/pdf/stellar_sea_lions.pdf

rates of Chinook salmon and halibut that were experienced by the 1990 and 1991 BSAI trawl fisheries during the first 3 weeks of January. A concurrent delay of the GOA trawl fisheries was implemented to avoid a temporary influx of trawl effort into the GOA fisheries during the period when the BSAI trawl fisheries are closed. The analysis prepared for that measure noted that delaying the BSAI trawl fisheries would benefit fishermen that target roe-bearing pollock by waiting to open the fishery until roe quality improves, thus increasing value.

1.3.1.16 Voluntary Cooperative Structures in the Existing GOA Trawl Fishery

Industry-led efforts to work with NMFS and keep the trawl fleet operating within the constraints of TAC limits and bycatch hard caps have been occurring in the GOA since 2010, most notably among the trawl fleet that operates out of Kodiak and fishes in the Central GOA (Areas 620 and 630). Council staff has reached out to industry participants to describe their efforts, successes that they have achieved, challenges encountered (and the reasons for such), and the extent to which they feel that voluntary co-management efforts can meet the fishery's needs in the future.

Staff received a written response from the Alaska Groundfish Databank (AGDB), which is included in this document as Appendix 1. That submission has been lightly edited for copy, but essentially remains the words of the submitters. AGDB works closely with trawl harvesters and processors operating out of, and delivering to, Kodiak shoreside processing plants. AGDB also manages the seven Central GOA Rockfish Program CV cooperatives.

Trawl participants that deliver to Western GOA shoreside processing plants have a shorter track-record of developing voluntary cooperative measures, with the first attempts occurring in the most recent one or two fishing years and with varying levels of success. To date, representatives of the Western GOA trawl fleet have not provided a written summary of their efforts or outcomes, thus none are included in this document. The authors of this document emphasize that the request for submission was provided with relatively short notice prior to the publication of this draft, and staff are confident that they will be in communication with that fleet regarding their voluntary management efforts as the action develops further.

1.3.2 GOA Fisheries

This section describes harvest limits, harvested amounts, gross harvest value, and PSC levels in the GOA trawl fisheries. Information on ABCs, TACs, and total catch is provided because the amount of fish available to harvest in a given year varies depending on not only policy decisions but also biological factors. Historical data on catch – relative to the TAC – and catch value reflects the fact that certain fisheries are fully harvested while others close by regulation or by the attainment of PSC limits before the TAC is fully harvested.

1.3.2.1 Gulf of Alaska ABC, TAC, Catch

Three tables are presented in this section. Table 1-17 presents the ABCs for most GOA species and areas, broken out by whether they are defined as potential primary, secondary, or not allocated species in the proposed GOA trawl program. Species/areas not included in the table are primary Central GOA Rockfish Program species and species that were included in the old "other species" category (sculpins, squid, sharks, and octopus). Information shown in the table indicates that pollock ABCs have shown substantial increases from 2008 through 2016 (477% increase Gulf-wide). Arrowtooth flounder has shown the greatest decrease in ABC (over 40,000 mt, with most of the decrease occurring in the Central GOA). ABCs of other species presented have varied, but not to the extent of pollock and arrowtooth flounder.

Table 1-17 GOA acceptable biological catch 2008 through 2016

	species	area	2008	2009	2010	2011	2012	2013	2014	2015	2016
Primary Species	Pollock	Shumagin (610)	17,602	15,249	26,256	27,031	30,270	28,072	36,070	31,634	56,494
	Pollock	Chirikof (620)	19,181	14,098	28,095	37,365	45,808	51,443	81,784	97,579	124,927
	Pollock	Kodiak (630)	13,640	11,058	19,118	20,235	26,348	27,372	39,756	52,594	57,183
	Pollock	WYK (640)	1,517	1,215	2,031	2,339	3,244	3,385	4,741	4,719	9,348
	Pacific cod	W	25,932	21,567	27,685	30,380	28,032	28,280	32,745	38,702	40,503
	Pacific cod	C	37,901	31,521	49,042	53,816	56,940	49,288	53,100	61,320	49,312
	Pacific Ocean Perch	W	3,686	3,713	2,895	2,798	2,102	2,040	2,399	2,302	2,737
	Pacific Ocean Perch	WYK	1,100	1,108	2,004	1,937	1,692	1,641	1,931	2,014	2,847
	Northern Rockfish	W	2,141	2,054	2,703	2,573	2,156	2,008	1,305	1,226	457
	Dusky Rockfish (pelagic shelf rockfish)	W	1,003	819	650	611	409	377	317	296	173
		WYK	251	234	434	407	542	495	1,384	1,288	275
Secondary Species	Sablefish (trawl)	W	1,890	1,640	1,660	1,620	1,780	1,750	1,480	1,474	1,272
	Sablefish (trawl)	C	5,500	4,990	4,510	4,740	5,760	5,540	4,681	4,658	4,023
	Sablefish (trawl)	WYK	1,950	1,784	1,620	1,990	2,247	2,030	1,716	1,708	1,475
	Shortraker Rockfish	W	120	120	134	134	104	104	92	92	38
	Shortraker Rockfish	C	315	315	325	325	452	452	397	397	301
	Rougheye and Blackspotted Rockfish	W	125	125	80	81	80	81	82	115	105
	Rougheye and Blackspotted Rockfish	C	834	833	862	868	850	856	864	632	707
	Thornyheads	W	267	267	425	425	150	150	235	235	291
	Thornyheads	C	860	860	637	637	766	766	875	875	988
	Other Rockfish	W	357	357	212	212	44	44	1,031	1,031	1,534
	Other Rockfish	C	569	569	507	507	606	606			
	Big Skates	W	632	632	598	598	469	469	589	731	908
	Big Skates	C	2,065	2,065	2,049	2,049	1,793	1,793	1,532	1,257	1,850
	Longnose Skates	W	78	78	81	81	70	70	107	152	61
	Longnose Skates	C	2,041	2,041	2,009	2,009	1,879	1,879	1,935	2,090	2,513
Unallocated Goundfish Species	Atka Mackerel	GW	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700
	Other Skates	GW	2,104	2,104	2,093	2,093	2,030	2,030	1,989	2,235	1,919
	Shallow-water Flatfish	W	26,360	26,360	23,681	23,681	21,994	19,489	20,376	22,074	20,851
	Shallow-water Flatfish	C	29,873	29,873	29,999	29,999	22,910	20,168	17,813	19,297	19,242
	Shallow-water Flatfish	WYK	3,333	3,333	1,228	1,228	4,307	4,647	2,039	2,209	3,177
	Deep-water Flatfish	W	690	706	521	529	176	176	302	301	186
	Deep-water Flatfish	C	6,721	6,927	2,865	2,919	2,308	2,308	3,727	3,689	3,495
	Deep-water Flatfish	WYK	965	997	2,044	2,083	1,581	1,581	5,532	5,474	2,997
	Rex Sole	W	1,022	1,007	1,543	1,517	1,307	1,300	1,270	1,258	1,315
	Rex Sole	C	6,731	6,630	6,403	6,294	6,412	6,376	6,231	5,816	4,445
	Rex Sole	WYK	520	513	883	868	836	832	813	772	766
	Arrowtooth Flounder	W	30,817	30,148	34,773	34,317	27,495	27,181	31,142	30,752	28,183
	Arrowtooth Flounder	C	167,936	164,251	146,407	144,559	143,162	141,527	115,612	114,170	107,981
	Arrowtooth Flounder	WYK	15,245	14,908	22,835	22,551	21,159	20,917	37,232	36,771	37,368
	Flathead Sole	W	12,507	13,010	16,857	17,442	15,300	15,729	12,730	12,767	11,027
	Flathead Sole	C	28,174	29,273	27,124	28,104	25,838	26,563	24,805	24,876	20,211
	Flathead Sole	WYK	3,420	3,531	1,990	2,064	4,558	4,686	3,525	3,535	2,930

Source: NMFS annual harvest specifications tables

Notes: Hook-and-line sablefish, other groundfish, Rockfish Program quota species are excluded from this table. The ABC for sablefish includes all sablefish and is not trawl specific, but only trawl sablefish would be allocated under the proposed program.

Table 1-18 reports the TACs that were set for GOA species. TACs for pollock and rockfish species are typically set equal to the ABC.[22] The TACs for most other species is reduced from the ABC for economic or biological reasons.

[22] Inseason adjustments of the pollock TAC, in recent years, may result in the final pollock TAC differing from the ABC in that area.

Table 1-18 GOA total allowable catch 2008 through 2016

	species	area	2008	2009	2010	2011	2012	2013	2014	2015	2016
Primary Species	Pollock	Shumagin (610)	17,602	15,249	26,256	27,031	30,270	24,676	30,884	31,824	56,494
	Pollock	Chirikof (620)	19,181	14,098	28,095	37,365	45,808	52,963	84,274	96,013	124,927
	Pollock	Kodiak (630)	13,640	11,058	19,118	20,235	26,348	29,248	42,452	53,970	57,183
	Pollock	WYK (640)	1,517	1,215	2,031	2,339	3,244	3,385	4,741	4,719	9,348
	Pacific cod	W	19,449	16,175	20,764	22,785	21,024	21,210	22,922	27,091	28,352
	Pacific cod	C	28,426	23,641	36,782	40,362	42,705	36,966	39,825	45,990	36,984
	Pacific Ocean Perch	W	3,686	3,713	2,895	2,798	2,102	2,040	2,399	2,302	2,737
	Pacific Ocean Perch	WYK	1,100	1,108	2,004	1,937	1,692	1,641	1,931	2,014	2,847
	Northern Rockfish	W	2,141	2,054	2,703	2,573	2,156	2,008	1,305	1,226	457
	Dusky Rockfish (pelagic shelf rockfish)	W	1,003	819	650	611	409	377	317	296	173
		WYK	251	234	434	407	542	495	1,384	1,288	275
Secondary Species	Sablefish (trawl)	W	378*	324*	332*	324*	356*	350*	296*	295*	1,272
	Sablefish (trawl)	C	1,100*	998*	902*	948*	1,152*	1,108*	936*	932*	4,023
	Sablefish (trawl)	WYK	267*	227*	210*	407*	271*	261*	221*	220*	1,475
	Shortraker Rockfish	W	120	120	134	134	104	104	92	92	38
	Shortraker Rockfish	C	315	315	325	325	452	452	397	397	301
	Rougheye and Blackspotted Rockfish	W	125	125	80	81	80	81	82	115	105
	Rougheye and Blackspotted Rockfish	C	834	833	862	868	850	856	864	632	707
	Thornyheads	W	267	267	425	425	150	150	235	235	291
	Thornyheads	C	860	860	637	637	766	766	875	875	988
	Other Rockfish	W	357	357	212	212	44	44	1,031	1,031	1,534
	Other Rockfish	C	569	569	507	507	606	606			
	Big Skates	W	632	632	598	598	469	469	589	731	908
	Big Skates	C	2,065	2,065	2,049	2,049	1,793	1,793	1,532	1,257	1,850
	Longnose Skates	W	78	78	81	81	70	70	107	152	61
	Longnose Skates	C	2,041	2,041	2,009	2,009	1,879	1,879	1,935	2,090	2,513
Unallocated Goundfish Species	Atka Mackerel	GW	1,500	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
	Other Skates	GW	2,104	2,104	2,093	2,093	2,030	2,030	1,989	2,235	1,919
	Shallow-water Flatfish	W	4,500	4,500	4,500	4,500	13,250	13,250	13,250	13,250	13,250
	Shallow-water Flatfish	C	13,000	13,000	13,000	13,000	18,000	18,000	17,813	19,297	19,242
	Shallow-water Flatfish	WYK	3,333	3,333	1,228	1,228	4,307	4,647	2,039	2,209	3,177
	Deep-water Flatfish	W	690	706	521	529	176	176	302	301	186
	Deep-water Flatfish	C	6,721	6,927	2,865	2,919	2,308	2,308	3,727	3,689	3,495
	Deep-water Flatfish	WYK	965	997	2,044	2,083	1,581	1,581	5,532	5,474	2,997
	Rex Sole	W	1,022	1,007	1,543	1,517	1,307	1,300	1,270	1,258	1,315
	Rex Sole	C	6,731	6,630	6,403	6,294	6,412	6,376	6,231	5,816	4,445
	Rex Sole	WYK	520	513	883	868	836	832	813	772	766
	Arrowtooth Flounder	W	8,000	8,000	8,000	8,000	14,500	14,500	14,500	14,500	14,500
	Arrowtooth Flounder	C	30,000	30,000	30,000	30,000	75,000	75,000	75,000	75,000	75,000
	Arrowtooth Flounder	WYK	2,500	2,500	2,500	2,500	6,900	6,900	6,900	6,900	6,900
	Flathead Sole	W	2,000	2,000	2,000	2,000	8,650	8,650	8,650	8,650	8,650
	Flathead Sole	C	5,000	5,000	5,000	5,000	15,400	15,400	15,400	15,400	15,400
	Flathead Sole	WYK	3,420	3,531	1,990	2,064	4,558	4,686	3,525	3,535	2,930

Source: NMFS annual harvest specifications tables

Notes: The reported pollock TAC is the final TAC and may have been adjusted during the fishing year which accounts for the difference from the ABC in recent years. Hook-and-line sablefish, other groundfish, Rockfish Program quota species are excluded from this table

* Trawl only. 2016 data shows the total TAC set for both hook-and-line and trawl sablefish.

Table 1-19 shows the total reported catch of the GOA species from 2008 through 2015. Data for 2016 is not included because the fishing year had not been completed when the data were compiled. Catch data provides one measure of the importance of each species to harvesters and processors by area. For example, the pollock and Pacific cod fisheries are important in both Western GOA and Central GOA. Flatfish species are generally important to Central GOA fishermen and processors, but less important to Western GOA fishermen and processors. As will be discussed later in this document, that finding is more evident for CV operations.

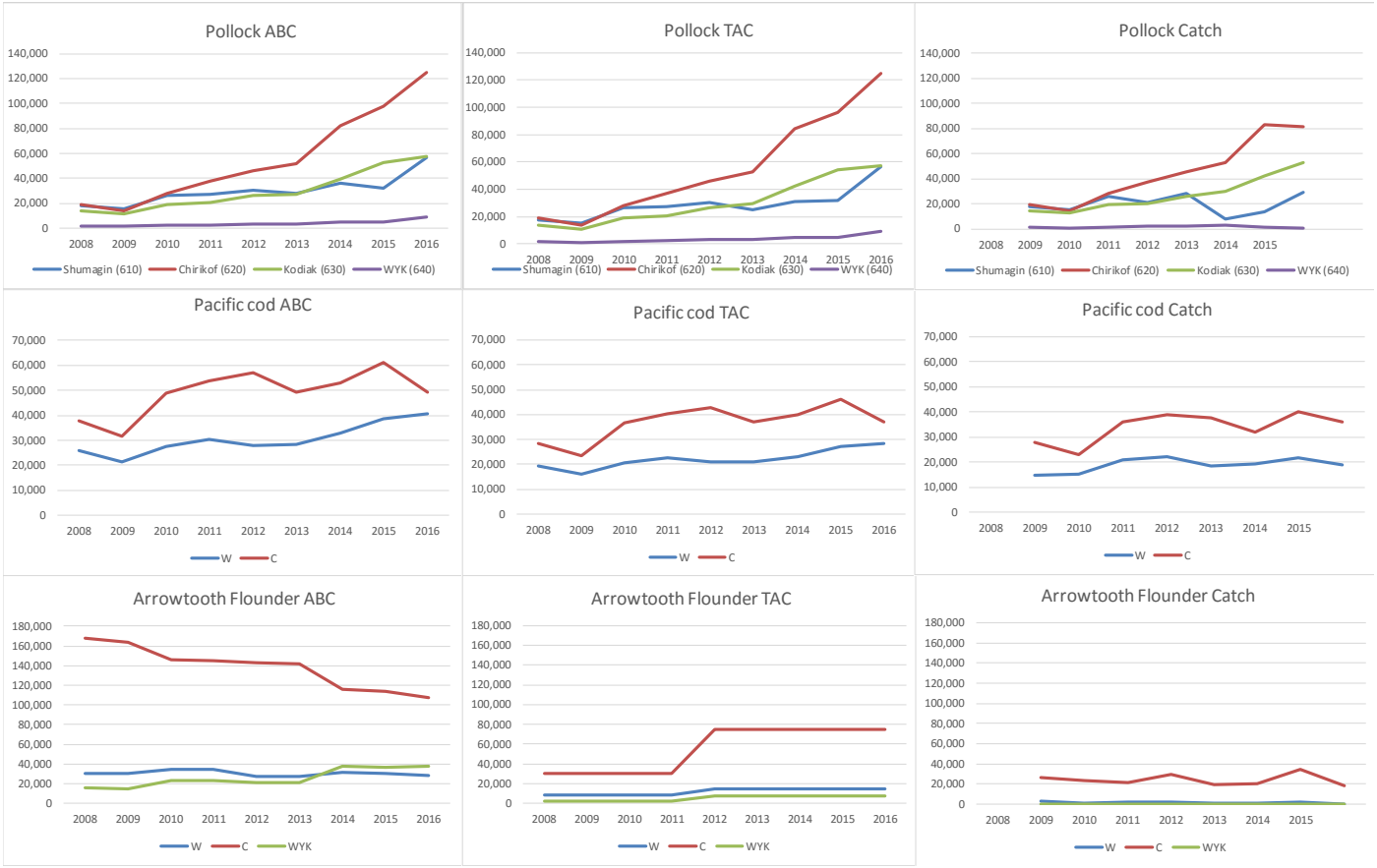
Table 1-19 Reported GOA catch 2008 through 2015

	species	area	2008	2009	2010	2011	2012	2013	2014	2015
Primary Species	Pollock	Shumagin (610)	17,260	15,079	26,051	20,597	27,893	7,711	13,364	28,739
	Pollock	Chirikof (620)	19,070	14,000	28,249	37,248	45,097	53,114	83,082	81,431
	Pollock	Kodiak (630)	14,456	12,469	19,134	19,731	25,986	29,963	42,496	52,644
	Pollock	WYK (640)	1,161	83	1,627	2,271	2,381	2,940	1,317	250
	Pacific cod	W	14,882	15,232	21,008	22,317	18,352	19,247	21,685	18,991
	Pacific cod	C	27,951	23,102	36,095	39,045	37,766	31,998	40,210	36,180
	Pacific Ocean Perch	W	3,678	3,804	3,141	1,819	2,452	447	2,096	2,038
	Pacific Ocean Perch	WYK	1,100	1,148	1,780	1,870	1,682	1,537	1,871	1,981
	Northern Rockfish	W	1,903	1,945	2,038	1,742	1,817	2,175	853	979
	Dusky Rockfish (pelagic shelf	W	566	717	535	367	435	217	139	184
	rockfish)	WYK	195	177	76	58	2	4	87	2
Secondary Species	Sablefish (trawl)	W	138*	93*	40*	54*	62*	13*	61*	43*
	Sablefish (trawl)	C	635*	668*	715*	925*	733*	660*	752*	804*
	Sablefish (trawl)	WYK	90*	128*	135*	109*	66*	173*	152*	212*
	Shortraker Rockfish	W	134	152	72	82	90	37	76	47
	Shortraker Rockfish	C	238	191	132	245	306	449	326	261
	Rougheye and Blackspotted Rockfish	W	75	76	89	26	28	15	25	46
	Rougheye and Blackspotted Rockfish	C	188	98	213	368	371	384	540	348
	Thornyheads	W	273	235	140	159	172	304	244	234
	Thornyheads	C	309	2,007	278	303	344	540	667	587
	Other Rockfish	W	300	403	365	303	255	202	889	1,056
	Other Rockfish	C	439	398	429	359	723	476		
	Big Skates	W	133	77	148	110	66	121	157	233
	Big Skates	C	1,241	1,898	2,220	2,111	1,902	2,320	1,411	1,228
	Longnose Skates	W	34	79	105	71	39	90	59	138
	Longnose Skates	C	966	1,072	846	892	793	1,255	1,159	1,176
Unallocated Goundfish Species	Atka Mackerel	GW	2,112	2,224	2,417	1,615	1,188	1,277	1,042	1,228
	Other Skates	GW	1,395	1,352	1,491	1,349	1,202	1,879	1,914	1,774
	Shallow-water Flatfish	W	762	97	84	124	153	155	246	274
	Shallow-water Flatfish	C	8,958	8,386	5,449	3,870	3,961	5,362	4,499	3,083
	Shallow-water Flatfish	WYK	0	1	1	0	0	1	2	1
	Deep-water Flatfish	W	13	8	3	13	1	20	68	54
	Deep-water Flatfish	C	556	454	532	445	255	215	277	195
	Deep-water Flatfish	WYK	1	4	6	7	3	3	5	2
	Rex Sole	W	185	342	134	131	215	104	126	76
	Rex Sole	C	2,522	4,410	1,498	2,745	2,228	3,603	3,450	1,881
	Rex Sole	WYK	0	1	1	1	0	0	1	0
	Arrowtooth Flounder	W	3,172	1,497	2,387	1,678	1,229	806	1,897	562
	Arrowtooth Flounder	C	26,043	23,312	21,512	29,123	19,274	20,717	34,328	18,439
	Arrowtooth Flounder	WYK	24	50	90	140	21	41	52	37
	Flathead Sole	W	297	303	462	393	277	588	219	199
	Flathead Sole	C	3,149	3,358	3,392	2,336	1,890	2,228	2,336	1,800
	Flathead Sole	WYK	0	1	0	0	0	0	1	1

Source: NMFS annual catch reports:
Note: Hook-and-line sablefish, other groundfish, Rockfish Program quota species are excluded from this table
* Trawl only

Figure 1-2 focuses on the three GOA species that account for the majority of GOA trawl groundfish harvest. The data displayed in the figure are the same as reported in the tables above. The pollock charts show that both the ABC/TAC (typically set equivalent to each other) and catch have increased over the years considered. The greatest increase has occurred in area 620, but areas 610 and 630 have also realized substantial increases. Pollock availability has had a substantial impact on GOA fishery value in recent years. Because pollock biomass fluctuates, it is anticipated that pollock TACs could decrease from these historically high levels in the future.

Figure 1-2 GOA Pollock, Pacific cod, and Arrowtooth flounder ABC, TAC, and catch, 2008 through 2016



Source: NMFS annual harvest specifications and catch reports

Pacific cod ABCs and TACs have not fluctuated as much as the pollock ABCs and TACs. Available Pacific cod harvest is divided between the trawl, pot, hook-and-line, and jig gear sectors[23], so the entire Pacific cod TAC is not available to trawl gear vessels. Also, note that the Pacific cod TAC is set as a reduced portion of the ABC, unlike pollock where the ABC and TAC are typically set equal.

The arrowtooth flounder charts reflect different trends and management decisions. The ABC has declined steadily in the Central GOA. ABCs in the Western GOA and West Yakutat District are less than that of the Central GOA, but have been relatively steady over the period considered. TAC for arrowtooth flounder has always been set lower than the ABC because the species has either had limited markets or the fishery was constrained by PSC limits. However, as markets developed for arrowtooth flounder, the TAC has been increased so that the fleet's harvest, which does not approach the ABC, would not exceed the catch limit.

1.3.2.2 Harvest by Target Fishery

Information in this section is presented by target fishery. That means the catch of all species caught in a target fishery is aggregated. Presenting the information in this manner allows the reader to understand the catch and value that occurs in the pollock target fishery, for example, but not the value of all pollock harvested. Given that the fishery is currently managed by opening and closing target fisheries, the information provides insights into the value of each fishery.

[23] https://alaskafisheries.noaa.gov/sites/default/files/16_17goatable5.pdf

When considering allocations to cooperatives later in the document, individual species will be considered and not target fisheries. It is understood, based on discussion by the Council, that when species are allocated based on catch history it is appropriate to make those allocations at the species level, and that allocation will be based on the retained catch of all a species, whether taken as directed or incidental catch in a target fishery.

1.3.2.2.1 Catcher vessels delivering to shorebased processors

Table 1-20 shows the GOA trawl catch by target fishery. The table excludes catch made under the RP. Rockfish species catches that are reported for 2003 through 2006 are primarily species that are now allocated under the RP, but these catches were made prior to the Rockfish Pilot Program being implemented. The bottom portion of the table shows the number of catcher vessels that made deliveries to shorebased processors by year and target fishery. Pollock, Pacific cod, arrowtooth flounder, and shallow-water flatfish have the greatest number of vessels participating, in recent years. All other fisheries, except rex sole, had too few vessels participating to report their catch in most years.

Table 1-20 Annual GOA wide catcher vessel trawl retained catch by target fishery, 2003 through 2015 (mt)

Year	Arrowtooth Flounder	Deep Water Flatfish	Flathead Sole	Other Species	Pacific Cod	Pollock	Rex Sole	Rockfish	Sablefish	Shallow Water Flatfish	Total
	Metric Tons of Retained Catch Delivered to Shorebased Processors										
2003	904	487	1,136	944	13,565	48,540	*	12,188	*	5,149	82,941
2004	6,092	793	243	392	13,571	62,484		10,874		2,412	96,862
2005	7,578	151	*	*	11,305	81,639		8,972	*	5,476	115,186
2006	11,243	*	*		9,111	72,454		8,225	*	8,378	109,711
2007	11,238	*	85	*	11,826	51,384		*	*	9,986	84,935
2008	14,532	*	446	*	16,312	48,907	85	*		10,622	91,468
2009	13,184	*	347	*	7,144	39,023	655			11,995	72,411
2010	12,580	175	868	*	15,838	75,336	*	*		6,631	112,254
2011	17,764	*	228	*	12,434	79,023	*	*	*	2,919	113,632
2012	9,055		*	*	17,320	99,638	*	265		4,029	130,891
2013	12,211	*	*	*	18,081	91,665	717		*	4,403	127,195
2014	12,647	*	*		18,579	141,008	735			3,101	176,607
2015	7,514				19,386	163,100	*	*	*	1,623	191,925
	Distinct Count of Catcher Vessels Delivering to Shorebased Processors										
2003	7	9	15	15	68	73	3	35	1	28	93
2004	23	7	11	4	62	68		32		25	77
2005	23	3	3	1	66	66		25	1	19	78
2006	23	1	7		57	65		25	1	24	73
2007	23	2	4	1	60	59		1	1	27	72
2008	30	1	7	4	64	61	3	1		30	72
2009	27	1	6	5	59	62	6			30	71
2010	25	3	9	2	52	63	2	2		24	67
2011	29	1	8	1	52	62	2	2	1	19	68
2012	22		3	1	61	67	2	3		27	70
2013	21	2	1	1	53	64	7		1	25	69
2014	17	1	2		53	68	5			17	69
2015	16				52	62	2	1	1	8	68
Total vessel count	47	17	35	22	110	100	17	42	6	53	124

Source: AKFIN summary of NMFS CAS data.
Note: Excludes RP catch for years after the Rockfish Pilot Program was implemented.

Table 1-21 provides the same type of information that was presented in Table 1-20 except the information is limited to catch from the Western GOA. Small amounts of catch taken, by fewer than three vessels were made in the shallow-water flatfish, flathead sole, rockfish, and other species target fisheries prior to 2008. Because that catch could not be reported under the confidentiality rules, it was excluded from the table. As a result, only the pollock and Pacific cod fishery participation is reported.

Pollock accounts for the majority of the groundfish harvest in the Western GOA CV groundfish fishery. Pollock harvests in 2013 and 2014 were substantially below the TAC that was set. Those years the pollock fleet realized low catch rates. The inability to find pollock resulted in the lower harvests, as opposed to PSC limit, poor market, or PSC limits.

The number of vessel participating in each fishery as well as the total number of vessels is reported at the bottom of the table. Approximately the same number of vessels participated in both the pollock and Pacific cod fishery annually and over the entire period. The total number of vessels that participated from 2003 through 2015 is approximately twice the number that fished in any one year.

Table 1-21 Trawl catch by catcher vessels in Western Gulf target fisheries, 2003 through 2015

Year	Pacific Cod	Pollock	Total
Metric tons of retained catch delivered to shorebased processors			
2003	1,359	16,177	17,536
2004	1,646	23,067	24,713
2005	4,253	31,090	35,343
2006	4,718	24,896	29,614
2007	4,226	17,832	22,058
2008	4,421	15,456	19,876
2009	1,804	14,417	16,222
2010	1,833	28,422	30,255
2011	2,099	21,173	23,272
2012	5,775	28,426	34,201
2013	5,688	7,818	13,507
2014	6,803	13,856	20,658
2015	6,843	28,926	35,768
Distinct count of catcher vessels delivering to shorebased processors			
2003	22	31	39
2004	17	25	33
2005	28	28	36
2006	25	28	34
2007	27	25	36
2008	23	19	28
2009	25	22	31
2010	15	26	29
2011	12	23	26
2012	24	29	32
2013	23	24	30
2014	24	25	27
2015	23	20	26
Total	**54**	**50**	**68**

Source: AKFIN summary of NMFS CAS data

Table 1-22 reports the annual catch by Central GOA target fishery and number of catcher vessels delivering to shorebased processors from 2003 through 2015. The catcher vessels in the Central GOA participate in a broader set of target fisheries than either the Western GOA or the West Yakutat District, but pollock, Pacific cod, arrowtooth flounder, and shallow-water flatfish are the target fisheries with the greatest volume of catch[24].

[24] Rockfish Program catches are excluded from this table because they are not considered under the proposed program, but are also an important fishery for the Central GOA, both in terms of volume and value.

Rockfish catches from 2003 through 2006 occurred prior to the implementation of the Rockfish Pilot Program. From 2007 through 2015, catches that occurred under the Rockfish Pilot Program or the Rockfish Program were excluded from the table. Primary Rockfish Program species for the Central GOA are not allocated under this action, so those numbers will not influence rockfish allocations considered under this proposed action.

Table 1-22 Trawl catch by catcher vessels in Central Gulf target fisheries, 2003 through 2015

Year	Arrowtooth Flounder	Deep Water Flatfish	Flathead Sole	Other Species	Pacific Cod	Pollock	Rex Sole	Rockfish	Sablefish	Shallow Water Flatfish	Total
Metric tons of retained catch delivered to shorebased processors											
2003	904	487	1,100	944	12,206	31,379	*	12,188	*	5,133	64,368
2004	6,092	721	192	391	11,925	39,190		10,874		2,405	71,791
2005	7,578	151	*	*	7,051	48,624		8,972	*	5,476	77,917
2006	11,243	*	*		4,393	45,948		7,841	*	8,355	78,082
2007	11,238	*	85	*	7,600	33,464			*	9,986	62,380
2008	14,532	*	446	18	11,892	32,244	85	*		10,622	69,976
2009	13,184	*	347	*	5,340	23,394	655			11,995	54,978
2010	12,580	175	868	*	14,005	45,302	*	*		6,631	79,889
2011	17,764	*	228	*	10,336	55,484	*	*	*	2,919	87,400
2012	9,055		313	*	11,545	68,848	*	*		4,029	94,070
2013	12,211	*		*	12,392	80,851	717		*	4,403	110,693
2014	12,647		*		11,777	125,822	*			3,101	154,612
2015	7,514				12,543	133,944	*	*	*	1,623	155,926
Distinct count of catcher vessels delivering to shorebased processors											
2003	7	9	14	14	50	49	3	35	1	27	64
2004	23	7	9	3	48	53		32		24	57
2005	23	3	3	1	38	47		25	1	19	51
2006	23	1	7		33	45		25	1	23	47
2007	23	2	4	1	34	38			1	27	41
2008	30	1	7	4	41	44	3	1		30	46
2009	27	1	6	5	34	40	6			30	40
2010	25	3	9	2	38	41	2	1		24	43
2011	29	1	8	1	41	47	2	2	1	19	51
2012	22		3	1	47	60	2	1		27	62
2013	21	2	1	1	44	49	7		1	25	58
2014	17		2		46	49	5			17	62
2015	16				34	54	2	1	1	8	56
Total	47	16	33	21	82	82	17	41	6	51	96

Source: AKFIN summary of NMFS CAS data
Note: Excludes RP catch. An asterisk denotes the catch was hidden to protect confidential data. All targets reported in the data are presented, even if they were not open to directed fishing (e.g., sablefish)

Table 1-23 reports the trawl catcher vessel catch by target fishery in the West Yakutat District. Since 2003 there has been limited participation in the rockfish, deep-water flatfish, and other species fisheries. The pollock target fishery has had between 12 and 18 catcher vessels participating from 2010 through 2014. That number decreased to 3 catcher vessels in 2015. These counts exclude vessels that participate in the Prince William Sound GHL pollock fishery, because it is outside the proposed program. However, in 2015, at total of 17 vessels harvested close to 10 million pounds of pollock in that fishery.

Table 1-23 Trawl catch by catcher vessels in West Yakutat District target fisheries, 2003 through 2015

Year	Deep Water Flatfish	Other Species	Pollock	Rockfish	Total
Metric tons of retained catch delivered to shorebased processors					
2003			985		985
2004	*	*	*		300
2005			1,925		1,925
2006			1,609	383	1,992
2007			*	*	407
2008			*	*	1,617
2009			1,212		1,212
2010			*	*	2,110
2011			*	*	2,960
2012			*	*	2,621
2013			2,995		2,995
2014	*		*		1,336
2015			230		230
Distinct count of catcher vessels delivering to shorebased processors					
2003			9		9
2004	1	1	4		6
2005			18		18
2006			5	4	7
2007			4	1	5
2008			4	1	5
2009			9		9
2010			18	2	19
2011			17	2	18
2012			13	2	15
2013			18		18
2014	1		12		12
2015			3		3
Total	2	1	30	6	33

Source: AKFIN summary of NMFS CAS data
Note: Excludes RP catch. An asterisk denotes the catch was hidden to protect confidential data. All targets reported in the data are presented.

1.3.2.2.2 Catcher/Processor catch by target fishery

CP target fishery retained catch in the Central GOA is reported in Table 1-24. The arrowtooth flounder fishery generally produces more than half the CP catch in the Central GOA. Rex sole, shallow-water flatfish, flathead sole, and rockfish are the other main fisheries. Limited amounts of catch are reported in the pollock and Pacific cod fisheries because of sideboard limitations placed on the Amendment 80 CP and AFA CPs are not allowed to fish in the GOA.

Table 1-24 Central GOA CP retained catch and number of vessels by target fishery, 2003 through 2015

Year	Arrowtooth Flounder	Atka Mackerel	Deep Water Flatfish	Flathead Sole	Other Species	Pacific Cod	Pollock	Rex Sole	Rockfish	Sablefish	Shallow Water Flatfish	Total
Metric tons of retained catch CPs												
2003	7,205			*	*	602		3,002	5,667	*	*	16,755
2004	*			*	*	740		820	6,007	*	*	8,211
2005	3,436			*	*	286		1,168	7,258		*	13,070
2006	5,376			*		*		2,433	6,621		*	15,043
2007	3,926	*		*				*	4,516			11,200
2008	5,266			*		*		1,952	693			8,460
2009	*			*		242		5,374	771		*	8,734
2010	*			*				3,393	1,154		*	8,965
2011	10,601			*			*	1,772	*		*	14,479
2012	6,970			*		*	*	1,738			*	9,782
2013	6,683	*		*			*	2,286	285		*	11,533
2014	22,781						*	*	*		*	25,537
2015	9,970			*			*	*	*		*	13,329
Distinct count of CPs												
2003	11			2	1	3		7	6	1	1	15
2004	1			1	1	4		4	8	1	1	11
2005	4			1	1	3		5	7		1	12
2006	7			1		2		3	6		2	12
2007	8	1		1				2	4			9
2008	5			2		1		3	6			10
2009	2			2		3		6	8		2	12
2010	2			2				4	5		1	8
2011	5			1			1	3	1		1	5
2012	5			1		1	1	3			1	5
2013	5	1		1			2	3	3		1	5
2014	4						1	2	2		1	4
2015	4			1			1	2	2		1	4
Total CG CPs	12	2		3	1	8	6	8	11	2	3	17

Source: AKFIN summary of NMFS CAS data

Note: Excludes RP catch. An asterisk denotes the catch was hidden to protect confidential data. All targets reported in the data are presented, even if they were not open to directed fishing (e.g., sablefish)

Table 1-25 indicates that rockfish is the primary CP target fishery in the Western GOA. Some retained catch is reported in the flatfish fisheries, but it typically accounts for less than 25 percent of the total retained catch. As stated for the Central GOA, some groundfish are reported to be retained in the pollock and Pacific cod target fisheries, but they are limited by other management measures.

Table 1-25 Western GOA CP retained catch and number of vessels by target fishery, 2003 through 2015

Year	Arrowtooth Flounder	Atka Mackerel	Deep Water Flatfish	Flathead Sole	Other Species	Pacific Cod	Pollock	Rex Sole	Rockfish	Sablefish	Shallow Water Flatfish	Total
Metric tons of retained catch CPs												
2003	5,676			396	*	341		605	2,353		*	9,476
2004	631			813		336		*	4,417		*	6,612
2005	990			856		*		*	3,578		*	5,817
2006	828			*		*		*	5,732		*	7,296
2007	1,622			541		*		*	7,363		*	10,157
2008	1,733			*		*		*	7,229			9,253
2009	341			*		*		*	8,059		*	9,220
2010	*			365		*		*	6,960			7,763
2011	895			*		*	*	*	4,923			6,541
2012	517			*		556		*	5,336			6,543
2013		*		*		*	*	*	3,217			3,774
2014	*		*	*			*	*	4,240			5,575
2015	174		*			*		*	4,039			4,334
Distinct count of CPs												
2003	9			3	1	3		7	9		1	16
2004	4			4		5		2	11		1	15
2005	5			4		1		2	8		2	13
2006	5			2		1		2	9		1	11
2007	9			3		2		2	5		2	13
2008	4			2		2		1	10			11
2009	3			1		2		2	13		1	14
2010	1			3		1		2	11			13
2011	4			2		1	2	1	11			14
2012	3			1		3		1	15			15
2013		1		2		1	2	1	9			10
2014	2		1	1			1	1	5			8
2015	3		1			1		1	6			8
Total WG CPs	13	1	1	5	1	6	4	7	18		4	19

Table 1-26 reports only the number of CPs that were active in the West Yakutat District by target fishery from 2003 through 2015. Confidentiality restrictions limit the reporting of any catch data on an annual basis. However, as seen in the table, CPs primarily focus effort in the rockfish fisheries. The sablefish fishery is not open to directed fishing, so activity in that fishery is an artifact of the targeting definition used in the data base. Almost no effort was reported in any other fishery during the period considered. While information cannot be reported annually, the average retained catch by CPs was approximately 1,500 mt per year.

Table 1-26 West Yakutat District CP number of vessels by target fishery, 2003 through 2015

Year	Arrowtooth Flounder	Atka Mackerel	Deep Water Flatfish	Flathead Sole	Other Species	Pacific Cod	Pollock	Rex Sole	Rockfish	Sablefish	Shallow Water Flatfish	Total
Distinct count of CPs												
2003									1			1
2004									1	1		1
2005									1			1
2006									1			1
2007									2			2
2008									1			1
2009							1		3	1		3
2010									2	1		2
2011									2			2
2012									1			1
2013									1			1
2014	1								2	1		2
2015									2	1		2
Total WYK CPs	1						1		5	2		5

1.3.2.3 Annual Gross Value of Target Fisheries

The Previous section focused on annual catch; this section is provided to show the value of the various GOA target fisheries throughout the fishing year. Information is presented that shows annual gross value as well as average weekly gross value by target fishery. While it is acknowledged that net value is a more important measure of the impacts to firms, that information is not included in this section because of limited cost data, especially for catcher vessels.

1.3.2.3.1 Gross ex-vessel value of catcher vessel harvests

The amount that CV owners were paid by shorebased processors for GOA groundfish they delivered is reported in Table 1-27. Dollar values are reported in millions of dollars and adjusted for inflation using the 2015 Producer Price Index as the standard adjustment factor. The values in the table represent all of the groundfish sold to the processor that was harvested in a given groundfish *target* fishery, as reported by AKFIN based on Catch Accounting System data. As such, the reported value includes any secondary species in addition to the primary species sold to the processor, by target fishery. Ex-vessel value data for 2015 was not finalized at the time this section of the report was produced, but will be added to future versions of the RIR.

Information presented shows that in the West Yakutat District, value generated by catcher vessels is small relative to the Central GOA and Western GOA. Also, most of the value in recent years was generated from the pollock fishery. In the Western GOA, pollock and Pacific cod account for almost all of the revenue generated by the fleet when fishing groundfish. In the Central GOA, pollock, Pacific cod, and arrowtooth flounder typically generate the most value for catcher vessels. The rockfish values that are reported from 2003 through 2006 are represent values prior to implementation of the Central Gulf of Alaska Rockfish Pilot Program. Values of rockfish harvested in the Central Gulf of Alaska Rockfish Pilot Program and the Central Gulf Rockfish Program (that replaced the pilot program) are excluded from these data. The Council explicitly indicated that catch and value from the Rockfish Program should be excluded. If the qualifying years included 2003 through 2006, it is assumed that no Central GOA rockfish would be included in the allocation of PSC or groundfish to cooperatives.

Real ex-vessel value in the Central GOA has increased in recent years, corresponding to the increase in pollock TACs especially in area 620. Value derived from other fisheries have not shown similar trends. While the GOA TACs currently remain high, members of industry have indicated in public testimony that prices are currently low due to a variety of factors including, small pollock being caught, weak foreign currencies, and the overall supply of whitefish relative to worldwide demand. So while 2016 value information is currently not available in the AKFIN data, it is expected that the declines in value may be reported when those data are available.

Table 1-27 Gross ex-vessel value ($ millions) of GOA groundfish paid to catcher vessels (real dollars adjusted by 2015 PPI) by target fishery, 2003 through 2014

	Central Gulf of Alaska							Western Gulf of Alaska				West Yakutat District			GOA
Year	All Other	Arrowtooth Flounder	Pacific Cod	Pollock	Rockfish	Shallow Water Flatfish	CG Total	All Other	Pacific Cod	Pollock	WG Total	All Other	Pollock	WY Total	Total
2003	$1.53	$0.21	$12.13	$10.20	$6.39	$2.39	$32.87	$0.02	$1.29	$6.26	$7.57	$0.00	$0.29	$0.29	$40.73
2004	$0.72	$1.57	$9.87	$13.97	$5.30	$1.02	$32.46	$0.02	$1.24	$7.61	$8.87	$0.05	$0.08	$0.13	$41.46
2005	$0.10	$1.74	$5.99	$20.28	$4.60	$2.99	$35.69	$0.00	$3.36	$10.80	$14.17	$0.00	$0.91	$0.91	$50.77
2006	$0.19	$3.17	$4.37	$18.14	$5.46	$5.06	$36.39	$0.00	$5.17	$9.19	$14.36	$0.24	$0.64	$0.88	$51.63
2007	$0.05	$3.47	$8.60	$10.89	$0.00	$7.16	$30.17	$0.04	$5.68	$6.22	$11.94	$0.16	$0.03	$0.19	$42.31
2008	$0.39	$3.95	$13.92	$15.27	$0.00	$7.54	$41.07	$0.13	$6.76	$7.88	$14.76	$0.20	$0.56	$0.76	$56.59
2009	$0.62	$3.02	$3.93	$10.98	$0.00	$5.80	$24.34	$0.00	$1.20	$6.61	$7.81	$0.00	$0.56	$0.56	$32.71
2010	$0.59	$3.23	$8.55	$20.37	$0.07	$2.86	$35.67	$0.00	$0.83	$10.68	$11.51	$0.25	$0.73	$0.98	$48.16
2011	$0.39	$5.73	$7.76	$23.27	$0.28	$1.63	$39.05	$0.00	$1.30	$7.39	$8.70	$0.33	$0.97	$1.30	$49.05
2012	$0.38	$3.07	$8.69	$30.47	$0.01	$2.27	$44.89	$0.00	$4.30	$10.25	$14.55	$0.19	$1.07	$1.26	$60.70
2013	$0.43	$3.55	$6.62	$32.74	$0.00	$2.18	$45.53	$0.00	$3.37	$2.61	$5.99	$0.00	$1.28	$1.28	$52.79
2014	$0.72	$3.87	$6.74	$37.00	$0.00	$1.51	$49.83	$0.00	$3.41	$3.80	$7.21	$0.00	$0.41	$0.42	$57.46

Note: Excludes the Rockfish Program rockfish target catch
Source: AKFIN summary of NMFS Catch Accounting data

The following information is aggregated over 2008 through 2014 to show, on average when vessels tend to fish various target species by area. Information is also provided on the number of vessels that participated in the fishery and by week and year. Microsoft Excel was used to assign a week to each reported landing date. The week headings represent the week of the year the fishing occurred based on how they were assigned by Excel. Because the weeks represent a range of dates, a start and stop date for each week was also included in the tables.

In the Western GOA, vessels tend to focus most heavily on the Pacific cod fishery at the beginning of the year, with some CVs also fishing for pollock (Table 1-28). When the Pacific cod fishery closes some of the Pacific cod vessels will fish pollock, depending on pollock catch rates, prices they are paid, and if they have a market (processor that will take the delivery) for that species. Vessels that fish groundfish during August, September, and October almost exclusively target pollock. Pacific cod tend to be less aggregated during those months which impacts catch rates which can influence both the harvester's decision to fish and the processor's decision to process Pacific cod. Only one catcher vessel reported landings in the rockfish target fisheries in July, the value of that catch cannot be reported under confidentiality rules.

Table 1-28Percentage of catcher vessel groundfish gross ex-vessel value in the Western GOA groundfish fisheries by week, averaged over the 2008 through 2014 period

Week		% of weekly ex-vessel value			% of total ex-vessel value	Number of CVs			
Start	End	Pacific Cod	Pollock	Rockfish	during week	Pacific Cod	Pollock	Rockfish	Total
22-Jan	28-Jan	74.8%	25.2%		3.2%	20	15		24
29-Jan	4-Feb	80.7%	19.3%		5.0%	29	11		31
5-Feb	11-Feb	84.3%	15.7%		7.5%	29	18		32
12-Feb	18-Feb	93.1%	6.9%		7.3%	30	15		33
19-Feb	25-Feb	95.3%	4.7%		8.3%	31	13		33
26-Feb	4-Mar	81.3%	18.7%		3.4%	32	14		33
5-Mar	11-Mar	0.4%	99.6%		3.4%	22	20		27
12-Mar	18-Mar	1.7%	98.3%		4.3%	19	23		28
19-Mar	25-Mar		100.0%		2.8%		27		27
26-Mar	1-Apr	*	*		6.8%	1	25		25
2-Apr	8-Apr		100.0%		2.4%		23		23
9-Apr	15-Apr		100.0%		1.7%		21		21
16-Apr	22-Apr		100.0%		0.1%		5		5
23-Apr	29-Apr		*		*		1		1
30-Apr	6-May		*		*		1		1
2-Jul	8-Jul			*	*			1	1
20-Aug	26-Aug		100.0%		0.6%		17		17
27-Aug	2-Sep		100.0%		9.1%		31		31
3-Sep	9-Sep		100.0%		9.0%		31		31
10-Sep	16-Sep		100.0%		3.1%		24		24
17-Sep	23-Sep		100.0%		1.1%		21		21
24-Sep	30-Sep		100.0%		0.5%		17		17
1-Oct	7-Oct		100.0%		8.3%		27		27
8-Oct	14-Oct	*	*		8.6%	1	29		29
15-Oct	21-Oct	*	*		2.2%	2	25		25
22-Oct	28-Oct		100.0%		0.8%		22		22
29-Oct	4-Nov		100.0%		0.1%		15		15
5-Nov	11-Nov		*		*		1		1
Total		*	69.5%	*	100.0%	36	40	1	49

Note: Not all weeks had reported catch.
Asterisks are used to indicate confidential data.
Source: AKFIN summary of NMFS Catch Accounting data

Catcher vessel participation in the Central GOA is more diverse, when compared to the Western GOA. Because the Rockfish Program catch is excluded from this table, based on 2008 through 2014 activity, the CVs primarily focused on flatfish in addition to Pacific cod and pollock. Like in the Western GOA, effort moves from Pacific cod to pollock when the pollock roe is close to being at its peak value. Movement from Pacific cod to pollock or arrowtooth flounder could also be due to shallow-water complex halibut mortality limits, Pacific cod trawl catch limits being reached, or the catchability of Pacific decreasing. This is highlighted by the weeks in mid-March where relatively high values are generated, based on the percentage of annual total, and percentage of that catch taken in the pollock target. During the summer months, modest amounts of value are derived, with most of that value being taken from the shallow-water flatfish target. The value generated from rockfish fisheries would show a spike during these months, but those data are excluded since they are not directly affected by the proposed program. Effort moves back into the pollock and Pacific cod fisheries in the fall, with some effort in the shallow-water flatfish and arrowtooth flounder fisheries.

Table 1-29 Percentage of catcher vessel groundfish gross ex-vessel value in the Central GOA non-Rockfish groundfish fisheries by week, averaged over the 2008 through 2014 period

Week		% of weekly ex-vessel value							Count of CVs						
Start	End	Arrowtooth Flounder	Flathead Sole	Pacific Cod	Pollock	Rex Sole	Shallow Water Flatfish	% of total ex-vessel value during week	Arrowtooth Flounder	Flathead Sole	Pacific Cod	Pollock	Rex Sole	Shallow Water Flatfish	Total
20-Jan	21-Jan			57.3%	42.7%		0.0%	0.2%			12	7			19
22-Jan	28-Jan	*		81.4%	16.6%	*	1.0%	4.2%	4		45	30	1	8	48
29-Jan	4-Feb	2.2%		53.7%	42.7%	1.2%	0.1%	4.5%	5		42	34	3	4	46
5-Feb	11-Feb	14.3%	*	17.5%	60.7%	4.1%	*	2.3%	19	2	32	35	7	7	41
12-Feb	18-Feb	15.1%	*	25.7%	56.7%	*	1.3%	2.6%	24	3	33	38	2	3	42
19-Feb	25-Feb	5.5%		7.4%	85.8%	0.5%	0.7%	4.4%	24		26	44	3	3	49
26-Feb	4-Mar	4.0%		18.6%	77.1%		0.3%	5.6%	19		46	46		6	59
5-Mar	11-Mar	7.5%	*	21.5%	69.6%	*	*	4.2%	14	3	43	45	1	1	56
12-Mar	18-Mar	*		3.9%	95.8%		*	10.9%	4		21	49		1	55
19-Mar	25-Mar	0.7%		30.2%	68.3%		0.5%	6.9%	4		44	49		7	55
26-Mar	1-Apr	9.0%	*	15.7%	72.9%	*	1.9%	4.6%	15	2	29	51	1	14	62
2-Apr	8-Apr	37.7%	1.2%	28.3%	17.5%	3.0%	10.8%	2.2%	23	4	31	45	5	22	61
9-Apr	15-Apr	75.8%	*	*	3.0%	4.1%	9.6%	1.3%	28	4	2	39	3	15	48
16-Apr	22-Apr	76.1%	2.1%	0.0%	0.0%	7.7%	12.7%	1.4%	27	4	6	31	5	16	47
23-Apr	29-Apr	75.5%	2.2%		*	*	22.3%	0.9%	23	3		3	1	18	31
30-Apr	6-May	45.1%				*	*	0.6%	20				2	23	28
7-May	13-May	38.9%	*		*	*	49.6%	0.5%	10	2		1	1	18	24
14-May	20-May	34.2%	*		0.0%	*	59.8%	0.2%	6	1		10	1	10	19
21-May	27-May	27.8%	*	*	0.0%		71.7%	0.2%	3	2	1	9		12	21
28-May	3-Jun	24.7%	*		*		69.3%	0.2%	3	1		1		9	14
4-Jun	10-Jun	46.6%	*				53.4%	0.2%	5	1				13	15
11-Jun	17-Jun	*	*			*	80.7%	0.1%	2	1			1	8	12
18-Jun	24-Jun	29.1%	*				67.6%	0.3%	5	1				8	10
25-Jun	1-Jul	26.2%	*				61.5%	0.3%	3	2				10	11
2-Jul	8-Jul	*	*				88.9%	0.5%	1	2				15	16
9-Jul	15-Jul	*	27.2%				71.4%	0.5%	1	4				14	15
16-Jul	22-Jul	12.2%					84.4%	0.2%	3					10	12
23-Jul	29-Jul	*	*				73.3%	0.3%	2	1				10	12
30-Jul	5-Aug	9.3%	*				79.8%	0.4%	5	1				16	19
6-Aug	12-Aug	20.1%	*			*	70.5%	0.6%	11	2			2	19	23
13-Aug	19-Aug	53.8%					46.2%	0.4%	9					11	15
20-Aug	26-Aug	39.5%					60.5%	0.3%	9					13	18
27-Aug	2-Sep	7.1%		*	85.2%		*	2.0%	14		1	39		12	42
3-Sep	9-Sep	2.0%		43.7%	52.7%	*	1.5%	5.0%	14		43	51	2	7	54
10-Sep	16-Sep	1.6%		21.9%	74.1%	*	*	5.8%	13		38	56	1	13	59
17-Sep	23-Sep	8.6%		7.1%	78.0%	*	*	3.1%	22		14	56	1	15	56
24-Sep	30-Sep	22.3%		38.9%	33.7%		5.0%	1.2%	20		22	37		14	41
1-Oct	7-Oct	2.2%		14.8%	80.5%		2.5%	7.2%	14		33	50		15	51
8-Oct	14-Oct	3.3%	*	20.0%	68.6%		*	5.2%	10	1	30	50		22	50
15-Oct	21-Oct	4.8%		6.6%	69.2%		19.4%	3.3%	15		16	49		33	49
22-Oct	28-Oct	8.3%	*	1.5%	80.9%		*	3.0%	16	1	6	57		23	57
29-Oct	4-Nov	14.8%		0.7%	51.3%		33.2%	1.1%	13		4	33		21	40
5-Nov	11-Nov	*				*	58.6%	0.4%	12				2	18	23
12-Nov	18-Nov	78.8%	*				*	0.2%	10	1				7	14
19-Nov	25-Nov	*	*			*	62.7%	0.2%	7	1			1	14	22
26-Nov	2-Dec	*	*				70.8%	0.1%	3	1				6	10
3-Dec	9-Dec	*	*				73.9%	0.1%	3	1				9	13
10-Dec	16-Dec	*				*	83.6%	0.1%	2				1	9	12
17-Dec	23-Dec	*	*				68.9%	0.0%	1	2				4	4
24-Dec	31-Dec	*					*	0.0%	1					1	2
Total		9.3%	0.5%	19.7%	61.6%	0.6%	8.0%	100.0%	41	21	68	67	16	41	75

Note: Excludes small amounts (less than 0.5% in each case) of target catch listed as rockfish, deep-water flatfish, sablefish, and other species. Central GOA includes areas 620 and 630 for pollock targets.

* denotes confidential data

Source: AKFIN summary of NMFS Catch Accounting data

Catcher vessel participation in the West Yakutat District is limited. Catcher vessels that do fish, primarily participate in the pollock fishery. Over the seven-year period included in the table only one CV was reported to target deep-water flatfish and three were reported to target rockfish. The remaining 26 CVs included in the data all fished pollock and accounted for over 85% of the value reported.

Table 1-30 Percentage of catcher vessel groundfish gross ex-vessel value in the West Yakutat District groundfish fisheries by week, averaged over the 2008 through 2014 period

Week		% of weekly ex-vessel value				Count of CVs			
Start	End	Deep Water Flatfish	Pollock	Rockfish	% of total ex-vessel value during week	Deep Water Flatfish	Pollock	Rockfish	Total
5-Feb	11-Feb		*		*		1		1
12-Feb	18-Feb		*		*		2		2
19-Feb	25-Feb		100.0%		10.9%		10		10
26-Feb	4-Mar		100.0%		3.6%		6		6
5-Mar	11-Mar		100.0%		25.1%		17		17
12-Mar	18-Mar		*		*		1		1
19-Mar	25-Mar		100.0%		22.2%		22		22
26-Mar	1-Apr		100.0%		10.7%		15		15
2-Apr	8-Apr		100.0%		4.4%		8		8
9-Apr	15-Apr		100.0%		3.9%		5		5
16-Apr	22-Apr		*		*		1		1
23-Apr	29-Apr		*		*		2		2
2-Jul	8-Jul			*	*			2	2
9-Jul	15-Jul			100.0%	5.8%			3	3
16-Jul	22-Jul	*		*	4.6%	1		3	4
23-Jul	29-Jul			*	*			1	1
6-Aug	12-Aug			*	*			1	1
20-Aug	26-Aug			*	*			1	1
10-Sep	16-Sep		*		*		1		1
24-Sep	30-Sep		*		*		1		1
8-Oct	14-Oct		*		*		1		1
29-Oct	4-Nov		*		*		1		1
26-Nov	2-Dec		*		*		1		1
Total		*	85.5%	*	100.0%	1	26	3	28

Source: AKFIN summary of NMFS Catch Accounting data. Excludes Rockfish Program catch
* Indicates confidential data. Not all weeks had reported catch.

1.3.2.4 Non-target Groundfish Catch

GOA non-target groundfish catch is reported in Table 1-19. The value associated with this catch is included in the target fishery catch described in the previous section. The most valuable non-target species are those presented in the secondary species section of Table 1-19. These secondary species are considered for allocation under Alternative 2 due to their commercial value and the ways in which pressures to maximize retainable catch of those species could affect harvest patterns if they are left unallocated.

1.3.2.5 Prohibited Species Catch

This section will provide a brief summary of estimated PSC mortality in the GOA trawl fisheries. The 2016 GOA halibut PSC limits are presented in Table 1-8. A PSC limit of 18,316 Chinook salmon is set for vessels engaged in directed fishing for pollock in the Central GOA; a limit of 6,684 Chinook salmon is set for the Western GOA. Chinook salmon PSC limits set for the non-pollock target fisheries are presented in Table 1-7. Because all Chinook salmon must be retained in the Central GOA and Western GOA trawl fisheries, the Chinook salmon PSC is equal to the Chinook salmon PSC mortality. While Chinook salmon PSC was not required to be retained in the WYK District, it is also assumed that the relatively small amounts of Chinook salmon PSC taken in that area did not survive.

1.3.2.5.1 Halibut PSC

Table 1-31 reports Halibut PSC mortality estimates for 2003 through 2015. PSC mortality in the Central GOA and West Yakutat are combined because the proposed program would combine a cooperative's PSC accounting in those areas. Those data could not be reported separately because too few vessels fished the West Yakutat District to meet the confidentiality requirements of three or more vessels. Following the Council's direction at the June 2016 meeting, the small amount of PSC that is taken by CVs that deliver to motherships is included in the CV portion of the table.

Table 1-31 GOA halibut PSC mortality estimates by area and vessel mode for 2003 through 2015

	CG/WY	WG	Total	CG/WY	WG	Total	CG/WY	WG	Total
Year	CP			CV			All Vessels		
2003	597	255	852	1,176	49	1,225	1,773	304	2,077
2004	597	176	773	1,610	61	1,671	2,207	237	2,444
2005	428	136	564	1,517	33	1,542	1,945	170	2,106
2006	469	90	559	1,363	62	1,425	1,832	152	1,984
2007	234	172	406	1,445	42	1,487	1,679	214	1,893
2008	321	113	434	1,365	103	1,467	1,686	216	1,901
2009	382	65	447	1,295	44	1,339	1,677	109	1,786
2010	421	62	484	1,077	9	1,086	1,498	72	1,570
2011	427	64	491	1,267	43	1,310	1,694	108	1,802
2012	285	77	362	1,143	113	1,257	1,429	190	1,619
2013	297	47	344	730	93	823	1,027	140	1,167
2014	388	75	463	782	70	851	1,170	145	1,314
2015	288	30	317	956	47	1,003	1,243	77	1,320

Source: AKFIN summary of CAS data

The table above reflects the fleet's substantial efforts to reduce halibut PSC mortality. An important aspect of estimating halibut PSC mortality is the data obtained through the observer program. That program was revised in 2013 and began a new vessel selection protocol that achieved higher coverage rates on GOA trawl CVs in the years since then. Those years also represent the lowest levels of mortality during the period of years considered in the table.

Table 1-32 shows the average percentage of GOA halibut PSC usage by month over the 2010 through 2015 period. The table illustrates the temporal distribution of PSC usage across CP fisheries. Due to the small number of active GOA trawl CPs and confidentiality restrictions, percentages cannot be broken out by area.

Table 1-32 Percentage of catcher/processor Halibut PSC usage by month and target fishery, 2010 through 2015 combined

	Month												
Target Fishery	1	2	3	4	5	6	7	8	9	10	11	12	Total
Arrowtooth Flounder	0%	1%	1%	19%	4%	2%	5%	3%	3%	6%	6%	1%	51%
Atka Mackerel	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Deep Water Flatfish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Flathead Sole	0%	1%	1%	2%	2%	0%	0%	1%	0%	0%	1%	2%	9%
Pacific Cod	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Pollock - bottom	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Rex Sole	0%	1%	3%	14%	4%	0%	1%	0%	1%	0%	1%	0%	25%
Rockfish	0%	0%	0%	0%	0%	0%	6%	1%	0%	1%	0%	0%	8%
Sablefish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Shallow Water Flatfish	0%	0%	0%	0%	1%	0%	0%	1%	0%	1%	1%	0%	5%
All Fisheries	1%	3%	5%	35%	10%	3%	12%	6%	5%	8%	9%	3%	100%

Source: AKFIN summary of NMFS catch accounting data
Note: Excludes Rockfish Program PSC usage

Table 1-33 shows the percentage of halibut PSC taken by month and area in non-Rockfish Program CV GOA target fisheries. The Central GOA/West Yakutat District panel of the table shows that most of the halibut PSC is used in the Arrowtooth flounder, Pacific cod, and shallow water flatfish fisheries. Pacific cod fisheries have the greatest usage relative to other fisheries when Pacific cod is open to directed fishing. Flatfish species are typically targeted after the pollock and Pacific cod fisheries are closed to directed fishing.

Table 1-33 Percentage of catcher vessel Halibut PSC usage by month, area, and target fishery, 2010 through 2015 combined

	Month												
	1	2	3	4	5	6	7	8	9	10	11	12	Total
Target Fishery	Central GOA/West Yakutat District												
Arrowtooth Flounder	0%	1%	3%	13%	5%	2%	0%	1%	2%	6%	3%	0%	37%
Deep Water Flatfish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Flathead Sole	0%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	3%
Other Species	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pacific Cod	5%	2%	7%	1%	0%	0%	0%	0%	9%	6%	0%	0%	29%
Pollock - bottom	0%	1%	0%	0%	0%	0%	0%	0%	3%	4%	0%	0%	8%
Pollock - midwater	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Rex Sole	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Rockfish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sablefish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Shallow Water Flatfish	0%	0%	0%	1%	3%	2%	4%	3%	2%	4%	1%	0%	21%
Total All Fisheries	**5%**	**4%**	**10%**	**16%**	**8%**	**4%**	**7%**	**5%**	**16%**	**19%**	**4%**	**0%**	**100%**
						Western GOA							
Pacific Cod	11%	82%	4%	0%	0%			0%	0%	0%	0%		97%
Pollock - bottom	0%	1%	1%	0%	0%			0%	0%	0%	0%		3%
Pollock - midwater	0%	0%	0%	0%	0%			0%	0%	0%	0%		0%
Total All Fisheries	**12%**	**82%**	**5%**	**0%**	**0%**			**0%**	**0%**	**0%**	**0%**		**100%**

Source: AKFIN summary of NMFS catch accounting data
Note: excludes Rockfish Program PSC usage

In the Western GOA, the vast majority of halibut PSC is taken in the Pacific cod CV fishery. This is not surprising, because very little CV flatfish effort has typically occurred in the Western GOA, and the mid-water pollock fisheries displays low rates of halibut PSC.

1.3.2.5.2 Chinook Salmon PSC

Table 1-34 reports the Chinook salmon PSC usage by area, vessel mode, and target fishery the Chinook PSC limits are set. As with the halibut PSC limits, the Central GOA and West Yakutat District areas are combined. Also any PSC assigned to the mothership sector was included in the CV category. The small amounts of Chinook salmon PSC reported in the West Yakutat District were added to the Central GOA to create a combined Central GOA/West Yakutat District total.

Table 1-34 Chinook salmon PSC by area, vessel mode, and fishery designation for 2003 through 2015

	Central GOA/West Yakutat District			Western GOA			GOA Total
Year	CP	CV	Total	CP	CV	Total	
All non-Rockfish Program fisheries							
2003	4,415	8,050	12,465	1,978	881	2,860	15,325
2004	492	12,935	13,427	1,830	2,347	4,176	17,604
2005	1,168	22,472	23,640	1,616	6,654	8,269	31,909
2006	1,479	12,226	13,704	150	4,722	4,871	18,575
2007	2,688	33,554	36,242	295	3,273	3,568	39,810
2008	2,793	9,208	12,001	174	2,223	2,397	14,399
2009	2,303	4,278	6,580	107	448	555	7,135
2010	3,158	16,911	20,069	1,277	31,796	33,073	53,141
2011	2,194	14,313	16,507	487	3,669	4,156	20,663
2012	1,071	11,360	12,431	438	6,005	6,443	18,874
2013	3,587	15,822	19,408	161	1,586	1,747	21,155
2014	1,369	8,983	10,352	1,376	3,143	4,519	14,870
2015	540	10,836	11,376	33	5,175	5,208	16,584
Pollock Fisheries							
2003	-	3,624	3,624		738	738	4,362
2004	-	10,684	10,684		2,327	2,327	13,011
2005	-	21,912	21,912		5,951	5,951	27,863
2006	-	10,998	10,998		4,521	4,521	15,518
2007	-	31,695	31,695		3,264	3,264	34,959
2008	-	8,453	8,453		2,116	2,116	10,569
2009	-	2,271	2,271		438	438	2,709
2010	-	12,747	12,747		31,796	31,796	44,543
2011	-	10,868	10,868	-	3,573	3,573	14,441
2012	-	10,445	10,445		6,004	6,004	16,449
2013	-	11,303	11,303	50	1,571	1,621	12,924
2014	-	7,553	7,553	-	3,142	3,142	10,695
2015	-	9,015	9,015		4,119	4,119	13,134
Non-Rockfish Program/Non-pollock fisheries							
2003	4,534	4,426	8,960	1,978	143	2,122	10,963
2004	492	2,251	2,743	1,830	20	1,850	4,593
2005	1,168	559	1,728	1,616	702	2,318	4,046
2006	1,479	1,228	2,706	150	201	351	3,057
2007	2,696	1,861	4,558	295	9	304	4,852
2008	3,109	762	3,871	174	107	282	3,830
2009	2,430	2,007	4,437	107	10	117	4,426
2010	3,210	4,167	7,377	1,277	-	1,277	8,598
2011	2,229	3,445	5,674	487	96	582	6,222
2012	1,131	920	2,052	438	1	439	2,425
2013	3,587	4,519	8,105	111	15	126	8,232
2014	1,416	1,430	2,846	1,376	1	1,377	4,176
2015	540	1,822	2,361	33	1,056	1,089	3,450

Source: AKFIN summary of NMFS catch accounting data
Note: excludes Rockfish Program PSC usage

The table also shows Chinook salmon PSC taken in the pollock fishery and non-pollock/non-Rockfish Program fisheries. As described in Section 1.3.1.5.1, separate PSC limits are set for each of those fisheries. The options considered by the Council include an option to reduce the Chinook salmon PSC limit in the pollock fishery by 25% from the current 25,000 fish limit.

Table 1-35 shows the average percentage of the total Chinook salmon PSC by area, target fishery, and month from 2010 through 2015. About 79% of the total Chinook salmon taken in the Central GOA/West Yakutat District was in the pollock fishery with only slightly higher percentages being taken in the fall fishery. In the

Western GOA, the majority of the Chinook salmon PSC is taken in fall pollock fishery, and overall about 98% of the Western GOA Chinook salmon PSC is taken in the pollock fishery.

Table 1-35 Percentage of catcher vessel Chinook salmon PSC usage by month, area, and target fishery, 2010 through 2015 combined

	Month												
Target Fishery	1	2	3	4	5	6	7	8	9	10	11	12	Annual
	Central GOA/West Yakutat District												
Arrowtooth Flounder	0%	0%	0%	8%	3%	0%	0%	0%	0%	2%	0%	0%	13%
Deep Water Flatfish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Flathead Sole	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%
Other Species	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pacific Cod	0%	0%	1%	0%	0%	0%	0%	0%	1%	1%	0%	0%	3%
Pollock - bottom	0%	1%	1%	0%	0%	0%	0%	0%	1%	6%	0%	0%	11%
Pollock - midwater	0%	16%	10%	1%	0%	0%	0%	1%	11%	28%	1%	0%	68%
Rex Sole	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Rockfish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sablefish	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Shallow Water Flatfish	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%
Total	**1%**	**18%**	**12%**	**9%**	**3%**	**0%**	**1%**	**1%**	**14%**	**38%**	**1%**	**0%**	**100%**
	Western GOA												
Pacific Cod	1%	1%	0%	0%	0%			0%	0%	0%	0%		2%
Pollock - bottom	1%	2%	1%	0%	0%			0%	6%	67%	2%		80%
Pollock - midwater	0%	0%	2%	1%	0%			1%	5%	9%	0%		18%
Total	**2%**	**3%**	**3%**	**1%**	**0%**			**1%**	**11%**	**77%**	**2%**		**100%**

Source: AKFIN summary of NMFS catch accounting data
Note: excludes Rockfish Program PSC usage

1.3.3 Harvesting Vessels

1.3.3.1 Catcher Vessels

Table 1-36 shows the unique number of GOA trawl CVs that reported groundfish landings from 2003-2015. The table also shows the unique number of trawl CVs that reported groundfish landings at any time during the periods considered in this amendment. The total number of active CVs in a year has been relatively stable since 2010. Typically about twice as many CV participate in the Central GOA trawl relative to the Western GOA. Participation in the West Yakutat District is more sporadic and fewer CV participate.

Table 1-36 GOA Trawl CVs by area, 2003-2015

Year	CG	WG	WY	CV Total
2003	64	40	9	93
2004	57	33	6	77
2005	51	37	18	79
2006	48	34	7	74
2007	41	37	5	72
2008	46	29	5	73
2009	40	31	9	71
2010	43	29	19	67
2011	51	26	18	68
2012	62	32	15	70
2013	58	30	18	69
2014	62	27	12	69
2015	56	26	3	68
2003-2015	97	69	33	126
2003-2012	94	66	31	122
2007-2015	76	54	28	98
2007-2012	72	51	26	94
2008-2015	75	49	28	93
2008-2012	71	46	26	89

Source: AKFIN Summary of NMFS Catch Accounting data

The bottom section of the table shows the number of CVs that had any reported landings during the years listed. Each of the year combinations considered by the Council is represented in the table. The table also show those year combinations with the most recent data available included. For example, comparing the 2008 through 2015 data with the 2008 through 2012 data indicates that four vessels only fished in the 2013 through 2015 period. If allocations were made based on time period that excluded those years those four vessels would not qualify for an allocation using that set of years, or any set of years the Council is currently considering. These data are presented to provide information on the difference in number of vessels that fished over the allocation period considered and individual years.

1.3.3.1.1 Rockfish Program Dependency

Table 1-37 show the number of CVs that reported landings of groundfish under the CG Rockfish Program. It is important to note that all of the CVs also reported landings in the CG in the non-Rockfish Program trawl fisheries. As a result, all of these vessels are also counted in Table 1-36.

Not all vessels that are members of a RP cooperative fish for rockfish in the Central GOA. Table 1-11 reports the names of the 43 catcher vessels that were members of CV RP cooperatives in 2016. Based on that comparison, about one-third of the CVs do not fish rockfish within their cooperative. These vessel likely lease their quota to other members of their cooperative.

Table 1-37 Number of CVs that reported landings in the CG Rockfish Program and nominal gross ex-vessel value ($million)

Year	Value	Vessels
2010	$2.47	27
2011	$2.86	25
2012	$6.10	28
2013	$4.21	29
2014	$4.21	28
2015	$4.45	28

Source: AKFIN Summary of NMFS Catch Accounting data

1.3.3.1.2 GOA Fixed Gear Fisheries Dependency

Table 1-38 reports the number of licenses that fished with fixed gear in the GOA and the ex-vessel value of their catch. It is important to note that the catch and participation information includes groundfish value as well as halibut in the IFQ fishery. In the Central GOA almost all of the hook-and-line value and participation were of halibut. Pot gear harvests were almost exclusively Pacific cod. Effort, as well as value derived from the Central GOA pot fishery, is relatively low and is constrained by the number of fixed gear endorsements associated with the GOA trawl LLP licenses. While the average revenue per vessel from fixed gear harvests are modest[25] compared to their trawl gear value, for the firms participating in those fisheries, those revenues may play an important role in the overall fishing plan and profitability.

Table 1-38 Ex-vessel value (nominal) and LLP licenses with trawl history that also reported fixed gear GOA landings, 2003 through 2014

	Ex-vessel value ($millions)				Number of LLP Licenses			
	Central GOA		Western GOA		Central GOA		Western GOA	
Year	Pot	HAL	Pot	HAL	Pot	HAL	Pot	HAL
2003	*	$0.98	$2.47	$0.31	1	16	27	16
2004	*	$0.79	$1.66	$0.27	1	15	31	15
2005	$0.68	$0.74	$0.65	$0.27	5	16	23	16
2006	$0.34	$0.95	$0.93	$0.18	6	18	22	18
2007	$0.61	$0.96	$1.04	$0.33	10	15	27	15
2008	$0.45	$1.44	$2.01	$0.50	3	16	27	16
2009	$0.34	$0.99	$1.21	$0.68	5	17	27	17
2010	$0.43	$1.08	$2.81	$0.35	5	21	25	21
2011	$1.42	$1.30	$4.32	$0.41	5	17	26	17
2012	$0.98	$1.24	$1.05	$0.48	6	14	18	14
2013	$0.25	$3.70	$1.35	$1.01	4	11	17	11
2014	$0.51	$3.45	$1.72	$0.88	3	10	22	10

Source: AKFIN summary of CAS and value data
Note: 2015 catch was not priced when data were provided.

In the Western GOA, the trawl fleet is more dependent on pot gear as part of their groundfish fishery. Many of the trawl vessels operate in a variety of fisheries round-out their fishing plan. The average revenue per vessel was about $100,000 when using pot gear and about $50,000 when using HAL gear.

1.3.3.1.3 BSAI Fisheries Dependency

Many catcher vessels that participate in the GOA trawl fisheries also participate in BSAI fisheries with trawl and/or fixed gear. Table 1-39 shows the ex-vessel revenue generated by GOA trawl vessels in total as well as in BSAI fisheries by gear type. These vessels generate most of their revenue in the BSAI fisheries from the AFA pollock fishery. During 2016 there were 38 AFA catcher vessel licenses that could fish in the GOA (see Table

[25] About $150,000 from pot gear and $180,000 for HAL gear.

1-14). Some of the vessels listed in the table also participated in other BSAI trawl fisheries including Pacific cod. Fewer GOA trawl vessels participated in the BSAI fixed gear fisheries, and the revenue generated was a much smaller portion of their total revenue than the trawl fisheries.

Table 1-39 Nominal ex-vessel value of associated with CV LLP licenses on GOA trawl vessels, 2003 through 2014

	All areas and gear		BSAI Trawl		BSAI Pot gear		BSAI HAL gear	
Year	$ Million	Vessels	$ Million	Vessels	$ Million	Vessels	$ Million	Vessels
2003	92.33	93	44.24	55	0.58	4	*	2
2004	87.46	77	37.59	49	0.80	7	0.00	3
2005	98.03	79	41.22	44	1.03	5		0
2006	106.41	74	44.18	40	2.18	3	*	2
2007	115.81	72	45.65	47	1.66	4		0
2008	141.39	73	49.26	42	2.91	5	0.33	4
2009	89.34	71	34.76	44	1.12	6	0.07	3
2010	110.82	67	32.92	40	1.02	5	0.22	5
2011	146.51	68	50.24	41	1.74	4	0.13	4
2012	149.82	70	56.88	38	1.82	6	*	2
2013	126.74	69	46.44	37	1.14	5	*	2
2014	126.59	69	46.63	33	1.41	6	*	2

Source: AKFIN summary of CAS and value data
Note: 2015 catch was not priced when data were provided.

1.3.3.2 Catcher/Processors

A total of 22 CPs were active in GOA trawl Fisheries from 2003 through 2015. In the three most recent years, 15 CPs have been active and five of those vessels were active in the Rockfish Program. During the time periods considered for allocations, from 20 to 22 CPs would qualify for an allocation, or about twice as many CPs as have fished in the two most recent years.

Table 1-40 Number of CPs active in the GOA trawl fisheries

	Rockfish Program		
Year	No	Yes	Total
2003	21	Pre-Rockfish Program	21
2004	16		16
2005	16		16
2006	16		16
2007	15		15
2008	7	7	14
2009	10	8	18
2010	13	4	17
2011	13	4	17
2012	12	5	17
2013	9	5	14
2014	6	5	11
2015	6	4	10
2003 through 2015	13	9	22
2013 through 2015	10	5	15
2003 through 2012	13	9	22
2007 through 2012	11	9	20
2008 through 2012	11	9	20

Source: AKFIN summary of Catch Accounting data
Note: Rockfish Program vessels also fished in other fisheries

1.3.3.3 Vessel and Company Dependency

1.3.3.3.1 Rockfish Program

Nine different CPs have made landings in either the Rockfish Pilot Program or the current Rockfish Program. However, since 2010 four or five CPs have made harvests in a given year. All of the vessels that had harvests from the Rockfish Program also had landings in other GOA trawl fisheries. Because Rockfish Program harvests are not included in any of the allocation schemes considered under this proposed program, the catch those vessels made when fishing in the Rockfish Program would be excluded from any allocation calculations.

Table 1-41 shows that CP vessels generated, on average, 30% of their GOA groundfish first wholesale value from the Rockfish Program fisheries. The remaining 70% of the GOA groundfish first wholesale value was generated from other groundfish trawl fisheries opened to these vessels. These percentages represent their revenue in the GOA trawl fisheries and not the overall value from all fishing activity.

Table 1-41 Percent of CP GOA groundfish 1st Wholesale value from Rockfish Program

Rockfish Program	2010	2011	2012	2013	2014	Average
No	74%	74%	63%	64%	72%	70%
Yes	26%	26%	37%	36%	28%	30%

Source: AKFIN summary of Catch Accounting data

The variation of the GOA value derived from the two fisheries varies by about 11% of the total over the years available. This indicates that while there is some variation in the value derived, there are not substantial swings is first wholesale value across the two fisheries. Some change in percentages are expected as relative prices, harvest amounts, and the underlying TACs change.

Table 1-42 Rockfish Program halibut PSC mortality usage and maximum amount available for rollovers, 2012 through 2015

2012	104	57	3.8%
2013	129	71	4.7%
2014	113	62	4.1%
2015	96	53	3.5%
Avg.	111	61	4.0%

Source: NMFS RP reports (e.g., https://alaskafisheries.noaa.gov/sites/default/files/reports/car163_rockfish_psc2012.pdf).
Note: Maximum available for roll-over was calculated as 55% of the remaining PSC.

1.3.3.3.2 BSAI Fisheries

Catcher Vessels

Ex-vessel value generated by GOA trawl catcher vessels that also fish in the BSAI is presented in Table 1-43. That table provides information on the gross ex-vessel value generated by GOA trawl vessels when operating in the BSAI. Many of these vessels are AFA vessels. The revenue generated in the BSAI with trawl gear reflects their dependence on that fishery. In 2014, about half the GOA trawl catcher vessels also fished with trawl gear in the BSAI. Those 33 vessel's catch with trawl gear in the BSAI accounted for approximately 37% of the gross ex-vessel revenue by all trawl vessels that fished in the GOA that year. The revenue generated by GOA trawl vessels using pot gear and hook-and-line gear in the BSAI was typically less than $2 million and less than 10 vessels participated in any year. While these fisheries are important to the firms that participate in them, as a whole, the GOA trawl fleet is less reliant on those fisheries. However, some vessels generate a relatively small percentage of their gross ex-vessel value from the GOA.

Table 1-43 Ex-vessel value generated by GOA trawl catcher vessels that also fish in the BSAI

	All areas and gear		BSAI Trawl		BSAI Pot gear		BSAI HAL gear	
Year	$ Million	Vessels	$ Million	Vessels	$ Million	Vessels	$ Million	Vessels
2003	92.33	93	44.24	55	0.58	4	*	2
2004	87.46	77	37.59	49	0.80	7	0.00	3
2005	98.03	79	41.22	44	1.03	5		0
2006	106.41	74	44.18	40	2.18	3	*	2
2007	115.81	72	45.65	47	1.66	4		0
2008	141.39	73	49.26	42	2.91	5	0.33	4
2009	89.34	71	34.76	44	1.12	6	0.07	3
2010	110.82	67	32.92	40	1.02	5	0.22	5
2011	146.51	68	50.24	41	1.74	4	0.13	4
2012	149.82	70	56.88	38	1.82	6	*	2
2013	126.74	69	46.44	37	1.14	5	*	2
2014	126.59	69	46.63	33	1.41	6	*	2

Source: AKFIN summary of CAS data

Catcher/processors

Table 9.7 (page 295) of the 2015 Economic Safe provides a summary of the Amendment 80 sector's participation in the GOA and BSAI fisheries (Fissel, et al., 2015). Based on the Council's definition for the catcher/processor sector it is limited to the Amendment 80 vessels. Information presented in that table shows that between 7% and 13% of the Amendment 80 vessels first wholesale gross value was generated in the GOA fisheries from 2010 through 2014. GOA value includes both the Rockfish Program fisheries and non-Rockfish Program fisheries. Excluding the Rockfish Program from the GOA values would reduce the percentages reported from GOA fisheries.

1.3.4 Shorebased Processors

Eight inshore processing companies took deliveries of GOA groundfish harvested with trawl gear between 2012 and 2014. This count excludes two companies that processed less than 1% of the total trawl caught GOA groundfish. One processing operation in Kodiak was taken over in 2015 by another company that already had a processing plant taking deliveries of trawl caught groundfish in that community. That acquisition reduced the number of inshore processing companies that are consistently active to seven, and the total number of processing companies active during that period to nine.

Excluding catcher/processors and catcher sellers, inshore processing companies operated 18 plants that took deliveries of GOA trawl groundfish harvests in 2015.[26] These plants include floating processing plants that list their official location where the companies are based, outside of Alaska. Kodiak was home to nine plants in 2015. Two of those plants reported relatively small amounts of gross revenue from trawl caught groundfish relative to the other seven plants. Akutan, False Pass, Dutch Harbor/Unalaska, King Cove, and Sand Point were home to between three and five active plants in total on an annual basis. Seattle and Kirkland, Washington were listed as the Intent to Operate[27] city for from three to six floating processors that are part of the inshore sector. Sitka and Seward were each home to plants that took deliveries during some years of the qualifying period, but not in the most recent year reported.

Table 1-44 Number of Processing plants in the inshore sector that took deliveries of trawl caught GOA groundfish from 2010 through 2015

City	2010	2011	2012	2013	2014	2015
King Cove, Sand Point, Akutan, Dutch Harbor/Unalaska, and False Pass	5	5	4	3	3	4
Kodiak	9	9	8	8	8	9
Sitka, Seward,	1	2	3	1	1	0
Seattle, Kirkland	3	6	5	5	6	5
Total	18	22	20	17	18	18

Source: AKFIN summary of CAS and COAR data

Table 1-45 reports the total nominal (not adjusted for inflation) first wholesale gross revenue generated by processors that received GOA trawl groundfish deliveries. The "GOA trawl value" is the nominal gross first wholesale value of trawl groundfish landings. The "Total value all species" is the nominal total first wholesale gross value of all species processed at the plants. This value includes species managed by the State of Alaska as well as the Federally managed fisheries. The "% GOA trawl column" reports the proportion of the total first wholesale gross revenue that was from GOA groundfish landed by trawl vessels. The total annual value ranged from $450 million to $840 million. Roughly 6% to 10% of that value was generated from GOA groundfish landings. The remaining value was generated from salmon, halibut, sablefish, and non-trawl fishing for groundfish. The actual percentage varies depending on the plant. Some plants are designed to produce products from a variety of species. Other plants are focused on specific species and products. As a result, changes in the GOA trawl fisheries that impact pollock harvests, for example, will have the greatest impact on plants that are designed to process that species. Plants that are designed to process groundfish during the winter/spring and fall but take mainly salmon during the summer would be impacted differently than a plant that only processes

[26] Based on unique Intent to Operate codes in the data.
[27] The "intent to operate city" is reported in the data as the city where the processing plant is located. In the case of floating processors, the ITO City reflects the city where the firm is located and not where actual processing occurred. The three processors that list Seattle as the ITO City are owned by either Trident Seafoods or Icicle Seafoods.

groundfish. From 2008 through 2015, two of the plants generated ≥ 65% of their nominal first wholesale gross value from GOA trawl caught groundfish. Of the remaining plants, two generated ≥ 20%, three generated from 10% to 20%, and the remaining plants less than 10% of the their nominal first wholesale gross value from GOA trawl caught groundfish.

Table 1-45 Nominal first wholesale gross revenue ($million) generated by processing plants from GOA groundfish trawl deliveries, 2003 through 2015

Year	GOA Trawl	Total value all species	% GOA trawl
2003	$26.36	$453.12	5.8%
2004	$27.24	$455.48	6.0%
2005	$36.51	$518.58	7.0%
2006	$39.40	$538.34	7.3%
2007	$38.46	$574.89	6.7%
2008	$50.89	$684.14	7.4%
2009	$31.63	$509.19	6.2%
2010	$52.59	$582.79	9.0%
2011	$59.90	$801.29	7.5%
2012	$75.27	$837.48	9.0%
2013	$67.63	$758.66	8.9%
2014	$76.61	$741.56	10.3%
2015	$70.68	$681.64	10.4%

Source: AKFIN summary of CAS and COAR data

1.3.5 Employment

Employment data for CVs, CPs, and shoreplants are described in detail in Section 1.8,1.10 1.10, and in the Preliminary Social Impact Assessment, which is also published under the C-10 agenda item for the December 2016 Council meeting. The reader is referred to those sections for a detail discussion of employment associated with firms that participate in the GOA trawl fisheries.

1.3.6 Products and Markets

The Alaska white fish products compete in the global white fish market. Alaska producers sell a diverse array of products that entail a range of levels on the value-added scale. The markets for these products are complex and constantly changing, depending on worldwide economic conditions and changes in consumer preferences. Prices are not only affected by demand for white fish products, but also by competing supply from other parts of the globe. Oversupply due to large inventories or increased catch limits outside of Alaska sometimes depresses prices for the most competitive fish markets, such as pollock. The effect of these factors, and others such as world currency exchanges, tend to fluctuate over time. Alaska producers may vary in their ability to withstand short-term dips in revenue, depending on their financial reserves or their capacity to innovate.

The annual Economic SAFE document describes the markets for key species in Alaska. The GOA trawl fishery only focuses on a subset of these species. According to the most recent Economic SAFE (Fissel, et al., 2015), GOA groundfish species targeted by trawl vessels generated lower than average gross first wholesale values in 2014. Table 1-46 excerpts Table 7-1 from the SAFE, and shows a recent downward trend in gross first wholesale values. The reader is referred to the Economic SAFE for a more complete discussion of groundfish markets. However, a short recap of that information is provided here for species important to the GOA shorebased and catcher/processor sectors. The reader is also referred to a May 2016 report titled *Wholesale Market Profiles for*

Alaska Groundfish and Crab Fisheries, which was produced as a collaboration between the Alaska Fisheries Science Center, Pacific States Marine Fisheries Commission, and McDowell Group, Inc.[28]

Table 1-46 Average gross first wholesale value per metric ton, 2010 through 2014

	2010	2011	2012	2013	2014	2014 Pct. Change from Average
Alaska Pollock	$2,906	$2,772	$2,874	$2,443	$2,384	-13%
Pacific Cod	$3,042	$3,484	$3,154	$2,735	$3,033	-2%
Yellowfin Sole	$1,154	$1,400	$1,387	$1,287	$1,043	-20%
Rock Sole	$1,368	$1,705	$1,990	$1,333	$1,290	-19%
Pacific Halibut	$14,659	$17,693	$15,508	$14,419	$17,194	10%
Sablefish	$15,247	$19,220	$14,316	$12,250	$14,577	-4%
Pacific Ocean Perch	$2,459	$3,560	$3,137	$2,259	$2,578	-10%
Atka Mackerel	$1,861	$2,292	$2,480	$2,705	$3,561	53%
Snow Crab	$7,277	$12,054	$10,559	$11,052	$11,650	14%
King Crab	$25,273	$32,573	$27,144	$24,370	$23,968	-12%

Source: Table 7-1 (Fissel, et al., 2015).

1.3.6.1 Shorebased

Two of the primary species harvested by GOA trawl CVs are pollock and Pacific cod. The value of these species, and others, is affected by world market forces. The Economic SAFE notes that Russia's pollock fishery has been a factor in depressing prices for pollock fillets in Europe. Many large European retailers require Marine Stewardship Council (MSC) certification, and the largest Russian pollock fishery currently holds that certification. Japan is a primary consumer of pollock roe. Increased supply from the US and Russia[29] and reduced demand due to changing consumer preferences have negatively impacted the price of pollock roe. In recent years, lower wholesale roe value and smaller fish sizes – which reduces roe quality – has reduced the amounts of the roe bonuses paid to CVs. Compared to block frozen pollock, surimi products are reported to be less affected by recent increases in world supply and reduced demand.

As the supply of Atlantic cod has declined, Pacific Cod is increasingly marketed to Europe. Recent increases in Atlantic cod production and protective tariffs in the European Union have made it more difficult for Pacific cod to compete in the European markets. However, the gross first wholesale value per metric ton of Pacific cod, reported in Table 1-46, reflect a smaller decline than was reported for pollock.

CVs and shorebased processors in the Central GOA are impacted by lower flatfish values. For flatfish, 2014 gross first wholesale value is down roughly 20% relative to the average value from 2010 through 2014.

1.3.6.2 Catcher/Processors

When operating in the GOA, catcher/processors are primarily involved in the flatfish and rockfish markets. CPs' ability to catch or process pollock and Pacific cod is limited to small, incidental amounts. The general direction of flatfish markets was noted above in the shorebased processing section. In general, the decrease in flatfish prices is attributed to a weaker euro relative to the U.S. dollar, as well as reduced margins from secondary processing in China as a result of dollar strength. Competition from worldwide sources of white fish production has also created downward price trends for flatfish in recent years.

[28] http://www.afsc.noaa.gov/News/pdfs/Wholesale_Market_Profiles_for_Alaskan_Groundfish_and_Crab_Fisheries.pdf
[29] The value of the Russian Ruble was down about 50% relative to the US dollar from Oct 2013 through October 2015. This makes Russian products effectively cheaper and more attractive on the world market.

The rockfish fisheries that are directly impacted by this action are in the Western GOA and West Yakutat District. These fisheries are primarily harvested by CPs. Pacific ocean perch and other rockfish species are commonly sold by CPs as a "head & gut" product form that is reprocessed in China. As described for flatfish, exchange rates have decreased demand for the raw Alaskan product. This has resulted in below average wholesale values for Pacific ocean perch (Table 1-46).

1.3.7 Alaska State-Managed Fisheries

Pollock and Pacific cod fisheries in the GOA are prosecuted in both State and Federal waters. As a result there are potential interactions between State and Federal management of these fisheries. This section describes the fisheries, possible interactions, and potential solutions to management issues that may arise as a result of both State and Federal authority over these fisheries.

1.3.7.1 Pollock

GHL Fishery. The Prince William Sound (PWS) pollock fishery is managed using a harvest rate strategy, where the Guideline Harvest Level is the product of the biomass estimate, instantaneous natural mortality rate (0.3) and a precautionary factor of 0.7. Biomass is estimated by bottom trawl surveys in summer and hydroacoustic surveys in winter. In 1999, the Board of Fisheries directed the ADF&G to establish a Prince William Sound pollock trawl fishery management plan to reduce potential impacts on Steller sea lions by geographically apportioning the catch. Although pollock in the Gulf of Alaska are considered one stock, pollock in Prince William Sound are surveyed by ADF&G and that information is used to set the GHL. This process is used rather than setting the PWS pollock GHL as a fraction of the federal Total Allowable Catch for the Gulf of Alaska.

Vessels must be registered by January 13th to fish PWS pollock during the noon January 20th through March 31st GHL fishery period. The fishery may be closed earlier, if the GHL is projected to be harvested, by emergency order. Registrations for this fishery will only be issued to individuals who possess a miscellaneous saltwater finfish permit card for trawl gear that is valid for that year.

The PWS Area is defined at 5 AAC 28.200 in State of Alaska regulations. All waters of PWS and waters of Alaska bounded on the west by the longitude of Cape Fairfield (148°50.25' W. long.) south to the latitude of Cape Douglas (58°51.10' N. lat.), then west to 149°00.00' W. long., then south along 149°00.00' W. long., and on the east by 144°00.00' W. long. define the PWS area.

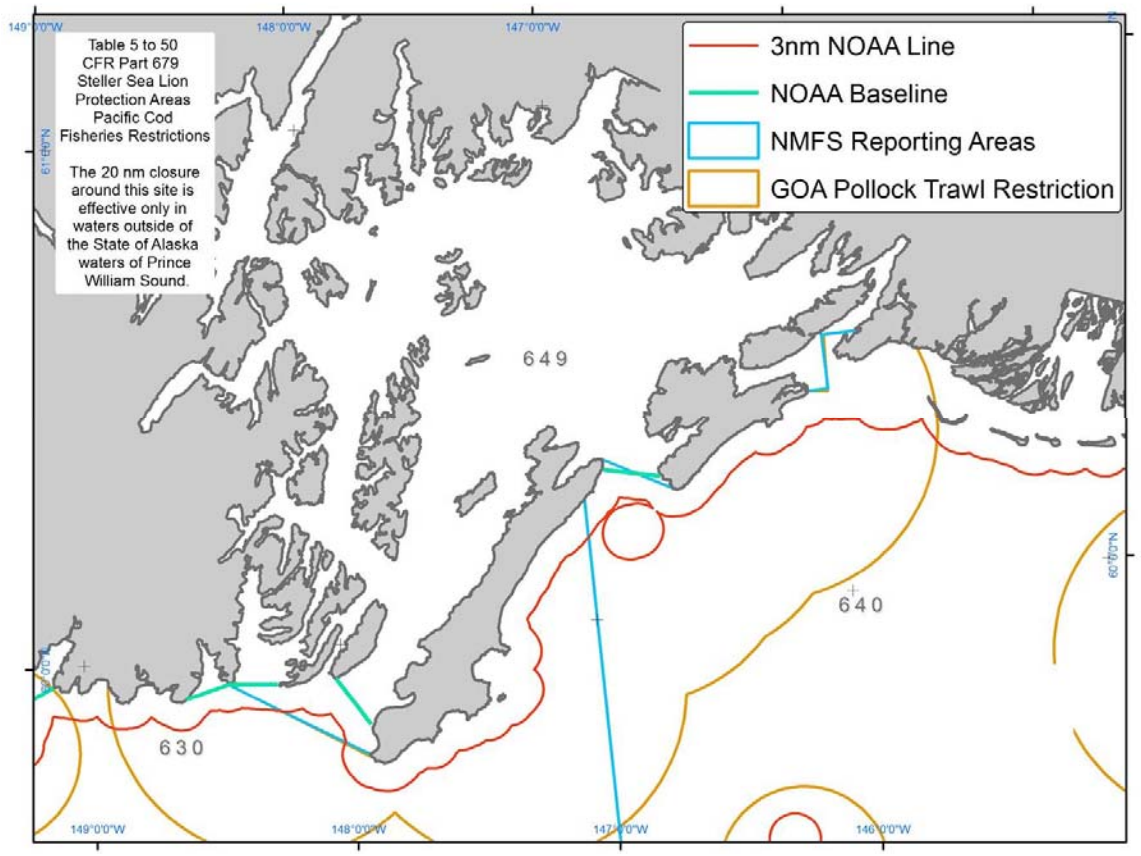
The PWS Inside District includes all waters of PWS enclosed by lines from Pt. Whitshed to Pt. Bentinck, Cape Hinchinbrook to Zaikof Pt., and Cape Cleare to Cape Puget. The PWS Outside District is divided into two sections. The Eastern Section includes waters of the PWS Outside District between 147°00' W. long. and 144°00' W. long; the Western Section includes waters of the PWS Outside District west of 147°00' W. long. The PWS Pollock Pelagic Trawl Management Plan (5 AAC 28.263) divides the Inside District into the following three management sections:

1) Port Bainbridge Section: waters west of 148° W. long.
2) Knight Island Section: waters between 148° W. long. and 147° 20.00' W. long.
3) Hinchinbrook Section: waters east of 147° 20.00' W. long.

The management plan restricts the harvest from any one management section to no more than 40% of the GHL (5 AAC 28.263). Once the allowable harvest level within a section is attained, the directed trawl fishery within that section closes by emergency order for the remainder of the season.

PWS Inside District management area is not contained within a single federal area (Figure 1-3). The federal definition of the West Yakutat area is from 140° W. long. to 147° W. long. The Central GOA area covers the remainder of the PWS Inside District west of 147° W. long.

Figure 1-3 Prince William Sound Management Area



Parallel Fisheries. As currently defined, typically each year the Commissioner of the Alaska Department of Fish and Game opens and closes, by emergency order, a parallel season for pollock, to coincide with federal seasons in the Central Gulf of Alaska and Western Gulf of Alaska Areas. Parallel fisheries for pollock take place in state waters around Kodiak Island, in the Chignik Area, and along the South Alaska Peninsula. Currently, when NMFS issues a closure notice for the Central/Western GOA trawl pollock or Pacific cod fisheries, a similar notice is issued by the Department of Fish and Game to close State waters, adjacent to the federal fishery, to directed fishing.

1.3.7.2 Pacific cod

GHL Fisheries. All GHL fisheries for Pacific cod currently exclude trawl gear as a legal gear type. Because the Council is considering limiting its proposed action to the trawl sector, Pacific cod trawl fisheries impacts from the Federal trawl bycatch management program are not anticipated at this time. Persons that are issued trawl quota may also fish state waters using gear allowed within state waters. Also, the Council may consider allowing persons issued quota in the federal fisheries to fish their trawl allocations with other gear types that may have lower bycatch rates than trawl gear. If the trawl bycatch management program would allow this activity, the program may consider deducting fixed gear harvests from both state and federal waters from a person's trawl gear allocation. For example, the Federal program may allow persons issued Pacific cod trawl quota share to fish that

allocation with hook-and-line or pot gear to reduce bycatch/PSC. It is assumed the catch would be deducted from the person's trawl apportionment, to maintain the allocations by gear type, but would provide the opportunity for additional harvest from State waters. Accounting for catch this way will require changes to the NMFS accounting system. Additional input from NMFS will be needed to determine if these change impose too great of a cost to warrant a change.

Parallel Fisheries. Typically, each year the Commissioner of the Alaska Department of Fish and Game opens and closes, by emergency order, a parallel season in the South Alaska Peninsula Area, Chignik Area, Kodiak Island Area, Cook Inlet Area, and the Prince William Sound Area, to coincide with the January 20th opening of the Central Gulf of Alaska Pacific cod trawl fisheries. While the parallel season is open, the same gear allowed in the federal Pacific cod fishery is permitted, unless use of that gear is explicitly prohibited by the state. Parallel fisheries for Pacific cod limit all vessels using trawl gear to a maximum of 58 feet in overall length for Chignik and the South Alaska Peninsula areas. Currently, when NMFS issues a closure notice for Pacific cod trawl fisheries in a federal area, a similar notice is issued by the Department of Fish and Game to close State waters, adjacent to the federal fishery, to directed fishing.

1.3.7.3 Pollock and Pacific cod catch in State and Federal waters

Table 1-47 reports the catch of pollock and Pacific cod that accrue to the Federal TACs, broken out by catch in State and Federal waters and the Central and Western GOA (2008 through October 2016). Based on historic catch data pollock is more likely to be harvested in State waters in the Central GOA and Western GOA than Pacific cod. Only a small amount of Pacific cod is harvested from State waters in the Central GOA. Pacific cod harvests from State waters in the Western GOA ranged from 4% to 23% of total catch in that area during the years considered.

Pollock catches from State waters in the WG ranged from 28% to 72% over the years considered. In the Central GOA, pollock catches from State waters ranged from 8% to 34%, with the lower percentages occurring in the more recent years.

Table 1-47 Amount (mt) and percent of pollock and Pacific cod harvested from State-waters in the Western and Central GOA, 2008 through October 2016

	Area	Waters	2008	2009	2010	2011	2012	2013	2014	2015	2016*
Pollock	CG	Federal	21,759	16,026	35,543	49,790	57,046	69,704	114,650	110,757	83,989
		State	10,019	8,367	10,675	5,222	12,492	10,912	9,432	21,986	15,226
		Total	31,778	24,392	46,219	55,012	69,539	80,615	124,082	132,743	99,215
		State % of Total	32%	34%	23%	9%	18%	14%	8%	17%	15%
	WG	Federal	10,009	4,972	10,877	9,726	7,536	3,296	7,768	20,606	38,493
		State	5,081	9,495	15,067	10,725	19,810	4,346	5,441	8,015	15,873
		Total	15,089	14,467	25,944	20,450	27,346	7,642	13,209	28,622	54,366
		State % of Total	34%	66%	58%	52%	72%	57%	41%	28%	29%
Pacific Cod	CG	Federal	11,816	8,425	16,000	12,797	12,622	13,208	15,507	14,071	7,505
		State	134	59	52	49	32	35	42	86	24
		Total	11,950	8,484	16,052	12,847	12,654	13,243	15,549	14,157	7,529
		State % of Total	1%	1%	0%	0%	0%	0%	0%	1%	0%
	WG	Federal	4,611	2,227	2,533	2,546	5,476	5,830	7,232	6,969	6,417
		State	392	297	767	347	1,252	318	476	321	990
		Total	5,002	2,524	3,300	2,893	6,728	6,148	7,707	7,290	7,407
		State % of Total	8%	12%	23%	12%	19%	5%	6%	4%	13%

Source: NMFS Alaska Region Catch Accounting System, data compiled by AKFIN in Comprehensive_BLEND_CA.
*2016 data as of October 31, 2016

1.3.7.4 Conditions on Federal Permits

The Council and NMFS may include conditions on a Federal permit when those conditions are necessary to meet the objectives of the management program. These permit conditions may require the permit holder to comply with certain Federal requirements even when the permit holder is fishing outside of Federal waters. Two examples of federal permit requirements that have been extended to fishing outside the EEZ are:

a. *Observer program* – persons that hold a Federal Fisheries Permit are required to abide by Federal observer program requirements when they are fishing in a parallel fishery (inside state-waters).
b. *Logbooks* – Persons are required to complete and submit a federal logbook when fishing in a parallel fishery.

In developing the trawl bycatch management program, the Council and NMFS may determine that Federal permit holders would need to comply with certain Federal requirements when operating outside of Federal waters in order to adequately conserve and manage the Federal fishery. For example, if the Council were to develop a management program that issued harvest privileges to a person, the Council may determine that in order to adequately conserve and manage the Federal TAC, all catch of the allocated species in the area (and perhaps gear[30]) specified on the permit should be deducted from the person's federal allotment. In such a case, catch by the Federal permit holder in a Federal or a parallel fishery could be deducted from the permit. More thought is needed by staff and more direction is needed from the Council before we can provide additional discussion of deducting GHL catch from a Federal quota holder's permit. Currently the Federal Fisheries Permit application states that

> *"…as a Federal Fisheries Permit holder fishing in State waters, you are responsible to know whether your catch is deducted from a Federal Total Allowable Catch (TAC) or from the State Guideline Harvest Level (GHL) and to comply with Federal fishery requirements when your groundfish catch will be deducted from the Federal TAC."*

Deducting all of a person's landings (or catch) of species from their federal harvest privilege, regardless of whether they were harvested in State or Federal waters, could help prevent the person from circumventing the intent of federal regulations by increasing participation in state waters.[31] If a person with a federal allocation has not harvested their entire allotment for a species/area, NMFS could potentially deduct State water harvests from their federal allocation. Implementation of a Quota program may require measures that require persons to offload catch prior to entering a GHL fishery.

Unless these limitations on movement between fisheries are implemented, NMFS may not be able to determine whether a person has exceeded their quota. Limitations on movement would be necessary to prevent the scenario in which a permit holder takes a trip in a GHL fishery and meets or exceeds their quota during that trip but continues to fish in the parallel or Federal fishery during the same trip[32]. Without a requirement to offload their harvest prior to moving between state and federal fisheries, it would complicate enforcement being able to determine if a person has exceeded their quota. Only after those landings are deducted from their federal quota holding (or deducted from the GHL) would the person be allowed to continue fishing.

[30] The Council is still in the process of developing alternatives, so the discussion paper does not presume that harvest of trawl allocations by hook-and-line or pot gear would be prohibited.
[31] If a person's initial allocation was based on harvest from both State and Federal waters, it may be considered appropriate to deduct catch (landings) from their allocation in both areas as well. However, the Council has not stated its intent. Only after it provides language regarding intent and how this action would address its intent can staff provide a discussion of how this action is necessary and appropriate for the conservation and management of the Federal fishery.
[32] Assuming GHL harvests are deducted from a quota holder's account.

In general, the above discussion means that any person holding a federal harvest privilege **could** be required to stop fishing in a federal or parallel fishery when their federal allocation for that fishery is taken. State of Alaska regulations will determine whether that person is permitted to continue fishing in GHL fisheries.

The ability of a permit holder to surrender their FFP in order to gain additional access to state water fisheries may be a concern in the development of a trawl bycatch management program. If the Council would determine that the ability to surrender a permit poses conservation and management concerns for the Federal fishery, the Council may wish to review policies that determine how often a person may surrender and then reacquire or modify a federal fisheries permit. Given current regulations, modifications may be unnecessary. Federal Regulations at 50 CFR 679.4 limit the amendment or re-issuance of Federal Fisheries Permits during the three-year permit cycle that have specific endorsements. Federal Fisheries Permits (FFP) may be voluntarily surrendered in accordance with 50 CFR 679.4(a)(9) or amended under 50 CFR 679.4(b)(4), except as specifically prohibited at 50 CFR 679.4(b)(4)(ii) and (iii). Those sections state that if an FFP is endorsed for the GOA and CP and/or CV Operation and trawl, pot, hook-and-line, or jig gear, once surrendered the permit cannot be re-issued until after the expiration date on the surrendered permit. Additionally, an FFP cannot be amended to remove the GOA, CP, CV, trawl gear, pot gear, hook-and-line gear, or jig gear endorsement.

NMFS will need to account for the anticipated state waters removals that are not deducted from any quota holder's permit, before the amount of fish allocated to quota holders is determined. This may include both target species and PSC. For example, the amount of a species (target and PSC) allocated under the federal program would be reduced by the amount assumed to be harvested in GHL fisheries by persons not holding federal quota or persons that have used their quota holdings. Therefore, the State and NMFS may wish to coordinate the time line for setting GHLs and the federal quota amounts, to provide adequate time to allocate quotas. In terms of PSC allocations, the Chinook salmon PSC allotment for the pelagic trawl pollock fishery would be reduced by the amount of Chinook taken in the PWS fishery and any new GHL fisheries implemented. For Pacific cod fisheries, the halibut PSC limit for the shallow-water complex (as currently specified) could be reduced by any amount of halibut PSC used in GHL fisheries that may be implemented.

1.3.7.5 State Fishery Management Options

The October 2013 discussion paper[33] described several potential decision points for the Board of Fisheries (Board) to consider in regard to state waters management, if state waters are to be open to trawl fisheries for which a catch share program is in effect in federal waters. These decisions are made outside the Council process, but will impact management decision in Federal fisheries. The discussion included various catch accounting options to coordinate with either State GHL or parallel fisheries, and specific issues associated with developing a federal quota program that includes Western Gulf pollock, where historically, the majority of the harvest occurs in state waters, where a federal license is not required.

One approach to coordinating State and federal waters management would be through a State GHL pollock fishery. State of Alaska staff presented the Board's pollock workgroup with this potential approach and its associated advantages and disadvantages[34]. Staff also presented an alternative approach which closely follows the

[33] http://www.npfmc.org/wp-content/PDFdocuments/bycatch/GOATrawlDiscPaper913.pdf

[34] State staff reported that the State of Alaska Department of Law found the most feasible proposed catch accounting mechanism associated with a GHL fishery to be in conflict with the Alaska State Constitution's equal access requirements. The catch accounting structure for a pollock GHL in state waters was proposed such that federally licensed trawl vessels' catch would accrue to their cooperative's quota and *not* to the GHL. The potential for inequity in state waters harvest opportunities arises if federally licensed vessels are able to catch more than non-federally licensed vessels because the former group would have access to cooperative quota, harvestable in state waters, which might exceed the size of the GHL.

regulatory structure of the current parallel fishery, but includes additional provisions that the Council and Board could consider in order to ensure the intended functionality and intent of the program. The objectives of the alternative approach proposed by staff are to coordinate with the proposed federal action and facilitate a program that reduces trawl bycatch in both State and federal waters while allowing trawl participants to continue to operate seamlessly from 0-200 nm. Additional objectives of the alternative approach include increased monitoring of trawl vessels (100% observer coverage) in State and federal waters, and the maintenance of an effective catch accounting system to ensure harvest and PSC limits are not exceeded.

The approach discussed is premised on achieving the objectives of the current motion while retaining the existing parallel fishery management strategy of mirroring federal regulatory actions as closely as possible. To prevent federally permitted vessels from exceeding their federal apportionments by fishing inside 3 miles, the Council would need to adopt regulatory language attached to an FFP that prohibits harvest or PSC beyond the amount allocated to federal license holders, whether in federal or state waters. Staff also considered whether a vessel would opt to surrender its FFP in order to harvest groundfish in excess of its cooperative quota in state waters. Although it is not required by State regulation, all vessels currently using trawl gear in the State parallel fishery also have an FFP, as those vessels fish federal waters at least some part of each year. FFPs are currently issued on a 3-year cycle; each permit is in effect from the date of issuance through the end of the cycle and cannot be surrendered and reissued but one time in the 3-year cycle. Thus, the risk of non-federally licensed vessels fishing in state waters is relatively low because: 1) no vessels have operated this way in the past; 2) it is unlikely a vessel would surrender its FFP to fish only in state waters or attempt to create a business plan around the parallel pollock fishery only; and 3) a vessel must have an FFP to participate in the federal program even if the vessel only wants to lease its quota to other vessels in the cooperative to fish. In addition, the Board could add some provisions to the parallel GOA trawl fisheries to facilitate catch accounting and prevent exceeding a TAC or bycatch amount if it meets the Board's objectives for state waters (e.g., 100% observer coverage, parallel fishery registration).

1.3.7.6 Recent Board of Fish actions for pollock

The Board considered pollock-specific proposals at its March 2016 meeting. The only motion impacting the GOA pollock fishery that received board approval was to establish state-waters pollock jig fishery management plans with guideline harvest levels deducted from total allowable catch (TAC) for the Eastern Gulf of Alaska, Prince William Sound, Cook Inlet, Kodiak, Chignik, South Alaska Peninsula and Bering Sea-Aleutian Islands. Motions that failed approval by the Board included:

- establishing a 58' overall length limit for vessels participating in South Alaska Peninsula parallel pollock fishery using trawl gear;
- establishing a state waters pollock purse seine fishery in Southeast Alaska; and
- establishing a fishing season for pollock that does not conflict with salmon seasons.

1.3.7.7 Fishery Development Decisions

Decisions that are needed to develop a State waters fishery are discussed in this section. The intent of this section is to lay out a general decision process and discuss issues that allow the Federal and State fisheries to function with minimal disruption if the Council/Secretary of Commerce moves ahead with a catch share system in the GOA.

Alternatively, accounting for federally licensed trawl vessels' harvest in state waters both against their cooperative quota *and* the GHL would double-count that harvest and potentially significantly under-harvest the Federal TAC, unless a complex reapportionment to federal participants occurred mid-season. This negates the benefits associated with cooperative management of being able to plan for the fishing year.

Will there be State managed fisheries?

The first decision that must be made is to decide whether there will be State managed fisheries that occur in State of Alaska waters. As discussed above, to date, the Board has not taken additional actions to address State waters trawl fisheries for pollock and/or Pacific cod in the Western GOA or Central GOA. This decision must be made by the State of Alaska, based on their authority. The June 2013 discussion paper (NPFMC 2013) pointed out the difficulties associated with the management of "parallel" fisheries in State waters when the adjacent Federal fisheries are managed using a catch share system. Parallel fisheries are typically managed by the State applying the same general management measures imposed on a Federal fishery to the adjacent State waters fishery. Both fisheries are closed when the shared quota is taken. If the Federal fisheries management structure changed to a catch share system that allocated quota to persons, the fishery would close to persons fishing under the Federal program when their allocation was harvested. Under a parallel fishing structure, there would not be single closure date that would be set for the Federal fisheries. As a result, there would not be a parallel closure date that could be applied to the State portion of the fishery. Changes to the Federal fishery cause the parallel fishery structure to not function properly under a Federal catch share program, compared to management under the under groundfish LLP structure. Therefore, the remainder of this discussion assumes that State managed fisheries would be patterned after the GHL fisheries and not the parallel fishery structure.

If the State determines that they do not want to implement and manage fisheries in their waters, then the Council could develop their "GOA Trawl Bycatch Management" program and only fishing in federal waters would be allowed. Persons with sufficient quota would be allowed to fish in federal waters. State waters would be closed to fishing unless the Federal government extended their authority to allow quota holders to fish inside State waters. Extending federal authority into State waters could potentially be controversial.

If the State decides that it wants to continue the GHL trawl fishery currently in place (Prince William Sound pollock) or develop new GHL trawl fisheries in the GOA, then the federal policy makers should account for those fisheries to ensure the federal program functions properly. To achieve this objective, State and Federal policy makers should coordinate their management structures. Because the structure is dependent on State decisions this discussion makes assumptions about how the Federal and State fisheries would work together.

- If the State develops or continues GHL trawl fisheries in the GOA, NMFS would deduct the GHL amount, or a pre-season estimate of the GHL harvest, from the apportionment available to the trawl QS holders. For example, in the Pacific cod fishery, the GHL fishery (or fisheries) amount would be deducted from the Federal allotment Pacific cod to the trawl sector harvesting from federal waters adjacent to the GHL fishery. The hook-and-line and pot allocations would not be adjusted to account for the GHL trawl fishery for Pacific cod. This assumption is not necessary for pollock, because it is not allocated by gear type used in its harvest. Alternative assumptions could be made, for example all GHL harvests are deducted before the TAC is set and divided among the gear groups.
- The discussion in this section assumes that GHL target species are allocated as quota in the Federal catch share program. If the Council's program only allocates PSC species, then slight modifications must be made to the catch accounting system that are described in this section. However, the same general principles would apply.

The first bullet is a general issue the Council addresses in this program. The second is based on the alternative selected by the Council.

Catch accounting under Alternative 2

One of the most formidable problems facing policy makers from the State and Federal government is how to account for harvest taken from a federal quota program and an adjacent GHL fishery, to ensure that the two fisheries combined do harvest too many (exceed ABC) or too few (not achieve OY) fish. This section describes some potential accounting methods and presents the beneficial and detrimental impacts each structure could impose on achieving policy goals and objectives, when the GHL target species are also allocated in a Federal catch share program occurring in adjacent waters.

The following structure seems to eliminate most catch accounting problems, but requires coordination between Federal and State accounting programs. Federal fisheries managers would issue quota to persons. A person that holds quota would be required to hold or have access to sufficient quota to cover all of the catch in State or Federal waters. NMFS would deduct all of the harvest from their available quota at the time the fish are landed. If the harvest occurred in a State water GHL fishery, NMFS would deduct the catch from the person's quota but the State would not deduct the catch from the GHL. Only State water harvests by persons that do not hold quota at the time the landing is made would be deduced from the GHL. This structure accomplishes two objectives:

1) Persons that hold quota cannot circumvent[35] the intent of the federal quota limits by fishing in GHL fisheries prior to harvesting their own allocation.
2) NMFS would know the GHL amount that would be deducted from available ABC prior to setting the quota and issuing catch shares. This means that total harvest is equal to GHL plus the quota issued. By making having no overlap in the GHL catch accounting and the quota catch accounting, the issues of over or under harvesting the total amount of fish available are reduced.

The catch accounting system will require that federal and state fish managers coordinate their efforts. The current eLandings system for groundfish provides data to both the federal and state groundfish managers. The Interagency Electronic Reporting System (IERS), also known as eLandings, is an interagency project involving the three agencies that manage commercial fisheries in Alaska: Alaska Department of Fish and Game, National Marine Fisheries Service, and the International Pacific Halibut Commission. Commercial seafood processors are required to report data on seafood harvest to these agencies using a single reporting tool. Information entered by the processor is then distributed to the appropriate persons in "real time". The eLandings program provides the tool and the vehicle to allow the necessary coordination between NMFS and ADF&G. Information collected should allow mangers of a GHL fishery and a quota program to determine which catch should be deducted from each program's harvest limits. The implementation of any catch share program would require modifications to the eLandings system to ensure landings are deducted from the appropriate quota holdings.

Other accounting issues that federal managers must account for are dependent on the catch share program that is implemented. Under an IFQ program, like halibut and sablefish, each person owns, controls, and harvests their quota. They are required to have sufficient quota before the trip to cover their harvest. An IFQ type of management system is relatively straight forward from an accounting standpoint. If the Council were to recommend a catch share program that includes cooperative structures (like AFA or Am80), the accounting system becomes somewhat more complicated from the federal perspective. Under a cooperative structure the Council and NOAA Fisheries would need to define rules for use of quota before members of a cooperative may enter a GHL fishery. For example, the Council could consider requiring any catch by members of a cooperative to be deducted from the cooperative's quota, whether it occurs in state waters (when a GHL fishery is open) or in

[35]This statement is based on the understanding that persons holding quota would have a strong incentive to fish in a GHL fishery if it did not count against their quota in the Federal fishery; and it is not the Council's intent to propose regulations that would exacerbate the race for fish in a State GHL fishery.

federal waters. Accounting for quota harvest as described would prevent persons in a cooperative from harvesting their combined allocation on a few member vessels while allowing other cooperative members to participate in a GHL fishery. In aggregate this behavior would potentially allow the cooperative to expand their harvest. When the cooperative has completed its participation in a directed fishery for the year, it could notify NMFS and ADF&G that it is their intent to check-out of the target fishery for the year (or season if appropriate). At that time its members could be allowed to enter the GHL fishery if it is still open. Once checked out of a target fishery, a cooperative would not be allowed to check back into that fishery for the reminder of the fishing year (or season). The check-out alternative would allow a cooperative to leave a directed fishery while some quota is still available. Regulations developed for cooperatives operating in a quota catch share program, prohibit cooperatives from exceeding their allocations. As a result, cooperatives typically leave a small amount of quota unharvested to avoid exceeding their allocation and incurring penalties. The check-out option allows the cooperative to determine to appropriate time to end a directed fishery for the year, based on their level of risk aversion. Without this option cooperative members would either never be allowed to participate in the GHL fishery or incur a greater risk of exceeding its cooperative allocation for a species. Allowing a cooperative to check-out of a fishery would also allow cooperative members to enter a GHL fishery if other quota (perhaps PSC) is a constraint, and not the target species. The Council may wish to consider if this behavior meets its intent.

The second structure would deduct all catch taken by quota holder from their allocation, and all catch in State waters, when the GHL is open, would be deducted from the GHL. This option differs from the first, because the State would not differentiate between harvests made by persons holding quota and those that do not. A problem associated with this method is that NMFS may need to account for how much of the GHL would be harvested by persons holding quota. That harvest would be double-counted (counted as a removal by both ADF&G and NMFS) and depending on the magnitude of the removals, could result in the OY not being achieved. To reduce the impacts of the double-counting, NMFS could either estimate the amount of double-counted fish before the federal catch shares are allocated and increase the catch shares by that amount, or calculate the double-counted fish in the eLandings system and adjust catch share amounts after the GHL closes. The first option would require NMFS to be conservative (underestimate the amount of double-counted catch) in its estimate, especially for species like pollock where the ABC has historically been set equal to the TAC. In that case, underestimating the double-counting means that the quota is increased less at the beginning of the year to ensure that ABC is not exceeded. Alternatively NMFS could account for the double-counted fish after the GHL fishery is closed. This would allow NMFS to calculate the amount the quota should be adjusted based on harvest data and not pre-season estimates. ABC would not be exceeded and OY could be achieved, but it would require a reallocation of quota at some point during the year. Reallocating that IFQ would increase the burden on NMFS and require additional decisions regarding how the available fish should be allocated. NMFS would likely wish to avoid reissuing quota during the year.

A third option would be for ADF&G to deduct all State waters harvests from the GHL and harvests from federal waters would be deducted from the quota holders allocation. One of the problems with this accounting system is that it would encourage persons that hold quota to starting in State waters when the GHL is opened, because that catch would not be deducted from their federal quota holdings. After the GHL was taken, these quota holders could move into federal waters and fish until their quota is harvested. Persons that did not hold quota, and only fished in the GHL fisheries would be required to stop fishing when the GHL fishery closed. These persons would likely realize greater competition for the GHL fisheries, as a result quota holders fishing there to start the year. This outcome does not seem to meet the objectives of the program being considered. Especially if the race for the GHL fishery results in increased PSC usage that may not be counted against the current PSC limits that are in place for federal fisheries in the GOA.

Catch Accounting under Alternative 3

The previous section was based on the assumption that target species, pollock and/or Pacific cod are allocated under a federal catch program. This section presents a brief discussion of catch accounting that could be implemented under Alternative 3 where the federal program does not allocate those GHL species.

The accounting option where the State of Alaska only deducts harvest from the GHL when the person does not hold federal quota (IBQ) could be applied to an IBQ program. In this case, the person would be required to hold sufficient IBQ to cover any PSC taken in the directed fishery. Target species harvested from State waters would be deducted from the Federal TAC and not the GHL. If the person, utilized all their IBQ or the cooperative checked-out of a fishery because they no longer wished to participate in the Federal fishery, their State waters harvest of the GHL species would be deducted from the GHL. This accounting system is presented in Table 1-48. The results indicate that IBQ holders cannot extend their IBQ by fishing in State waters while they still hold quota. It also means that they cannot harvest from the GHL while their IBQ is still being used. Depending on how the IBQ is allocated by target fishery, this may mean persons would no longer use their IBQ holdings for a specific directed fishery or for all groundfish fisheries. Because IBQ could be allocated for a specific area, or subset of areas, it may also mean that a person is through fishing IBQ for the Western and Central Gulf, one of the areas, or Gulf-wide. These decisions have yet to be made.

Table 1-48 Catch accounting when quota holders harvest from State waters is deducted from the TAC and PSC is deducted from their IBQ

Harvest	IBQ	Primary Species	Result
Federal Waters	All PSC deducted from IBQ	Deducted from TAC	There no incentive for a person that holds IBQ to fish in State waters when open, unless it is more economically efficient. No double counting.
State waters (Person holder IBQ)	PSC deducted from IBQ	Deduct from TAC	
State waters (Person does not hold IBQ)	Not counted against IBQ allocation	Deduct from GHL	

Another option is that the State of Alaska would deduct all groundfish catch taken from State waters from the GHL, regardless of whether the person holds quota (IBQ). IBQ would not be deducted from State waters landings. Catch from Federal waters would count against the IBQ a person holds and their groundfish harvest would be deducted from the TAC. This option assumes that persons holding IBQ would be allowed to enter the GHL fishery before their IBQ was exhausted for the year. A result of this system is that IBQ holders would have an incentive to enter the GHL fishery and save their IBQ for the Federal fisheries. This behavior would increase competition at the beginning and throughout the open access GHL fishery. After the State fishery closes, IBQ holders could utilize their quota to harvest fish from Federal waters. The negative impacts realized by persons that participate in the GHL fishery, but do not holder Federal quota, would depend on the amount of fish that is allocated to the GHL fishery. Since currently all of the people that fish in the Western GOA trawl fishery also hold an FFP, increasing the GHL will move pollock from the quota program to the GHL fishery where they currently do not operate under a Chinook limit and they would compete in an open access race for fish.

Table 1-49 State water harvests deducted from GHL and PSC catch does not count against a person's IBQ holdings

Harvest	IBQ	Primary Species	Result
Federal Waters	All PSC deducted from IBQ allocation	Deducted from TAC	Depending on the accounting system there could be incentive for a person that holds IBQ to fish in State waters to save IBQ and
State waters (Person holder IBQ)	Not counted against IBQ allocation	Deduct from GHL	

State waters (Person does not hold IBQ)	Not counted against IBQ allocation	Deduct from GHL	TAC. Persons not holding IBQ have more competition in GHL. No double counting of catch.

Table 1-50 describes a scenario where all State water target catch is deducted from the GHL, but IBQ holdings are deducted from a person's IBQ holdings. This option creates an incentive for person to fish in State waters to extend the amount of primary species held. In this case we are assuming the primary species is Western Gulf pollock. The incentives will be greatest for persons whose Federal fisheries are not limited by PSC. For example, the amount of PSC a person is annually allocated is sufficient to cover their pollock and Pacific cod target fisheries and they do not intend to expand effort into flatfish fisheries.

Table 1-50 State water harvests deducted from GHL and PSC catch deducted from a person's IBQ holdings

Harvest	IBQ	Primary Species	Result
Federal Waters	All PSC deducted from IBQ allocation	Deducted from TAC	There is incentive for a person that holds IBQ to fish in State waters when open to save TAC if limiting. Persons not holding IBQ could have more competition in GHL. No double counting.
State waters (Person holder IBQ)	PSC deducted from IBQ allocation	Deduct from GHL	
State waters (Person does not hold IBQ)	Not counted against IBQ allocation	Deduct from GHL	

The final scenario discussed would deduct the primary species catch from State waters, by an IBQ holder, from the TAC but would not deduct PSC from IBQ. Persons that are limited by PSC would be more likely to fish in the State GHL fishery when it is open. They could generate revenue from GHL harvests without using their IBQ. Because IBQ may constrain their target harvest in the Federal fisheries, implementing strategies to minimize IBQ usage would be anticipated. This accounting system, where primary species are deducted but not IBQ from the Federal quota, may only make sense if observer coverage rates in the GHL are insufficient to determine IBQ usage in State waters.

Table 1-51 State water harvests of PSC deducted from IBQ primary species are deducted from the TAC

Harvest	IBQ	Primary Species	Result
Federal Waters	All PSC deducted from IBQ allocation	Deducted from TAC	There is incentive for a person that holds IBQ to fish in State waters when open to save IBQ. Persons not holding IBQ have more competition in GHL. No double counting.
State waters (Person holder IBQ)	PSC not deducted from IBQ allocation	Deduct from TAC	
State waters (Person does not hold IBQ)	PSC counted against IBQ allocation	Deduct from GHL	

1.3.7.7.1.1 Size of the GHL

If the State of Alaska develops a Western GOA GHL trawl pollock fishery it must determine the GHL amount. Historically GHLs have been set as a percentage of the area's ABC. In the Western Gulf pollock fishery, the TAC is currently set equal to the ABC. Assuming this practice continues in the future, the percentage of the ABC selected by the State would result in an equal reduction to the amount of fish available to the federal fishery. The federal program does not allocate GHL catch and the TAC is already equal to the ABC.

The previous section described the impacts of various accounting methods on the GHL and federal fisheries. To simplify this discussion, the following assumptions are made based on the earlier accounting methodologies presented:

- Harvest that occurs in State waters is deducted from a person's Federal quota if they hold quota for that species;
- Harvest that occurs in State waters is deducted from the GHL if the persons harvesting the fish do not hold Federal quota or their cooperative has checked-out of the target fishery (State management decision).

If the assumptions above were implemented, State water harvests would only count against the GHL when the persons harvesting the fish did not hold quota. That means the person was never issued quota or used had already used the entire quota amount they were issued. Based on 2012 data for the Western Gulf, every person that harvested pollock from State waters with trawl gear also held a Federal Fisheries Permit. It is possible, depending on the qualification criteria developed, that all these participants would be allocated Western Gulf pollock quota that they could fish either as IFQ or take in to a cooperative. If the State set the GHL at a level that included all State waters harvest, the quota allocated to the persons would be reduced. Including their State waters harvest of pollock in the allocation formula would simply change the amount of pollock each person is allocated and not the total amount available.

Persons that were allocated relatively small amounts of pollock could fish their quota and then enter State fishery to effectively increase their pollock harvest. Their ability to implement such a strategy is dependent on the size of the GHL and new entry into the State fishery. If the GHL is relatively large and the fishery starts with relatively small amounts of effort, it may be worthwhile for the person to hurriedly fish their quota to enter the GHL fishery. If the GHL is relatively small and the amount of effort in the fishery could result in the GHL being taken before or shortly after the quota holder enters the fishery, the person has less incentive to harvest their entire quota allocation at the start of the year. It may be more prudent for persons to hold their quota until the roe is at its peak value, to generate more profit from the quota they are allocated.

Structure of the Catch Share Program

The structure of the catch share program also factors into whether stakeholders support a program that where a substantial amount of the harvest occurs in a GHL fishery. Catch share programs that allocate long-term fishing privileges (up to 10-years under the current MSA) allows recipients to capitalize the value of those shares. That value can then be used to access funds to improve the efficiency of the current vessel or purchase permits to expand in other fisheries. The CDQ program provides an example of a fishery were about 10 percent of the available quota was allocated and the recipients have been able to utilize their profits to successful expand their participation through vessel and permit purchases. While the value of the quota in the Western Gulf pollock fishery is a fraction of the value of the Bering Sea pollock fishery, the increased asset value could be utilized is a similar manner. The value of the shares could be capitalized to purchase permits (i.e., salmon, herring, or groundfish LLPs) or expand into other groundfish fisheries using their current vessel and permits.

Alternatively the program could be structured to reduce the capital value of the allocation. If the value of the underlying quota was not held by the person receiving the annual allocation they would be unable to capitalize the long-term profit stream of that quota. Depending on the leasing provisions the quota holder could generate profits from the annual allocation. In addition, the increased uncertainty associated with future annual allocation, a person's allocation could be reduced, and the lack of long-term quota for collateral, will limit a person's ability to leverage the allocation. This may result in a quota program with a relatively small federal allocation receiving less support from current stakeholders.

Fishery Timing

A person's ability to hold quota in the Western Gulf pollock fishery may provide the ability to increase roe value through the timing of harvest, depending on the catch accounting rules imposed. Pollock roe matures in the late

winter and early spring. Harvesting roe when it is at its highest quality can increase the value that can be generated at the ex-vessel, wholesale, and retail markets. Under the current LLP management structure, when the fishery is opened to directed fishing on January 20th, vessels operators face pressure to start fishing or risk forgoing harvest. Agreements between GOA harvesters to delay fishing have met with limited success. During years when biological conditions result in the roe not being mature early in the fishing season, the fleet may harvest all or most of the pollock before the roe is attains its greatest value. If persons were issued quota that could be held until the pollock roe is mature, it could allow the pollock harvest to be timed to generate greater value.

However, depending on the catch accounting system used, quota holders would need to weigh the value of fish forgone in the GHL fishery against the increased value they may gain from delaying harvest until the roe matures. If a relatively large percentage of the pollock ABC were allocated to the GHL fishery and quota holders had to use their federal quota before entering the GHL fishery, the financial incentives to hold quota until the roe matures could eliminated. The pressure would be more intense if the GHL fishery was a relatively large percentage of the ABC and the fishery attracted new participants that did not hold quota. In that case the value of pollock that could have been harvested in the GHL may outweigh the increased value derived from higher roe prices.

Timing when fish are more aggregated could be a benefit of holding some level of quota. When pollock and Pacific cod are aggregated the costs to harvest those fish may be reduced. Holding quota could provide this opportunity. Again, the ability to use quota to harvest when fish are aggregated will depend on pressures to enter the GHL fishery and the catch accounting system.

Finally, if quota is allocated for the Western Gulf and the quota is harvested through a cooperative structure, it may result in a system were vessels within the cooperative work together and can plan their fishing beyond the quota allocations. If there is limited effort in the GHL fisheries, the cooperative may act as the mechanism that allows members to develop and enforce rules for participation in related fisheries. For example, if a single cooperative, or two cooperatives (based on vessel length) formed they may be able to decide when fishing by member vessels would occur. The allocation of some amount of quota that causes this cooperation could be beneficial.

Who May be Attracted to GHL Fishery

Another question to consider, given that in 2012 all the participants in the State water pollock fishery in the Western Gulf also held an FFP is, who would be attracted to the GHL fishery when it opens. The pool of potential participants seems to fall into two general classes:

- Persons that have access to capital, knowledge of the fisheries, and would not have to give up other federal permits on the vessel they enter in the fishery.
- Persons that have vessels that could be equipped with trawl gear that have traditionally participated in State waters fisheries for salmon or herring.

The first group could include persons that are owners of vessels already fishing in the North Pacific trawl fisheries. These persons could purchase a vessel that would be allowed to harvest pollock in the GHL fishery. Given capacity reduction in other fisheries, it may be possible to obtain a vessel at a cost that would allow profitable participation in the GHL fishery. The vessel owner would only need to obtain the appropriate State permits which are not cost prohibitive.

1.4 Analysis of Allocations

This section is intended to provide the reader information on sector allocations and some limited information on individual allocations that would result from each of the alternatives. Sector allocations are presented for both groundfish and PSC species under each alternative and option considered. The sector allocations are calculated using the CAS data. It is the best information available to the analysts. The allocations considered are defined by the Council motion in addition to current regulations. Individual allocations are presented rounded to the nearest percentage of the total available for that sector for each groundfish species proposed to be allocated. Exact allocations for each vessel are not presented because of confidentiality restrictions under Alternative 2 and the uncertainty associated with the number of vessels that would apply for an allocation and the percentage of the TAC that will be assigned to each pool under Alternative 3. Therefore, any individual allocations presented in this section should be considered as a general range of the potential target species allocations that could result from each alternative and option.

1.4.1 Groundfish

1.4.1.1 Alternative 1

Under the no action alternative, no additional allocations beyond those currently in regulation are made to or within the defined sectors (i.e., catcher vessels and catcher processors). The no action alternative would retain the existing allocations presented in Section 1.3.1.2 and Section 1.3.1.3. The other management measures implemented for the GOA and described in Section 1.3.1 would continue to determine eligible participants and how they may operate.

1.4.1.2 Alternative 2

Under Alternative 2 the Council will divide selected primary and secondary species between the two sectors prior to making allocations to holders of trawl LLP licenses. The mechanics of the sector allocations of groundfish are described in the Council's motion and presented below.

Allocations to the trawl CV sector for WG and CG Pacific cod (Am 83), CGOA rockfish program (Am 88), and GOA pollock (Am 23) are maintained. Allocations to the trawl CP sector for the CGOA rockfish program are maintained. GOA flatfish eligibility for the trawl CP sector under Am 80 is maintained.

a. Pollock and Pacific cod:
Pollock and Pacific cod TACs would be allocated to the inshore sector; the offshore sector would receive an incidental catch allowance (ICA) for Pacific cod and pollock and be managed under maximum retainable amounts.

b. Other target species and secondary species: Sector allocations would be based on each sector's retained catch (Option: total catch for secondary species) from:
Option 1. 2008 – 2012
Option 2. 2007 – 2012
Option 3. 2003 – 2012

c. In addition to the options based on catch history above, options for establishing WG and WY rockfish sector allocations include:
Option 1. Allocate based on Am 80 sideboards
Option 2. Allocate to the CP sector only. The CV sector is prohibited from directed fishing and managed under MRAs.
Option 3. Establish a CV sector allocation of WG rockfish of 2% - 5%. Any unharvested rockfish (by a specified date) is reallocated to the CP cooperatives.

1.4.1.2.1 Primary Species not Allocated under Alternative 2

Primary species that have traditionally been open to directed fishing that are not allocated under Alternative 2 are presented in Table 1-52 (excluding Central GOA Rockfish Program species). These species are excluded because the TAC has not been traditionally taken and in some cases the TACs could be increased because they are currently set lower than the ABC. Because the TAC has not been fully harvested, these species have been constrained by either PSC limits or markets. PSC limits allocated to cooperatives or the limited access fishery under Alternative 2, or the markets for these species are expected to constrain their harvests. The Council did consider allocating these species, but determined that limiting future participation in these fisheries was unnecessary. The Council also indicated that since the TAC was not fully harvested, determining how to allocate the percentage of the TAC left unharvested was problematic. If the entire TAC was allocated to persons that have fished these species in the past it would overstate their historic participation. If past participants in the fishery were only allocated a portion of the future TACs, it could increase management complexities, increase allocation values, and provide limited benefit in terms of reducing PSC usage in the fishery. Benefits associated with PSC usage would be limited by allocating these species because PSC limits are typically the constraint in their harvest. Persons will need to manage their individual/cooperative PSC limits to ensure they are able to participate in the unallocated species fisheries at a level that fits their business plan.

Table 1-52 GOA species traditionally open to directed fishing with trawl gear, but not proposed to be allocated under Alternative 2

Species	Areas
Shallow water flatfish	CG, WG, and WYK
Deep water flatfish	CG, WG, and WYK
Arrowtooth flounder	CG, WG, and WYK
Rex sole	CG, WG, and WYK
Flathead sole	CG, WG, and WYK

CG = Central GOA; WG = Western GOA; WYK = West Yakutat District

1.4.1.2.2 Primary Species Allocated under Alternative 2

The species that the Council considered for allocations are described next. Primary species are listed in Table 1-53. These species are traditionally open to directed fishing and the TAC set for these species is the constraint on harvest and not the PSC limits. The Council divided the primary species into two options. It may select species included in Option 1 or in Options 1 and 2. (Theoretically, the Council could select Option 2 by itself, but it has never indicated any desire to do so because pollock and Pacific cod are generally the first fisheries prosecuted when they are open to directed fishing.)

Table 1-53 Primary species considered for allocation to cooperatives under Alternative 2

Option	Species	Area(s)
1	Pollock	610, 620, 630, and 640
1	Pacific cod	CG and WG
2	Northern rockfish	WG
2	Dusky rockfish	WG and WYK
2	Pacific ocean perch	WG and WYK

CG = Central GOA; WG = Western GOA; WYK = West Yakutat District

Note: CG Pacific cod allocated to RP as a Secondary Species would be deducted from amount available before allocations for the proposed program would be determined. CG rockfish are excluded from the table because they are allocated under the RP.

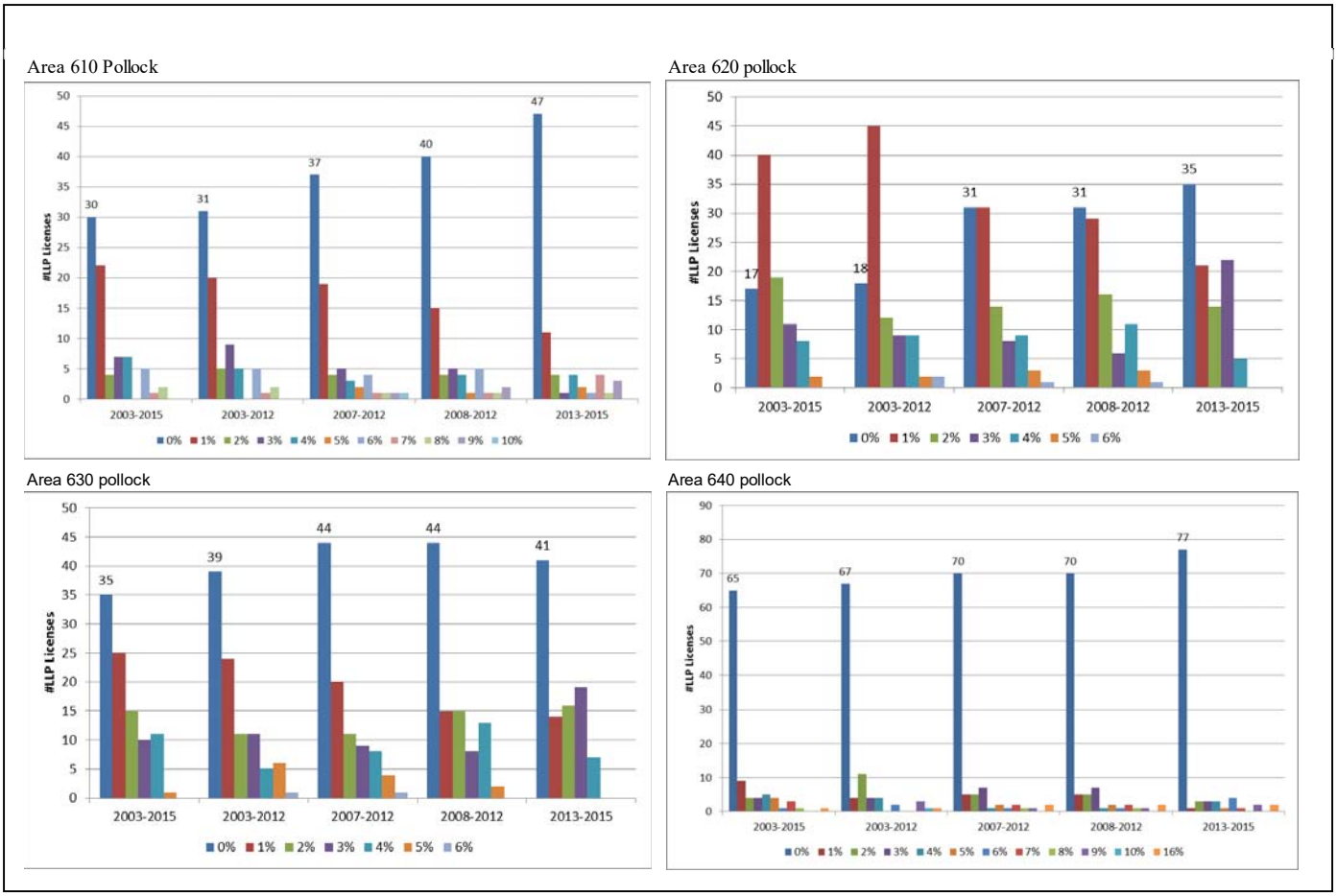
Option 1 defines the allocation of GOA pollock and Pacific cod to the CP and CV sectors. The entire directed pollock fishery in each GOA area would be allocated to the CV sector based on GOA Amendment 23. That allocation was implemented as part of the original Inshore/Offshore program. The CP sector would be allocated a pollock ICA for each management area. The ICA would be different than the sideboard limit currently set for Amendment 80 CPs[36] which sets a limit on the amount of pollock the Amendment 80 vessels may catch. The Amendment 80 sideboard limits for the GOA are based on their average aggregate harvests (total catch) from 1998 through 2004. The ICA would be a fixed amount determined annually by NMFS and not a limit, so that the CV allocations can be determined. The ICA would be managed through MRAs that are set for each non-pollock target fishery. Pollock ICAs would not be set for individual CP cooperatives.

The estimated percentage of the area 610, 620, 630, and 640 pollock TACs that would be allocated to LLP licenses associated with CVs are shown in Figure 1-4. The information presented is in the same format as the Pacific cod figures presented earlier. Also, as presented earlier, the figures show time periods that extend beyond the Council's 2012 cutoff date for catch history. Data for years after 2012 are presented to show recent participation, and should be considered during the allocation process. However, the Council may provide justification for including those data or excluding them at final action.

Information presented for pollock shows a similar trend as Pacific cod. Extending the qualifying catch history period back in time increases the number of LLP licenses that would receive an allocation, but the allocations LLP holders will receive are typically smaller for licenses that have been active through the entire allocation qualification period.

[36] Except the Golden Fleece which is prohibited from directed fishing for pollock, Pacific cod, Pacific ocean perch, dusky rockfish, and northern rockfish in the GOA.

Figure 1-4 Percentage of the available Pollock TAC allocated to Inshore (CV) LLP licenses, by time period



Source: AKFIN summary of CAS data

In addition to the overall allocation, the amount of each species would also be subject to the seasonal allowances. For example, if the pollock fishery is divided between two seasons and is allocated 60% in the "A" season and 40% in the "B" season, each cooperative would only be allowed to harvest 60% of their pollock allocation during the "A" season. Without this limitation the cooperatives may compete to harvest more pollock in the "A" season and the race to fish would not be eliminated by the allocations.

The Western GOA and Central GOA Pacific cod fisheries would be divided using the sector allocations defined in Amendment 83. The Eastern GOA Pacific cod TAC is not included in this amendment and will continue to be divided 90% of the annual TAC to the inshore sector and 10% of the annual TAC to the offshore sector. The offshore sector includes both fixed gear and trawl gear CPs.

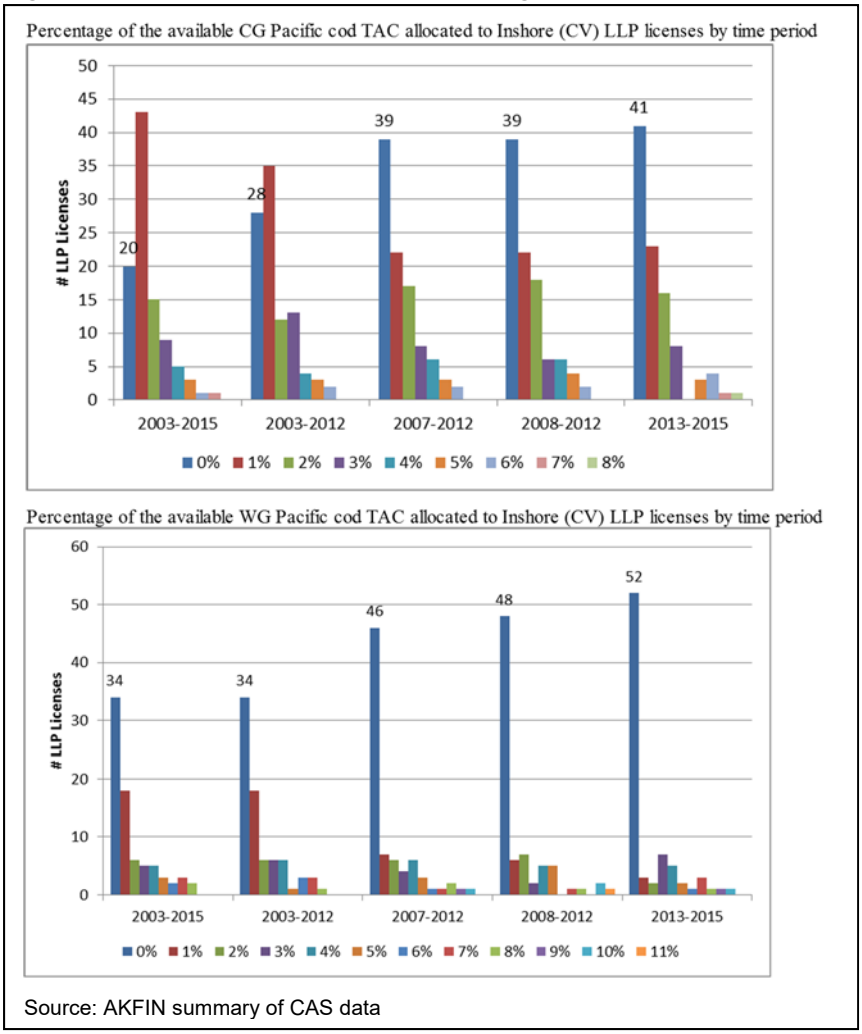
The Western GOA and Central GOA Pacific cod TACs would continue to be allocated to the trawl sectors a reported in Table 1-54. The table shows both the percentage of the total non-jig TAC and the sector percentage by fishing season. These percentages would be maintained regardless of any changes in B season dates that may result from this action. The percentage in the table only accounts for the trawl portion of the non-jig Pacific cod allocation. For example, 40.8% is allocated to trawl gear in the Western GOA and the remaining 59.2% is allocated to hook-and-line and pot gear fisheries. Jig gear allocations are set prior to making these splits of the TAC for the trawl, pot, and hook-and-line gear fisheries. Because Pacific cod is allocated to all the sectors that fish that species, there is no need to set an ICA for Pacific cod.

Table 1-54 Pacific cod allocations in the Western and Central GOA, as percentage of the non-jig TAC

Area/Sector	A season	B season	Annual total
Western GOA trawl CV	27.70	10.70	38.40
Western GOA trawl C/P	0.90	1.50	2.40
Western GOA trawl total	**28.60**	**12.20**	**40.80**
Central GOA trawl CV	21.14	20.45	41.59
Central GOA trawl C/P	2.00	2.19	4.19
Central GOA trawl total	**23.14**	**22.64**	**45.78**

Source: Table 6 - final 2016 seasonal apportionments of GOA Pacific cod
Note: Trawl vessels participating in Rockfish Program cooperatives receive 3.81 percent of the annual Central GOA TAC (see Table 28c to 50 CFR part 679), which is deducted from the Trawl CV B season allowance reported in this table.

Figure 1-5 Pacific cod CV allocation percentages



Source: AKFIN summary of CAS data

The estimated percentage of the Pacific cod TACs for the Western and Central GOA that would be allocated to LLP licenses associated with CVs are shown in Figure 1-5. Recall that in 2015 there were 78 LLP licenses issued that included a Western GOA trawl endorsement and 97 LLP licenses with a Central GOA trawl endorsement. Some (51) of the LLP licenses are issued both area endorsements for trawl gear. The total number of licenses in each figure represent these totals.

The 0% allocation indicates that the license was either inactive or reported very small amounts of Pacific cod landings[37]. As expected, the longer the time series considered, the greater the number of LLPs that receive an allocation. The shorter time periods increase the number of LLPs that receive a larger percentage of the allocation. This reflects the tradeoff between rewarding persons that are the current participants in the fishery versus those that have been active, but have made the business decision to leave the fishery.

The three primary rockfish species would be divided between the CV and CP sectors before being allocated to cooperatives. Table 1-55 shows the percentage of the TAC each trawl sector would be allocated after ICAs for the fixed gear fisheries are deducted. Note that there has been very little participation, two or fewer vessels each year that caught Northern rockfish in the West Yakutat District, and it is not considered for allocation under this program. The CP sector retained at least 98% of the three rockfish species in the Western GOA. In the West Yakutat district they retained at least 90% of the Dusky rockfish and about 75% or more of the Pacific ocean perch reported.

Table 1-55 Percentage of retained catch of the three primary rockfish species, by sector and area

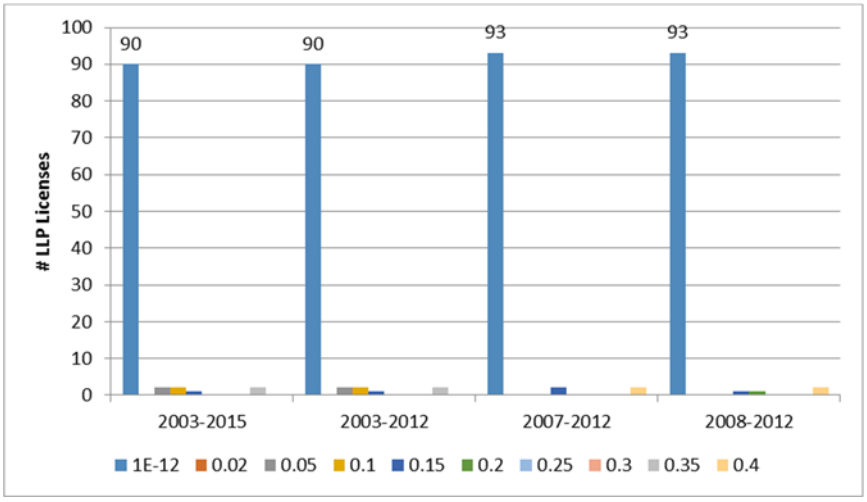
		WG			WY		
Species		CP	CV	Total	CP	CV	Total
Pacific ocean perch	2003-2012	98.9%	1.1%	100.0%	78.7%	21.3%	100.0%
Pacific ocean perch	2007-2012	98.4%	1.6%	100.0%	74.9%	25.1%	100.0%
Pacific ocean perch	2008-2012	98.2%	1.8%	100.0%	75.1%	24.9%	100.0%
Dusky rockfish	2003-2012	99.9%	0.1%	100.0%	96.6%	3.4%	100.0%
Dusky rockfish	2007-2012	99.9%	0.1%	100.0%	91.9%	8.1%	100.0%
Dusky rockfish	2008-2012	100.0%	0.0%	100.0%	90.0%	10.0%	100.0%
Northern Rockfish	2003-2012	99.7%	0.3%	100.0%			
Northern Rockfish	2007-2012	99.6%	0.4%	100.0%		n/a	
Northern Rockfish	2008-2012	100.0%	0.0%	100.0%			

Source: AKFIN summary of CAS data

Figure 1-6 shows the aggregate rockfish allocations to CVs during the various qualification periods and the 2003 period through 2015. Aggregate totals are presented because of the limited CV participation in these fisheries. Even using the aggregated totals very few LLPs would receive an allocation and the allocation would be a small percentage of the TAC. The scale on the X-axis for the largest allocation is only 0.4% of the TAC available.

[37] Less than 0.5% of the retained catch of that species in all target fisheries during the time period considered.

Figure 1-6 Percentage of the available WYK Rockfish TACs allocated to Inshore (CV) LLP licenses by time period



Source: AKFIN summary of CAS data

A figure is not provided for the Western GOA CV rockfish LLP licenses, because of the lack of historical participation in those fisheries. This is reflected in the Council's motion that includes options to only allocate Western GOA rockfish to CPs, to base the sector allocations on the Amendment 80 sideboard limits, or to establish a 2% to 5% allocation to CV that is not based on catch history. This allocation would be a sector allocation to CVs and percentages of the available TAC would not be assigned to specific LLP licenses or CV cooperatives.

Option c describes three options to allocate Western GOA and WYK primary rockfish species using a method other than catch history during the qualifying years. **These percentages are based on a trawl allocation of each species TAC. The TAC for these species are not currently divided between trawl and fixed gear. From 2007 through 2012 the trawl sectors caught over 99 percent of each of the primary species. Therefore, it is assumed that NMFS would set a fixed gear ICA for these species. The amount that remains after the ICA is set would be divided between the CV and CP trawl sectors.**

The first option, based on Amendment 80 sideboard limits, would allocate the CP sector the percentages of the primary rockfish TACs that are currently defined by those sideboard limits. Those limits are shown in Table 1-56. The amount set for Pacific ocean perch and Northern rockfish would need to cover the ICA to cover incidental catch of these species in other fisheries. NMFS would determine on an annual basis whether it was sufficient for the ICA. It is unlikely that those amounts would be adequate for NMFS to open a directed fishery.

Table 1-56 Options to allocate primary rockfish species to sectors not using catch history years

		WG			WY		
Species	Option	CP	CV	Total	CP	CV	Total
Pacific ocean perch	Amendment 80 Sideboards	99.4%	0.6%	100.0%	96.1%	3.9%	100.0%
Pacific ocean perch	All CP	100.0%	ICA	100.0%	100.0%	ICA	100.0%
Pacific ocean perch	CV 2%-5%	95% to 98%	2% to 5%	100.0%	95% to 98%	2% to 5%	100.0%
Dusky rockfish	Amendment 80 Sideboards	99.9%	0.1%	100.0%	89.6%	10.4%	100.0%
Dusky rockfish	All CP	100.0%	ICA	100.0%	100.0%	ICA	100.0%
Dusky rockfish	CV 2%-5%	95% to 98%	2% to 5%	100.0%	95% to 98%	2% to 5%	100.0%
Northern Rockfish	Amendment 80 Sideboards	100.0%	ICA	100.0%			
Northern Rockfish	All CP	100.0%	ICA	100.0%		n/a	
Northern Rockfish	CV 2%-5%	95% to 98%	2% to 5%	100.0%			

Source: Amendment 80 sideboard limits as reported in Table 26 to GOA harvest specifications.
https://alaskafisheries.noaa.gov/sites/default/files/16_17goatable26.pdf

Option 2 would allocate all these directed fisheries to the CP sector. They have traditionally harvested almost all of these species in these areas. CVs have had limited markets for these species in those areas and some of the 58' limit seiners are targeting salmon when these fisheries traditionally occur. This option would require NMFS to set a sector wide ICA for CVs. It would also be important to monitor the MRAs for these species if the intent is to limit ICA levels in the future.

Option 3 would only define the Western GOA sector allocations of these species. One of the other sector allocation options would need to be selected for the WYK**.** CVs would receive the largest allocation under this alternative in the Western GOA. **The analysts assume that the percentages defined under Option 3 are intended to include the amount needed for the ICA and any directed fishery.** As stated for the other options, NMFS will need to annually determine whether the percentage selected under this option would allow a directed CV fishery. Any amount not harvested by the CV sector could be rolled-over to the CP sector. The date would need to be determined. CV Pacific cod fishing in the Western GOA has historically concluded by mid-March. CPs historically fished rockfish in July, Therefore, the Council could consider selecting a roll-over date after the Pacific cod fishing slows and before the CPs harvest rockfish. Cooperative allocations could somewhat change the CV fishing year, but Pacific cod are more aggregated earlier in the year it is expected that CVs will continue to fish most of their Pacific cod allocation then.

1.4.1.2.3 Secondary Species under Alternative 2

Secondary species listed are not traditionally opened to directed fishing with trawl gear in the GOA, outside of the Rockfish Program. Table 1-57 lists the secondary species that could be allocated under Alternative 2. These species are tiered as options that could be selected jointly or individually.[38] Option 1 would allocate sablefish, option 2 would allocate secondary rockfish species, and a suboption to Option 2 would allocate big and longnose skates.

Secondary species that have little value in the trawl fishery are excluded from the allocation. Trawl operators do not have an economic incentive to race to catch low value secondary species. Allocating more species than necessary to reduce the race to fish would not achieve the overarching goal and objective outlined by the Council for this action. The overarching goal of the Gulf of Alaska Trawl Bycatch Management program is to provide the fleet tools for the effective management while limiting harvest privileges that may be allocated. Not allocating those species should still provide the fleet effective management tools while limiting the number of species allocated.

As shown in Table 1-18 some of the Western GOA rockfish TACs are relatively small. For example, the shortraker rockfish TAC is 38 mt and the thornyhead rockfish TAC is 291 mt. From 2013 through 2015, the average annual fixed gear catch of these species was 27 mt.of shortraker rockfish and 209 mt of thornyhead rockfish. It is understood that NMFS will review the TAC available for secondary species and determine the amount that would be allocated as quota to the trawl sectors and the amount needed as ICA for the fixed gear sectors. NMFS inseason management staff will set conservative ICAs. Setting conservative ICAs by rounding up historic catch estimates could equate to an ICA of 30 mt for shortraker rockfish and 300 mt for thornyhead rockfish. Based on this information NMFS would need to reduce the conservative ICAs based on the TAC when the program is implemented to provide sufficient amounts of those species to the trawl sector to allow the cooperatives to function. Even if less conservative ICAs are set for the fixed gear sectors, the trawl sectors may

[38] If the Council selects Option 3 under Alternative 2, Element 3.b, no secondary species would be allocated. Rather, cooperatives would be charged with managing secondary species under MRA limits.

need to adapt risk pools or something similar to manage small rockfish allocations. Therefore, NMFS recommends that instead of setting a fixed percentage of the TAC for Western GOA and West Yakutat District secondary species ICAs that NMFS would annually determine the appropriate trawl and fixed gear sector's ICAs based on current fishery conditions. NMFS also recommends that it be granted the authority to make in-season adjustments to the ICAs as necessary to promote the orderly harvest of the fisheries. If these species are allocated to the trawl cooperatives, the allocations could be relatively small and potentially constrain the cooperative's harvest.

For skates, the non-trawl (hook-and-line fleet) has historically topped off (fished close to the MRA) on those species when fishing in other targets. This fishing pattern and the low longnose skate TAC in the Western GOA could result in a Western GOA longnose skate ICA that is equal to the TAC. Similar issues described for rockfish secondary species could result for these skate species. If the TACs are low and a relatively large percentage is allocated to fixed gear fisheries, they have the potential to be a constraint to cooperative and the limited access fishery.

The next GOA trawl survey is scheduled for 2017, which means 2018 TACs could change based on that survey. This will occur prior to this proposed amendment being implemented. The potential for changes in future TACs does not change the recommendation by NMFS.

Table 1-57 Secondary species considered for allocation to cooperatives under Alternative 2

Option	Species	Area(s)
1	Sablefish (trawl)	CG*, WG, and WYK
2	Thornyhead rockfish**	CG* and WG
2	Shortraker rockfish**	CG* and WG
2	Rougheye/Blackspotted rockfish**	CG* and WG
2	'Other' rockfish	CG and WG
Suboption (Option 2)	Big skates**	CG and WG
	Longnose skates**	CG and WG
3	(*Mutually exclusive with Options 1 and 2*) Cooperative measures are required to manage secondary species under maximum retainable amounts (MRAs), as opposed to cooperative allocations.	

CG = Central GOA; WG = Western GOA; WYK = West Yakutat District
*Secondary species under CGOA RP are maintained.
** There is no WYK allocation - the allocations are for the entire Eastern GOA. The Other Rockfish category does have a WYK TAC, but is excluded from the secondary species allocations because of low levels of historical catch.

The percentage of the TACs allocated to the Central GOA Rockfish Program would be maintained under the proposed program and are shown in Table 1-58. Annual TACs will vary as will the annual allocation to the RP, but the percentages listed in the table would be retained. The TAC that remains after the RP allocations and deductions for ICAs will be divided between the CV and CP sectors based on either catch history or a combination of the three options described earlier.

Table 1-58 CG RP percentage of TAC allocations of secondary species would be maintained

		CV Cooperatives		C/P Cooperatives		
	TAC (2016)	% of TAC	Allocation (mt)	% of TAC	Allocation (mt)	Total
Sablefish	4,023	6.78%	273	3.51%	141	414
Shortraker rockfish	301	0.00%	0	40.00%	120	120
Rougheye rockfish	707	0.00%	0	58.87%	416	416
Thornyhead rockfish	988	7.84%	77	26.50%	262	339

Source: https://alaskafisheries.noaa.gov/sites/default/files/16_17goatable12.pdf

Pacific cod is also a secondary species allocated to CVs under the RP. CVs are allocated 3.81% of the Central GOA TAC. Maintaining the RP allocations means that trawl CVs would continue to be allocated 3.81% of the Central GOA Pacific cod TAC. That amount and any ICA would be deducted from the total Central GOA CV trawl allocation prior to determining allocations for the inshore cooperatives or the limited access fishery under this program.

Table 1-59 shows the percentage of each secondary species, other than Pacific cod, that was retained by GOA trawl CVs and GOA trawl CPs relative to total trawl gear catch. All rockfish species are reported as a percent of trawl retained catch and total retained catch of all gear types. Sablefish is only reported as a percentage of the trawl gear catch, because it has its own trawl gear allocation. All other secondary species annual TACs are not divided between fixed and trawl gear types. The percentage of retained catch of trawl CVs and trawl CPs indicates the percentage of the TAC that could be allocated to each sector under the proposed qualifying years.

Table 1-59 includes cells for the 2003 through 2012 period that is listed as “n/a”. Information was not included in these cells because the species did not have its own TAC set for the entire time period. For example, the skate species were not divided by species or area prior to 2005. Because the time period considered included the years 2003 and 2004, the calculation for big skates and longnose skates was included for each area.

The Central GOA RP allocation of secondary species, as presented in Table 1-58, would be maintained. Information in Table 1-59 excludes those area/species groups. As a result only the other rockfish and skate species groups are presented in the table for the Central GOA. The percentages in the “retained catch % trawl” are the percentages that would be used to divide the ICA set by NMFS between the trawl sectors. The other data presented in the table is provided as background information.

Table 1-59 Percent of GOA secondary species retained by CVs and CPs

	Allocation	Retained	Catch % trawl		Retained	Catch % all gear
Year	Area	Trawl	Trawl CV	Trawl CP	Trawl CV	Trawl CP
			Sablefish			
2008-2012	WG	Trawl	67.8%	32.2%		
2007-2012	WG	gear has	69.6%	30.4%		
2003-2012	WG	its own	66.7%	33.3%	n/a	
2008-2012	WY	allocation	66.4%	33.6%		
2007-2012	WY	for	67.3%	32.7%		
2003-2012	WY	sablefish	64.7%	35.3%		
			Other rockfish			
2008-2012	CG	34.8%	39.2%	60.8%	13.6%	21.1%
2007-2012	CG	34.6%	38.1%	61.9%	13.2%	21.5%
2003-2012	CG	35.3%	29.1%	70.9%	10.3%	25.1%
2008-2012	WG	23.0%	0.0%	100.0%	0.0%	23.0%
2007-2012	WG	28.7%	0.3%	99.7%	0.1%	28.6%
2003-2012	WG	30.6%	0.2%	99.8%	0.1%	30.5%
			Rougheye/blackspotted Rockfish			
2008-2012	WG	64.1%	0.8%	99.2%	0.5%	63.6%
2007-2012	WG	65.0%	0.8%	99.2%	0.5%	64.5%
2003-2012	WG	n/a	n/a	n/a	n/a	n/a
			Shortraker Rockfish			
2008-2012	WG	61.4%	0.0%	100.0%	0.0%	61.4%
2007-2012	WG	67.2%	0.1%	99.9%	0.0%	67.2%
2003-2012	WG	n/a	n/a	n/a	n/a	n/a
			Thornyhead Rockfish			
2008-2012	WG	41.7%	0.1%	99.9%	0.1%	41.7%
2007-2012	WG	47.6%	0.1%	99.9%	0.1%	47.5%
2003-2012	WG	45.4%	0.1%	99.9%	0.1%	45.4%
			Longnose Skate			
2008-2012	WG	7.3%	4.5%	95.5%	0.3%	7.0%
2007-2012	WG	7.3%	5.7%	94.3%	0.4%	6.9%
2003-2012	WG	n/a	n/a	n/a	n/a	n/a
2008-2012	CG	43.8%	75.1%	24.9%	32.9%	10.9%
2007-2012	CG	40.9%	76.7%	23.3%	31.4%	9.5%
2003-2012	CG	n/a	n/a	n/a	n/a	n/a
			Big Skate			
2008-2012	WG	10.0%	0.9%	99.1%	0.1%	9.9%
2007-2012	WG	11.2%	0.9%	99.1%	0.1%	11.1%
2003-2012	WG	n/a	n/a	n/a	n/a	n/a
2008-2012	CG	60.0%	82.6%	17.4%	49.6%	10.5%
2007-2012	CG	56.7%	82.6%	17.4%	46.9%	9.8%
2003-2012	CG	n/a	n/a	n/a	n/a	n/a

Source: AKFIN summary of CAS and NMFS annual reports

The Council included an option that would allocate secondary species as a percentage of total catch, instead of retained catch. Total catch would be the sum or retained catch, plant discards, and at-sea discards for catcher vessels. Retained catch and plant discards are reported on industry reports (e.g., fish tickets) and included in the

CAS data used for this analysis. There were no plant discards of these species reported in the 2003 through 2012 data. Based on this information the difference between retained catch for these species and total catch would be equal to the at-sea discards.

At-sea discards are typically not reported on industry reports because the processing plant employee filling out the fish tickets cannot verify the amount of at-sea discards by the catcher vessel. Observer data are used to estimate at-sea discards (Cahalan, Gasper, & Mondragon, 2014). That report defined the processes of estimating at-sea discards. Observer data are used entirely to estimate the amount of groundfish that was discarded at-sea when vessels have full observer coverage (i.e., CPs). For CVs delivering their catch to plants on shore, observer based at-sea discard rates are applied to the total retained catch. The at-sea discard rates are based on data:

- aggregated on a 5-week period, centered on week 3, and defined by week end-date, gear type, trip target code, and reporting area; and
- aggregated across reporting areas and by a 5-week period, centered on week 3, and defined by weekend date, gear type, trip target code, and FMP area.

Because observer coverage in the GOA trawl fisheries, especially in Western GOA was relatively limited during the proposed qualifying periods, the observed at-sea discard rates from a few hauls could be extrapolated over many unobserved hauls. The heterogeneous CV fishing operations and the potential variation in at-sea discards by vessel could result in estimates of at-sea discards that have greater uncertainty than the CP data.

1.4.1.3 Alternative 3

Alternative 3 only allocates pollock and Pacific cod at the sector level (CV and CP). No further allocations of groundfish species are made to cooperatives. Sector level allocations were defined by the Council as follows:

Sector allocations of target species
Allocations to the trawl sectors for WG and CG Pacific cod (Am 83), CGOA rockfish program (Am 88), and GOA pollock (Am 23) are maintained. GOA flatfish eligibility for the trawl CP sector under Am 80 is maintained.

These are the same pollock and Pacific cod sector allocations that were described for Alternative 2. The reader is referred to that section for a more complete discussion. Pollock and Pacific cod would not be further allocated to cooperatives. The PSC allocations described in Section 1.4.2.2 are the only allocations that will be made to cooperatives.

1.4.1.4 Alternative 4

Allocations under Alternative 4 are described below and only apply to CV sector allocations under Alternative 2.

Allocate 5% - 15% of the fishing quota for all species allocated to CVs under the program to a Community Fishing Association established under §303A(c)(3) of the MSA. Quota allocated to the Community Fishing Association may not be sold.

Quota will be leased on an annual (option: every 3 years) basis according to distribution criteria established by the Board which meet the goals and objectives for the CFA established by the Council in regulation.

Under this proposed option, the CV allocation is reduced by the percentage selected (5% to 15%). That percentage of the sector's allocation is held by NMFS and assigned to cooperatives based on allocations made by the CFA board of directors. Because the quota shares will be held by NMFS they cannot be sold. The annual quota that is

derived from the quota shares may be leased by fishermen for up to three years at the discretion of the CFA board of directors. This quota must be fished in a cooperative and the cooperative must notify NMFS of the amount of groundfish quota and PSC quota limits that have been assigned to their cooperative by the November 1 deadline for cooperative applications.

Because the allocation process is determined by the CFA in the future it is not possible to project how the 5% to 15% reduction of the CV sector quota will be redistributed among individuals or cooperatives. It is assumed that the entire allocation will stay within the CV sector. If the CFA objective focuses on supporting new entry, the allocation could result in additional CV operators fishing that do not hold an LLP trawl license with any catch history or sufficient catch history to justify the expense of entering a vessel in a cooperative and participation in the fishery. Also, while the Council retains the option to implement an Adaptive Management program as part of this action, that program needs further definition before the allocation of species to sectors and cooperatives can be described.

1.4.2 PSC

1.4.2.1 Alternative 1

The apportionment of Chinook salmon PSC between the CV and CP sectors is already established by GOA Groundfish FMP Amendment 97, and the Inshore definition of the GOA directed pollock fishery. Those sector level allocations would be maintained under the No Action alternative.

Amendment 93 set a Chinook salmon PSC limit of 25,000 for the directed pollock trawl fishery. Because there is no directed GOA pollock trawl fishery for CPs, all of this Chinook salmon PSC would be part of the PSC pool that is assigned to the support the directed CV pollock fishery. By regulation, that limit is divided by area as follows: 18,316 Chinook salmon for the Central GOA, and 6,684 Chinook salmon for the Western GOA.

Amendment 97 set a 7,500 Chinook salmon PSC limit for the GOA non-pollock trawl fisheries. Of that, 3,600 Chinook salmon are apportioned to the CP sector. That amount supports the CP sector's Pacific cod, flatfish, rockfish, and Rockfish Program (RP) activity, and would be unchanged by this action. By contrast, Amendment 97 apportioned 3,900 Chinook salmon to the non-pollock CV sector. After removing 1,200 from that amount for the RP CV fishery, 2,700 Chinook remain to support the sector's Pacific cod and flatfish activity.[39] That amount is not apportioned in regulations between the Central and Western GOA.

Table 1-60 Summary of the no action GOA trawl fishery Chinook salmon PSC limits

Sector	Baseline Annual Limit	If the previous year's annual use is less than:	The next year's limit will be:
Trawl CP	3,600	3,120	4,080
Rockfish program CV	1,200	N/A	
Non-rockfish program non-pollock CV	2,700	2,340	3,060
Central GOA pollock fishery (CV)	18,316	N/A	
Western GOA pollock fishery (CV)	6,684		
CV total	28,900	28,560	29,260

[39] As well as any directed CV rockfish fishery that might develop in the Western GOA in the future.

Table 1-8 provides a summary of the halibut PSC limits set for the GOA under the no action alternative. Information in that table shows how the 1,705 mt limit is divided seasonally, by sector, and by fishery complex. Information in that table also shows the halibut sideboard limits that have been established for the AFA and Amendment 80 sectors.

1.4.2.2 Alternative 2

The Council is considering dividing the PSC limits between sectors and areas, where they do not currently exist, and then cooperatives and the limited access fishery. It is also considering reducing the overall pollock fishery Chinook salmon limit as well as the trawl halibut PSC limit under Alternative 2. The Council selected the following options for allocating PSC between sectors under Alternative 2.

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a. Chinook salmon:

The Chinook salmon PSC limit allocated pro rata based on pollock trawl landings is a CV allocation only of:

Option 1. 25,000 (status quo based on Am 93)
Option 2. 18,750 (25% reduction)

Chinook salmon PSC allocated pro rata based on trawl CV and CP non-pollock landings (excluding CG rockfish program for the CV sector) are based on GOA Amendment 97. Any Chinook salmon PSC caught in WY comes off the cooperative's Chinook salmon PSC limit.

b. Halibut:

Historical PSC use would accrue to the history of the sector in which the license holder operated (i.e., PSC associated with vessels that operated as CVs would accrue to the CV sector PSC apportionment; PSC associated with vessels that operated as CPs would accrue to the CP sector PSC apportionment.)

i. The halibut PSC limit allocated pro rata based on CV and CP trawl landings (excluding the CG rockfish program) is:

Option 1. 1,515 mt (status quo under Am 95 by 2016, with full 15% reduction in place)
Option 2. 1,364 mt (additional 10% reduction relative to 2016, phased in over a two-year period)
Option 3. 1,288 mt (additional 15% reduction relative to 2016, phased in over a three-year period)
Option 4. 1,212 mt (additional 20% reduction relative to 2016, phased in over a three-year period)
Option 5. 1,136 mt (additional 25% reduction relative to 2016, phased in over a three-year period)

ii. Halibut PSC apportionment between the CP and CV sectors will be based on halibut PSC use during:

Option 1. 2008 - 2012
Option 2. 2007 - 2012
Option 3. 2003 - 2012

For the purpose of apportioning halibut PSC between the two sectors, the Council determined that any PSC attributed to CVs that were delivering to motherships (or to CPs acting as motherships) during the qualifying years would be allocated to the CV sector. This represented a very small amount of PSC by too few companies to report. This decision by the Council provides clear direction on how to treat that catch, but has minimal impact on the PSC limit that would be assigned to each sector.

Before any PSC apportionment is calculated, the program would account for any halibut PSC reduction that might be selected under Element 3.b.ii. Any halibut PSC reduction will be assumed to apply proportionally to the CV and CP sectors.

1.4.2.2.1 CP sector allocation

Table 1-61 shows the CP Chinook salmon PSC limits under the status quo and how it would be divided by area. The number of fish shows the number of Chinook salmon that would be available to the CP sector in the Western GOA and Central GOA/West Yakutat District when PSC allocations to cooperatives are calculated by target fishery.

Table 1-61 Estimated Chinook salmon PSC limits for the non-rockfish program CP sector

	Percentage			Number of Fish		
Years	WG	CG & WY	GOA Total	WG	CG & WY	GOA Total
2003-2012	26.60%	73.40%	100%	957	2,643	3,600
2007-2012	15.70%	84.30%	100%	565	3,035	3,600
2008-2012	15.38%	84.62%	100%	554	3,046	3,600

Source: AKFIN summary of CAS data

The numbers of Chinook salmon in the table above are next assigned to the CP target fishery based on historic use during the qualifying period. The estimated amounts that would be assigned to each target fishery are shown in **Table 1-62**. Each CP license holder would then be allocated a percentage of that area/target fishery PSC limit based on their percentage of the CP sector's retained catch of the species. It is important to note that the assignments of quota in the table below is based on the use of PSC in the target fishery. The assignment of a percentage of that limit to a license and then cooperative is based on catch of each of those primary species assigned to the LLP license. For example, the total retained catch of arrowtooth flounder in all target fisheries by a CP license holder would be divided by the total retained catch of arrowtooth by all CP license holders. That LLP license would then be assigned that percentage (their retained catch of arrowtooth divided by all CPs in the sector retained catch of arrowtooth) of the Chinook salmon associated with the arrowtooth target fishery in that area. That percentage would be multiplied by the number of Chinook salmon reported in the table below to determine the Chinook salmon PSC limit that would be assigned to the LLP license based on its arrowtooth flounder history. That same process would be repeated for each target fishery. The total number of Chinook salmon assigned to the LLP license would then be assigned to the cooperative the LLP license holder joins. Once in the cooperative, the cooperative's Chinook salmon PSC limit could be used in any trawl CP fishery that is open to directed fishing in the GOA.

Table 1-62 Chinook salmon PSC attributed to CP target fishery

Target	WG	CG & WY	GOA Total
		2003-2012	
Arrowtooth Flounder	522	699	1,221
Atka Mackerel	2	-	2
Flathead Sole	188	113	301
Pacific Cod	70	18	88
Rex Sole	51	1,632	1,682
Rockfish	123	174	297
Shallow Water Flatfish	1	7	8
Total	957	2,643	3,600
		2007-2012	
Arrowtooth Flounder	198	905	1,103
Atka Mackerel	3	-	3
Flathead Sole	49	189	238
Pacific Cod	89	1	89
Rex Sole	15	1,739	1,754
Rockfish	211	191	402
Shallow Water Flatfish	0	11	11
Total	565	3,035	3,600
		2008 - 2012	
Arrowtooth Flounder	206	881	1,087
Atka Mackerel	4	-	4
Flathead Sole	53	206	259
Pacific Cod	56	1	57
Rex Sole	9	1,752	1,760
Rockfish	226	196	422
Shallow Water Flatfish	-	12	12
Total	554	3,046	3,600

Source: AKFIN summary of CAS data

Table 1-63 shows the halibut PSC limits that would be available to the CP sector for the non-RP fisheries. The overall halibut PSC limits are reported in the top row of the table. The second row of the table shows the halibut limit after reducing the total by 191 mt to reflect the deduction for the RP. After that deduction is made, the remaining halibut PSC limit is multiplied by the percentage assigned to the CP sector, based on qualifying period, generating the estimated halibut PSC limit for the CP sector.

Table 1-63 Estimated halibut PSC limits for the CP sector in metric tons, based on options considered

	Percent of halibut PSC limit available to		Reduction				
			Status Quo	10%	15%	20%	25%
		Total Limit (mt)	1,706	1,555	1,479	1,403	1,327
Years	Offshore sector	Non-RP Limit (mt)	1,515	1,364	1,288	1,212	1,136
2003-2012	28.0%		425	383	361	340	319
2007-2012	24.8%		376	339	320	301	282
2008-2012	25.6%		387	349	329	310	290

Source: AKFIN Summary of NMFS Catch Accounting Data

The estimated trawl halibut PSC limit allocated to the CP sector would be available for use by any vessel that is qualified to participate in the fisheries that are open to that sector. Alternative 2 would remove the fishery and area limits that further divided the trawl CP limits under the no action alternative. As a result the CP sector would receive an overall halibut PSC limit that the cooperatives or the sector as a whole would manage. When the PSC limit is taken the sector or cooperative that has reached its limit would be required to stop fishing for the remainder of the year. They would be required to stop fishing in the GOA because all groundfish fisheries that are open to the CP sector in the GOA are limited by halibut PSC. The CPs would also be limited by Chinook salmon on all their fisheries. CPs would need to apportion their Chinook salmon such that it allows them to fish under the RP as well as the non-RP fisheries that are open to directed fishing by CPs. It is assumed that to function most efficiently the cooperative structure would help manage the sector allocations.

After the PSC limit is assigned to sectors, the limits are further divided by target fishery and area. Table 1-64 shows those estimated percentages. All target fisheries reported in the AKFIN data are included in the table. As discussed before the pollock and sablefish fisheries are not open to directed fishing with trawl gear by CPs. These targets show up in the data because of the targeting algorithm that is applied to the data based on the catch composition. The PSC associated with those targets would be assigned to LLP licenses based on the target formula but could not be used in those target fisheries under the proposed program.

Table 1-64 CP sector allocation by percentage assigned to target fishery and area

Target Fishery	Central GOA & West Yakutat	Western GOA	GOA Total
	2003_2012		
Arrowtooth Flounder	27.85%	8.36%	36.21%
Atka Mackerel	0.00%	0.00%	0.00%
Flathead Sole	4.58%	3.85%	8.43%
Other Species	0.20%	0.02%	0.22%
Pollock	2.96%	1.80%	4.76%
Pollock - bottom	0.06%	0.02%	0.07%
Rex Sole	26.88%	1.82%	28.69%
Rockfish	6.07%	5.91%	11.99%
Sablefish	0.04%	0.00%	0.04%
Shallow Water Flatfish	8.81%	0.78%	9.59%
Area Total	77.45%	22.55%	100.00%
	2007_2012		
Arrowtooth Flounder	31.00%	8.30%	39.30%
Atka Mackerel	0.00%	0.00%	0.00%
Flathead Sole	8.51%	2.93%	11.44%
Pollock	0.81%	1.69%	2.51%
Pollock - bottom	0.11%	0.03%	0.15%
Rex Sole	33.52%	0.93%	34.46%
Rockfish	2.74%	7.02%	9.76%
Sablefish	0.00%	0.00%	0.00%
Shallow Water Flatfish	2.21%	0.18%	2.39%
Area Total	78.92%	21.08%	100.00%
	2008_2012		
Arrowtooth Flounder	32.21%	4.91%	37.12%
Flathead Sole	10.05%	2.75%	12.80%
Pollock	0.96%	1.57%	2.53%
Pollock - bottom	0.14%	0.04%	0.17%
Rex Sole - GOA	34.26%	0.54%	34.80%
Rockfish	2.58%	7.27%	9.85%
Sablefish	0.00%	0.00%	0.00%
Shallow Water Flatfish	2.62%	0.11%	2.72%
Area Total	82.81%	17.19%	100.00%

Source: AKFIN summary of CAS data

Multiplying the percentage of each target fishery the LLP accounted for during the qualifying period by the PSC assigned to that fishery (by species and area), yields estimates of the PSC assigned to each LLP. After the calculation was made the results were ranked from lowest to highest by the amount of halibut PSC assigned to the LLP license. In general the LLP licenses, were in the same order of rank for Chinook salmon PSC. The LLP licenses were then placed in groups of four based on their rank. The average PSC allocation of those groupings are presented in Table 1-65. Halibut is halibut mortality in metric tons. Chinook salmon PSC estimates are reported in numbers of fish.

The information in the table indicates that the LLP licenses in group 6 would be allocated about 72% of the CP halibut PSC and about 71% of the Chinook salmon PSC. The concentration of PSC in the CP sector is largely due to the flatfish fishery limitations that have resulted in as few as four vessels participating in those fisheries in recent years.

Table 1-65 Estimated average PSC assigned to groups of four LLP licenses based on rankings of halibut PSC limits assigned to license (2003 through 2012)

Group	Halibut	Chinook Salmon	Halibut PSC reductions			
	No PSC reduction		10%	15%	20%	25%
1	0.81	4.9	0.73	0.69	0.65	0.61
2	1.98	11.9	1.78	1.68	1.58	1.48
3	3.90	29.7	3.51	3.31	3.12	2.92
4	7.86	62.2	7.07	6.68	6.29	5.90
5	15.35	154.2	13.82	13.05	12.28	11.52
6	76.35	637.1	68.72	64.90	61.08	57.26

Source: AKFIN summary of CAS data

1.4.2.2.2 Catcher Vessel sector allocation

Chinook Salmon PSC

The CV sector Chinook salmon PSC limit for use in a cooperative would be the combined pollock and non-pollock/non-RP Chinook salmon PSC limits. The combined Chinook salmon PSC limit could be used to harvest any species available to the cooperative.

The Chinook salmon PSC limit associated with the pollock fishery is presented in Table 1-66**.** The Council has included an option to reduce the 25,000 Chinook salmon PSC limit by 25%, to 18,750. That this reduction is proportional by area, resulting in a limit of 13,737 Chinook salmon for the Central GOA/West Yakutat District and 5,013 for the Western GOA. Because no further breakdown by target fishery or area are necessary to allocate by LLP license, no further breakdowns of this Chinook salmon PSC limit are presented.

Table 1-66 Chinook salmon PSC limit for the GOA pollock fishery

	CG	WG	GOA Total
Status Quo	18,316	6,684	25,000
25% Reduction	13,737	5,013	18,750

Source: AFKIN summary of CAS data

Table 1-67 shows the percentage of non-Rockfish Program/non-pollock Chinook salmon assigned to each area. The sector limit is also presented in percentage of the 2,700 fish limit and in numbers of fish by area and target fishery. The Council has not proposed any reductions in this PSC limit as part of this action. These divisions were made based on the PSC usage in each area by qualification period defined by the Council.

Table 1-67 Non-rockfish/non-pollock CV Chinook salmon PSC division by area

	% of 2,700 fish			# of fish		
	2003-2012	2007-2012	2008-2012	2003-2012	2007-2012	2008-2012
Arrowtooth Flounder	32.7%	48.3%	47.8%	882	1,305	1,290
Deep Water Flatfish - GOA	0.0%	0.0%	0.0%	-	-	-
Flathead Sole	3.1%	0.1%	0.1%	84	2	2
Other Species	0.0%	0.0%	0.0%	-	-	-
Pacific Cod	31.3%	19.6%	19.1%	844	529	517
Rex Sole - GOA	1.7%	2.7%	3.2%	45	74	86
Rockfish	8.9%	0.2%	0.2%	241	4	5
Shallow Water Flatfish - GOA	19.4%	27.5%	27.8%	524	741	750
Central GOA & West Yakutat Total	97.1%	98.3%	98.1%	2,622	2,655	2,650
Arrowtooth Flounder	0.3%	0.0%	0.0%	7	-	-
Flathead Sole	0.1%	0.0%	0.0%	2	-	-
Other Species	0.0%	0.0%	0.0%	-	-	-
Pacific Cod	2.6%	1.7%	1.9%	69	45	50
Rockfish	0.0%	0.0%	0.0%	0	0	-
Shallow Water Flatfish - GOA	0.0%	0.0%	0.0%	0	-	-
Western GOA total	2.9%	1.7%	1.9%	78	45	50

Source: AFKIN summary of CAS data

PSC limits assigned to CV LLP licenses under Alternative 2 are calculated using the same method as described for CPs. PSC limits are divided by area and target species. The PSC limits are then assigned to CV LLP licenses based on the percentage of target species (by area) that was harvested using that LLP license.

After the PSC limits are allocated to a LLP license and assigned to cooperative the total amount of Chinook salmon assigned to the cooperative may be used in any fishery that is open to directed fishing by that cooperative's members in the GOA. This means that once in a cooperative the PSC limit is not divided between pollock and non-pollock fisheries. Rockfish Program Chinook salmon will still be accounted for separately. When a cooperative is checked into the RP fishery, their PSC usage will count against the RP PSC limit. When the cooperative is checked out of the RP cooperative and checked into the GOA Trawl Bycatch Program cooperative, the PSC will count against that cooperative's limit.

Halibut PSC

The CV sector halibut PSC limits considered by the Council are presented in **Table 1-68 GOA CV halibut PSC limits**. Those limits exclude the deduction for the RP. The 15 different limits considered are combinations of the three time periods and the five non-RP overall limits (status quo and the four options to reduce the limit). Based on the option selected the CV sector could be allocated from 818 mt to 1,139 mt as a halibut PSC limit. The 818 mt limit is 28.2% less than the 1,139 mt limit.

Table 1-68 GOA CV halibut PSC limits

	Percent of halibut PSC limit available		Reductions				
			Status Quo	10%	15%	20%	25%
		Total limit (mt)	1,706	1,555	1,479	1,403	1,327
Years	to CV sector	Non-RP limit (mt)	1,515	1,364	1,288	1,212	1,136
2003-2012	72.0%		1,091	982	927	873	818
2007-2012	75.2%		1,139	1,026	969	911	854
2008-2012	74.4%		1,127	1,015	958	902	845

Source: AFKIN summary of CAS data

Table 1-69 reports the percentage of halibut PSC that would be attributed to each area and target species. These percentages would be used to assign PSC limits to LLP licenses under Alternative 2. Because of the halibut PSC usage associated with the target fisheries that that trawl CVs have historically participated in during the qualifying years, the Central GOA is assigned over 95% of the halibut PSC limit in each option. The Western GOA is most heavily reliant on the pollock and Pacific cod fisheries. The Western GOA bottom pollock fishery accounted for less than 0.2% of the total under any year combination and the Western GOA Pacific cod fishery accounted for less than 5.0% during the qualifying years considered. CVs in the Western GOA have had very limited participation in the flatfish fisheries, which accounted for the majority of the halibut PSC usage in the Central GOA. As a result, CVs in the Western GOA used somewhat small amounts of halibut PSC, relative to CVs in the Central GOA, that rely more heavily on flatfish fisheries (primarily arrowtooth flounder and shallow-water flatfish).

Table 1-69 Percentage of CV halibut PSC by area and target fishery

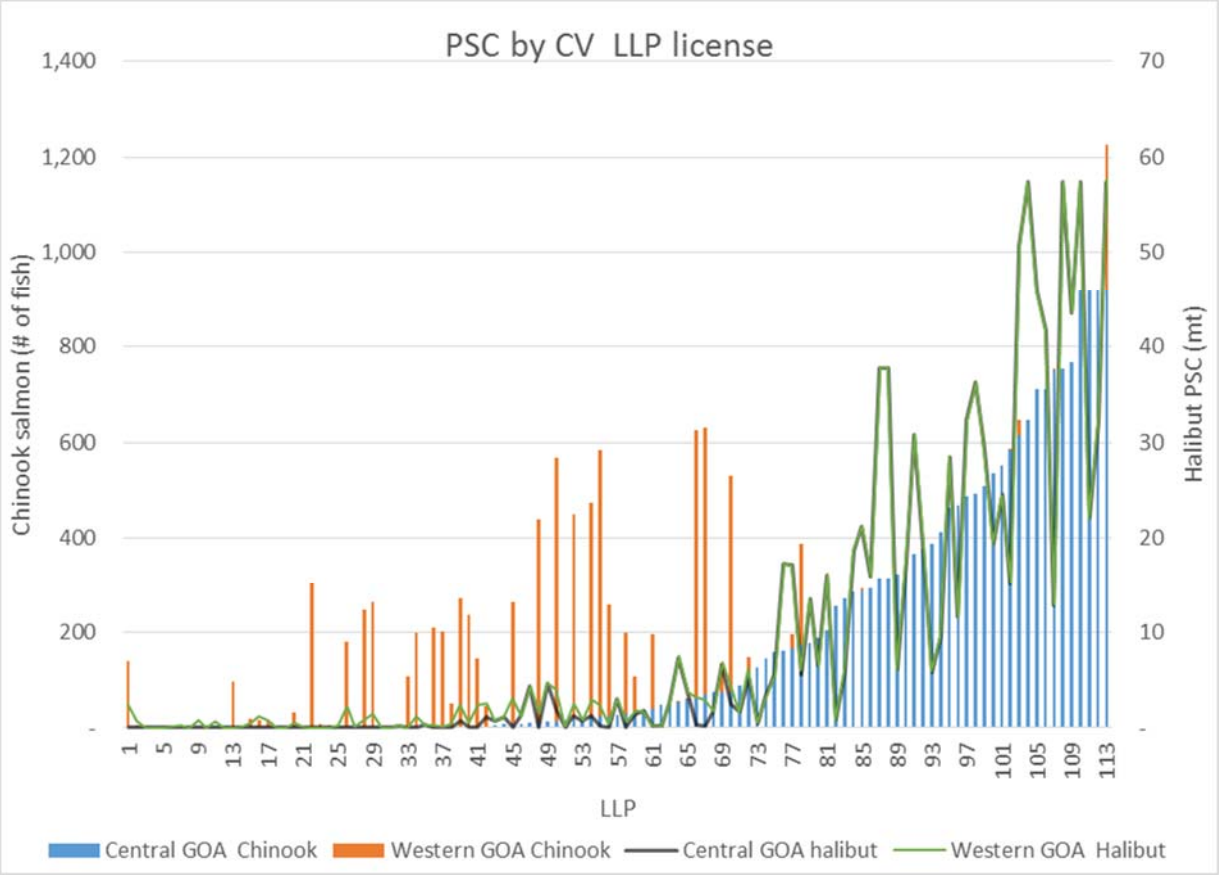
Target	CG & WY	WG	Total
	2003 through 2012		
Arrowtooth Flounder	21.36%	0.06%	21.42%
Deep Water Flatfish	0.62%	0.00%	0.62%
Flathead Sole	1.98%	0.04%	2.02%
Other Species	0.26%	0.00%	0.26%
Pacific Cod	29.91%	3.81%	33.72%
Pollock - bottom	3.11%	0.10%	3.21%
Rex Sole	0.36%	0.00%	0.36%
Rockfish	4.26%	0.01%	4.27%
Shallow Water Flatfish	34.11%	0.02%	34.13%
Total 2003 through 2012	*95.97%*	*4.03%*	*100.00%*
	2007 through 2012		
Arrowtooth Flounder	25.32%	0.00%	25.32%
Deep Water Flatfish	0.00%	0.00%	0.00%
Flathead Sole	2.28%	0.00%	2.28%
Other Species	0.02%	0.00%	0.02%
Pacific Cod	26.39%	4.27%	30.66%
Pollock - bottom	4.25%	0.17%	4.42%
Rex Sole	0.58%	0.00%	0.58%
Rockfish	0.04%	0.02%	0.06%
Shallow Water Flatfish	36.67%	0.00%	36.67%
Total 2007 through 2012	*95.55%*	*4.45%*	*100.00%*
	2008 through 2012		
Arrowtooth Flounder	27.54%	0.00%	27.54%
Deep Water Flatfish	0.00%	0.00%	0.00%
Flathead Sole	2.80%	0.00%	2.80%
Other Species	0.02%	0.00%	0.02%
Pacific Cod	25.99%	4.62%	30.61%
Pollock - bottom	4.00%	0.20%	4.20%
Rex Sole	0.71%	0.00%	0.71%
Rockfish	0.04%	0.01%	0.06%
Shallow Water Flatfish	34.06%	0.00%	34.06%
Total 2008 through 2012	*95.17%*	*4.83%*	*100.00%*

Source: AFKIN summary of CAS data

Figure 1-7 shows estimates of the PSC allocations that would be assigned to CV LLP licenses based on the 2003 through 2012 qualifying period with no PSC reductions. The figure is designed to provide a big picture overview of how Chinook salmon PSC and halibut PSC would be distributed across LLP licenses in the Western GOA and Central GOA. The vertical bars in the figure represent Chinook salmon PSC limits and the lines represent halibut PSC limits. The bars are presented as stacked bars to show the total PSC Chinook salmon limit assigned to an LLP license. The blue portion of the bars represent Central GOA Chinook salmon PSC and the orange portion is the Western GOA Chinook salmon PSC. The data was sorted by Central GOA Chinook salmon PSC from the smallest issuant to largest. Because the other PSC categories that are assigned to that LLP license – i.e., Western GOA Chinook, and halibut – do not follow the same trend, the bars and lines for the other PSC limits vary across the figure. The figure is presented in this way to allow all the PSC associated with an LLP license to be represented by a single point on the X-axis.

The lines represent halibut PSC assigned to a LLP license. The black line represents Western GOA halibut PSC quota assigned to an LLP license and the green line represents Central GOA halibut PSC. As described earlier, the black line tends to be very close to the x-axis, indicating that small amounts of halibut PSC are associated with that LLP license. The green line shows greater variability and the values tend to be greater, especially for LLPs that had greater numbers of Central GOA Chinook salmon assigned to the LLP license.

Figure 1-7 Estimated GOA PSC limits by CV LLP license based on 2003 through 2012 data and no PSC limit reductions



Source: AFKIN summary of CAS data

Since the figure was sorted by Chinook salmon PSC in the Central GOA, the LLP license that were fished primarily in the Western GOA tend to be listed in the left portion of the table. These LLP license have relatively small amounts of halibut PSC and often small amounts of Central GOA Chinook. However, some of the LLP licenses have large orange bars, some that represent over 600 Chinook salmon. These bars represent LLP licenses used on vessels that fished pollock in the Western GOA.

A figure is not presented for each of the options considered by the Council. Other figures would change based on the sector allocations of PSC species, the relative catch of target species associated with each LLP, and the amount of PSC associated with each target fishery. Also, when fewer years are used for the qualifying period, a smaller number of LLP licenses were active, so the total number of LLPs that receive an assignment of PSC would be reduced and LLP licenses would, in general, receive larger PSC limits.

The information presented in the figure assumes that all LLPs would join a cooperative. The amounts presented in the figure would be reduced by up to 30% of the amounts listed for LLP licenses that choose to join the limited access fishery. The total limit assigned to the limited access fishery will continue to be fished under the system of

seasonal and complex-based PSC limits (5 seasonal apportionments, with deep-water and shallow-water PSC divisions for the first 4 seasons), the annual allocation process will start with a table that resembles the current specifications table for GOA trawl halibut PSC.[40] Once all of the halibut PSC limit allocated to vessels that join cooperatives is removed, NMFS will determine whether sufficient PSC is available in the limited access fishery to open directed fisheries. That determination will also depend on the amount of primary species assigned to the limited access fishery. The result could mean that pollock and Pacific cod would be closed to directed fishing, but flatfish targets could be opened. It is anticipated that sufficient PSC and primary species to cover effort over a 24-hour period would be required for NMFS to open any directed limited access fisheries.

1.4.2.3 Alternative 3

Alternative 3 allocates PSC species to cooperatives, but does not allocate any target species. The cooperative members' target catch is limited by the overall TAC and whether the cooperative has sufficient PSC available. The Council's PSC allocation options for Alternative 3 are listed below:

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a. PSC species allocated to the cooperative are halibut and Chinook salmon, divided first by area (WG and CG/WY) based on historical PSC use (*options: 2003 – 2012; 2007 – 2012; 2008 - 2012*). Once in the cooperative, PSC can be used to support any target fisheries within the cooperative in that area at any time (no seasonal PSC apportionments). PSC would be apportioned to the cooperatives as follows (a different option may be selected for each area, WG and CG/WY):

   Option 1. Equal shares. Annually apportion PSC limits to each cooperative on an equal share basis relative to the number of member vessels in the cooperative.

   Option 2. Vessel dependency. Apportion (Option: 10% - 50%) halibut PSC and Chinook salmon PSC limits to each cooperative on a pro rata basis relative to the dependency on GOA trawl groundfish by species (pollock, flatfish, and Pacific cod) and area (WG and CG/WY) of the vessel assigned to the cooperative member's vessels the 3 prior years. The remaining PSC would be distributed based on equal shares. The vessel's dependency on GOA trawl groundfish, by species and area, is established by affidavit at the time of filing intent to join a cooperative or participate in the Limited Access fishery. Dependency on GOA groundfish is based on a threshold of (Option: 25% - 75%) of total pounds landed, by species and area, in GOA trawl groundfish fisheries.

   Option 3 (can be selected with Option 1 or 2 above). Each processor controls a portion of the annual PSC [options: 5% - 20%] within a cooperative associated with its member vessels. Each processor would assign the incremental PSC to vessels in the cooperative under the terms of the cooperative agreement. PSC made available by these agreements cannot be used by vessels owned by the processor (a vessel with more than 10% ownership by a processor using individual and collective rules for determining ownership).

      Suboption 1: Cooperatives that consist exclusively of processor-owned vessels are exempt from this prohibition.

[40] See Harvest Specifications Table 15 at: https://alaskafisheries.noaa.gov/sites/default/files/16_17goatable15.pdf

Suboption 2: No prohibition on processor-owned vessels using processor-controlled PSC. Processor-owned vessels cannot access an amount of the cooperative's processor-controlled PSC greater than the amount they brought into the cooperative.

b. Participants can choose to either join a cooperative or operate in a limited access fishery on an annual basis. Harvesters would need to indicate by affidavit their intent to participate in the GOA trawl pollock, Pacific cod, or flatfish fisheries in the upcoming year and be in a cooperative with a processor by November 1 of the previous season to access a transferable PSC allocation. A trawl CV license holder can be in one cooperative per region (WG and CG/WY) on an annual basis.

   Option: Cooperative formation requires at least [options: 2 – 5] vessels with a CV trawl LLP.

c. Each cooperative would be required to have an annual cooperative contract filed with NMFS by November 1 of the previous year. Cooperative members shall internally allocate and manage the cooperative's PSC allocation per the cooperative contract. Cooperatives are intended only to conduct and coordinate harvest activities of the members and are not FCMA cooperatives.

d. Allocate (Options 5% - 20%) of the PSC limits (halibut and Chinook salmon) to cooperatives that sign an inter-cooperative agreement to share member vessel bycatch rates on a tow-by-tow basis and provide bycatch reduction incentives at the vessel level. Allocation of PSC is contingent upon agreement to the terms of information sharing within the inter-cooperative agreement. PSC is allocated by area on a pro-rata basis relative to the number of member vessels (Option: the number of member vessels that meet the active participation requirements) within each cooperative.

1.4.2.3.1 Catcher Processor Sector PSC Limits

Under Alternative 3, the CP sector's halibut PSC limit is determined using the same method described for Alternative 2. That limit is not further divided by area or complex, and no cooperative structure is defined. As reported under Alternative 2, the CP sector would be allocated 3,600 Chinook salmon for their groundfish fisheries. This is the Chinook salmon limit they currently operate under. The halibut PSC limit is based on the historic use by the CP sector as a percentage of the total GOA trawl halibut PSC usage during the qualifying period. Percentages of the total are calculated for the three time periods considered by the Council. Reductions to the PSC limit are also considered. Table 1-63 shows the GOA halibut PSC limits that would be assigned to the CP sector under each of the options that were considered. Also like under Alternative 2, any PSC taken by CV would be attributed to the CV sector allocation, regardless of whether it was delivered to a CP or a Mothership.

If the CP sector wishes to form cooperatives, member vessels must all participate in a voluntary cooperative or, at a minimum, must sign onto an inter-cooperative agreement that divides PSC limits among CP cooperatives. Alternative 3 does not explicitly define the CPs that are allowed to participate in the CP sector. Under Alternative 2, CP sector eligibility was defined as those vessels listed in Table 31 CFR Part 679. That limitation does not apply to Alternative 3. As a result new CPs could enter the sector that are not part of the Amendment 80 cooperatives and reduce the stability need for a voluntary cooperative to form.

CVs would still be allowed to deliver to CPs under this program, but any PSC used by that CV would be deducted from the CP limit. Because there have been some CV deliveries to CPs in the GOA historically, maintaining that option allows those patterns to continue. It also clarifies how that PSC should be accounted for in the CAS.

1.4.2.3.2 Catcher Vessel Sector PSC Limits

CV PSC limits are also determined the same under Alternative 3 as they were under Alternative 2. CVs are assigned 2,700 Chinook salmon for the non-Rockfish Program/ non-pollock target fisheries (see Table 1-67). Table 1-66 shows the apportionment of the pollock Chinook salmon PSC limit. **Table 1-68** shows the CV halibut PSC limits under the various options considered by the Council.

1.4.2.3.3 Catcher Vessel PSC Limits Assigned to Vessels

Once the halibut and Chinook salmon PSC limits for the CV sector have been established, the next step is to allocate that available PSC across individual vessels according to the options that have been selected (under Elements 4.b, 4.e, and Alternative 4). Each vessel registered for an allocation would have an amount of halibut and Chinook PSC attached to it for the year. The vessel would carry that PSC limit to either a cooperative or to the Limited Access sector.[41] Each vessel's annual PSC allocation is determined by the sum of the PSC limit amounts from each PSC pool for which that vessel qualifies.

The concept of "PSC pools" is central to Alternative 3. The analysts presume that the equation for distributing PSC among vessels – the mix of selected options, or "mechanisms" – would be applied to each PSC limit separately and would be summed to result in the annual allocation that a particular vessel brings to a cooperative (or the Limited Access sector). A vessel "draws" an equal share of PSC from each pool for which it qualifies; the size of that draw is determined by the number of vessels that qualify for that pool in that year. Qualification is determined by declaring an intent to participate during the upcoming year in a GOA trawl fishery that is capped by an existing PSC limit, depending on the options selected[42], and other factors such as having joined a cooperative or meeting a dependency threshold.

The Council has proposed three different mechanisms that would affect how the various PSC limits are allocated to vessels. These mechanisms could be selected in many combinations:

1. Equal shares
2. Vessel dependency
3. PSC allocated to cooperatives that sign an inter-cooperative agreement

For each of the three allocation mechanisms, the Council has assigned percentage ranges of the PSC limit – which means *each* PSC limit – that would be allocated on that basis (Table 1-70). Percentages associated with each selected mechanism must, in the end, add up to 100 percent.

Note that the processor-held PSC option affects the allocation of PSC at a different step in the "order of operations." It directs the control of PSC quota *after* PSC has been allocated amongst the cooperatives (according to their vessel membership) and the Limited Access sector. It does not impact the amount of PSC a vessel takes into a cooperative, but once in the cooperative the processor controls a percentage of the cooperative's PSC contributed by the member vessels.

As reflected in Table 1-70, equal shares is the mechanism by which all remaining PSC quota would be allocated across vessels after accounting for all other selected mechanisms. Meaning that if the 10% was selected for each

[41] Per Element 6, a CV that chooses not to join a cooperative is in the Limited Access sector. That vessel might have an individual PSC limit (Element 6, Option 2), or might fish competitively under a PSC limit that is shared amongst all of the vessels that pre-register to trawl in the GOA by November 1, but do not join a cooperative (Element 6, Option 1).
[42] For example, if the Council only selects Element 4.b Option 1 (equal shares), without the suboption, a vessel would qualify for a PSC allocation by declaring an intent to participate in *any* GOA non-Rockfish Program trawl fishery.

of the vessel dependency allocation, and participation in an inter-cooperative agreement allocations, the remaining 70% would be divided equally among the qualified vessels.

The Council may select different allocation percentages for the pools that exist within each existing PSC limit. For example, the Council might specify that vessel dependency governs the distribution of 20% of the Central GOA pollock fishery's Chinook salmon PSC limit, but only 10% of the halibut PSC limit. Selecting lower allocation percentages means that a larger share of the available PSC is annually distributed across all active vessels based on "equal shares."

Table 1-70 Range of PSC allocation percentages for each proposed mechanism

Mechanism	Range
Vessel Dependency	10% - 50%
Inter-cooperative Agreement	5% - 20%
Equal Shares	Remainder

Using the percentage ranges listed in Table 1-70 estimates of the Chinook PSC limit by area are presented in Table 1-71. As an example, if in the Western GOA Chinook salmon PSC limit was based on no PSC reduction in the pollock fishery and the Non-pollock/non-Rockfish Program PSC was divided by area using 2008 through 2012 and the Council selected allocating 10% of the Chinook PSC by being part of an inter-cooperative agreement, all the Western GOA CVs that qualify for that limit would equally share 673 Chinook salmon. Assuming 30 vessels qualify, each vessel would be assigned about 22.4 Chinook salmon as its Chinook PSC limit based on that pool. A similar process would be followed for each pool, and the sum total for all pools would be the number of Chinook salmon that vessel may take into a cooperative. However, if the dependency pools were considered the limits would need to be considered at the pollock and non-Pollock/Non-Rockfish Program levels.

Table 1-71 Estimated number of Chinook salmon associated with the percentage assigned to each pool

			Percentage of Area Total						
Pollock fishery	Non-pollock/non-Rockfish Program	Total Chinook salmon	5%	10%	15%	20%	30%	40%	50%
Central GOA & West Yakutat District					All Fisheries				
No Reduction	2003-2012	20,938	1,047	2,094	3,141	4,188	6,281	8,375	10,469
No Reduction	2007-2012	20,971	1,049	2,097	3,146	4,194	6,291	8,388	10,486
No Reduction	2008-2012	20,966	1,048	2,097	3,145	4,193	6,290	8,386	10,483
25% Reduction	2003-2012	16,359	818	1,636	2,454	3,272	4,908	6,544	8,180
25% Reduction	2007-2012	16,392	820	1,639	2,459	3,278	4,918	6,557	8,196
25% Reduction	2008-2012	16,387	819	1,639	2,458	3,277	4,916	6,555	8,194
					Pollock Fisheries				
No Reduction	n/a	18,316	916	1,832	2,747	3,663	5,495	7,326	9,158
25% Reduction	n/a	13,737	687	1,374	2,061	2,747	4,121	5,495	6,869
					Non Pollock/Rockfish Program				
n/a	2003-2012	2,622	131	262	393	524	787	1,049	1,311
n/a	2007-2012	2,655	133	266	398	531	797	1,062	1,328
n/a	2008-2012	2,650	133	265	398	530	795	1,060	1,325
Western GOA					All Fisheries				
No Reduction	2003-2012	6,762	338	676	1,014	1,352	2,029	2,705	3,381
No Reduction	2007-2012	6,729	336	673	1,009	1,346	2,019	2,692	3,365
No Reduction	2008-2012	6,734	337	673	1,010	1,347	2,020	2,694	3,367
25% Reduction	2003-2012	5,091	255	509	764	1,018	1,527	2,036	2,546
25% Reduction	2007-2012	5,058	253	506	759	1,012	1,517	2,023	2,529
25% Reduction	2008-2012	5,063	253	506	759	1,013	1,519	2,025	2,532
					Pollock Fisheries				
No Reduction	n/a	6,684	334	668	1,003	1,337	2,005	2,674	3,342
25% Reduction	n/a	5,013	251	501	752	1,003	1,504	2,005	2,507
					Non Pollock/Rockfish Program				
n/a	2003-2012	78	4	8	12	16	23	31	39
n/a	2007-2012	45	2	5	7	9	14	18	23
n/a	2008-2012	50	3	5	8	10	15	20	25

Source: Annual PSC limits and AKFIN summary of CAS data

The information in Table 1-71 does not account for annual PSC adjustments based on the previous year's usage in the non-pollock/non-Rockfish Program fishery. Recall that the annual limit would be increased or decreased by 360 Chinook salmon based on achieving PSC thresholds. Taking into account the area division of Chinook salmon PSC, about 98% of the increase or decrease would be applied to the Central GOA totals.

It is not possible to determine the exact number of vessels that will qualify for each pool based on the information that is available. As a result, PSC estimates at the vessel/cooperative level are not generated in this section.

Table 1-72 is the companion table to Table 1-71 and focus on halibut PSC limits that would be assigned based on the options considered and the various pool percentages. Because the halibut PSC limits would be applied to all the target fisheries potentially constrained by that PSC limit. As a result this table is not further divided by fishery as was reported for the Chinook salmon limits. The amounts listed in the table would be divided by the number of vessels that qualify for that pool percentage to determine the halibut PSC limit a vessel would derive from each pool. The PSC limits from each pool would be summed to calculate the PSC limit the vessel would take into a cooperative or the limited access fishery.

Table 1-72 Estimated halibut PSC (mt) associated with the percentage assigned to each pool

		Total Halibut	Percentage of Area Total						
Year	Reductions	PSC	5%	10%	15%	20%	30%	40%	50%
					Western GOA				
2003-2012	Status Quo	43.98	2.20	4.40	6.60	8.80	13.19	17.59	21.99
2003-2012	10%	39.60	1.98	3.96	5.94	7.92	11.88	15.84	19.80
2003-2012	15%	37.39	1.87	3.74	5.61	7.48	11.22	14.96	18.70
2003-2012	20%	35.19	1.76	3.52	5.28	7.04	10.56	14.07	17.59
2003-2012	25%	32.98	1.65	3.30	4.95	6.60	9.89	13.19	16.49
2007-2012	Status Quo	50.74	2.54	5.07	7.61	10.15	15.22	20.30	25.37
2007-2012	10%	45.69	2.28	4.57	6.85	9.14	13.71	18.27	22.84
2007-2012	15%	43.14	2.16	4.31	6.47	8.63	12.94	17.26	21.57
2007-2012	20%	40.60	2.03	4.06	6.09	8.12	12.18	16.24	20.30
2007-2012	25%	38.05	1.90	3.80	5.71	7.61	11.41	15.22	19.02
2008-2012	Status Quo	54.48	2.72	5.45	8.17	10.90	16.34	21.79	27.24
2008-2012	10%	49.05	2.45	4.90	7.36	9.81	14.71	19.62	24.52
2008-2012	15%	46.31	2.32	4.63	6.95	9.26	13.89	18.53	23.16
2008-2012	20%	43.58	2.18	4.36	6.54	8.72	13.07	17.43	21.79
2008-2012	25%	40.85	2.04	4.08	6.13	8.17	12.25	16.34	20.42
					Central GOA & West Yakutat District				
2003-2012	Status Quo	1,046.82	52.34	104.68	157.02	209.36	314.05	418.73	523.41
2003-2012	10%	942.48	47.12	94.25	141.37	188.50	282.74	376.99	471.24
2003-2012	15%	889.97	44.50	89.00	133.50	177.99	266.99	355.99	444.98
2003-2012	20%	837.45	41.87	83.75	125.62	167.49	251.24	334.98	418.73
2003-2012	25%	784.94	39.25	78.49	117.74	156.99	235.48	313.98	392.47
2007-2012	Status Quo	1,088.54	54.43	108.85	163.28	217.71	326.56	435.41	544.27
2007-2012	10%	980.04	49.00	98.00	147.01	196.01	294.01	392.02	490.02
2007-2012	15%	925.44	46.27	92.54	138.82	185.09	277.63	370.17	462.72
2007-2012	20%	870.83	43.54	87.08	130.62	174.17	261.25	348.33	435.41
2007-2012	25%	816.22	40.81	81.62	122.43	163.24	244.87	326.49	408.11
2008-2012	Status Quo	1,072.68	53.63	107.27	160.90	214.54	321.81	429.07	536.34
2008-2012	10%	965.77	48.29	96.58	144.87	193.15	289.73	386.31	482.88
2008-2012	15%	911.96	45.60	91.20	136.79	182.39	273.59	364.78	455.98
2008-2012	20%	858.15	42.91	85.81	128.72	171.63	257.44	343.26	429.07
2008-2012	25%	804.34	40.22	80.43	120.65	160.87	241.30	321.73	402.17

Source: Annual PSC limits and AKFIN summary of CAS data

The amounts for the percentages listed above may be added to determine a percentage not listed. For example, if at final action one of the pools was assigned 25% of the total halibut PSC in the Western GOA, based on 2008 through 2012 with no PSC reductions, the amount assigned to the pool would equal 13.62 mt (2.72 mt + 10.90 mt). Because it is assumed that the percentages assigned to each pool are based on a percentage of the total PSC limit available to the trawl sector, the amount assigned to the PSC pools considered in the next sections can be estimated based on the two tables above. What cannot be estimated with any degree of certainty is the PSC limit that will be associated with a specific vessel. Those amounts cannot be determined because the number of vessels that will qualify for each pool on an annual basis cannot be determined with information that is available. Ranges can be estimated based on the number of LLP license that are available and historical participation patterns. The actual number of vessels that would qualify for an allocation will likely fall within these two estimates of the number of vessels.

1.4.2.3.3.1 Vessel Dependency PSC

The core principle of the dependency option is to associate a relatively greater amount of PSC limits with vessels that have a defined level of reliance on GOA fisheries, as opposed to trawl fisheries in the BSAI, for their Alaska groundfish trawl harvest operation. Based on that thinking, vessels that make a few hauls when transiting through

the GOA on the way to the BSAI should not qualify for an equal amount of PSC limits – particularly if those deliveries are primarily being made for the purpose of receiving a larger GOA PSC limit allocation. The threshold is a minimum proportion of pounds landed in a GOA trawl fishery compared to the total number of pounds landed in all Alaska trawl fisheries of that type.[43] Limiting the landings used in the threshold calculation to those made with trawl gear is a fairly narrow definition of dependency[44], but focuses on the Council's objective of rewarding GOA activity when participating in Federal trawl fisheries in Alaska.

The portion of each PSC limit designated as dependency-based quota (10% to 50%) is allocated only to vessels that join cooperatives. The options states: "Apportion […] PSC limits *to each cooperative* […]" (emphasis added). Vessels that opt to join the Limited Access sector forgo the opportunity to access this pool. As a result the only portion of the PSC limit they could access is from the equal shares pool[45].

A vessel's "dependency" will be assessed separately at the level of each fishery for which a PSC limit is established. The separate pools of dependency-based PSC quota, were described in Section 1.4.2.2.2. Pools for CV halibut are defined for the Western GOA and Central GOA/West Yakutat District. CV Chinook salmon pools are defined for the Western GOA pollock fishery, Central GOA/West Yakutat District pollock fishery, Central GOA/West Yakutat District non-pollock/non-Rockfish Program fishery and the Western GOA non-pollock/non-Rockfish Program fishery. Vessel owners who join a cooperative would apply to receive an equal share of PSC quota from a "dependency pool" by submitting an affidavit stating that the vessel named on their LLP has been credited with sufficient landings (by weight) to meet the threshold for a that pool. The proposed Council action does not intend for NMFS to verify the information submitted on annual affidavits that indicate dependence on GOA groundfish fisheries for the specified time period. However, if NMFS is required to verify the information submitted on annual affidavits at any time in the future, any affidavits found to include inaccurate information based on prior landings data would be forwarded to the Office of Law Enforcement for investigation.

The various thresholds would be judged based on landings during the three years prior to the year for which PSC quotas are being issued.[46] This analysis defines "prior" years as the three years prior to the year the dependency affidavit is being submitted to NMFS for an allocation in the next year. For example, if the years 2014, 2015, and 2016 would be used to determine dependency for 2018. The affidavit would be submitted prior to November 1, 2017.

The dependency threshold for each PSC pool would be assessed looking only at landings on Alaska trawl trips that targeted the species that are managed under that PSC limit. For example, the dependency threshold for the pollock fishery Chinook salmon PSC limit is assessed by relating landings from GOA trawl gear trips targeting

[43] This equation represents the basic scheme for calculating dependency:

$$\boldsymbol{Eq.1}\ \frac{Lbs.GOA\ Trawl}{(Lbs.GOA\ Trawl + Lbs.BSAI\ Trawl)} \geq Threshold\ [25\%, 75\%]$$

[44] It excludes harvests of other gear types, harvests from outside Alaska, harvests in State fisheries, and dependence on salmon tendering.

[45] Vessels in the Limited Access fishery would also not have access to CFA quota that must be fished in a cooperative or the pool assigned based on inter-cooperative agreements. Adaptive Management quota is not currently defined in terms of who could access that pool. However, based on Council objectives it is not expected that it would be available to vessels in the Limited Access fishery.

[46] The Council's motion states that the "3 prior years" would be considered, but there was some discussion on the record that one or two years could be selected instead. In either case, the analysts assume that the threshold would be judged on the basis of the most recent years, and not a choice of one or two years from the most recent set of three.

pollock to landings from BSAI trawl pollock target trips.[47] Similarly, the threshold for the dependency pool within the GOA non-pollock/non-Rockfish Program CV sectors Chinook salmon PSC limit would be assessed by relating GOA non-pollock/non-Rockfish Program trawl landings to the BSAI trawl landings of non-pollock groundfish.[48] Note that Central GOA /West Yakutat District and Western GOA are considered jointly when assessing whether or not a vessel meets a GOA dependency threshold. The rationale for this interpretation is described below.

The Council's motion defines dependence on GOA groundfish fisheries by species: pollock, Pacific cod, and flatfish. Dependency pools are defined as each existing PSC limit (or a subset of that limit broken out by area) that is allocated to qualifying vessels that join cooperatives. Chinook salmon PSC limits are divided by species groups (pollock, non-pollock/non-Rockfish Program CV sector, and Rockfish Program CV sector); the Chinook PSC limits for pollock and the Rockfish Program CV sector are already divided by area. These definitions match fairly well with the Council's motion to consider dependence based on pollock, Pacific cod, and flatfish species. The primary difference is that dependency pools combine Pacific cod and flatfish into a single dependency group (non-pollock/non-Rockfish Program CVs that is further divided by area).

The procedure for determining dependency is that each vessel will be determined to have either qualified or not qualified as "GOA dependent" for each fishery or set of fisheries that is governed by an existing PSC limit. For our purposes, these would include (1) the directed GOA pollock trawl fishery (for Chinook salmon PSC), (2) the CV non-pollock/non-Rockfish Program fishery (for Chinook salmon PSC), and (3) GOA trawl fisheries, excluding mid-water pollock (for halibut PSC limits). The result is area-specific dependency pools for each existing PSC limit. Vessels that complete the following tasks by November 1 are then allocated an equal share from each dependency pool for which it qualifies:

- Join a cooperative;
- Register intent to participate in specific fisheries (by area);
- Submit an affidavit to NMFS stating which dependency thresholds the vessel meets.

Evaluating vessel dependency separately for each existing PSC limit makes clear sense for the allocation of Chinook salmon PSC, since those limits are already divided between pollock and non-pollock fisheries. The halibut PSC limit supports all trawl groundfish target fisheries (except mid-water pollock), so by our own definition the dependency threshold should be evaluated based on catch from all groundfish trips (except mid-water pollock). The threshold would be evaluated in the manner described by Equation 1 in footnote 43.

Finally, it is noted that the dependency mechanism does not treat relatively new entrants any differently than it treats vessels that have a long history in the GOA. As long as a vessel has at least one year of past participation in the GOA non-Rockfish Program trawl fisheries, the vessel is eligible to draw from one or all of the dependency pools if its distribution of GOA/non-GOA catch meets the selected thresholds. The only case where a new entrant to the GOA might be treated differently is if a vessel had participated in the BSAI in some of the years counted in the dependency calculation prior to their participation in the GOA. Relative to a vessel that enters the GOA with no Alaska trawl history, that vessel would have a harder time meeting the GOA dependency threshold; this likely conforms to the Council's intent.

[47] $\boldsymbol{Eq.2}\quad \frac{Lbs.GOA\ Trawl_{pollock\ targets}}{(Lbs.GOA\ Trawl_{pollock\ targets}+Lbs.BSAI\ Trawl_{pollock\ targets})} \geq Threshold\ [25\%, 75\%]$

[48] $\boldsymbol{Eq.3}\quad \frac{Lbs.GOA\ Trawl_{NPNR}}{(Lbs.GOA\ Trawl_{NPNR}+Lbs.BSAI\ Trawl_{non-pollock\ targets})} \geq Threshold\ [25\%, 75\%]$

1.4.2.3.3.2 PSC Allocated to Cooperatives that Sign an Inter-Cooperative Agreement

This element functions as an incentive for individuals to join a cooperative, and for those cooperatives to agree to share data with the anticipation that information sharing can lead to the development of bycatch reduction tools and incentives.[49] As discussed earlier, this pool of PSC is not available to vessels that are members of the Limited Access sector. The percentage of the PSC limits assigned to this pool would be divided equally among cooperative member vessels whose cooperative signed an inter-cooperative agreement. For example, if the Council selects 10% for this pool, then 10% of each existing PSC limit would be placed into PSC pools that are only accessible to vessels that are members qualifying cooperatives as of November 1. From the perspective of vessels that choose Limited Access or join a cooperative that does not sign an inter-cooperative agreement, these PSC pools represent an "off the top" reduction to the amount of halibut and Chinook salmon that they could access.

The total PSC limits considered were shown in Table 1-71 and Table 1-72. Cooperative members are not required to be active in specific fisheries to access this pool. Any vessel that is assigned to a cooperative would be granted an equal share of the Chinook salmon PSC and halibut PSC that is assigned to this pool. For example, if a vessel was assigned to a Central GOA/West Yakutat District cooperative that meet the inter-cooperative agreement requirements, it would be assigned an equal share of the 107.27 mt halibut PSC limit pool. It would also be assigned an equal share of the 2,097 Chinook salmon PSC limit for the Central GOA. The NMFS would then assign those limits to vessel's cooperative for the year. If that vessel also was a member of Western GOA cooperative it would be assigned an equal share of the 5.45 mt Western GOA halibut PSC limit and an equal share of the 676 Western GOA Chinook salmon PSC limit. Those portions of the Western GOA PSC limits would be assigned to the Western GOA cooperative it is a member.

The language of the element refers to "cooperatives that sign an inter-cooperative agreement," but does not specify whether there could be multiple inter-cooperative agreements within each area (Western GOA or Central GOA/West Yakutat District). Having a different agreement for cooperatives in each region makes sense because the shared bycatch information and reduction incentives would revolve around locally-specific information and operations. Within a region, the requirement to have a single inter-cooperative agreement also makes sense to meet the objective of sharing information to reduce PSC and bycatch.

During discussions it was noted that if more than one inter-cooperative agreement were allowed in a region it allows *willing* contracting partners (cooperatives) to come together as parties that can work with one another smoothly and effectively. Requiring that there be only one agreement in the area could create a situation where a cooperative that cannot agree to the incentive terms being proposed by the other cooperatives has no alternative path to access this PSC pool. This could occur if the incentive terms are difficult for cooperatives that participate in specific fisheries to achieve, or are punitive as opposed to geared toward sharing of information for the benefit of all members. Smaller or less influential parties in the negotiation might then have to choose between agreeing to unfavorable terms or sacrificing some access to PSC. If the terms are punitive and complex, the analysts assume that forcing many diverse cooperatives to reach a single agreement will be a more costly and time-intensive process, relative to the alternative. It might be easier to get all cooperatives to sign onto a single agreement and share information if the agreement is simple, designed promote cooperative behavior, and achieves

[49] As written, the option merely asks that cooperatives share bycatch rates on a tow-by-tow basis. This piece of mandatory information sharing could be more effectual if the Council were to ask for more specific data. For example, the Council could require cooperatives to share tow-level bycatch rates in conjunction with spatial and temporal data, or some indicator of how the vessel was operative (e.g., early-season test tows, what the vessel was targeting, etc.). All things equal, sharing highly aggregated tow-level bycatch data might not be much more useful that sharing no data at all.

fleet-wide reductions in PSC usage or better utilization of PSC. It was also noted that a cost of allowing multiple inter-cooperative agreements to form, in the abstract, is that it shrinks the number of parties that are sharing bycatch rates and it creates silos of information. An explicit objective of the program is to create a system in which the sharing of information is beneficial to all participants. The Council has often described bycatch information sharing as an important tool for reducing and/or better utilizing available PSC. Cooperatives that perceive the cost of obtaining access to additional PSC through sharing information and defining vessel-level incentives as burdensome, they are free not to sign the inter-cooperative agreement.

In all likelihood, the analysts expect that GOA trawl cooperatives would take a minimalist approach in defining the terms of an inter-cooperative agreement, thus avoiding situations where one cooperative feels alienated or unable to sign on. An example of "minimalist terms" could be that the agreement simply states that the cooperatives consent to share data and that each individual cooperative contract will define vessel-level incentives for its members.

1.4.2.3.3.3 Processor-Held PSC

This option is a mechanism that directs the control of PSC *after it is allocated to a cooperative*. The first sentence in the option explicitly refers to PSC within a cooperative; PSC that arrived in the cooperative via the vessels that signed on as members. As a result this option does not change the allocation of PSC limits that vessels take into a cooperative or the distribution of PSC limits between cooperatives. The purpose of the option is to provide the processor some additional control over the benefits of the PSC assigned to their cooperative. It is also anticipated that processors will use the PSC to create incentives for more efficient use of PSC within the cooperative, either but making it available to responsible users or as incentive to share information.

The option also states that processor-held PSC cannot be used by vessels that are wholly or partially owned by the processor (10% threshold). Tracking whether or not a processor-owned vessel uses any of this PSC will be difficult to do in a direct manner. A simple but indirect way to enforce this rule would be to prohibit any processor-owned vessel from using more PSC than 100% of the amount that it brought into the cooperative. However, using an example of giving processors control over 5% of the PSC limit assigned to the cooperative, non-processor-owned vessels would have access to 95% of the PSC that they brought into the cooperative plus any amount of processor-held PSC that is distributed under the terms of the cooperative contract (this would be subject to limitation by a vessel use cap that could be set at 110% to 150% of a vessel's initial PSC allocation, as defined under Element 5).

The 10% ownership and control rule would be determined by an affidavit provided to NMFS during the cooperative formation process. That affidavit would define the ownership of the vessel, and any linkage any of the owners have to the cooperative's processor.

1.4.2.4 Alternative 4

Alternative 4 would allocate 5% - 15% of the fishing quota for all species allocated to CVs under Alternative 2 to a Community Fishing Association established under §303A(c)(3) of the MSA. The quota assigned to the CFA would be controlled by the CFA in terms of determining how it is allocated among vessels and cooperatives. NMFS would annually reserve the percentage of the quota for each allocated species and during the allocation process assign it to the cooperative that submits information from the CFA verifying they are entitled to a defined percentage of the CFA quota.

Based on the options considered by the Council, the CFA would be assigned from 938 to 3,750 Chinook salmon it could reassign as PSC and from 41 mt to 171 mt of halibut PSC. The CFA in turn would distribute the quota to harvesters based on criteria developed by their board of directors in consultation with the Council.

Table 1-73 Estimated PSC limits assigned to CFA under the options considered

		Percent of PSC limit to CFA		
Option	PSC Limit	5%	10%	15%
		Chinook salmon (# of fish)		
Status Quo	25,000	1,250	2,500	3,750
25% Reduction	18,750	938	1,875	2,813
		Halibut (mt of mortality)		
25% reduction (2003-2012)	818	41	82	123
25% reduction (2008-2012)	845	42	85	127
25% reduction (2007-2012)	854	43	85	128
20% reduction (2003-2012)	873	44	87	131
20% reduction (2008-2012)	902	45	90	135
20% reduction (2007-2012)	911	46	91	137
15% reduction (2003-2012)	927	46	93	139
15% reduction (2008-2012)	958	48	96	144
15% reduction (2007-2012)	969	48	97	145
10% reduction (2003-2012)	982	49	98	147
10% reduction (2008-2012)	1,015	51	101	152
10% reduction (2007-2012)	1,026	51	103	154
Status Quo (2003-2012)	1,091	55	109	164
Status Quo (2008-2012)	1,127	56	113	169
Status Quo (2007-2012)	1,139	57	114	171

Source: AKFIN summary of CAS data applied to Council options

CFA quota is a reduction off the total quota and PSC limits available to the CV sector. Each LLP license holder that receives an allocation based on catch history will have their allocation reduced by the percentage assigned to the CFA. Some of the LLP license holders and their associated cooperatives are expected to receive some the initial reduction back through the CFA allocation process. How individuals and cooperatives are impacted by the CFA allocation and the CFA Board of Director's decision process cannot be estimated. However, it will likely redistribute the allocations relative to what would have resulted if Alternative 2 was not selected as an additional element of the Alternative 2 allocation process.

1.5 Excessive Share Limits

National Standard 4 in the Magnuson-Stevens Fishery Conservation and Management Act states that *"if it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be […] carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges."* As noted in the NRC study "Sharing the Fish," use caps are generally favored as a means to prevent the control of a disproportionate amount of shares by a single person or entity.

In general, it is likely better to begin a program with rules that more aggressively prevent consolidation, and loosen the rules as appropriate. Tightening consolidation rules after the fact would be less effective, in part because consolidation will already have occurred.

The Council's action alternatives define a cooperative structure for participants in the GOA CV non-Rockfish Program trawl fisheries. Only Alternative 2 defines a cooperative structure for the GOA CP non-Rockfish Program trawl fishery participants. Like the Rockfish Program and the BSAI rationalization programs, this proposed action includes options for limiting excessive accumulation of shares and activity in the GOA trawl fishery for species that are allocated. For CVs, options limit individual and cooperative share use and holdings as well as vessel share use. For processors, options limit PSC share holdings and processing activity. For CPs, Alternative 2 limits individual share use and holdings and vessel share use.

Issuing transferrable quota shares will likely result in some consolidation relative to the initial allocation, as excess capital leaves the fishery. While this consolidation might be favored for developing economies of scale, excessive concentration of share-holdings and share use among a relatively few individuals or entities can result in disproportionate market power. The concentration of market power can affect working conditions and wages, and disadvantage smaller participants in a fishery. The impact on market power is expected to be limited to the fisheries managed under this program and perhaps other non-rationalized fisheries in which these vessels participate. Concentration of shares in the GOA trawl fisheries is unlikely to affect final product markets because the Pacific cod, pollock, and flatfish products compete on a world market. Concentration of shares, however, could affect the balance of power between the harvesters, processors, and employees that participant in the GOA trawl fisheries.

Ownership, control, and use caps have been used as methods of preventing excessive concentration of shares. The level of the cap, as seen in other rationalized fisheries, could vary among target fisheries or sectors depending on the particular structure of the fishery and the objectives of the cap.

As stated in the Rockfish Program RIR, the Council might pursue several different objectives in its setting of use caps. Caps on excessive shares can be used to—

1. *prevent consolidation of market power that is used to influence ex-vessel prices. If one or a small group of quota share holders are able to consolidate interests in the fisheries, it is possible that they would be able to withhold supplies of fish to raise the ex-vessel prices.*
2. *influence the availability of quota shares in the market to facilitate entry to the fishery. Consolidation of quota shares in the hands of a few holders could prevent the development of an active market for shares that is necessary for entry to the fishery.*
3. *prevent consolidation of market power that is used to influence crew shares and working conditions. The concentration of shares can also facilitate control of the labor market by the participants in the market.*
4. *limit windfalls granted during the allocation of shares. If allocations in excess of the caps are not permitted by a grandfather clause, use caps can be used to limit the windfall granted to persons receiving allocations in excess of the share.*
5. *ensure that the resource supports a reasonable number of participants. Use caps can be used to limit consolidation, which could result in the resource supporting the activities of few participants.*

As part of the process for setting ownership, control, and use caps for species that are allocated, the Council must determine both the rationale for its caps and the appropriate level of those caps. The degree to which a cap will serve its intended purpose is complicated by several factors. The fluctuation of stocks and unpredictability of

prices lead to uncertainty of harvesting and processing revenues. For example, participants in these fisheries, both harvesters and processors, have noted that current biological conditions (e.g., small sized pollock being harvested that command a low price) and current world-wide market conditions (the relatively strong US dollar and changes in supply and demand for products), have created a challenging environment to remain economically viable. These information shortcomings also limit the ability to predict the threat of market consolidation to competition in both ex-vessel prices and the labor market. The unavailability of ownership data prevents estimation of the current distribution of interests in the GOA trawl fisheries and prevents a complete assessment of the number of participants currently supported in the fisheries. To manage and enforce the cooperative quota caps in the RP the persons applying for quota must submit an application.[50] That application requires the submitter to report the names of all persons, to the individual level, holding an ownership interest in the LLP license(s) assigned to the cooperative and the percent of ownership each person and individual holds in the LLP license(s). A similar affidavit will be required under the proposed program to manage ownership caps under Alternative 2 or Alternative 3. Until those affidavits are submitted, it is difficult to provide an accurate estimate of the effects of use caps on various aspects of the fisheries.

1.5.1 Alternative 1

Alternative 1 would maintain the Limited Access structure of the fishery. Persons would be limited by the LLP license they hold and any sideboard limitations from other rationalized fisheries. The only ownership cap is currently associated with the number of LLP licenses (10) that a person may hold. The owners of a valid LLP licenses compete for a portion of the TAC that is available. That completion, the race to fish, sideboard limits from other fisheries, and the LLP license limit are currently used to limit excessive consolidation. No other consolidation limits are proposed under the No Action alternative.

A relatively simple measure of market concentration in the Herfindahl Index. The Herfindahl index is simply the sum of the squares of the market shares for each firm within the industry. The resulting number is always less than one. The closer the number is to one the greater the market concentration. The Herfindahl equation is presented below:

$$\text{Herfindahl index} = = \sum (mkt\ share_n)^2$$

The Herfindahl formula was applied to the 2015 retained catch data by LLP license to estimate the current market concentration of the Western GOA, Central GOA, and West Yakutat District CV pollock and Pacific cod fisheries. Those results are shown in Table 1-74. Overall the level of concentration in the Western GOA and Central GOA is between 0.023 and 0.071. These values do not indicate a high degree of concentration. However, these values are most useful for comparing the proposed allocation and consolidation that occurs after the program is implemented.

Table 1-74 Herfindahl Index based on 2015 percentage of pollock and Pacific cod retained catch by LLP license

	Pacific cod				Pollock				Pollock and
Year	CG	WG	WY	Total	CG	WG	WY	Total	Pacific cod
2015	0.045	0.061	0.927	0.027	0.023	0.071	0.387	0.018	0.018

Source: AKFIN summary of CAS data

[50] https://alaskafisheries.noaa.gov/sites/default/files/cq_app.pdf

1.5.2 Alternative 2

CV Consolidation limits

Option 1. Harvest use (ownership) caps in each region (WG and CG/WY). Harvesters that exceed these percentages are grandfathered into the program. No person may hold or use more than the following percentage of individual target species CV cooperative quota, using the individual and collective rule:

Suboption 1. 3%
Suboption 2. 5%
Suboption 3. 7%

Option 2. Vessel use caps are also applicable within the cooperatives. A vessel may not be used to harvest more than the following percentages of individual target species cooperative quota issued to the CV sector:

Suboption 1. 3%
Suboption 2. 10%
Suboption 3. 15%

Option 3. Processor use caps (facility-based) in each region (WG and CG/WY). Processors that exceed these percentages during the qualifying years are grandfathered into the program. No processor shall receive or process more than the following percentage of individual target species issued to the CV sector:

Suboption 1. 10%
Suboption 2. 20%
Suboption 3. 30%

CP Consolidation Limits

a. No person may hold or use more than the following percentage of allocated target species CP cooperative quota in each region, using the individual and collective rule:
Option 1. 30%
Option 2. 40%

Rules creating caps on share use and holdings indicate that no person could hold licenses that, collectively, are allocated an amount of shares that exceeds the threshold, and persons cannot acquire annual shares that would push quota holdings beyond the threshold. Vessel caps are interpreted similarly, such that no vessel can harvest target species generated from shares in excess of the threshold. Processing caps are structured differently. They are set at the facility level and limit the percentage of the quota allocated to region that a plant may process. The processing cap does not limit the amount of a target species that a firm (person) may process.

Individual use caps for both catcher processor and catcher vessel sectors will be calculated using the "individual and collective rule." The "individual and collective rule" defines how much of the sector's catch history a person may use or hold. Persons holding 100% of an eligible license would be assigned 100% of the license's history toward their use cap. If they hold 50% of the license, they are credited with holding or using 50% of the history assigned to that license. Once the person is assigned an amount equal to the maximum excessive shares cap, that person would not be allowed to acquire any additional amount of the sector allocation.

Processing caps are not based on the individual and collective rule. They are set at the facility level and limit the percentage of the target species quota allocated to region that a plant may process. For example, if a person owned two plants (facilities) in the Central GOA/West Yakutat District each of its plants could process up to the cap.

The individual, vessel, and processor caps include an option to grandfather entities that historically exceeded the cap. Such a provision would allow all individuals, vessels, and processing facilities to maintain activity at historical levels. Individuals and vessel would be grandfathered at the level of their initial allocations. Processors would be grandfathered at their percentage of the allocated target species during the qualifying years. Individuals and vessels over the cap at the initial allocation would not be allowed to acquire additional harvest shares, unless they divest of their initial allocation to a point at which they fell below the use cap. At that time, they would be permitted to acquire harvest privileges, until they reached the excessive share cap. If the option to grandfather allocations above the excessive share cap is not adopted, individuals who would receive initial allocations greater than the cap would not be allocated the portion over the cap. Unless the license is transferred to a person able to comply with the cap, that portion of the allocation would be redistributed, in proportion to qualifying history, to other eligible license holders in the sector.

Several factors could be used to assess whether excessive share caps on share-holdings and use will serve the objective of the Council. The number of participants that would remain in the sector if all participants buy or lease shares up to the cap would illustrate the potential limit on concentration of shares. The number of historical participants in the fisheries receiving allocations provides some indication of the number of participants that these fisheries may support and some insight into whether the cap is consistent with past participation levels. Also, since allocations might be a reflection of historical participation, the number of persons that would receive allocations at or above the cap provides some insight into whether the cap is consistent with historical participation. The analysis below is intended to provide the Council with a discussion of the options under consideration, and available data that might form the basis for a decision of an acceptable use cap.

1.5.2.1 Catcher/Processors

In the West Yakutat district of the Eastern GOA, the Council is considering allocating POP and dusky rockfish to CPs as target species. Ownership and use caps are considered at the 30% and 40% levels for target species allocated to CPs. Based on historical catch, the initial allocation for one CP would exceed the ownership and use caps for both rockfish species in that area. The grandfather provision would allow that CP to continue harvesting and processing its historical percentage of those fisheries. One other vessel is relatively close to the 30% cap for WY dusky rockfish, but only in the case that initial allocations are based on the 2007 through 2012 period. All other CPs would be allowed to acquire and use additional shares through the cooperative, if shares are available. Because some CPs would receive small initial quota allocations in West Yakutat District, but others are grandfathered in over the excessive share limit, it is possible that two or three CPs would have to fish small amounts of WY rockfish in order for the fishery to be fully prosecuted.

In the Western GOA, the Council is considering allocating POP, Northern rockfish, and dusky rockfish to CPs as target species. None of the CP LLP licenses accounted for more than 30% of any target species in that area, under any set of considered qualifying years. This analysis does not calculate potential individual LLP allocation amounts due to the limited information on the ownership structure of companies that own CP LLP licenses and vessels. One vessel in the Western GOA would be allocated more than 20% of the dusky rockfish quota if the selected qualifying years are 2003 through 2012 or 2007 through 2012. No other vessel would be allocated more than 20% of any target species in the Western GOA. These results do not necessarily mean that no license holders would receive grandfathered initial allocations above the excessive share limit after the individual and collective rule is applied.

On the whole, the considered excessive share limits for CPs will not prevent current participants from increasing their quota holdings through acquisition since the cap level options are high enough to allow as few as three or four vessels to hold or fish all of the sector's allocation (depending on the area). Table 1-25 and Table 1-26 in

Section 1.3.2.2.2 of this document provide annual counts of unique CPs that fished in the Western GOA and West Yakutat since 2003. In the Western GOA, eight to 10 CPs retained groundfish each year during the 2013 through 2015 period. Prior to that, the number of active Western GOA CPs had been within the range of 11 to 16 vessels. In West Yakutat, only five different CPs have retained groundfish during the 2003 through 2015 period, with no more than three CPs active in any given year. Only CP fished WY in seven of the 13 years considered; two CPs fished in five of the 13 years.

Excessive share holding and vessel use limits do not affect the amount of PSC quota allocated to CPs or the opportunity to harvest flatfish. As a result, these consolidation measures will have the greatest effect on CPs that tend to focus on rockfish targets when trawling in the GOA.

1.5.2.2 Catcher Vessels

Option 1 would allocate pollock in Areas 610, 620, 630, and 640 and Pacific cod in the Western GOA and Central GOA. Option 2 would allocate Western GOA rockfish (northern, dusky, and Pacific ocean perch) and West Yakutat District rockfish (dusky and Pacific ocean perch).

Table 1-75 shows the number of individual LLP licenses that would be over the 3%, 5%, and 7% target species quota ownership caps proposed for the CV sector, depending on the selected qualifying years. Whether or not individual owners or stakeholders in these (or other) LLPs are over ownership caps depends on how the ownership of each LLP license is structured. As stated earlier, available data does not support precise estimates that account for the individual and collective rule. NMFS would be informed of a given license's ownership structure if it were being wholly transferred (or if it has been transferred since the establishment of the LLP regulations), but the agency does not hold ownership-stake information on all licenses at this time. Applying the individual and collective rule will mean that persons who hold large ownership stakes in multiple licenses could be over the cap, but are not captured in the table below.

Table 1-75 Number of CV LLP licenses that are over the ownership caps

	Pacific cod		Pacific ocean perch		Dusky rockfish		Northern rockfish	Pollock			
Option	CG	WG	WG	WY	WG	WY	WG	610	620	630	640
2003-2012 (3%)	9	14	3	6	2	3	2	13	13	12	11
2003-2012 (5%)	1	7	2	5	1	2	1	8	0	0	7
2003-2012 (7%)	0	1	2	4	1	2	1	2	0	0	5
2007-2012 (3%)	13	17	2	5	3	4	2	14	14	15	10
2007-2012 (5%)	2	6	2	5	3	3	2	7	1	0	7
2007-2012 (7%)	1	5	2	5	3	3	2	3	0	0	6
2008-2012 (3%)	12	16	1	4	2	3	1	14	14	14	10
2008-2012 (5%)	1	5	1	4	2	2	1	9	1	0	6
2008-2012 (7%)	0	4	1	4	2	2	1	1	1	1	1

Source: AKFIN summary of CAS data

LLP license holders who wish to exit the GOA CV trawl fishery would presumably prefer more liberal use caps that would allow them to sell their holdings to the buyer who is willing to pay the most for the harvest privileges. Restrictive caps would exclude some buyers from the market, which may in turn reduce sale prices relative to what the market would bear under more liberal use caps.

In addition to individual use caps (ownership caps), the Council is also considering vessel use caps. Vessel use caps limit the percentage of the CV sector's allocation of a target species that an individual vessel may harvest. The vessel use caps being considered are 3%, 10%, or 15% of the CV sector's quota of each allocated species, and would be applied by area. Implementing a vessel use cap would ensure that no vessel harvests over that cap,

and that a minimum number of vessels remain active in the fisheries. A 3% vessel use cap would require at least 34 CVs to harvest the target species allocated to the sector/area, a 10% cap would require 10 vessels, and a 15% cap would require seven vessels.

Table 1-76 shows the number of CVs that would have been over the proposed vessel use caps based on catch of those species in the years 2012 through 2015. The vessel use caps do not include the option to grandfather vessels over the cap. The vessels listed in the table would have been required to stop catching that species when they reached the cap.

Table 1-76 Number of CVs that were over the vessel use cap by fishery and year, 2012 through 2015

Cap amount and harvest	Pacific cod		Pacific ocean perch		Dusky Rockfish		Northern rockfish	Pollock			
year	CG	WG	WG	WY	WG	WY	WG	610	620	630	640
3% (2012)	14	13	2	4	N/A	2	1	15	11	12	9
3% (2013)	14	13	N/A	13	N/A	2	N/A	17	13	16	16
3% (2014)	11	16	N/A	6	N/A	N/A	N/A	12	1	4	8
3% (2015)	11	14	N/A	2	N/A	N/A	N/A	12	4	10	3
10% (2012)	0	0	2	3	N/A	2	1	0	0	0	4
10% (2013)	0	1	N/A	3	N/A	2	N/A	1	0	0	2
10% (2014)	0	0	N/A	1	N/A	N/A	N/A	1	0	0	3
10% (2015)	0	0	N/A	2	N/A	N/A	N/A	2	0	0	3
15% (2012)	0	0	2	1	N/A	2	1	0	0	0	2
15% (2013)	0	0	N/A	1	N/A	2	N/A	1	0	0	0
15% (2014)	0	0	N/A	1	N/A	N/A	N/A	0	0	0	3
15% (2015)	0	0	N/A	2	N/A	N/A	N/A	0	0	0	3

Source: AKFIN summary of CAS data
Note: N/A means no CV reported landing that species during the year in that area.

A vessel use cap of 3% would have impacted the largest number of vessels in the Pacific cod, pollock, and WY Pacific ocean perch fishery. At least 13 vessels would have been affected during one or more years in those fisheries. The other rockfish fisheries only had sporadic CV participation, meaning that vessel caps would impact only a small number of vessels in those fisheries. However, those vessels could account for the vast majority of CV catch of that species in a given area (WGOA or WY). Imposing a vessel use cap at the lower levels considered might mean that CVs cannot harvest all the quota allocated to a cooperative. The low levels of rockfish harvest by CVs in the Western GOA is one reason that the Council might not choose to allocate rockfish quota based on historical catch. If the Council does not allocate WGOA rockfish, the CV sector would be managed under MRAs (directed fishing would not be permitted), or a sector-level allocation of Western GOA rockfish species could be set at 2% to 5% of each target species TAC.

The estimated levels of market concentration at the LLP license level for 2015 and the 2008 through 2012 period is reported in Table 1-77. Because more LLP licenses qualify for an allocation than fished in 2015, the Herfindahl index is smaller for all species/area combinations. This means that some consolidation must occur before the fishery is at the No Action alternative level of consolidation. This measure does not provide any information on how much concentration will occur after the program in implemented, but it does provide a baseline to measure concentration that could occur in the future.

Table 1-77 Herfindahl Index based on 2008 through 2012 allocations of pollock and Pacific cod under Alternative 2

	Pacific cod				Pollock				Pollock and
Year	CG	WG	WY	Total	CG	WG	WY	Total	Pacific cod
2015	0.045	0.061	0.927	0.027	0.023	0.071	0.387	0.018	0.018
2008-2012	0.029	0.052	0.275	0.020	0.027	0.051	0.067	0.019	0.019

Source: AKFIN summary of CAS data

The Council could choose not to apply vessel use caps to the CV rockfish fisheries. Whether or vessel use caps are applied depends on whether or not the Council wishes to ensure that the fishery supports a minimum number of CVs. One could argue that the rockfish fisheries in the WGOA and WY areas have not been integral to the CV fishery in the past, and that a broad group of CVs have not been reliant on those fisheries. Setting vessel use caps for those areas might require an expansion of the active fleet in those areas, lest some amount of quota remain unharvested. In either case, fleet contraction is not a concern relative to historic participation. Because many of these vessels participate in several fisheries[51], consolidation in the rockfish fisheries is not likely to affect the number of jobs on participating vessels.

Fleet consolidation in the pollock and Pacific cod fisheries might occur as a result of the cooperative structure and the transferability of quota shares between and within cooperatives. Reducing the number of vessels in the fleet might improve the overall economic efficiency of the sector, as the most efficient CVs harvest more of the sector's allocation. The owners of those vessels may lease (or otherwise contract) the harvest privileges that they were assigned to other vessels to achieve these efficiencies.

1.5.2.3 Processors

The Council is considering a limit (processor use cap) on the amount of each allocated target species allocated to CVs that a particular plant may process to 10%, 20%, or 30% of the area total. The processor cap also includes a grandfather provision that is based on activity during the selected qualifying years. Assuming that no processing plants qualified for the grandfather provision and that all CV quota was caught, a 10% cap would require that 10 plants process fish in a given area; a 20% cap would mean 5 plants are necessary, and 30% would mean 4 plants must remain active.

Annual data from 2010 through 2015 is reported in Table 1-78. The values reported in the table are the number of processing plants that exceeded the proposed processing caps by area and target species, and could be grandfathered in. As discussed previously under the CV caps, the CV sector displayed lower participation levels in the Western GOA and West Yakutat District rockfish fisheries. A value reported as "N/A" indicates there were either no deliveries to plants that year in an area, or that the plant identifier that took all the reported deliveries was missing. Blank processing identifiers were excluded from the counts. This same process of excluding blank identifiers was used for the CV and CP tables reported earlier.

In Area 610/Western GOA, two plants are typically over the cap for pollock and Pacific cod, until the cap level reaches 30%. At that point only one plant is typically over the cap. In Areas 620/630/Central GOA, the 10% cap results in three to six plants exceeding the cap. When the cap is raised to 20%, one to two plants are over the cap. Finally, when the cap is raised to 30%, only one plant is over the limit for pollock and none are over the limit for Pacific cod. In the Area 640 pollock fishery, the trends are similar to those reported for the Area 630 pollock fishery.

[51] In the Western GOA these fisheries include Federal fisheries, State of Alaska fisheries, and tendering operations. In the Central GOA the fisheries can include Federal fisheries, State of Alaska fisheries, tendering, and fishing in the West Coast fisheries.

Table 1-78 Number of processing plants that exceeded the proposed processing use caps in a year, 2010 through 2015

Area	Cap	2010	2011	2012	2013	2014	2015
				Pollock			
610	10%	2	2	2	4	2	2
610	20%	2	2	2	2	2	2
610	30%	1	1	1	1	1	1
620	10%	4	5	5	5	4	3
620	20%	2	2	2	1	1	1
620	30%	0	0	0	0	1	1
630	10%	4	5	5	4	5	3
630	20%	2	2	2	2	1	1
630	30%	0	0	0	1	1	1
640	10%	5	2	5	5	2	0
640	20%	3	2	2	2	2	0
640	30%	0	2	0	0	1	0
				Pacific cod			
Central GOA	10%	4	5	6	5	5	4
Central GOA	20%	1	1	1	1	0	2
Central GOA	30%	0	0	0	0	0	0
Western GOA	10%	2	2	2	2	2	2
Western GOA	20%	2	2	2	2	2	2
Western GOA	30%	2	2	2	2	2	2
				Dusky rockfish			
Western GOA	10%	1	n/a	n/a	n/a	n/a	n/a
Western GOA	20%	1	n/a	n/a	n/a	n/a	n/a
Western GOA	30%	1	n/a	n/a	n/a	n/a	n/a
West Yakutat District	10%	3	2	3	2	n/a	n/a
West Yakutat District	20%	2	2	2	2	n/a	n/a
West Yakutat District	30%	2	1	2	2	n/a	n/a
				Pacific ocean perch			
Western GOA	10%	1	1	2	n/a	n/a	n/a
Western GOA	20%	1	1	2	n/a	n/a	n/a
Western GOA	30%	1	1	1	n/a	n/a	n/a
West Yakutat District	10%	3	3	3	5	2	0
West Yakutat District	20%	3	1	3	3	2	0
West Yakutat District	30%	1	1	1	1	1	0
				Northern rockfish			
Western GOA	10%	n/a	n/a	1	n/a	n/a	n/a
Western GOA	20%	n/a	n/a	1	n/a	n/a	n/a
Western GOA	30%	n/a	n/a	1	n/a	n/a	n/a

Source: AKFIN summary of CAS data

A processing plant cap would ensure that no plant purchases more than the specified share of the landings from allocated target fisheries. If any processing caps are implemented, the most impact would be observed in the allocated pollock and Pacific cod fisheries. The cap might be intended to maintain a distribution of processing activity in the fisheries among several plants, which could benefit employees at those plants. However, a cap may not provide substantial constraints to companies that own more than one plant in an area. Caps do not prevent companies with access to floating processor capacity from bringing those plants into a fishery to increase their processing capacity.

It is also worth noting that recent changes have occurred in the GOA groundfish processing sector. Those changes include the sale of plants and construction of new facilities. Additional detail on these activities is provided in the Social Impact Assessment (Appendix 5).

A processor use cap could also be intended to stabilize the processing sector. If accompanied by a Kodiak landing requirement and a grandfather provision for plants that historically exceeded the cap level, the cap could limit (or delay) any redistribution of landings among plants that are active in the fisheries under the program.

Any new plant entering the fishery would be limited to processing no more than 10% of the landings from the allocated target species, while the grandfathered processors may continue to process up to their historical levels. By imposing these limits through a combination of a low processing cap and a grandfather provision for historical processors, it is possible that the redistribution of landings among processors in the fisheries could be constrained. This constraint could provide stability for the sector and its employees.

Processing competition may also be decreased, to the extent that a processor limited by the cap might not offer the highest ex-vessel prices that it would otherwise be willing pay. For example, if the two most efficient processors would be willing to pay a few cents more than other processors, but are limited by the cap, they may be unwilling to compete with each other (bidding to their highest prices) as they would be unable to secure additional landings.

One motivation for capping a processing plant might be the protection of historically active processing plants. The extent of this protection is likely to vary over time and may be minimal depending on the level of the cap and the decision on whether or not to grandfather processors into the program above the selected cap level. Eleven plants processed CV pollock and Pacific cod during 2015. If the cap is set at 20%, it is possible that the six least efficient plants could be unable to attract landings after the first two years of the program. However, the Kodiak plants are not homogeneous and some of the less efficient groundfish plants could process non-trawl groundfish, salmon, herring, crab, halibut, or other species. Changes in the relative distribution of groundfish trawl landings may have a negative impact on some operations, but the plants would not necessarily cease operations if they are reliant on a diverse mix of species.

Table 1-79 reports the estimated number of processing plants that would qualify for the grandfather provision under each option. Options that only use more recent years tend to increase the number of plants that would qualify. Plants that entered the fishery after 2012 would not be eligible for the grandfather provision and would be subject to any cap that is selected by the Council.

Confidentiality standards prohibit showing the amount that each plant is over the cap. Grandfathering plants' use-levels could decrease the minimum number of plants that must be active to process the entire CV allocation of target species.

Table 1-79 Number of plants grandfathered under options considered by the Council

Area	Cap	2003-2012	2007-2012	2008-2012
		Pollock		
610	10%	3	3	4
610	20%	3	3	4
610	30%	2	2	4
620	10%	5	5	7
620	20%	3	3	4
620	30%	1	1	2
630	10%	5	5	7
630	20%	3	3	4
630	30%	1	1	2
640	10%	1	3	4
640	20%	1	3	4
640	30%	1	2	3
		Pacific cod		
Central GOA	10%	4	5	5
Central GOA	20%	1	1	1
Central GOA	30%	0	0	0
Western GOA	10%	2	2	2
Western GOA	20%	2	2	2
Western GOA	30%	2	2	2
		Dusky rockfish		
Western GOA	10%	1	1	2
Western GOA	20%	1	1	1
Western GOA	30%	1	1	1
West Yakutat District	10%	1	1	1
West Yakutat District	20%	1	1	1
West Yakutat District	30%	1	1	1
		Pacific ocean perch		
Western GOA	10%	2	2	1
Western GOA	20%	1	1	1
Western GOA	30%	1	1	1
West Yakutat District	10%	4	3	3
West Yakutat District	20%	1	1	1
West Yakutat District	30%	1	1	1
		Northern rockfish		
Western GOA	10%	1	1	1
Western GOA	20%	1	1	1
Western GOA	30%	1	1	1

Source: AKFIN summary of CAS data

Underlying market forces could change as the cap level is reduced. A 10% cap could substantially limit competition for landings by preventing a plant from capturing a significant share of that fishery market. A lower cap might encourage smaller plants or plants that were historically less reliant on trawl groundfish to participate. It is unlikely that a large, highly automated plant specializing in a specific species would enter the fishery knowing they would only be able to access 10% of the Central GOA CV trawl quota, especially if pollock and Pacific cod quotas could decline in the future or if reductions to PSC limits could further constrain flatfish fisheries.

Small caps would likely need to be accompanied by a grandfather clause. This is certainly true in the rockfish fisheries where very few plants have taken deliveries rockfish harvested from the Western GOA.

It should be noted that NOAA General Counsel has advised that the Council's authority with respect to regulation of processing is limited. The Council may regulate processing in a manner that serves a permissible purpose such as consideration of "harvesting and processing employment" and "the current and historical participation of fishing communities," and assumedly to recognize "investments in, and dependence on, the fishery," but the Council may not establish "processing privileges."

Using processor caps to stabilize the processing sector and protect processor employees may not be workable due to other factors such as changes in TACs, PSC closures, and the world markets that the GOA trawl fisheries supply. Processing caps should therefore be used simply to limit over-consolidation in the processing sector.

Companies that own more than one plant, including floating processors, might utilize tender vessels to transport fish if they are at the cap. Processing caps are set at the plant level and not the firm level, so it may be in the best interest of the firm to move production from a plant that is capped to one that still has room under the cap. This decision would be based on the long-term operational efficiency of the plant and the CVs that deliver to them, and might not be based on the availability of landings in a single year.

While the plants that are currently active in the fishery are likely to gain an advantage from this limit on competition in the near-term, it is possible that processors with little or no history in the fisheries could receive the benefits of depressed competition that arise from a processing cap. The potential for an entering processor to receive this benefit is higher if the Kodiak landing requirement is not incorporated into the preferred alternative. The analysts do not expect a large influx of processing capacity and production efficiency to develop in the Central GOA outside of Kodiak; nevertheless, implemented a Kodiak landing requirement for a large portion of allocated quota would preclude such a development over the long-term.

Overall, processing caps would constrain production efficiency to the extent that competition to purchase landings is decreased. Harvesters in the GOA trawl fisheries could receive a lower price for landings when that competition is constrained. This reduction in competition could, in turn, reduce the incentive for processors to improve products and enhance marketing efforts to maintain their competitiveness in global product markets. The extent of this effect is not known given the limited information on plant operators' ability to increase product values through marketing efforts and product improvements.

1.5.3 Alternative 3

Alternative 3 defines two types of consolidation limits. The proposed limits apply to halibut PSC and Chinook salmon PSC because those are the only species allocated. Both options, as defined by the Council, are presented below.

(Annually) Allow transferability of PSC cooperative quota for annual use within the cooperative. Limit the amount of each PSC species annual cooperative quota PSC limit a vessel may use in the cooperative to (options: 110% - 150%) of what it brought into the cooperative.

Cooperatives can engage in inter-cooperative transfers of PSC to other cooperatives on an annual basis. Inter-cooperative transfers must be processed and approved by NMFS. Limit the amount of annual PSC cooperative quota a cooperative can transfer to another cooperative to no more than (option: 10% - 50%) of the initial cooperative allocation.

The CV use cap allows a vessel in a cooperative to use up to 150% of the amount of a PSC species that it was allocated. For example, if the 150% level was selected and a CV brought a PSC limit of 10 mt of halibut and 100 Chinook salmon into a cooperative, the vessel would be allowed to use up to 15 mt of halibut PSC and 150 Chinook salmon. Other CVs in the cooperative would need to use less PSC than they brought into the cooperative, or the cooperative would need to acquire PSC to balance the increased use by the first CV.

The vessel use cap is applied by regulatory area and by PSC species (halibut or Chinook salmon). The use of PSC is not restricted to the target fishery from which it was derived. In other words, a CV fishing for Pacific cod in a Central GOA cooperative could use Chinook salmon PSC that was allocated to the cooperative from either the CGOA pollock fishery's overall Chinook PSC apportionment or the Chinook apportionment for the non-pollock/non-Rockfish Program PSC limit.

The second option is an inter-cooperative transfer limit of up to 50% of the cooperative's initial allocation. As with the vessel limit, the Council could select a cap level that is less than the maximum (e.g., 50%). This option does not explicitly state that it should be applied at the species level, but because halibut PSC and Chinook salmon PSC are allocated in different units and are generally used to prosecute different target fisheries, the analysts assume that to have been the Council's intent. Using the numbers in the previous example, if a cooperative had an initial PSC limit of 10 mt of halibut and 100 Chinook salmon, it could transfer up to 5 mt of halibut PSC and up to 50 Chinook salmon to other cooperatives. Those transfers must be made through and approved by NMFS. Members of the cooperative would either use the remaining PSC as part of their fishing operation or it would remain in the water as PSC savings.

Within-year PSC rollovers that are already established in regulation would not affect the vessel-level or cooperative PSC use and transfer limits. For example, if Chinook salmon are rolled over from the Rockfish Program CV sector's PSC limit into a GOA Trawl Bycatch Program cooperative, it will not impact either the amount of PSC a vessel may use or the amount a cooperative can transfer. The application of both limits are based on the initial amount that was assigned to a cooperative.

The two consolidation limits considered in this section are proposed to for distinct reasons. The vessel use cap is designed to limit fleet consolidation by stacking PSC on the most efficient CVs. Assuming that vessel operators attempt to qualify for as many PSC allocation pools as possible, the initial allocations to smaller and larger vessels in the fishery will be similar, as will allocations to vessels that have been most active in the GOA historically and those that have had more diverse fishing patterns and historically rely on other fisheries and areas. Based on equal PSC shares and allocations through other pools, vessels that have been more active in the GOA trawl fisheries may historically use more than 150% of the initial allocation that they would receive under this alternative. These vessel operators will either need to improve their historical PSC usage rates or fish less in the GOA. The vessels and fisheries most likely to be affected are the Central GOA flatfish fisheries, which can register high halibut PSC usage, and pollock fisheries, where vessels sometimes encounter an unexpectedly large amount of Chinook PSC in a single tow. Vessels fishing flatfish in the Central GOA are traditionally vessels that are based in Kodiak and that spend a greater proportion of their fishing year in that area. Pollock boats encountering Chinook salmon at higher rates could be of any size, but vessels making larger and longer tows may be unaware of the high Chinook encounter and therefore catch more Chinook salmon before they can adjust fishing behavior by moving to a different area or changing the depth and time at which they are fishing.

PSC use caps could have very different effects than imposing use caps on target species. For example, using more PSC might allow a person to fish longer or with less care to minimize PSC rates but it does not, in and of itself, limit the amount of target species he or she can catch. To harvest target species a cooperative, and members

within that cooperative, must have PSC available to fish. A vessel that fishes carefully and with some good fortune may need less PSC than the amount it is allocated in order to harvest target species at its historical level. This person would not need to acquire and use additional PSC to fish as he or she had in the past. Conversely, a person that experiences high PSC rates might need to enter the market to supplement his initial allocation. The person that operates a CV in a cooperative is constrained not only by the amount of PSC available to them through the cooperative, but also by the PSC use limits. As a result, the PSC use cap may be less effective in reducing consolidation of target species catch on a vessel than target species caps. However, allowing some fleet consolidation through transfer of PSC could result in lower overall PSC rates if the vessels that fish are the ones that are most effective at avoiding PSC. Since avoiding PSC to the extent practicable is a goal, increasing the proportion of catch that is landed by the "cleanest" vessels should help achieve that program goal. If, instead, PSC transfers flow from vessels that fished with lower bycatch to those that did not – and thus need additional PSC – the effect of the program on overall PSC use will resemble the status quo. The extent to which PSC does flow to vessels with higher bycatch rates will depend on the market price for PSC quota, which the Council will not influence. The price is likely to be high if the PSC limit is constraining for most or all vessels, and low when PSC usage is well below the cap. In the latter situation, low transfer prices could weaken the incentive to avoid PSC and potentially have a marginal upward effect on total PSC use.

The cooperative transfer restriction is designed to limit the number of vessels that could conceivably exit a fishery as a result of quota leasing between cooperatives. The cooperative restriction could also help ensure that a cooperative that is efficient in its use of PSC cannot lease all of their PSC savings to others. Tables are presented later in this section to show these potential impacts. The vessel use cap limits the number of CVs that can lease all of their PSC within a cooperative.

Holland (Holland, 2016) describes perceived market failures and responses to concerns about constraining bycatch quotas in the Pacific Groundfish Trawl IFQ program. He found that "an effective, efficient quota pounds market is not automatically created when an IFQ system is implemented, even if an efficient mechanism for implementing transfers is." He also found that markets for multispecies fisheries can create unique concerns. PSC quota value is determined by the amount and the value of the target and secondary species that can be harvested with the PSC. Therefore, the value of PSC is variable across years and is different for each individual participant. The uncertainty associated with the amount of PSC a person needs also creates inefficient markets, particularly in regard to Chinook salmon because rates of salmon bycatch on a given trip or haul are nearly impossible to predict with certainty. Individuals might keep more PSC than they truly need as a hedge against an unanticipated high PSC rate on a future haul or trip. This tendency increases transactions costs, and reduces the market liquidity that is critical to having an efficient market that allocates PSC to the users that need it most and are willing to pay for it. As a result of these concerns, fishermen on the West Coast created risk pools. A similar mechanism could be developed within cooperatives using cooperative contracts to distribute PSC within a cooperative or access PSC through inter-cooperative agreements. Limiting PSC use and trade could impede the function of such risk pools or agreements. The overall effect will depend on whether and how much PSC limits are reduced, biological factors that impact PSC rates, and the constraints imposed on use by vessels and transfers between cooperatives.

Due to the manner by which PSC would be allocated under Alternative 3 – with different PSC pools and qualification requirements – not all vessels in a given cooperative will enter the year with the same initial PSC allocation. This complicates the estimation of the impact that limits will have in terms of fleet and processor consolidation. Another confounding factor for analysis is that the maximum transferable amount of PSC under the limits – in terms of metric tons of halibut or number of Chinook salmon – also depends on how many vessels enroll in cooperatives versus the Limited Access sector, and how many vessels join a given individual cooperative. These issues are illustrated in the examples below.

Under Alternative 3 CVs are allocated PSC based on qualifying for the pools of PSC defined in Section 1.4.2.3.3 of this document. Because we cannot determine the amount of PSC that each vessel will be allocated or the cooperatives they will decide to join, the analysts make some simplifying assumptions to frame a discussion. First, it is assumed that each vessel will be given an equal share of the available PSC and all CVs will join a cooperative in each area they fish. Second, it is assumed that the cooperatives that form will have a wide range in the number of member vessels. For simplicity sake, the example will be based on Central GOA cooperatives that range from two to 25 CV members. Recall that in 2015 there were 56 CVs that reported trawl landings in the Central GOA, and 26 CVs reported landings from the Western GOA. The actual number of CVs that could receive an allocation may be greater, because not all LLP licenses with a GOA trawl endorsement were used to fish in 2015.

Table 1-80 provides an example of an equal share allocation to CVs based on the number of vessels that fished in 2015, by area. The table allocates the total PSC limits to cooperatives of various sizes. Because of the simplified example, all the calculations are linear estimates, and each vessel is issued 374 Chinook salmon and 19.16 mt of halibut in the Central GOA. In the Western GOA each vessel is issued 259 Chinook salmon and 2.10 mt of halibut as its PSC limit.

Table 1-80 Example of the PSC allocations to vessels and cooperatives under Alternative 3

				CVs in the cooperative		
No PSC reductions using 2008-2012 data		Total	Per vessel	2	10	25
			56 vessels			
Central GOA	Chinook Salmon (# fish)	20,966	374	749	3,744	9,360
Central GOA	Halibut (mt)	1,073	19.16	38.31	191.55	478.88
			26 vessels	2	5	15
Western GOA	Chinook Salmon (# fish)	6,734	259	518	1,295	3,885
Western GOA	Halibut (mt)	54	2.10	4.19	10.48	31.43

The inter-cooperative transfer limits under consideration range from 10% to 50% of a cooperative's initial allocation. Using information from the table above, Table 1-81 and Table 1-82 show how much PSC cooperatives in the Central GOA and Western GOA could transfer, respectively. The Council motion is silent on whether a Central GOA cooperative could transfer PSC to a Western GOA cooperative. However, because the proposed action does not limit PSC use to specific fisheries and because transfers must be approved by NMFS, the analysts presume that such transfers would be allowed as a means to increase PSC market efficiency.

Table 1-81 Central GOA PSC limit a cooperative could transfer based on equal shares

Cooperative	Chinook Salmon (# of fish)					Halibut (mt)				
CVs (#)	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%
1	37	75	112	150	187	1.92	3.83	5.75	7.66	9.58
2	75	150	225	300	374	3.83	7.66	11.49	15.32	19.16
3	112	225	337	449	562	5.75	11.49	17.24	22.99	28.73
4	150	300	449	599	749	7.66	15.32	22.99	30.65	38.31
5	187	374	562	749	936	9.58	19.16	28.73	38.31	47.89
6	225	449	674	899	1,123	11.49	22.99	34.48	45.97	57.47
7	262	524	786	1,048	1,310	13.41	26.82	40.23	53.63	67.04
8	300	599	899	1,198	1,498	15.32	30.65	45.97	61.30	76.62
9	337	674	1,011	1,348	1,685	17.24	34.48	51.72	68.96	86.20
10	374	749	1,123	1,498	1,872	19.16	38.31	57.47	76.62	95.78
11	412	824	1,235	1,647	2,059	21.07	42.14	63.21	84.28	105.35
12	449	899	1,348	1,797	2,246	22.99	45.97	68.96	91.94	114.93
13	487	973	1,460	1,947	2,434	24.90	49.80	74.70	99.61	124.51
14	524	1,048	1,572	2,097	2,621	26.82	53.63	80.45	107.27	134.09
15	562	1,123	1,685	2,246	2,808	28.73	57.47	86.20	114.93	143.66
16	599	1,198	1,797	2,396	2,995	30.65	61.30	91.94	122.59	153.24
17	636	1,273	1,909	2,546	3,182	32.56	65.13	97.69	130.25	162.82
18	674	1,348	2,022	2,696	3,370	34.48	68.96	103.44	137.92	172.40
19	711	1,423	2,134	2,845	3,557	36.39	72.79	109.18	145.58	181.97
20	749	1,498	2,246	2,995	3,744	38.31	76.62	114.93	153.24	191.55
21	786	1,572	2,359	3,145	3,931	40.23	80.45	120.68	160.90	201.13
22	824	1,647	2,471	3,295	4,118	42.14	84.28	126.42	168.56	210.71
23	861	1,722	2,583	3,444	4,306	44.06	88.11	132.17	176.23	220.28
24	899	1,797	2,696	3,594	4,493	45.97	91.94	137.92	183.89	229.86
25	936	1,872	2,808	3,744	4,680	47.89	95.78	143.66	191.55	239.44

Source: AKFIN summary of CAS data for vessel counts and PSC distribution by area

Table 1-82 Western GOA PSC limit a cooperative could transfer based on equal shares

Cooperative	Chinook Salmon (# of fish)					Halibut (mt)				
CVs (#)	10%	20%	30%	40%	50%	10%	20%	30%	40%	50%
1	26	52	78	104	130	0.21	0.42	0.63	0.84	1.05
2	52	104	155	207	259	0.42	0.84	1.26	1.68	2.10
3	78	155	233	311	389	0.63	1.26	1.89	2.51	3.14
4	104	207	311	414	518	0.84	1.68	2.51	3.35	4.19
5	130	259	389	518	648	1.05	2.10	3.14	4.19	5.24
6	155	311	466	622	777	1.26	2.51	3.77	5.03	6.29
7	181	363	544	725	907	1.47	2.93	4.40	5.87	7.33
8	207	414	622	829	1,036	1.68	3.35	5.03	6.70	8.38
9	233	466	699	932	1,166	1.89	3.77	5.66	7.54	9.43
10	259	518	777	1,036	1,295	2.10	4.19	6.29	8.38	10.48
11	285	570	855	1,140	1,425	2.30	4.61	6.91	9.22	11.52
12	311	622	932	1,243	1,554	2.51	5.03	7.54	10.06	12.57
13	337	673	1,010	1,347	1,684	2.72	5.45	8.17	10.90	13.62
14	363	725	1,088	1,450	1,813	2.93	5.87	8.80	11.73	14.67
15	389	777	1,166	1,554	1,943	3.14	6.29	9.43	12.57	15.71

Source: AKFIN summary of CAS data for vessel counts and PSC distribution by area

Table 1-83 estimates the amount of each PSC species that a CV could use based on the assumptions above, and the range of use limits being considered. Because the limits are based on a CV's initial allocation, the limits are different in the Western GOA and Central GOA. Limits may also differ by vessel and area depending on the pool allocation structure. The cooperative and individual vessel operators will need to ensure that the use caps are not

exceeded. Any overages must be reported in the annual cooperative report, which the Council and NMFS will review each year. Violations of the use caps will be passed on to NOAA OLE.

Table 1-83 Vessel PSC use caps under the options considered

	Central GOA		Western GOA		Vessels	
	Chinook (# of fish)	Halibut (mt)	Chinook (# of fish)	Halibut (mt)	Central GOA	Western GOA
100%	374	19.16	259	2.10	56	26
110%	412	21.07	285	2.30	51	24
120%	449	22.99	311	2.51	47	22
130%	487	24.90	337	2.72	44	20
140%	524	26.82	363	2.93	40	19
150%	562	28.73	389	3.14	38	18

The following information considers the effect of use and transfer limits on processors. The counts in this section are based on the Intent to Operate code reported in AKFIN's summary of CAS data; each ITO code represents an individual processing plant and not a processing company. In 2015, 10 shorebased processing plants took trawl CV deliveries from vessels fishing the Central GOA. The number of CVs delivering to these plants ranged from 1 to 32. Six plants took deliveries from 6 or fewer vessels (the Intent to Operate city for these plants were Seattle[52], King Cove, and Kodiak) and four plants took deliveries from 10 or more trawl CVs. These plants were located in Sand Point and Kodiak. The reported numbers double-count vessels that delivered to more than one plant. Five plants took deliveries from trawl CVs in the Western GOA during 2015. The number of trawl CVs delivering to each plant ranged from 1 to 16. Two plants took deliveries from 10 or more trawl CVs (King Cove and Sand Point) and three plants took deliveries from six or fewer CVs (False Pass and Seattle).

Because processors are members of the cooperatives, it is assumed that they will have some voice in determining whether and how PSC is transferred out of the cooperative. Processors may also control a percentage of the PSC limit assigned to the cooperative. As long as PSC limits do not constrain the harvest by the cooperative's vessels as a whole, the processor associated with the cooperative is less likely to limit transfers of PSC. However, if the limit constrains or threatens to constrain the harvest of valuable primary and secondary species, they are less likely to agree to inter-cooperative transfers outside their firm because it will result in less product flowing into the firm's plants. As stated above, cooperatives might be hesitant to transfer Chinook salmon PSC out of the cooperative because of the uncontrolled possibility of a high-encounter event. Transfers would be the least likely to occur and involve the highest transaction costs early in the season, when many opportunities for a Chinook encounter still exist.

Some processing companies own or control multiple plants that could be part of different cooperatives. Flexibility to move PSC and vessels between these plants may be somewhat constrained by the proposed limits. For example, a processing company that owns a plant in the Western GOA and the Central GOA may find that it could increase its profitability and the profitability of the CVs in the cooperative by transferring PSC from one cooperative to another. The transfer may be a result of unforeseen or unavoidable high PSC rates in one area relative to the other during a particular season or year. In some cases, the ability to transfer PSC could be essential to catching the entire TAC of pollock or Pacific cod. In a future year, PSC rates by area may show a much different trend and transfers the other direction would be beneficial. As with all caps, higher limits pose a smaller constraint, and increase the maximum potential economic benefit. These efficiency gains may also result in higher aggregate PSC levels as it is moved to cooperatives with the greatest PSC use.

[52] Plants listed as Seattle in the Intent to Operate files that are referenced in this section are always floating processors.

Restricting PSC transfers out of a cooperative ensures that a cooperative cannot lease all of its PSC and collect royalties while not actively participating. However, depending on the number of CVs in the cooperatives and the limits established, some vessels could leave the fishery or focus on specific fisheries. Not all cooperatives would tend to focus on the same fisheries, so different cooperatives may have different PSC needs. For example, Western GOA vessels that delivered to Sand Point may need to acquire more Chinook salmon and have excess halibut to cover their historical needs. These vessels accounted for about 58% of the halibut PSC and 70% of the Chinook salmon PSC taken in the Western GOA from 2012 through 2015). Vessels delivering to King Cove may be allocated Chinook salmon PSC in excess of their historical need, but be forced to seek additional halibut PSC through transfer. That set of vessels accounted for 40% of the halibut PSC, but only about 26% of the Chinook PSC during the same period. If the Council selects the low end of the range of considered use caps, some vessels and/or their cooperatives and processing partners that encounter spikes of PSC might not be able to achieve historical harvest levels, while other vessels or cooperatives are unaffected. Allowing vessels to use at least 115% of the initial allocation would be necessary to reach historical average levels. This amount would need to be increased to account for peak years of PSC use or variation between years.

Gauging the need for transferred PSC in the Central GOA it is more complex because of the historically observed variation in PSC levels and the fact that some cooperatives are likely to focus more on flatfish. Depending on whether the Council chooses to allocate halibut PSC according to planned participation in each particular target fishery (or group of fisheries – e.g., flatfish), cooperatives focusing on flatfish could receive a greater portion of the halibut PSC. However, if vessels operators that register for flatfish fisheries do not end up participating heavily in that fishery, they might have excess halibut that is partially restricted from being transferred to cooperatives where it could enable productive harvest. It is not possible to forecast the cap level that will be most appropriate to meet the needs of all cooperatives and achieve optimum yield, because the number of vessels that apply to draw PSC quota from each "quota pool" is unknown. To do so, the analysts would also need to know how many vessels would join each cooperative – and by extension how PSC would be distributed across the cooperatives. Transfer caps would have different effects if one cooperative had many vessels and controlled a large proportion of the annual PSC quota compared to a scenario where all cooperatives control roughly the same amount of PSC quota.

As described earlier, a portion of each cooperative's PSC limit might be placed under the control of the cooperative's processor member. That portion would be a percentage of the cooperative's total PSC quota holdings (for each allocated species), and thus is determined by the number and nature of the vessels that join the cooperative. Because each vessel's PSC use limit is based on its initial allocation, it is assumed the baseline amount of PSC used to calculate the cap is the initial amount and not the amount after deducting what is controlled by the processor.

Processor-held PSC quota could also be transferred between cooperatives. Individual cooperative contracts might establish bylaws for these transfers and stipulate the division of value received from the PSC limit lease. However, the analysts presume that if the processor was granted control over a percentage of the PSC in the cooperative, it would receive concessions from the CVs in their cooperative or CVs and processors from the cooperatives receiving the PSC limit transfer. Those concessions could take a variety of forms including price concessions, delivery of some of the fish harvested with that PSC, or direct payment for the agreed upon value of the PSC.

1.5.4 Alternative 4

Alternative 4 would create a separate pool of PSC that would be allocated to a CFA or set aside for an adaptive management program. The CFA motion indicates that any CFA PSC would be allocated in such a way that PSC use caps are not exceeded. The reader is referred to Alternative 2 for the discussion of the caps under that alternative.

1.6 Analysis of PSC Reductions

Both the Chinook salmon and halibut PSC limits are described in detail in Section 1.3.1.5. This section is focused on the impacts of the PSC limit on the trawl fishery with limited background information on the PSC limits.

Amendment 93 and Amendment 97 to the GOA FMP have implemented Chinook salmon PSC reductions for the GOA pollock fishery and non-pollock/non-RP fisheries, respectively. The combined annual GOA trawl PSC limits under Amendments 93 and 97 are 32,500 Chinook salmon. Amendment 103 to the GOA was implemented to allow some flexibility in the movement of Chinook salmon PSC between sectors defined in Amendment 93 and 97.

Amendment 95 to the GOA FMP reduced the trawl halibut PSC limit by 15%. That reduction was phased in over three years and is now fully in effect. As a result the non-RP trawl GOA fisheries are subject to a 1,515 mt halibut PSC limit, before any roll-overs that might occur in the fall from the RP halibut PSC limit.

A primary motivation for the proposed action is to provide the GOA trawl fishing industry the tools[53] to operate under the PSC limit reductions that have been imposed for halibut and Chinook salmon. However, because PSC usage remains a concern in the GOA trawl fisheries the Council also considered additional PSC reductions which could be implemented if they are determined by the Council to be practicable. Alternatives other than the no action alternative will focus on the impacts associated with additional PSC reductions proposed under this amendment.

1.6.1 Alternative 1

Alternative 1 would maintain the current PSC limits. The PSC limits currently in regulation are discussed in Section 1.4.2. Based on historical fishing information, the CV non-pollock/non-Rockfish Program fisheries are most at risk of early closures from Chinook Salmon PSC limits. The flatfish and late season Pacific cod fisheries are most at risk from halibut PSC limits being reached.

On August 10, 2015, NMFS implemented an emergency rule that provided the Non-RP sector with up to 1,600 additional Chinook salmon PSC for the remainder of 2015 (80 CFR 47864, August 10, 2015). The Emergency Rule was determined to be necessary because, on May 3, 2015, considerably earlier than had been expected, NMFS prohibited directed fishing for groundfish by the Non-Rockfish Program GOA trawl CV Sector after determining that the sector had exceeded its annual PSC limit of 2,700 Chinook salmon. The additional Chinook salmon PSC allowed the Non-Rockfish Program CV sector to resume fishing in 2015. The directed fishing closure would have been in place for the remainder of the calendar year and would have left significant amounts of non-pollock groundfish unharvested by the Non-Rockfish Program CV Sector. Fishermen, shoreside processors, and communities that participate in the Non-Rockfish Program CV Sector had limited alternatives to mitigate the resulting significant, negative economic effects. It was estimated that forgone harvest would have been approximately $4.6 million in ex-vessel value and $11.3 million in first wholesale value without the

[53] "Tools" are basically the ability to adjust fishing behavior to better avoid PSC without forgoing substantial losses in net revenue as a result of implementing those practices. It is typically associated with ending the race to fish.

emergency rule. Because being an unforeseen "emergency" is one of the requirements for the use of the emergency rule provision, the future use of an emergency rule to mitigate adverse impacts on the persons reliant on the fishery is not possible. As a result the Council proposed and the NMFS implemented Amendment 103.

Amendment 103 improves NMFS' inseason flexibility for reapportioning Chinook salmon PSC to minimize closures in the GOA trawl fisheries and to increase the likelihood that groundfish resources are more fully harvested. Amendment 103 continues the incentives created by Amendments 93 and 97 because potential receivers of Chinook salmon PSC reapportionments will continue to face uncertainty about whether and when NMFS will determine that unused Chinook salmon PSC is available. The two non-pollock sectors (Rockfish Program CV sector and Non-Rockfish Program CV sector) are more likely to be constrained by their Chinook salmon PSC limits because Amendment 97 set those two sectors' Chinook salmon PSC limits close to their levels of historic Chinook salmon PSC use. Amendment 97 for the Trawl C/P sector provided a proportionally larger buffer measured from the sector's historical average Chinook salmon PSC use.

Amendment 93 set the GOA Chinook salmon PSC limit for the pollock fisheries above historical usage. As a result the PSC limit has not been a constraint in the pollock fisheries. Given that GOA pollock TACs have been set at very high levels relative to the recent past, it is anticipated that if TACs decline and PSC rate do not increase substantially, it will not be a constraint in the future. If PSC rates do increase further study would be needed to determine if it was due to increased Chinook salmon abundance, not associated with farmed Salmon, or changes in groundfish harvest strategies.

Studies conducted on the streams of origin are beginning to provide a better understanding of where the Chinook salmon taken as PSC in the GOA trawl fisheries originate (Guthrie, 2016). The first years of data from these studies have indicated that the majority of these fish originate from the rivers on the West Coast, Canada, and the Eastern GOA. Some Chinook salmon stocks in the Pacific Northwest, including Washington, Oregon, and Idaho, are listed as endangered or threatened under the ESA and some of these ESA-listed Chinook salmon are caught in GOA trawl fisheries. However, the November 30, 2000, Biological Opinion on the effects of the Alaska groundfish fisheries on ESA-listed salmon of the Pacific Northwest included an incidental take statement (ITS) with an annual incidental take threshold of 40,000 Chinook salmon for the GOA groundfish fisheries. Exceeding the ITS for Chinook salmon triggers reinitiating section 7 consultation under the ESA. The Status Quo will maintain Chinook salmon PSC limits in the Western GOA and Central GOA that are no more than 32,500 Chinook salmon. Few Chinook salmon are taken in the West Yakutat District trawl fisheries (See Section 1.3.1.5.1), as a result the aggregate limit is below the annual Chinook salmon ESA threshold of 40,000 Chinook salmon that was identified in the incidental take statement accompanying the November 30, 2000, Biological Opinion.

The halibut PSC limits constrain the catch of GOA flatfish and, in some years, Pacific cod by the trawl fleet (NPFMC, 2013). A Change in halibut PSC management in 2012 allow more halibut use in the second season.by combining the deep and shallow-water limits. Combining the limit reduced the likelihood that OY would be overly constrained, by one complex being closed to directed fishing because of halibut PSC while there was sufficient halibut PSC available for the other complex that was not needed. The flexibility resulted in increased effort in the flatfish fisheries during that season.

Closures of GOA trawl fisheries because of PSC limits being reached, while TAC is still available and markets are demanding these products, reduces value derived by participants in the fisheries. It is expected that closures will continue because the trawl fleet has had limited success forming voluntary agreements to rationalize harvest. Historically agreements to control the pace and timing of the fishery, which is advantageous to improving PSC

rates, are developed when the fishery is projected to last less than 24 hours. In these cases the fishery would not be opened to directed fishing. The incentive to form and comply with an agreement can be sufficient in that situation to get all participants to agree on a fishing plan. Not only does the threat of not being allowed to fish aid the agreement process, but also the short duration of the fishery after it is open, typically does not provide members much time to break the agreement.

It is also worth noting that the Council is beginning the process of considering abundance-based management of halibut PSC in the BSAI. This study is in the early stages and it is too early to determine potential future impacts on the GOA trawl fisheries and PSC limits. Establishing abundance-based halibut PSC limits is considered an intuitive approach but it is recognized that establishing appropriate limits is challenging because of complex Pacific halibut population and fisheries dynamics and the difficulties and uncertainties involved in assessing the spawning biomass of the coastwide Pacific halibut stock.

1.6.2 Alternative 2

Alternative 2 proposed for consideration options that would reduce the GOA trawl PSC limits for halibut and Chinook salmon. The Chinook salmon PSC limit reductions considered ranged from 0% to 25% of the pollock fishery PSC limit. The Chinook salmon PSC limit for the non-pollock/non-RP fisheries would not be reduced under any of the options considered. Halibut PSC limit reductions for GOA fisheries also ranged from 0% to 25%.

1.6.2.1 Groundfish Sector

Table 1-84 shows the estimated GOA halibut PSC mortality in the non-Rockfish Program GOA trawl fisheries. The data are not separated by deep-water and shallow-water complex because halibut PSC limits can be used in any non-Rockfish Program fishery after it is allocated to the cooperative. Over these years the general trend has been for the GOA trawl sector to reduce the amount of halibut PSC to prosecute their fisheries. The information for 2013 through 2015 represents the years the restructured observer program has been in place. Those years are considered the best information available, and are used to show the average PSC usage in recent years.

Table 1-84 Estimated GOA Halibut PSC mortality in non-Rockfish Program from 2003 through 2015.

	CP			CP	CV			CV	GOA
Year	CG	WG	WY	Total	CG	WG	WY	Total	Total
2003	590	255	7	852	1,176	49	0	1,225	2,077
2004	591	176	6	773	1,595	61	16	1,671	2,444
2005	426	136	2	564	1,517	33	0	1,550	2,114
2006	467	90	1	559	1,362	62	1	1,425	1,984
2007	229	172	6	406	1,444	42	1	1,487	1,893
2008	320	113	1	434	1,363	103	1	1,468	1,902
2009	377	65	5	447	1,295	44	0	1,339	1,786
2010	419	62	2	484	1,076	9	0	1,086	1,570
2011	422	64	5	491	1,265	43	2	1,310	1,802
2012	283	77	3	362	1,143	113	1	1,257	1,619
2013	297	47	0	344	729	93	1	823	1,167
2014	388	75	0	463	782	70	0	851	1,314
2015	286	30	2	317	956	47	0	1,003	1,320
Average 2013-2015	324	51	1	375	822	70	0	892	1,267

Source: AKFIN summary of CAS data

Table 1-85 provides comparisons of the halibut PSC limits that are proposed under each Council option relative to the estimated PSC allocations by sector. Information in the table indicates that the CP will need to reduce their

halibut PSC mortality, relative to the 2013 through 2015 average, under almost all of the options that include a PSC limit reduction. Only the 10% reduction using the years 2003 through 2012 to allocate halibut PSC to the CP sector is the estimated allocation above the three-year average PSC usage. In that case the sector is only allocated slightly more (8 mt) than their average usage. Under the 25% PSC reduction the CP sector would need to reduce their three-year average PSC usage by 25% to stay within the limit.

Table 1-85 Halibut PSC allocations relative to average PSC usage from 2013 through 2015 in metric tons
Option

	GOA PSC	GOA difference	Estimated allocation			Difference from average			Percent of average		
Option	Limit	from average	2003-2012	2007-2012	2008-2012	2003-2012	2007-2012	2008-2012	2003-2012	2007-2012	2008-2012
					CP						
Status Quo	1,515	248	425	376	387	50	1	12	113%	100%	103%
-10%	1,364	97	383	339	349	8	-36	-26	102%	90%	93%
-15%	1,288	21	361	320	329	-14	-55	-46	96%	85%	88%
-20%	1,212	-55	340	301	310	-35	-74	-65	91%	80%	83%
-25%	1,136	-131	319	282	290	-56	-93	-85	85%	75%	77%
					CV						
Status Quo	1,515	248	1,090	1,139	1,128	198	247	236	122%	128%	126%
-10%	1,364	97	981	1,025	1,015	89	133	123	110%	115%	114%
-15%	1,288	21	927	968	959	35	76	67	104%	108%	107%
-20%	1,212	-55	872	911	902	-20	19	10	98%	102%	101%
-25%	1,136	-131	817	854	846	-75	-38	-46	92%	96%	95%

Source: AKFIN summary of CAS data and Council allocation options

Halibut PSC in the groundfish fisheries must be avoided and when it cannot be avoided its use minimized to the extent practicable. The tradeoff in the groundfish fisheries is that avoiding halibut PSC can increase the cost of harvesting groundfish and potentially increase the amount of Chinook salmon PSC used. Chinook PSC could increase if movement from areas or times with high halibut PSC rates (Table 1-86) result in vessels unintentionally move to areas or times with higher Chinook salmon rates (Table 1-87 and Table 1-90). Experience has shown that certain times of the year have higher PSC rates in some fisheries. Table 1 82 shows the average monthly halibut PSC rates in the GOA Pacific cod trawl fisheries. Rates early in the A season tend to be lower than the B season. This is due to the spawning aggregation of adult Pacific cod from January to May (NMFS, 2004). Higher levels of aggregation increase Pacific cod catch rates and, as a result reduces halibut PSC rates. While the data indicates in a general sense the times and areas has higher Chinook salmon PSC rates, public testimony has often indicated that avoiding Chinook salmon PSC can be difficult when large numbers of salmon are encountered at times and areas when they are not anticipated. These “lighting strikes” of Chinook salmon PSC can result in high Chinook PSC usage and are difficult to avoid.

Costs are anticipated to increase if vessels employ slower fishing practices, change fishing areas to avoid PSC (due to increased fuel costs, increased days at-sea for observers, etc.), fishing during times of the year when catch rates are relatively lower to avoid PSC, and investing in fishing gear to reduce PSC usage. All of these fishing practices are more likely to occur under a cooperative system where vessel operators are not competing to harvest the groundfish quotas. A secure allocation of groundfish species allows vessel operators to fish slower and reduce PSC or improve PSC usage rates by making shorter tows. Tows that are shorter can allow the vessel operator to return halibut to the water sooner, especially if deck sorting is utilized. It also allows the skipper to determine if higher PSC rates are encountered in an area and if they are move fishing locations. The flexibility to fish at a slower pace also allows vessel operators to fish during times of the day when PSC rates are known to be lower. For example, vessels operators could reduce night time fishing for target species that have higher halibut rates at night.

Table 1-86 Kilograms of halibut mortality per mt of groundfish in the Pacific cod target fishery by month (based on 2013 through 2015 average)

	Kilograms of halibut mortality per metric ton of groundfish	
Month	Central GOA	Western GOA
1	11.328	13.769
2	15.757	12.558
3	9.398	4.376
4	11.550	
5	12.353	
6		
7		
8	4.008	
9	34.310	23.026
10	20.566	
11		
12		

Note: Month is based on date landing was reported. The fishery is closed to directed fishing in June, July, November and December
Source: AKFIN summary of CAS data

Vessel operators are also more likely to invest in and utilize excluder devices to reduce PSC if they have a secure allocation of groundfish. Under a limited access fishery, harvesters that use an excluder could realize lower groundfish catch rates[54]. The cost of buying, installing, and tuning the device along with potential reduced catch could reduce the overall profitability of a firm. Because the PSC savings their forgone revenue generates is shared by the entire fleet, in a limited access fishery, it reduces the incentive for vessel operators to employ the technology. When the increased costs benefit the person making the investment, that individual has a greater economic incentive to employ the technology, because it PSC savings could have value. That value would be through either inter or intra cooperative transfers or the ability of the vessel operator to catch more non-allocated groundfish. Reductions in the halibut PSC limits would have the greatest impact non-pollock/non-Rockfish Program GOA trawl target fisheries. Currently the Rockfish Program fisheries in the Central GOA have their own halibut PSC limit. The least likely fishery to be impacted is the CV mid-water pollock fishery. Under the cooperative structure the cooperatives will need to save enough halibut to cover any halibut PSC taken in that fishery. The value of the fishery to the harvesters and processors (see Table 1-27) and low halibut PSC rates in the fishery create an economic incentive for the cooperative to harvest its pollock allocation.

The fisheries most likely to be relatively impacted by halibut PSC limit reductions are the flatfish fisheries. These fisheries are traditionally constrained by halibut PSC limits. To the extent fishing practices can reduce halibut PSC usage, the impact of the PSC reductions can be somewhat offset. However, the greater the halibut PSC reduction the less likely the fleet, especially the CP fleet, will be able to make up for the reduction by achieving lower PSC rates. In the CV sector the CVs most likely to be negatively impacted are the firms that spend more of the fishing year in the GOA and harvest flatfish in addition to pollock, Pacific cod, and Central GOA Rockfish. Many of these vessels are considered part of the local Kodak fleet. Therefore, they will be most at risk from large PSC reductions. Vessels that are less dependent on GOA flatfish have a more diverse fishing portfolio (AFA pollock, West Coast groundfish, or trawl vessels less than 58' that fish salmon during the summer.

Halibut PSC reduction tools that have been used in the Amendment 80 fleet were presented at the 2016 IPHC meeting. That paper presented information regarding tools that are being used by the CP sector in the BSAI to reduce halibut PSC mortality. Cooperative members reduced halibut usage through choices of fishing location and time of day, effectively deploying halibut excluders in their nets, and deck sorting halibut to help improve survival rates of discarded halibut. The report noted that while these were important factors to reducing

[54] Target species escaping through the excluder or lost fishing time adjusting the excluder to maximize effectiveness.

halibut mortality, the principal halibut avoidance measure was active communication among captains on the grounds. Implementing a cooperative structure where the participants have a secure allocation of groundfish typically not limited by PSC and PSC species, cooperative could employ these measures in the GOA to reduce PSC. The one exception is deck sorting. Ongoing EFP work being conducted in the BSAI may provide a templet, if successful, to allow deck sorting in the GOA fisheries.

The same principles hold true for Chinook salmon PSC. Vessel operators are expected to change their fishing patterns and incorporate technology to reduce PSC rates. The extent of the reduction in rates are highly dependent on environmental conditions such as the biomass of halibut and Chinook salmon in the GOA during times the trawl fishery is operating and the fleet's ability to project when and where the PSC species will be encountered at higher levels. This has traditionally been easier to project for halibut; Chinook salmon tend to be more random encounters with greater variability from tow to tow.

Table 1-87 Chinook Salmon per mt of groundfish in the pollock target by month (based on 2013 - 2015 average)

	Chinook salmon per metric ton				Chinook salmon per 300,000 pound trip			
Month	610	620	630	640	610	620	630	640
1	0.051	0.090	0.004		6.9	12.2	0.5	
2	0.019	0.106	0.103	0.066	2.5	14.4	14.1	9.0
3	0.055	0.037	0.135	0.037	7.5	5.0	18.4	5.0
4	0.078	0.028	0.051	0.049	10.6	3.8	7.0	6.7
5	0.022	0.017			3.0	2.3		
6								
7								
8	0.046	0.078	0.010		6.2	10.7	1.4	
9	0.209	0.061	0.032	0.145	28.5	8.3	4.3	19.8
10	0.301	0.232	0.096		41.0	31.6	13.1	
11								
12								

Source: AKFIN summary of CAS data

Dividing the PSC limits into several smaller limits (cooperative allocations) will require each cooperative to stay within their limit. Cooperatives are expected to take a conservative approach to managing their quota to ensure they are not over their limit at the end of the fishing year. While post harvests transfers of groundfish quota and PSC limits may allow cooperatives to fish closer to their limit with the expectation that they can cover any small overages that might occur. Cooperative agreements are expected to require the cooperative member that went over their limit to cover the costs of the cooperative accessing the needed quota, when it is not available from other members of their cooperative. The cooperative agreement may also include language that provides strong incentives for a person not to exceed their individual allocations. Together these measures will provide incentives for individuals and the cooperative as a whole to leave a buffer between their allocation and their catch. The aggregate amount of that buffer will reduce the total PSC used in the fishery, essentially reducing the overall PSC limit that was set for the fishery.

The reductions in ex-vessel revenue for harvesters and first wholesale revenues for catcher/processors and inshore processors will depend on the harvesting fleet's ability to avoid PSC and the total amount of PSC available. Past analyses of PSC reductions have made assumptions about when future fisheries would be closed based on historical PSC rates in fisheries, the amount of PSC available, and the catch that would be forgone if the PSC limit is projected to be taken. The value of the groundfish forgone has been calculated in two ways:

1) Based on the value catch after the fisheries were projected to close (Amendment 95 to GOA FMP), or
2) Based on the avoiding trips with the highest PSC rates (Amendment 111 to the BSAI FMP).

Both of these methods rely on assumptions that are unlikely to hold in the fisheries. Those assumptions include that historical PSC rates would be the same under the limited access fisheries and the cooperative programs, the TACs would be similar in the future, the timing of harvests would not change so differences in PSC rates at different times of the year would not need to be considered. The calculation of value derived from the fishery would also ignore any changes in increased value derived from product quality improvements, higher retention rates, and higher product recovery rates. It would also ignore changes in the division of revenue that is associated with shifts in market power that is associated with moving from a limited access fishery to a cooperative structure where harvesters hold a majority or all of the groundfish and PSC quota.

Those analyses also assumed that ex-vessel and first wholesale groundfish prices would not change as a direct result of the quantity of fish harvested. These species are sold in a world market for groundfish and the changes in quantities delivered are not expected to influence the world market prices. Past studies have also shown that halibut prices are inelastic (Singh, Dey, & Surathkal, 2014) and the change in the Fishery CEY that results from this action is likely too small to influence world halibut prices.

Those analyses acknowledged that comparing changes in gross revenue does not provide information on the profitability of firms or net benefits to the Nation. The retrospective analyses assume that the Status Quo would not result in any change. The 2012 GOA halibut PSC reduction also clearly stated that direct comparisons should not be made between gross revenue increases in the directed halibut fisheries and the gross revenue foregone in the groundfish fisheries. Estimates for the two sectors were made using different methodologies and assumptions. Direct comparisons may generate misleading results in terms of changes in gross revenue gained or foregone by this action.

Because of all the factors described above estimates of the change in gross value and net value of the fishery at the first wholesale and ex-vessel levels are not provided. It is assumed that Alternative 2, without any PSC reductions, would increase the gross revenue generated at both the first wholesale and ex-vessel levels. Gross value is also expected to increase for CVs and shorebased processors under most, if not all the options considered, because their PSC allocations would be greater that the three-year average usage, except under the 25% halibut PSC reduction. Changes in the net value of the fishery at the first wholesale and ex-vessel levels are less certain because of the potential decrease in groundfish harvests, under more restrictive PSC limits, and anticipated costs associated with avoiding PSC, cooperative management costs, and increased observer coverage costs, and increased paperwork[55] costs.

CPs are more likely to have their gross and net revenue reduced by PSC reductions. The amount of halibut PSC they would be allocated under the status quo would be close to their three-year average usage. Halibut PSC reductions relative to the status quo would result in the fleet needing to improve PSC rates to maintain their current level of harvest, all else being equal. It is expected that the CP sector will have fewer costs associated with moving to the cooperative structure. First they are already operating on BSAI cooperatives under Amendment 80 (except one vessel that only operates in the Central GOA flatfish fisheries). Second, they are already operating under full observer coverage. So for the CP sector, any decrease in net revenue is more likely to be driven by reductions in gross revenue associated with PSC limit reductions, as opposed to increases in costs associated with moving to the cooperative structure.

[55] Preparing applications and affidavits that are required to be submitted to NMFS as part of the program. These costs are expected to be relatively small and will be considered when developing the Paperwork Reduction Act costs to members of the industry.

1.6.2.2 Halibut Directed Fisheries

As shown in Figure 1-8, the GOA groundfish management areas directly regulated by this action encompass all of IPHC halibut management Area 3B and part of IPHC Areas 3A and 4A. Trawl gear is not permitted in the GOA east of the West Yakutat District (area 640), so no trawl PSC occurs in IPHC Area 2C.

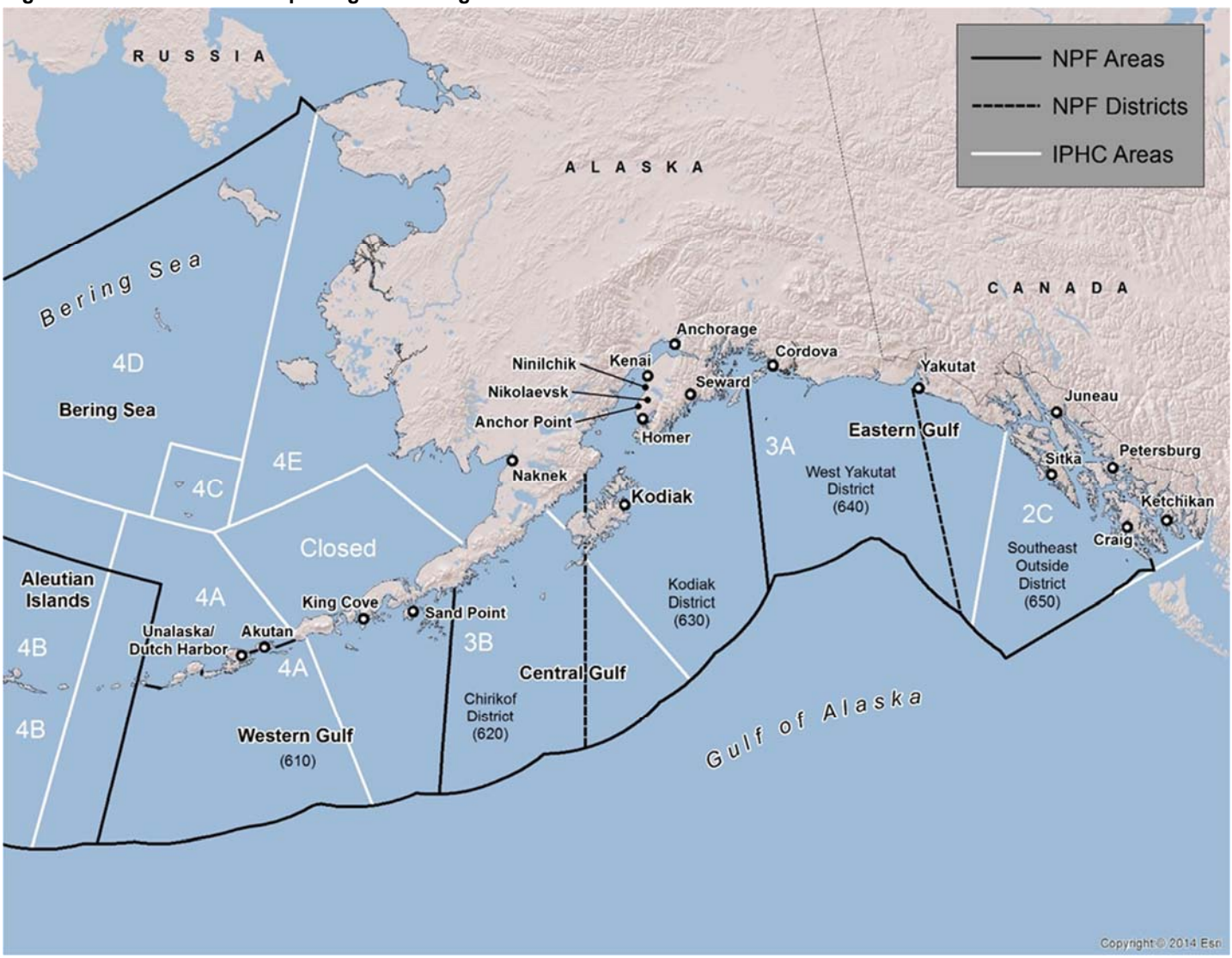
Halibut display migratory behavior, as indicated by stock assessments (Clark, 2008) and the mark-recapture experiment conducted by IPHC staff (Webster R. a., 2007) (Webster R. , 2010). These studies show a predominantly eastward migration of catchable fish from the western areas (Areas 3 and 4) to the eastern areas (Area 2). The coast-wide model used by the IPHC captures some of that migration, but the migration from west to east means that bycatch in one area can impact future biomass in areas outside of where the bycatch occurred. Though this action would only regulate halibut PSC taken in areas of the GOA where trawling is permitted, reductions to halibut PSC usage could affect the amount of halibut that is available to directed halibut fishery participants throughout Southeast Alaska and farther down the coast. The most recent Council analysis of the impact of PSC reductions on directed halibut fisheries in the GOA assumed that migration did not impact future harvests in areas outside of those in which the PSC occurred (NPFMC, 2013). That assumption was made to simplify the analytical model, but was acknowledged not to hold in the real world .[56]

Actions that alter PSC removals will affect other areas, and thus will affect future exploitable biomass levels. Because PSC is an element of the estimated removals that determine the IPHC's total constant exploitation yield (CEY) when calculating the Fishery CEY, PSC impacts the amount of halibut that is available to the directed halibut fisheries at a given level of exploitable biomass.[57]

Total CEY is reduced by the amount of halibut PSC mortality that is anticipated in the upcoming year, and not the PSC limit that is set in regulation. As a result, when the anticipated PSC mortality is less than the proposed reduction to the GOA trawl halibut PSC limit, the reduction would not impact the fishery CEY that is calculated. If the PSC limit reduction results in a PSC limit that lowers PSC use to a level below the amount used under the status quo, the PSC limit reduction would impact future female halibut spawning biomass estimates, and thus reduces CEY in the directed fishery.

[56] The uncertainty associated with including migratory impacts would have resulted in estimates of future benefits to the directed fisheries that were not verifiably better than a qualitative discussion of issues.
[57] See page 8 of https://alaskafisheries.noaa.gov/sites/default/files/csp-faq1115.pdf. Catch deducted in this step of determining directed commercial and guided sport fishery harvests includes unguided sport, subsistence, and bycatch in all other non-target commercial fisheries.

Figure 1-8 IPHC and NMFS reporting areas for groundfish fisheries and halibut fisheries



Source: Northern Economics (from Appendix 5)

After the fishery CEY is calculated, the IPHC may adjust the fishery CEY before setting the annual combined catch limit. The fishery CEY may be adjusted based on IPHC staff recommendations, harvest strategy rules, and stakeholder input. The annual combined catch limit is the amount of halibut assigned to the commercial halibut fishery and the charter fishery.

Based on information presented in the 2016 IPHC Bluebook[58], the estimated apportionment of Over 32" halibut harvest was 31.2% for area 3A, 11.4% for area 3B, and 6.2% for area 4A. This equates to almost 50% of total coast-wide halibut harvest. The IPHC recommended higher annual catch limits for 2016 relative to 2015 for Areas 2A (17.5%), 2B (3.7%), and 2C (6.5%) based on a stable and upward trend in exploitable biomass in these areas.[59] The catch limit for Area 3A (-5.0%) was reduced compared to 2015 because the survey showed a third consecutive annual decrease in weight per unit effort (WPUE). The Area 3B (+2.3%) catch limit was increased slightly relative to 2015 due to increased survey and fishery WPUE and an increased biomass estimate. The IPHC recommended catch limits for Areas 4A and 4B that are the same as the 2015 limits.

[58] Page 163, http://www.iphc.int/publications/bluebooks/IPHC_bluebook_2016.pdf.
[59] Federal Register notice for March 16, 2016 (81 FR 14002)

The analysis that was conducted to implement the 15% GOA halibut PSC limit reductions that were phased in from 2014 through 2016 was, in part, based on information provided by IPHC staff (Hare, Williams, Valero, & Leaman, 2011). IPHC staff estimated both the immediate (over 26") and delayed (under 26") increases to halibut CEY and Female Spawning Biomass that would result from reductions in the halibut PSC limits. That analysis was prefaced with the following statement:

> *Recent history has illustrated that even short-term projections of halibut biomass and yield are problematic and can be unreliable. Reasons for unreliable projections are numerous[…] but include the following: retrospective behavior of the halibut stock assessment subsequent downward revisions of earlier biomass estimates with each new annual assessment, ongoing changes in size-at-age, variable recruitment, changes in accounting for under-32 (U32) inch halibut, changes in target harvest rate, poor harvest control of sport fisheries, and uncertainty over bycatch mortality estimates. Given these myriad difficulties, attempting to project actual levels of catch or spawning biomass are, at best, of questionable value and likely to be counterproductive. This is not to imply that no useful information can be provided about the benefits [to the directed halibut fisheries] that would accrue from reduced halibut PSC limits.*

That analysis assumed that the groundfish fisheries would catch up to the PSC limit each year. That assumption does not hold true given current GOA trawl PSC limits and relative PSC usage in the GOA trawl fisheries in recent years. In this analysis, the impacts on the directed halibut fisheries are assumed to occur at the same rates as presented in that paper. However, the amount of reductions is simply assumed to be the difference between the average PSC usage in the three most recent years and the PSC limit imposed. If the PSC limit reduction does not constrain the trawl fishery, then the reduced limit is not assumed to affect the directed halibut fisheries.

Hare et al. (2011) estimated that, across the GOA IPHC regulatory areas in aggregate, reducing PSC limits would result in an immediate increase of CEY in the amount of 62.5% of the reduction. The author also stated that a reduction would have a delayed cumulative benefit to future CEY from the U26 component of the bycatch mortality equal to approximately 114% of the weight under 26" halibut that would have been taken in the trawl fishery. When the under 26" and over 26" halibut PSC are combined, the total benefit to the directed halibut CEY is slightly greater than 1:1 for any trawl PSC limit reduction. That model did not account for migration so benefits were assumed to accrue where the PSC occurred. Increases to the female spawning biomass are attributed entirely to the under 26" component of PSC, and would accumulate over 30 years. Because the total PSC limit also includes over 26" halibut, the cumulative increase in female spawning biomass was estimated to account for roughly 215% of any trawl PSC reductions. These gains would accrue approximately in proportion to current female spawning biomass distribution, with slight variations due to differential growth rates between Areas 2C, 3A, and 3B.

In a more recent paper, IPHC staff again indicated that there is roughly a 1:1 ratio of PSC reduction to increases in the directed fishery yields. "*Current harvest policy calculations do not respond to changes in projected annual U26 bycatch mortality; however, changes in bycatch removals (including both the O26 and U26 mortality) are found to have an approximate pound-for-pound effect on directed fishery yields when all other sources of mortality are considered"* (Stewart, Leaman, & Martell, 2015). Again, the analysts do not presume that the entire PSC limit will be taken; the "reduction" of interest is the actual amount that PSC usage declines as a result of the action, and not the reduction to the PSC limit in regulation. Based on estimates provided in Table 1-85, PSC limit reductions that would be greater than the most recent three-year average PSC usage would be 131 mt under a 25% reduction and 55 mt under a 20% reduction. PSC reductions of 15% or less result in a GOA trawl halibut PSC limit that is greater than the three-year average usage. In those cases, a PSC limit reduction would not result in an

increase in the amount of halibut available to the directed fisheries, all else held constant. As discussed under the impacts to the trawl fishery, lower PSC limits could result in behavior that further reduces PSC usage. The greatest benefit to the directed fishery is expected to come from the tools provided to the trawl fleet to reduce PSC usage rather than from reductions to the trawl PSC limit. Pressure to avoid PSC to the extent practicable is expected to have a greater impact than reducing the overall GOA trawl PSC limit.

Assuming that unguided sport harvest and subsistence harvest remain the same, implementing a PSC limit reduction of 25% or 20% will provide a direct benefit to the directed halibut fisheries by constraining the amount of PSC that is deducted from Total CEY to calculate the Fishery CEY. A true comparison of the impacts requires converting the amount PSC taken as round fish to thousands of pounds of net weight halibut available to the directed fishery. The IPHC uses net weight for all calculations, this dressed, head-off weight is approximately 75% of the round weight (Stewart, Leaman, & Martell, 2015).

Table 1-88 shows that the estimated net weight increase in the directed fishery yield by area in thousands of net lbs. The information reported in the table assumes that all of the increase would be attributed to the commercial IFQ fishery in IPHC areas 3B and 4A. In Area 3A, it is assumed that the increase in the combined catch limit (CCL) is equal to the Fishery CEY and that, at the current CCL in Area 3A, the increase is divided 81.1% to the commercial IFQ fishery and 18.9% to the charter fishery.

Table 1-88 Estimated increase in Fishery CEY as a direct result of PSC reductions

	2016 bycatch (million lbs net weight)		% of the 3 area's	1,000 lb CEY increase from PSC reduction		Increased CCL 1,000's net lbs (20% PSC limit reduction)		Increased CCL 1,000's net lbs (25% PSC limit reduction)	
Area	o26	u26	bycatch	20%	25%	Commercial	Charter	Commercial	Charter
3A	1.44	0.64	61.2%	55.6	132.5	45.1	10.5	107.5	25.0
3B	0.48	0.18	19.4%	17.7	42.0	17.7	0.0	42.0	0.0
4A	0.47	0.19	19.4%	17.7	42.0	17.7	0.0	42.0	0.0
Total of areas (1,000 lbs net weight)				90.9	216.6	80.4	10.5	191.6	25.0

Source: IPHC 2016 catch projections

Table 1-89 provides an estimate of the increase in annual value to the directed commercial IFQ fishery in each area. The increase in the amount of halibut assigned to the directed commercial IFQ fishery was multiplied by a net weight price of $6.50/lb. That price is approximately the price applied to halibut landings to determine the most recent cost recovery fee. Those fees vary by port, but the $6.50 value fell within the rage of the standard prices that were published for GOA ports in the Federal Register.[60] The actual gross value will vary from the estimated value by year, depending on the actual prices received by harvesters and projected PSC (bycatch), all other factors held constant. Based on the assumptions described in this section, the impact of the changes in gross ex-vessel value are projected to be about $500,000 under a 20% PSC reduction and $1.25 million under a 25% PSC reduction. Benefits are also expected to accrue to processors that receive halibut. Assuming a first wholesale price of $8.50/lb. in 2015, processors' gross revenue from halibut could increase by $680,000 to $1.6 million, depending on the PSC limit reduction. On the other hand, processors that are also involved in groundfish processing might generate less revenue from groundfish due to the PSC reduction. The net change in value is not projected because of the many assumptions that would be required. Employing those assumptions would yield projections with high levels of uncertainty.

[60] https://alaskafisheries.noaa.gov/sites/default/files/80fr78172.pdf

Table 1-89 Impact of PSC reduction on commercial IFQ fishery

	20% PSC limit reduction			25% PSC limit reduction		
		Ex-vessel	1st Wholesale		Ex-vessel	1st Wholesale
Area	1,000 Lbs	$1,000	$1,000	1,000 Lbs	$1,000	$1,000
3A	45.1	$293	$384	107.5	$699	$913
3B	17.7	$115	$150	42.0	$273	$357
4A	17.7	$115	$150	42.0	$273	$357
Total	80.4	$523	$684	191.6	$1,245	$1,628

Source: 80 FR 78172 standard ex-vessel prices and http://www.alaskaseafood.org/wp-content/uploads/2015/10/Feb2016-Halibut-and-Bcod-Market-Bulletin.pdf (p. 3) for first wholesale prices.

Consumers of commercially caught IFQ halibut would also benefit from increases in the supply of halibut in the market. However, as stated earlier, increasing the supply of commercially caught halibut is not expected to result in a significant change to consumer prices due to inelastic demand and the relatively small change in in the total amount supplied.

Demand for charter trips is driven by a variety of factors including the attributes of the trip. A trip's attributes are different in Area 3A depending on a charter client's bag limit and fish size restrictions. Demand has been shown to increase when clients are allowed to catch more fish or fish that have certain attributes, such as size; those factors also impact angler welfare or satisfaction (Criddle, Herrmann, Lee, & Hamel, 2003). A modest change in the amount of halibut available to the charter sector could trigger changes in fish size limits or bag limits if the charter sector's allocation is close to the threshold beyond which size and/or bag limits increase. The Council annually recommends the charter fishery size and bag limits in Areas 2C and 3A to the IPHC. The IPHC considers those recommendations along with input from stakeholders and staff when setting the charter management measures for the upcoming year. Those limits constrain the charter sector's portion of the CCL. Since the implementation of the Catch Sharing Plan, the Council has tended to recommend, and the IPHC has selected, limits that allow the charter sector to harvest up to or slightly exceed their allocation. Depending how close the charter allocation is to the net threshold level to implement less stringent harvest limitations, a small increase in halibut available in Area 3A could impact the harvest restrictions that are implemented that year. Determining exactly how the limitations will vary in the future is not possible with the information currently available.

1.6.2.3 Chinook Salmon Directed Fisheries

Reducing the amount of Chinook salmon PSC that is used in the GOA groundfish trawl fisheries could affect directed salmon fisheries. To better understand these impacts, NOAA Fisheries provides annual reports to the Council regarding genetic stock of origin identification data from Chinook salmon taken in the GOA trawl fishery (Guthrie, 2016). As part of the 2016 NOAA Technical Memorandum, the authors provide a note on how to read and apply their estimates of salmon of different origins that are taken as PSC:

> *"The extent to which any salmon stock is impacted by the bycatch of the GOA trawl fishery is dependent on many factors including 1) the overall size of the bycatch, 2) the age of the salmon caught in the bycatch, 3) the age of the returning salmon, and 4) the total escapement of the affected stocks taking into account lag time for maturity and returning to the river. As such, a higher contribution of a particular stock one year does not necessarily imply greater impact than a smaller contribution the next year."*

The derived stock composition estimates for Chinook salmon PSC samples collected from federally managed GOA trawl fisheries show that the vast majority of intercepted salmon originated from river systems that flow into

the Gulf of Alaska and the Pacific Ocean. As a result, it is concluded that GOA Chinook salmon PSC has a relatively smaller impact on Western Alaska Chinook salmon stocks than does Chinook salmon PSC taken in BSAI fisheries.

All Chinook salmon caught in the GOA pollock trawl fishery must be retained, as required under GOA Groundfish FMP Amendment 93. This retention requirement did not mandate complete observer coverage, and not all GOA pollock trips are observed at-sea. Starting in 2014, the observer program implemented a simple random sampling (SRS) protocol to collect random genetic samples from trips.

The 2016 report on the 2014 pollock fishery estimated that 99.7% of the GOA trawl Chinook salmon PSC originated from GOA/Pacific coastal regions, with the British Columbia grouping contributing the most (43%), followed by the West Coast US (34%), Coastal Southeast Alaska (16%), and Northwest GOA (5%) (Guthrie, 2016).[61] The report indicated that stock of origin varied to some degree depending the GOA pollock management area (610/620/630/640) in which the catch of PSC occurred. However, the general proportionality of origin stocks remained constant across pollock management areas.

Under the current set of alternatives, the Council could reduce the GOA pollock trawl fishery's Chinook salmon PSC limit to as few as 18,750 fish (from the current GOA-wide limit of 25,000 fish). Table 1-90 shows the estimated number of Chinook salmon used as PSC GOA pollock fisheries from 2003 through 2015. Since 2008, the only year in which the GOA pollock fleet exceeded its current PSC limit of 25,000 fish was in 2010. That year was prior to the 25,000 fish limit being implemented (Amendment 93). As reported in a letter from the Alaska Regional Administrator[62], the majority of the 2010 Chinook salmon incidental catch occurred between October 1, 2010, and October 18, 2010, with 72% of the fish taken during this time period. Approximately 82% (42,206 Chinook salmon) were caught by vessels using trawl gear in directed pollock fisheries. Of that number 72% (30,560 Chinook salmon) were caught in the final pollock fishery season that opened on October 1. The majority of the PSC was attributed to the Western GOA. The 2010 PSC estimate was made in accordance with the catch estimation protocols in place at the time, but industry stakeholders have testified to the Council that the result was higher than their own records of Western GOA Chinook salmon PSC. Because observer coverage levels in the Western GOA were very low that year, those claims cannot be scientifically verified or rejected.

As described in Section 1.3.1.6, the information used to estimate PSC removals changed when the restructured Observer Program was implemented in 2013. Due to the changes and improvements in coverage levels, NMFS staff and Council analysts have determined that it is most appropriate to base this analysis of impacts on PSC estimates for the years since restructuring. From 2013 through 2015, an average of 12,250 Chinook salmon has been taken as PSC in the GOA pollock trawl fisheries. That amount equates to roughly half of the current PSC limit, or about two-thirds of the 18,750 fish limit proposed as an option for consideration under this action.[63] These PSC removal estimates reflect three years in which GOA pollock TACs have been at high levels relative to the previous years included in this analysis (2003 through 2012). If future PSC levels were to remain similar to those observed since 2013, the considered 25% PSC limit reduction would not close the pollock fishery or directly reduce the amount of PSC that is taken, and thus would not have a direct impact on the amount of Chinook salmon available to directed fishery users.

[61] The genotyped sample set was 1,163 fish, corresponding to a sampling rate of 10.7%
[62] http://www.npfmc.org/wp-content/PDFdocuments/bycatch/ChinookESAletter1210.pdf
[63] That is the smallest limit proposed. If another PSC limit within the proposed range was selected the percentage would fall between 50% and 67% of the total.

Table 1-90 Chinook salmon PSC taken in the GOA pollock trawl fisheries

	Area			GOA
Year	CG	WG	WY	Total
2003	3,557	738	67	4,362
2004	10,655	2,327	29	13,011
2005	21,429	5,951	483	27,863
2006	10,908	4,521	89	15,518
2007	31,660	3,264	34	34,959
2008	8,063	2,116	390	10,569
2009	2,212	438	59	2,709
2010	12,308	31,796	439	44,543
2011	10,788	3,573	109	14,470
2012	10,324	6,004	120	16,449
2013	11,056	1,621	247	12,924
2014	7,465	3,142	87	10,695
2015	8,996	4,119	19	13,134
Average (2013-2015)	9,173	2,961	118	12,251

Source: AKFIN summary of NMFS CAS data

However, reducing the PSC limit could create additional motivation for the fleet to further reduce PSC usage through the use of tools they are given to meet National Standard 9 requirements. Participants in the directed Chinook salmon fishery might benefit from the trawl sector reducing its PSC usage over and above what would have occurred if the fleet were not granted the ability to coordinate and time fishing to reduce expected PSC rates and levels through to allocation of groundfish quotas to voluntary cooperatives. National Standard 9 requires the trawl fleet to minimize bycatch (PSC) to the extent practicable, and to minimize the mortality of such bycatch if it cannot be avoided. That requirement – combined with the trawl sector's economic incentive to keep groundfish fisheries open, and the sociocultural value placed on Chinook salmon, creates pressure on the trawl fleet to take advantage of self-management tools if they are provided.

Chinook salmon fishermen and other non-fishing stakeholders might also benefit from better estimates of trawl PSC mortality that would result from higher levels of observer coverage (though even under 100% observer coverage, catch estimation will still involve some level of "expansion" between observed and unobserved hauls within a given trip).

Under Alternative 2, a CV cooperative may use Chinook salmon PSC that was allocated on the basis of its members' historical activity in the pollock fishery to support fishing in the non-pollock/non-Rockfish Program fisheries. Once Chinook salmon PSC is allocated to a cooperative, cooperatives will determine its best use in any fishery managed under the program. If a cooperative is constrained in the non-pollock/non-Rockfish Program fisheries, then it is possible that Chinook PSC that would be contained to the pollock fishery would flow to the non-pollock fisheries. However, the increased use of Chinook salmon to prosecute these fisheries is not anticipated to result in a substantial shift of PSC from the pollock fishery – i.e., a net increase in overall PSC usage – for three reasons. First use of Chinook salmon PSC in those fisheries has been relatively small compared to the pollock fishery. This is reflected in the 2,700 Chinook salmon limit currently assigned to those CV fisheries, as opposed to the 25,000 fish limit for the pollock fisheries. Second, Alternative 2 prohibits the transfer of Chinook salmon PSC (or any quota assigned under this program) to cooperatives in the CP sector. Third, the non-pollock/non-Rockfish Program fisheries are historically constrained by halibut PSC rather than Chinook salmon PSC. If this holds true under the new management structure, cooperatives would reach halibut PSC limits before substantial amounts of Chinook salmon PSC that were assigned to the cooperative based on the pollock fishery are utilized to support non-pollock fisheries.

Any increase in the amount of Chinook salmon needed in the non-pollock fisheries could increase the *utilization* of Chinook salmon PSC that was initially assigned to the pollock fishery. Additional PSC use, relative to status quo regulations that confine PSC within the pollock/non-pollock bounds, impacts directed salmon fisheries. The impact on the overall number of Chinook salmon that return to streams in the various regions of the GOA and Pacific Northwest are expected to be small, but it is not possible to quantify the expected impact on directed Chinook salmon users at specific locations. As concluded in the NOAA Technical Memorandum cited above, small reductions in returns to some river systems could have a noticeable impact for a variety of factors, but little or no impact for others. Additional information on specific fisheries is provided in the Social Impact Assessment (See Appendix 5)

1.6.3 Alternative 3

Alternative 3 includes the same options for reducing halibut and Chinook salmon PSC limits as Alternative 2. The impacts of the PSC limit reductions discussed in Section 1.6.2 also apply to Alternative 3. The primary difference in the amount of PSC that is used in future GOA trawl fisheries will be based on the specific harvest strategies employed by vessel operators under each alternative. While it is not possible to predict with certainty how the fisheries will be prosecuted by the trawl fleets under the various alternatives and options, this section will focus on general differences that are anticipated based on the cooperative structure and the allocations to cooperatives.

Alternative 2 would allocate, at a minimum, pollock and Pacific cod as target species to cooperatives in addition to Chinook salmon and halibut PSC. Alternative 3 would only allocate those two PSC species to cooperatives. Pollock and Pacific cod are target species that are traditionally limited by the TAC (or catchability of the fish in the Western GOA some years) and not halibut and Chinook salmon PSC. As a result participants with PSC quota will face a choice in determining the appropriate level of PSC avoidance. Anticipating that the target species TAC will be constraining, the participant must decide whether more rapidly harvesting the target species (with the associated cost of using more PSC quota in the process) will increase the participant's share of the available target species sufficiently to justify forgoing fishing in other GOA fisheries because of the potentially constraining PSC allocation. For example, in the GOA, some participants may choose to fish more aggressively for Pacific cod during the A season to increase profits in that fishery but losing the opportunity to use PSC allocations in a later Pacific cod season or in the flatfish fisheries. Each vessel will need to balance the value of fishing more rapidly and using their PSC to obtain a larger share of the A season Pacific cod TAC against lower A season Pacific cod catches and a greater quantity of PSC available for use in later seasons. If A season Pacific cod generates relatively high profits in comparison to other seasonal and species targets, vessels are likely to be willing to use more PSC to obtain a greater share of the available A season Pacific cod. In other words, a race for fish (A season Pacific cod) may result despite the PSC quotas being allocated to cooperatives. In this race, participants do not disregard PSC rates, but choose a PSC rate that sacrifices PSC quota at a rate that equalizes the difference between profit attained from the additional share of the A season Pacific cod and the profit derived from the use of PSC for harvest of less valuable species later. This incentive structure could affect the ability (or tendency) of the fleet to achieve optimum yield. In other words, the potential of participants to adjust effort to attain individual profits could lead to flatfish or B season Pacific cod being unharvested because of relatively higher PSC usage in the A season.

Vessels that rely heavily on pollock and Pacific cod may be more willing to use more PSC in the early seasons to fish pollock and A season Pacific cod faster because they do not rely on GOA flatfish for revenue later in the year. Table 1-91 shows that about half of the CVs that fish with trawl gear in the GOA get over 95% of their gross ex-vessel GOA groundfish value from the pollock and Pacific cod target fisheries. These vessel operators are more likely to use PSC at a rate that would ensure they maximize revenue from the pollock and Pacific cod fisheries

under Alterative 3. They will not need to save any PSC for flatfish fisheries based on their historic catch patterns. This does not mean that they would initially use PSC at a rate higher than necessary. It means they may be less willing to forgo implementing measures to reduce their PSC usage beyond that needed to harvest pollock and Pacific cod in a competitive race to fish if the value generated from the increased use of PSC outweighs the value that can be generated from the PSC savings. Any PSC they do not intend to use will have value in the market if it is transferable. However, the market value of a unit of PSC in the flat fish fishery is expected to be less than in the pollock and Pacific cod fisheries. The lower market value being a function of the revenue that can be derived from a unit of PSC in the pollock and Pacific cod fisheries relative to the flatfish fisheries.

Table 1-91 Counts of CVs based on the percentage of gross ex-vessel GOA groundfish revenue derived from pollock and Pacific cod target fisheries.

	Percent of gross ex-vessel GOA groundfish value from pollock and Pacific cod targets						
Years	100%	95% to 100%	80% to 95%	70% to 80%	50% to 70%	0% to 50%	All CVs
2003-2015	58	11	8	8	25	16	126
2008-2015	45	5	0	6	13	24	93
2013-2015	37	1	1	14	7	10	70

Source: AKFIN summary of CAS data

The race to harvest the Pacific cod and pollock TACs under Alternative 3 does not mean that Alternative 2 would use less PSC overall. It means that relatively more PSC may be used in the pollock and Pacific cod target fisheries under Alternative 3. Vessels would then have less PSC available to use in the flatfish fisheries. Flatfish TACs are not currently completely harvested or the TACs could be increased in the annual specifications process since some are set below the ABC, so PSC savings under Alternative 2 could be shifted for use in the flatfish fisheries, particularly halibut PSC, to increase harvests of those species. Vessel operators would be willing to increase effort in those fisheries if there are economic incentives (the fisheries are profitable) to harvest flatfish. Increased costs associated with additional observer coverage or future market conditions that decrease demand could make fishing these species unprofitable for some firms. If flatfish fishery profit margins are negative, Alternative 2 could result in lower halibut PSC usage than Alternative 3. The amount of Chinook salmon used in the flatfish fisheries is relatively small, so changes in effort in those fisheries will have a small impact on the total Chinook salmon usage. The primary changes in the amount of Chinook salmon usage will be driven by fishing strategies implemented in the pollock fisheries.

Target species allocations may address some of the concerns associated with fishing strategies described above, since they would allow vessels to determine when to fish within a season or year to achieve the greatest return from available PSC. Secure target species allocations would allow a share holder to decide when and where to fish based on a variety of factors (including target species catch rates, availability of incidental species, PSC rates, market conditions, and weather) without concern for others depleting the availability of the target species.

While allocating target species with constraining allowable catch limits may address the potential for participants to race for those species, the full allocation of all target species could reduce the potential for the fleet to achieve optimum yield or decrease total harvests, as well as affect incentives for improved PSC utilization. Specifically, the complete allocation of low value targets that are not fully utilized (flatfish target species) could reduce harvests of those species relative to a program that leave those species unallocated, particularly if share markets are not fluid. For example, if arrowtooth flounder is fully allocated, participants in the fisheries who are interested in harvesting arrowtooth flounder will likely attempt to save on PSC in pollock and Pacific cod targets to ensure that they have adequate PSC available to support harvest of their arrowtooth allocations. These participants could be even more interested in saving PSC, if they believed that additional arrowtooth would be available for harvest beyond what they would be allocated based on catch history. Both Alternative 2 and Alternative 3 propose not

allocating these low valued species which could help the fleet better achieve optimum yield, but could result in more PSC being used by the trawl sectors.

1.6.4 Alternative 4

Alternative 4 would allocate up to 15% of the fishing quota for all species allocated to CVs under the program to a Community Fishing Association. Elements and options included under Alternative 2 will define the total amount of PSC available to the CV sector, including any reductions in the overall PSC limit. The percentage allocated to the CFA will change the rules that PSC is fished under and could change the behavior of harvesters that receive that quota as well as the harvesters that have their PSC limit reduced.

Catcher vessel operators that have their PSC limit reduced will also have their allocation of target and secondary species reduced in the same proportion. The CFA impact on these harvesters will depend on whether they receive an allocation from the CFA and the amount of that allocation. If they are allocated an amount of quota that results in approximately the same allocation they would have received it will still impact their operation, since they will be required to harvest under the rules and objectives of the CFA in addition to those developed by NMFS and the Council. The CFA requirements may place greater emphasis on PSC reductions relative to achieving optimum yield. If that is the case, vessels using CFA quota during the year may have increased costs associated with reducing PSC usage. The CFA could also leverage their allocations of PSC to require persons improve PSC rates for all fisheries, not just those funded by CFA quota. That incentive could reduce overall PSC usage or if the costs associated with accessing the quota are too great, limit the number of CV license holders that would apply for CFA quota.

1.7 Analysis of Impacts on Harvesters

Harvester participation and fishing practices in the GOA trawl fisheries will vary under the different alternatives under consideration. Under the No Action alternative, participation and fishing practices will likely be similar to those that occur in the current fisheries. Fishing patterns under Alternative 2 are expected to result in the at-sea practices that have been observed under other North Pacific cooperative programs. Harvesters will fish in a more measured and efficient manner when they are not under economic pressure to race for fish. The flexibility to lease a portion of their quota for primary and secondary groundfish species and PSC quota will allow harvesters to adjust their initial allocation to better meet their fishing operation's business objective. On the other hand, leasing quota will also create opportunities for quota holders to extract rents from other participants that could be considered excessive. Alternative 2 creates the opportunity for quota holders lease quota and collect fees while not actively fishing their GOA trawl allocation. Alternative 3 would result in fisheries that have aspects of both the status quo and the Alternative 2 cooperative program. Catcher vessel operators would still race to harvest pollock and Pacific cod unless voluntary agreements can be developed to divide those TACs among harvesters. The particulars of the selected PSC allocation mechanisms would influence who would participate during the year, and would likely limit harvest of flatfish species whose TAC is constrained by those limits. Alternative 4 is expected to add new entrants to the fishery when paired with Alternative 2, but additional requirements imposed by the CFA option might result in different behavior than what would be expected under Alternative 2.

1.7.1 Analysis of Impacts - Alternative 1: No Action

The no action alternative would preserve management under the LLP license program and the other regulations described in Section 1.3.1. Table 1-1 shows the number of LLP licenses with a GOA trawl endorsement; that table also provides a breakout of licenses by CV and CP endorsement. Table 1-2 shows all the endorsements associated with the 124 GOA trawl CV LLP licenses. Table 1-3 provides detailed information on the LLP licenses with a CP trawl endorsement. Section 1.3.2.2 provides information on trawl harvests by CVs and CPs in the GOA fisheries

from 2003 through 2015. The number of vessels active in those fisheries are also provided in that section. Section 1.3.2.3 provides historical harvest value information from 2003 through 2015.

Maintaining the LLP management structure is likely to result in fishing practices and patterns similar to those observed in the recent past. The GOA trawl fisheries will open annually on January 20th. Vessel operators will initially fish for species that generate the greatest value; traditionally that has been pollock and Pacific cod for CVs (Table 1-28 and Table 1-29). CPs generally begin their fishing year in the BSAI.[64] Some CPs move into the GOA in April to fish flatfish and Central GOA rockfish starting in May. Those vessels will also fish GOA rockfish in July in Western GOA and West Yakutat District, then return to fishing flatfish in the GOA, or Amendment 80 species in the BSAI.

GOA pollock TACs are not divided between trawl and fixed-gear, and are fished primarily by trawl catcher vessels. The Pacific cod TAC is allocated between all fixed and trawl gear sectors in the Central GOA and Western GOA. Whether trawl vessel operators choose to fish pollock or Pacific cod first depends on pollock roe maturity, the size of pollock, relative catchability of the two species, and relative prices. Trawl LLP license holders compete to harvest as much of those TACs as possible. After the pollock and Pacific cod fisheries are closed or slow, a subset of the GOA trawl license holders fish flatfish as long as PSC is available and economic conditions are such that vessel operators are willing to participate in those fisheries. Fishermen often utilize valuable secondary species to augment the revenue they derive from lower value primary species. Both CVs and CPs will fish rockfish in the Central GOA under the Rockfish Program. CPs primarily fish rockfish in the Western GOA and West Yakutat District as well as the Central GOA.

Given that the number of endorsed LLP licenses considerably surpasses the number of vessels historically participating in the GOA trawl fisheries, substantial growth in participation would be permitted under the no action alternative. Any new entrants would have to forego opportunities in other fisheries and would need to compete for landings and for delivery markets with current participants. Simultaneous openings in the BSAI and GOA distribute effort across fisheries and areas, and are likely to help restrict new entry by fisherman currently engaged in those non-GOA fisheries. Some of these potential GOA trawl entrants are limited in the amount of some GOA TACs they may harvest as a result of their participation in other catch share programs (sideboards). In addition to GOA trawl LLP licenses, entry into the federal GOA groundfish fisheries will be constrained by markets and market conditions. Catcher vessels will still need to contract with a processor to take deliveries of groundfish at an agreed upon price. The CVs' price is in part determined by the relative bargaining power of the CVs and the processor. The ex-vessel price paid to CVs and the first wholesale price CPs are paid are also influenced by worldwide demand for whitefish, which is relatively substitutable.

Observer coverage on CVs is determined through the trip selection process (ODDS), which is directly funded through 1.25% fee on ex-vessel value. The fee is paid by the first processor of the fish, from fees equally divided between the harvesters and processors. However, the proportion of the fee paid by harvesters and processors is not audited to determine the actual amount paid by each entity.[65]

As shown in Table 1-36, the number of trawl CVs participating in the GOA has declined over the 2003 through 2015 period. Over that period, the pollock TAC has increased substantially, and Pacific cod TAC has increased as

[64] The Golden Fleece only fishes in the GOA.
[65] Verifying the percentage paid by harvesters and processors would be complicated and costly. Harvesters and processors often have complex business relations including the processor providing goods and services to harvesters that can impact the ex-vessel price received by the harvester. Sorting out all of those individual business arrangements make determining the actual amount of the fee paid by each firm impractical.

well. Declining participation was not due to the amount of landings, but is more a function of the net value firms derive from the fishery (general market conditions and operating costs). Consolidation in the future will depend on the profitability of the firms in the fishery and opportunities for new entrants. When economic conditions improve, it is anticipated that persons holding a trawl LLP license could choose to enter the fishery; when firms are not profitable or there are better economic opportunities available, they may exit the fishery. Firms that buy into the fishery by acquiring LLP licenses or vessels are firms that have sufficient financial resources. These firms are less likely to be local, small, family-owned businesses and more likely to be larger, perhaps vertically integrated, firms that can better withstand poor economic years.

Catcher/processors are less likely to exit the GOA fisheries and the number of vessels fishing is anticipated to remain relatively stable. CPs primarily participate in the rockfish fisheries, with approximately four CPs fishing GOA trawl flatfish. Implementation of the Central GOA RP and flatfish limitations on Amendment 80 vessels have already played a significant role in determining CP effort in the GOA. Those limitations will continue under the No Action alternative and, as a result, CP effort is expected to remain relatively consistent, assuming no major changes in TACs, markets, and economic conditions worldwide.

1.7.2 Analysis of Impacts- Alternative 2: Cooperatives with Allocations of Target, Secondary, and PSC Species

Alternative 2 would base allocation of primary and secondary groundfish species and PSC between the CV and CP sectors on historical GOA harvests by vessels using trawl gear. The resulting distribution of groundfish to each sector would be similar to the historical distribution of harvest during the selected qualifying years. Catch associated with the LLP licenses in each sector is used to allocate groundfish to individual licenses. Existing PSC limits would be allocated pro rata in proportion to the target species quota that an LLP license holder is allocated. This method was selected so that licenses that were historically associated with high levels of PSC usage relative to target catch would not be rewarded for that past behavior. That said, individuals who harvested relatively higher proportions of the groundfish harvest due to their higher PSC rates would receive a higher target species allocation and, consequently, more PSC quota. However, it is presumed those individuals would receive less of the PSC quota than they would have if PSC allocation were bases solely on past usage. Allocations to cooperatives will be based on the catch histories associated with the aggregation of LLP licenses that are attached to vessels that join (or are initially assigned to) each cooperative. The number of persons receiving allocations is much larger than the average annual participation in the fisheries; the number of individual license holders who would receive an allocation grows as more years are added to the qualifying period. This pattern indicates that there has been entry and exit from these fisheries over time periods considered.

1.7.2.1 Catcher Vessel Sector

Harvesters in the catcher vessel sector will be allowed to fish their allocation or transfer them to another member of a catcher vessel cooperative. CV cooperative quota may not be transferred to a catcher/processor cooperative or to the limited access fishery. Transfers to the CP sector are prohibited, in part, because it could have negative impacts on other CVs, shorebased processors, and the communities where those firms are located. Specifically, those transfers could decrease the amount of groundfish and PSC quota available to the CV sector, decrease the total potential value that shorebased processors can derive from the fishery, decrease individual processor's market share, decrease employment opportunities for plant workers, decrease income for shorebased support industries, and reduce taxes paid to communities where the shorebased processors are located.

The concern that quota would flow from the CV sector to the CP sector is partly driven by the fact that CPs can capture income at the first wholesale level and not just the ex-vessel level, include higher value added product forms. As a result, CP operators may be willing and able to pay more for the quota than independent CV operators

would be. Allowing for that quota to flow to the CP sector through transfers (purchase) would change the sector allocations that are defined for the initial allocation, which are based primarily on economic benefits to the harvesters.

The potential for transfers from the CP to the CV sector might increase if participants in the shore-based sector are able to develop markets for higher quality or more highly processed products that cannot be served by the offshore fleet, which produces mostly frozen head-and-gut or whole product forms. Transfers could also take place if quota constraints are realized for specific species. For example, a member of a CV cooperative might need to acquire additional Chinook salmon PSC to catch his or her entire fall/winter pollock quota. While it is anticipated that CVs would realize improved PSC usage rates, proposed PSC reductions in conjunction with unpredictable PSC events and PSC sampling/estimation procedures could lead to a situation where transfers between sectors are necessary and mutually beneficial. Transfers might also occur as a rollover after catcher processors check out of the GOA fishery. However, if a CV fishing within a cooperative needs to cover unexpectedly high PSC usage it could engage in direct cooperative transfers to ensure it balances its quota ledger at the end of the year. Post-harvest transfers are allowed to cover any overages that occur during the year.

1.7.2.2 Catcher/Processor sector

Alternative 2 allows CP cooperatives to either fish their annual allocation or transfer it to other CP cooperatives or to CV cooperatives. While this alternative would have design characteristics similar to the Rockfish Program, the fisheries tend to be very different in structure. Two CP cooperatives and seven catcher vessel cooperatives were formed under the Rockfish Pilot Program and the subsequent Rockfish Program. One CP cooperative does not fish actively, instead transferring most of its allocation to shore-based cooperatives, since the primary owner in the cooperative has shore-based affiliates.

1.7.2.3 Allocated Species

1.7.2.3.1 Target Species

The allocation of target species was discussed in detail in Section 1.4.1.2.2. Target species are allocated based on total retained harvests of that species made during the qualifying years in all GOA non-Rockfish Program trawl fisheries. After the ICA to support fisheries outside the GOA trawl program have been deducted, allocations are issued to sectors (CV/CP) and then to LLP licenses.

Pollock, Pacific cod, and shallow-water flatfish are already subject to retention requirements under the Improved Retention/Improved Utilization (IR/IU) program. The Council is also considering requiring full retention of any target species allocated. This could bring northern rockfish, Pacific ocean perch, and dusky rockfish under a full retention requirement. Table 1-92 shows the percentages of these three species that were retained or discarded in 2015. The table includes small amounts of catch made by fixed gear vessels. Because of their value, operators in the Central GOA areas that deliver to Kodiak generally retain these species regardless of whether they are subject to full retention requirements. CVs that deliver to Western GOA processors tend to discard these species because they do not have a market with their processor. The amount of each species delivered by CVs to the Western GOA processors is very small. Any catch (retained or discarded) of an allocated species will be deducted from a cooperative's allocation, so discarding these species will result in forgone value when vessels have a market.

The full retention requirement is patterned after the IR/IU program, where certain exemptions are built into the program to protect the quality of fish delivered to processors. For example, previously caught and decomposing fish may be discarded to prevent other fish in the hold from being contaminated.

Table 1-92 Percentage of primary rockfish species retained and discarded in 2015

	Catcher Processor		Shoreside	
Species/Area	Discarded	Retained	Discarded	Retained
Dusky rockfish	8.3%	91.7%	1.4%	98.6%
610	7.1%	92.9%	100.0%	0.0%
620	7.4%	92.6%	14.6%	85.4%
630	10.5%	89.5%	0.8%	99.2%
Northern rockfish	6.4%	93.6%	0.8%	99.2%
610	3.3%	96.7%	100.0%	0.0%
620	7.7%	92.3%	12.5%	87.5%
630	19.3%	80.7%	0.2%	99.8%
Pacific ocean perch	7.0%	93.0%	1.7%	98.3%
610	4.3%	95.7%	0.0%	100.0%
620	8.6%	91.4%	7.7%	92.3%
630	7.5%	92.5%	1.6%	98.4%
Total all species	7.0%	93.0%	1.6%	98.4%

Source: https://alaskafisheries.noaa.gov/sites/default/files/reports/car230_disc_ret2015.csv

1.7.2.3.2 Secondary Species

Secondary species may be harvested in conjunction with target species up to a maximum retainable amount (MRA). In the current limited access fisheries, managing harvests of valuable species that are not open for directed fishing through MRAs has proven effective. Vessels balance their directed harvests with harvests of MRA limited species. This management is effective in derby fisheries, where participants must trade time targeting directed species with time targeting MRA species. However, participants in a catch share fishery are not subject to time pressures and would likely be able to catch up to the MRA for all MRA species. Since participants place a high value on some secondary species, a race to harvest these high-value secondary species may result. The allocation of secondary species can help avoid creating a race. High value secondary species are proposed to be allocated as an option under Alternative 2.

Allocations of secondary species to sectors would be based on aggregate retained harvests of that species made in all GOA non-Rockfish Program trawl fisheries during the selected qualifying years. Secondary species are allocated to each LLP license based on the percentage of that sector's allocation that the LLP license is credited with harvesting. The within-sector allocation amongst LLP licenses could be based on either retained or total catch depending on the option selected.

Secondary species are not required to be retained under this program but all catches are counted against the cooperative's allocation. If they have a market, vessel operators likely have an economic incentive to retain allocated secondary species because of their value. If these species are not allocated as part of the program it could create an economic incentive for persons holding target species to top off on valuable secondary species up to the MRA. As a result, NMFS may prohibit retention of secondary species. In those instances NMFS requires that catches of secondary species on non-retention status be treated in the same manner as prohibited species and be discarded at sea with a minimum of injury.

1.7.2.3.3 PSC species

Under most options that allocate PSC to sectors (see Table 1-63), the CP fleet will need to reduce its halibut PSC to levels below its historical PSC usage (see Table 1-31). Based on the nine years from 2007 through 2015, the CP sector would have exceeded its halibut PSC limit under any PSC reduction option in four of the nine years; the

sector avoided exceeding its limit in a fifth year by only 1 mt. Based on the 25% reduction option, the fleet would have only been under the limit during one year, and then only if the option to allocate PSC by sector based on 2003 through 2012 is not selected. Therefore, it is expected that the CP sector would need to improve its PSC usage rates in order to harvest GOA groundfish at historical levels under all the proposed options.

1.7.2.4 Fishery Changes

Under this alternative, eligible CVs and CPs may choose to participate in the GOA trawl fisheries through either a cooperative or a limited access fishery. Cooperative members may time their GOA fisheries to achieve efficiencies. These efficiencies include fishing when gross value can be maximized and costs can be minimized, including costs associated with excessive PSC usage. PSC usage creates costs either through forgone harvest or the need to acquire PSC quota on the market.

Holders of small allocations are likely to consolidate their allocations with others to achieve harvest efficiencies, or to opt out of the fishery by leasing their quota within the cooperative or to members of another cooperative, allowing their allocations to be redistributed among active harvesters. Cooperative members will have some incentive to reach agreements with the recipients of small allocations to have them join their cooperative, since these allocations would be inaccessible to cooperatives if they were allocated to a limited access sector.

Alternatively, vessels with small allocations could choose to fish the limited access sector simply to attempt to catch more than their individual historical allocation would have allowed under the cooperative structure and the expected terms of a cooperative contract. Whether or not an individual harvester adopts this tactic will be highly dependent on how many other vessels opt into the limited access sector, and which specific vessels those are. If too few vessels joined the limited access fishery, the available TAC may be too small for NMFS in-season management to open the fishery to directed fishing, using a conservative management approach. Vessel operators might prefer to join a cooperative and receive some value for their small initial allocation if they do not feel that they would be competitive with the other limited access vessels in their area. An operator's decision about whether or not to risk fishing in limited access might also depend on his or her ability to secure a market for their catch, since many of the historically active shoreside processors are expected to be engaged in cooperatives that have harvest allocations.

A case could arise where only a few vessels register for the limited access fishery, as happened under the CP portion of the Rockfish Pilot Program. CPs developed arrangements to coordinated catch to the benefit of their associates from Bering Sea cooperatives. As a result of these arrangements, the CP Rockfish Pilot Program limited access fishery functioned more like a cooperative than a limited access fishery. While this type of arrangement may work in the CP sector because of the Amendment 80 relationships, it is unlikely to work in the CV sector because of the number of latent licenses and lack of widespread coordination through existing cooperatives in other fisheries.

Within cooperatives it is anticipated that each member would receive revenues based on the allocation that his or her LLP licenses brings to the cooperative. Under this arrangement, participants that fish other member's quota would compensate them by paying a lease rate or bartering quota shares for needed species within or across cooperatives. As noted in the Rockfish Program CV cooperative reports, when a harvester exceeds its quota and is required to use another member's quota, the person with the overage is required to pay 100% of the ex-vessel value (as the lease rate) of that fish to the person supplying the quota. This measure was implemented to provide strong incentives to prevent persons from exceeding their quota limits in the cooperative. It is expected that similar provisions would be implemented for the GOA trawl bycatch cooperatives to ensure cooperative members do not have an incentive to exceed their allocations within the cooperative. Those allocation amounts are

determined through the cooperative agreement, but are likely based on the amount of catch history assigned to the cooperative member's LLP license.

Lease rates that are not part of settling an overage will likely not be set at 100% of the ex-vessel value and would vary by fishery and agreement. Leasing has been an issue of concern in many North Pacific quota share programs. High lease rates can result in person holding underlying quota and annually leasing all their shares through cooperatives. This practice can create a disincentive for people to sell their quota even if they do not intend to actively participate in fishing. High lease rates can result in low profit margins for the person actively fishing the quota and, depending on how crew shares are calculated, negatively impact the crew's compensation. This behavior also reduces opportunities for operators who want to expand their operation to gain access to harvest through the purchase of quota shares, and raises entry barriers to new operations. High lease rates – in addition to vessel, gear and other operating costs – impose a substantial barrier to entry for the next generation of harvesters. High lease rates could reduce net revenues of harvesters that actively participate in the fisheries as vessel owners/operators. Lower lease rates could allow for more of the fisheries' revenues to be realized by vessel owners/operators.

As discussed for the crab rationalization program, when high lease rates became a concern, cooperatives could implement a lease cap in their cooperative agreements. If a cooperative were to oversee all transactions to implement a cap on leases, that cooperative would need to monitor all transfers of shares to ensure that the cap is not exceeded. The limitation could be applied to any transfer or lease within a cooperative or between the cooperative and any other cooperative. The role of the cooperative manager and cooperative members would be to verify that no lease rate exceeded the specified cap. The report on lease rates could be required as part of the annual report to the Council, but would not specify any lease rates. The annual report could contain three parts:

1. The maximum lease rate allowed by the cooperative or set through an inter-cooperative agreement, as a percentage of gross vessel value (ex-vessel for CVs and first wholesale for CPs);
2. Description of inter- and intra-cooperative leases by cooperative members[66]; and
3. Authorized cooperative representative affirmation that lease rates were not in excess of the lease cap.

If some number of persons exclusively participate by leasing out their quota, the fishery could become more concentrated than the underlying allocations. The most likely consolidation scenario would arise out of the choices of persons that receive small GOA trawl allocations, are highly dependent on other BSAI or West Coast fisheries, or want to leave the fishery for other reasons (approaching retirement age). Persons eligible for the program that receive relatively small allocations could choose to join a cooperative, only to allow other members of the cooperative to fish their allocations. These vessel owners would save on costs associated with fishing in the GOA. Some of these vessel owners may use the opportunity to increase activities in other fisheries through cooperative arrangements.

At this point, the analysts cannot predict whether some or all vessels associated with the LLPs would choose to lease all of their quota instead of participating actively in their GOA cooperative. These decisions are highly dependent on their opportunities in other fisheries, or the relative profitability of not actively participating in any fisheries. Finally, some initial recipients of quota may see the quota share program as a way to generate income for their retirement. Leasing of quota could provide a revenue stream without incurring the costs, time and effort associated with operating a vessel. That behavior would result in consolidation of the active fleet.

[66] The cooperative members would be required to supply the cooperative representative information on the lease price and quantity leased for every lease that occurred during the year. That information would not be reported in the annual report because of confidentiality restrictions.

As discussed in Section 0, both CVs and CPs are subject quota ownership and vessel use caps. These limitations are designed to limit the consolidation of harvest on a few vessels and limit control of excessive amounts of quota. The tradeoff between allowing improvements in efficiency and limiting consolidation to protect fishing jobs, processing jobs, and support industries must be weighed through the public decision making process. Selecting limits that are too low to provide the desired protections will be more difficult to correct than implementing stricter limitations initially and relaxing them as appropriate in the future. Experience with other quota-based fisheries suggests that the majority of consolidation will occur in the early years of a new program, and tightening consolidation limits after the fact would not achieve the desired effect in its entirety. Waiting to restrict consolidation limits increases the risk that external market forces will appear that make it difficult for smaller operators to remain profitable while actively fishing their own quota, meaning that they are more likely to encounter a situation where they face pressure to sell quota to participants with greater access to financial reserves when weathering poor market cycles.

The timing of harvests is likely to change for cooperative members under Alternative 2. If LLP license holders choose to fish in the Limited Access fishery (assuming they do not form a voluntary cooperative of the members), they will continue to race to harvest the quota available. The pressure to catch fish before they are taken by another harvester will lead vessel operators to begin fishing as soon as the fishery is opened to directed fishing. The only reasons they would not begin fishing at the start of the year is if the economic conditions would result in them losing money, or if they face more urgent time pressures to participate in other fisheries.

The exact timing of cooperative members GOA activity will likely depend on the operational needs of cooperative members and their fishing success. Low target species catch rates or high rates of incidental catch, especially of PSC species, could also lead a cooperative to change its fishing patterns. Part of that change in fishing patterns could be the result of better information that is gained by cooperative members being more willing to share real-time data. Sharing information when a vessel operator has a secure allocation of target species is more likely, since doing so will not result in competitive disadvantage to their own operation.

Cooperative members are likely to adopt fishing practices that reduce incidental catch of unmarketable groundfish and PSC species. The use of excluder devices[67] are often associated with these discussions. Some members of the GOA groundfish fleet have already experimented with various configurations of excluder devices and use those devices in their nets during the competitive limited access fisheries. These practices are expected to be more widely adopted when the fisheries slow down under allocations of target species to cooperatives. The use of these devices could reduce catch rates of target species and slightly increase costs overall, but the benefit of reduced PSC usage is realized by the persons incurring the costs and are not shared among all fishermen subject to the fishery-wide PSC limits.

The allocation of each target, secondary and PSC species to a cooperative will operate as a hard cap on the total harvests by the cooperative. When a cooperative has fully harvested any one of its species allocations, it would be prohibited from any further catch of GOA trawl species they did not hold quota to cover. Recall that quota for groundfish species is defined by both species and management area. For example, a cooperative would need to have Western GOA Pacific cod quota to continue fishing in that area. It would not be sufficient to hold Central GOA Pacific cod quota to continue fishing in the Western GOA. PSC quota is not area-specific after it is assigned to a cooperative, and PSC assigned to a cooperative based on Central GOA target catch would be used for

[67] Excluder devices have been developed for halibut and Chinook salmon. These devices continue to be refined to meet their operational objectives in GOA fisheries at a reasonable cost.

Western GOA fisheries. Depending on the ICAs set for secondary species allocations, those species could be constraining. In that situation, cooperative members will need to carefully monitor their catch of those species to ensure they do not become a constraint. MRAs will not be necessary for species that are allocated, since the amount of those species taken by cooperative members is limited by his or her cooperative's allocation. MRAs would continue to be necessary for vessels that choose to fish in the limited access fishery.

MRAs will remain necessary for valuable species that are not allocated to cooperatives. Cooperative members will still have incentives to harvest up to the MRA for these species to maximize the value of trips. The incentive to harvest these species up to the MRA will increase the likelihood that in-season management staff at NMFS will need to place them on PSC status and prohibit retention at later points in the year. This is most likely to occur for the highest value species, like sablefish. However, the same outcome could occur for some rockfish species and skate species, especially in years when the TAC for those species is relatively small and vessel are under less time pressure to harvest their primary species allocations.

1.7.2.5 Observer Coverage and Monitoring

The current partial and full observer coverage categories are defined in regulation at §679.51(a)(1) and (2). The full coverage category includes CPs and motherships that are harvesting, receiving, or processing groundfish in a federally managed or parallel fishery. Full coverage also applies to CVs while participating in the Central GOA Rockfish Program, directed fishing for pollock in the Bering Sea, and fishing CDQ groundfish with trawl or hook-and-line gear. The partial coverage category includes all other CVs that are designated on a FFP. All GOA trawl CVs, except those delivering all their catch (unsorted codends) to a mothership[68], would be reclassified from the partial coverage category to the full coverage category. When and if regulations are implemented to allow trawl CVs to utilize Electronic Monitoring as a component of their observer coverage requirement, EM could be used to fulfill observer requirements as defined in the implementing regulations for that program.

CVs delivering to a tender vessel would be subject to 100% observer coverage. Any CVs delivering to a tender vessel would be required to pay the daily observer costs in the full coverage category. Monitoring requirements for tenders and CVs delivering to tenders are discussed in more detail later in this section. The new observer requirements will apply to both vessels enrolled in voluntary cooperatives and to vessels fishing in the Limited Access sector.

In October 2015, the Council received a discussion paper on the potential effects of placing *all* GOA trawl CVs in the full observer coverage category.[69] That paper relied on estimates of the daily cost for a full coverage observer that were drawn from the 2014 NMFS Observer Program Annual Report (NMFS, 2015). The best information available to the Alaska Fisheries Science Center's Fisheries Monitoring and Analysis (FMA) division at that time placed the daily cost to a vessel owner around $330 to $370. FMA was able to make estimates for trawl CVs as a category, but could not provide a specific estimate for trawl CVs operating in the GOA due to confidentiality restrictions (fewer than three full coverage observer providers work with the GOA trawl sector; refer to MSA §402(b)(1)). The Council has heard subsequent testimony that those estimates are not an accurate reflection of the daily rates paid by GOA trawl vessel operators for a full coverage observer.

[68] CV cannot deliver pollock to motherships in the GOA because of inshore processor definitions for pollock, unless the mothership is less than 125 ft (38.1 m) LOA and holds an inshore processing endorsement on their Federal fisheries permit, and processes no more than 126 mt per week in round-weight equivalents of an aggregate amount of pollock. Whether the increased observer costs would create economic incentives to deliver Pacific cod and flatfish to motherships is not known.
[69] http://npfmc.legistar.com/gateway.aspx?M=F&ID=918c7758-9e37-4685-aefb-c47ef6ab874d.pdf

Section 2.4 of NMFS's 2015 Observer Program Annual Report updates the estimated cost per day for full coverage to the extent possible (NMFS, 2016). FMA's conclusion is that the average daily rate for a trawl CV is $375, but again that estimate is not specific to the GOA. FMA staff are able to analyze confidential data to get closer to understanding the specific costs for GOA trawl CVs operating under full coverage (i.e., Central GOA Rockfish Program). Overall, FMA staff finds evidence that daily rates billed for the GOA are higher than the reported trawl CV average, and that the two main cost drivers are transportation/location and trip duration. Both factors increase fixed costs, or the costs to get an observer to the point of embarkation and onshore housing costs between deployments at sea. Shorter trip duration means that vessel owners amortize fixed costs over fewer actual fishing days. The nature of the GOA fisheries also means that observers are less likely to be deployed to a boat for a long period that covers multiple trips. The location factor in the GOA drives costs because observers must be deployed out of multiple ports, rather than having an effective "hub" in Dutch Harbor/Unalaska for the BSAI fisheries. Moreover, the GOA trawl fishery includes relatively remote ports such as Sand Point and King Cove, the latter of which does not receive regular commercial air service. The 2015 Annual Report includes the following statement:

> *"[A]nalysis of stratified results indicate that (1) the average cost per day of observer coverage is highest for the trawl CV sector particularly in the Gulf of Alaska, and (2) based on sampled invoices where deployment durations were 5 days or less, the average cost per day of shorter duration trips could be significantly higher than the average cost per day for the trawl CVs as a whole. The higher costs in these strata are the result of higher fixed costs (airfare and other incidental expenses) and fewer days of coverage. The higher fixed costs are likely attributable to the fact that the scale of CV fishing activities requiring full coverage is smaller in the Gulf of Alaska with fewer days of coverage per vessel."*

Across all gear sectors and fisheries in both FMP areas, FMA staff finds that fixed costs (transportation and incidentals) account for approximately 10% of the total invoiced amount paid to observer providers by vessel owners. The conclusions in the Annual Report suggest that this proportion is higher in the GOA, but the exact amount is not known.

Because daily observer costs specific to the GOA are not available, a cost estimation methodology used for the October 2015 discussion paper is used here. Because the cost per day is assumed to be greater than $371/day used in that paper, daily rates of $400/day, $500/day, and $600/day are used to provide a range of values that is expected to contain the actual average daily cost. The decision makers and public will have a range of potential impacts to consider, and will need to rely on public testimony and anecdotal evidence to decide which marker provides the most accurate depiction of the cost of full coverage.

Table 1-93 reports the number of observed days, total days fished, and estimates of full observer coverage costs at the assumed daily rates. The number of days fished is summarized for trips using trawl gear in Areas 610, 620, 630, and 640, excluding trips for the Rockfish Program. The number of days fished for a trip reflects the landing date minus the fishing start date plus one. In the event that there was more than one landing date, suggesting partial deliveries, the last landing date was used to calculate days fished. The observed days reflects the estimated number of days fished on trips where a partial coverage observer was present. This count does include travel days or days spent at the dock by observers. The total days fished is the estimated number of days fished for trips with or without an observer present. This does not include travel days or days spent at the dock by observers.

A fishing trip may occur in more than one FMP subarea. The days fished on trips that occur in both the CG and WY areas are only counted once in the CG/WY summary. The days fished on trips that take place in both the CG/WY and WG areas are reflected in both the CG/WY summary and the WG summary. The days fished on a trip are only counted once in the "Total" summary, regardless of how many of the FMP areas the trip covered.

Table 1-93 Estimated observer costs for the GOA trawl CV vessels

Year	Area	Observed Days	Total Days Fished	% of Days Observed	Observer Fee ($million) at Assumed Daily Rate $400	$500	$600
2013	CG/WY	551	3,368	16%	$1.35	$1.68	$2.02
2013	WG	197	904	22%	$0.36	$0.45	$0.54
2013	Total	723	4,123	18%	$1.65	$2.06	$2.47
2014	CG/WY	534	4,111	13%	$1.64	$2.06	$2.47
2014	WG	139	1,180	12%	$0.47	$0.59	$0.71
2014	Total	673	5,253	13%	$2.10	$2.63	$3.15
2015	CG/WY	990	4,263	23%	$1.71	$2.13	$2.56
2015	WG	275	1,604	17%	$0.64	$0.80	$0.96
2015	Total	1,262	5,846	22%	$2.34	$2.92	$3.51

Source: NMFS CAS data

Table 1-94 shows the estimated change in GOA-wide trawl observer fees that could be borne by the fleet as a result of moving to the full-coverage category. The estimated change should be considered a rough estimate of the potential range of change that could occur, since as stated above, the GOA daily rate for observer coverage is not known. Also the comparison is made against the total partial coverage fee collected. The calculation assumes that the harvester paid half of the total fee. The partial coverage fee collected, based on 2013 through 2015 invoices, does not include any administrative fees and interest charged for late fee payments; it only includes the fee assessed based on the 1.25% fee rate levied on the standardized ex-vessel value of groundfish landed.

Depending on the year and daily rate assumed, moving to the full coverage category could increase the fleet's observer costs in the GOA by about 500% to 800%. That percentage assumes the harvester and processor each paid half of the 1.25% fee. Assuming that some of the increased cost would be offset by increases in value derived from the fishery, either by increasing the amount of fish caught or deriving more value per pound harvested. The change in net value will vary by year depending on other factors related to costs of fishing, fish quality, and market conditions. However, it is expected that the increase in observer costs will be one of the primary drivers of increased costs associated with the cooperative program, along with the cost recovery fee and cooperative expenses.

Table 1-94 Estimated change in GOA trawl CV observer costs

Year	Observed Days	Total Days Fished	Actual Reported Observer Fees	% Increase in CV Observer Fees at Assumed Daily Rate $400	$500	$600
2013	723	4,123	$621,731	531%	663%	796%
2014	673	5,253	$874,919	480%	600%	720%
2015	1,262	5,846	$922,176	507%	634%	761%

Source: NMFS CAS data

Moving all GOA trawl CVs to the full observer coverage category might affect harvesters in the following ways:

- Full observer coverage is more costly to vessel owners than paying the 1.25% ex-vessel based fee that is levied on vessels operating in the partial coverage category (See Table 1-93).

- Moving trawl CVs from partial to full coverage would eliminate a cost factor for shoreside processors, which are assumed to pay half of the partial coverage fee[70] and as a result the catcher vessels would be required to pay all of the higher observer costs.
- Because a vessel's observer costs under the full coverage category are determined by the number of contracted observer days, carrying a full coverage observer is effectively a variable operating cost (analogous to fuel). The fact that costs are driven by sea-time could affect vessel operators' decisions. If a vessel has contracted an observer, standing down to avoid fishing during a spike in local PSC rates would be more expensive. Spending time running to more distant fishing grounds with lower expected PSC rates would have a similar cost impact. Vessel owners would also have to consider the cost factor of additional running time when deciding whether to take shorter trips in order to deliver fresher product, which has been mentioned as a value-creating opportunity under a catch share program like Alternative 2. In general, the time-driven costs of carrying a full coverage observer might complicate decisions about the timing of fishing effort and coordination of deliveries, both of which are cited as positive opportunities under a program structure that allocates groundfish.

Catcher/Processors

Under any scenario that allocates groundfish to the CP sector, NMFS would extend the monitoring tools currently in place for CPs fishing under CGOA Rockfish Program to all trawl CP vessels under this program. These tools would include:

- 200% coverage, which enables every haul to be sampled by an observer;
- Availability of an observer sampling station;
- Requirement to weigh catch on a NMFS-approved flow scale;
- Video system to monitor compliance;
- Use of a single fish processing line in the factory; and
- Prohibition on deck sorting.

If the Council recommends transferrable PSC allocations of Chinook salmon, then additional tools would be required if the PSC accounting is to be based on a census of salmon. These requirements would be the same as the set of tools that were necessary to implement a Chinook salmon census on CPs under Amendment 91 in the Bering Sea. These requirements would include:

- All salmon PSC of any species must be retained until it is counted by an observer;
- Vessel crew must transport all salmon PSC from each haul to an approved storage location adjacent to the observer sampling station so that the observer has free and unobstructed access to the salmon, and the salmon must remain within view of the observer from the observer sampling station at all times;
- The observer must be given the opportunity to count the salmon and take biological samples, even if this requires the vessel crew to stop sorting or processing catch until the counting and sampling is complete;
- The vessel owner must install a video system with a monitor in the observer sample station that provides views of all areas where salmon could be sorted from the catch and the secure location where salmon are stored;
- No salmon PSC of any species may pass the last point where sorting occurs in the factory; and
- Operators of CPs must report the count of salmon by species in each haul to NMFS using an electronic logbook.

[70] The fee is collected from the processors. When the regulation was implemented the language stated that the fee liability would be paid equally by the harvester and processor, but actual amount funded by each is not verified.

All CPs, except one, are already required to meet these requirements in the BSAI. All CPs would incur somewhat greater costs to comply with the video monitoring requirements in the GOA to monitor Chinook salmon brought onboard the vessel.

For the one CP that does not fish in the BSAI and is not currently subject to these requirements, perhaps the greatest additional cost would be to reconfigure the vessel to accommodate a flow scale. This is a smaller CP (<125' LOA) and design and placement of the flow scale to fit the flow of fish in the processing plant would be a challenge. The cost of refitting the boat to meet this requirement is not known and could not be reported if the information was available, because of confidentiality restrictions.

Catcher Vessels

The monitoring tools currently in place for CVs participating in the CGOA Rockfish Program provide the model for the monitoring NMFS would propose for this program. These requirements include:

- Full observer coverage (carry an observer on all trips);
- Retain all primary and secondary groundfish species and salmon PSC;
- After sampling is completed by an observer, discard all halibut PSC;
- Computer for observer to enter data; and
- Deliver all catch to a processor that has a NMFS approved Catch Monitoring and Control Plan (CMCP) and shoreside observer coverage (see details in the following subsection on shoreside processors).

Retention of all primary, secondary[71], and salmon PSC would be required for CVs fishing under this program. However, observers are unable to monitor all sorting and discard activity aboard CVs while they are completing other duties, so sorting catch at sea can present catch-monitoring vulnerabilities. To ensure that all allocated species make it to the plant, NMFS is considering prohibitions on sorting and discarding groundfish while at sea. However, a broad prohibition on sorting and discarding would necessitate changes to regulations regarding MRAs and would have to incorporate provisions for regulatory discards such as halibut PSC and lingcod during certain times of the year.

Full observer coverage is considered to be necessary to monitor at-sea discards and obtain data to estimate PSC of halibut; however, it might also be possible to accomplish these monitoring goals on CVs using video monitoring systems. Prior to the implementation of full observer coverage on CVs in the Rockfish Program, Alaska Groundfish Databank, in conjunction with NMFS, conducted several pilot studies to assess the efficacy of video for recording and quantifying the discard of halibut from trawl CVs. The studies demonstrated that the use of video had potential, but the costs for the video systems and the video analysis were higher than the cost of observer coverage, and the time lag of up to two weeks to receive the data was unacceptable for NMFS and industry quota managers. One solution suggested that broader use of video could create economies of scale, reducing the costs of the video systems and the associated video data analysis. Implementing a video monitoring system across all fisheries under the GOA trawl LAPP might be a mechanism to accomplish this economy of scale.

[71] NMFS notes this requirement would be necessary for monitoring the allocations. This is slightly different from the Council's alternative that would require the retention of primary species and Chinook salmon. However, requiring the retention of secondary species would not expected to result in a substantial impact to the harvesters delivering to Kodiak since those are relatively high valued species and markets exist. The cost could be greater in the Western GOA where these species, other than sablefish, are more likely to be discarded.

NMFS has also begun investigating the use of video analytic software and newer camera technology. Continued improvements in technology might decrease the time lag before video data are available to manage the fisheries. The use of video monitoring technology was included as an option if and when it is allowed and available.

Currently, all vessels in full coverage and CVs greater than 125' LOA are required to provide a computer and communication equipment for use by an observer. The requirements include: (1) a computer and data transmission capabilities that meets NMFS specifications and are supplied by the vessel, shoreside, or stationary floating processor, and (2) dedicated software called ATLAS that is provided by NMFS. Together the hardware and software allow observers to communicate with, and transmit data to, NMFS. The ATLAS software contains business rules that perform many quality control and data validation checks, which dramatically increase the quality of the preliminary observer data when it is submitted. Transmitting data electronically, instead of via fax, reduces the time before the data are available for management by a week or more. Additionally, observers onboard vessels with the ATLAS software have the ability to communicate directly with Observer Program staff in near real time to address questions regarding sampling as well as notify staff of potential compliance concerns.

The CVs participating in the CGOA Rockfish Program are currently required to provide the computer for the ATLAS software but are not required to provide the ability to transmit data while at sea. Under these regulations, observers enter all their data into the ATLAS software that is installed on a computer provided by the vessel. Once the vessel returns to port to offload catch, the observer downloads their data to a memory stick and transmits the data from a shore-based computer with internet access. In development of the Rockfish Program, NMFS determined that vessels made short duration trips and that the costs of requiring communications equipment would outweigh the benefits of increased timeliness of data transmission. This has worked under the Rockfish Program. However there can be delays in the availability of the observer data if the observer was unable to get access to a computer onshore to transmit their data before needing to leave on their next trip. This can be especially challenging if the observer has many duties to complete during the offload, or if computer access at the shoreside processing plant is not readily available. One way to avoid these problems and to increase the timeless of the data while still minimizing costs to the vessel might be to require processing plants to provide wireless access to the internet at the dock. This would enable to observer to enter and transmit the data from the computer on the boat instead of downloading data to a USB drive and locating a computer on shore. However, under the GOA trawl LAPP there could be a few vessels that deliver to locations without reliable internet access. This would need to be considered before the Agency could decide to move forward with requirements for wireless internet at processing plants.

Finally, if regulations are implemented in the future to allow the use of EM to monitor fishing activities on GOA trawl vessels, this action indicates that EM could be used as part of this program. Changes in costs compared to full coverage by observers and the actual EM configuration requirements are not described in this package. The EM requirements will be defined in the regulations that approve their use in the GOA trawl fisheries. Likewise the cost of the EM relative to the full coverage costs are not known at this time. However, recent studies have indicated that the cost of EM is highly dependent on whether it is used to estimate discards by species or simply determine whether discards occurred (NPFMC, 2016). The costs are also driven by the percentage of the video from trip that must be reviewed. Because the structure of EM that could be used in the trawl fishery is not currently defined, cost estimates are not provided. Given current technology and the cost of that technology, substantial cost savings to harvesters are not anticipated.

1.7.2.6 Changes in Season Dates and Seasonal Apportionments

Alternative 2 includes an option to modify the pollock and Pacific cod season dates so that they could potentially remain open to directed fishing from January 20 to November 1. As part of that change, the

pollock fishery could be reduced from four seasons to two. Alternative 2 also includes an option to change the percentage of the pollock TAC assigned to each of the four fishing seasons. While the options are not worded the same in both alternatives, they have the same effect. The three options considered are presented below.

Option 1. Revise the GOA-wide pollock apportionments to 30% (A); 30% (B); 20% (C); 20% (D)

Option 2. Modify the pollock fishery to two seasons: Jan 20 to June 10 and June 10 to Nov 1. (If selected with Option 1, the seasonal split would be 60%/40%).

Suboption: The second season for pollock is June 10 to December 31.

The GOA pollock TAC was first apportioned across four seasons in the Western and Central GOA beginning in 1990 to prevent the rapid harvest of the pollock TAC early in the year (55 FR 37907, September 14, 1990). Steller sea lion protection measure emergency and final rules implemented from 1999 through 2003 maintained the importance of the seasonal pollock TAC allocations to reduce the potential for the pollock fishery to compete with Steller sea lions for prey. Under the Council's Steller sea lion protection measures implemented in January 2003 (68 FR 204, January 2, 2003) and modified in 2004 (69 FR 56384, September 21, 2004), pollock TACs are currently allocated equally by season (25%) across the combined 610, 620, and 630 regulatory areas. The West Yakutat District and SEO Districts pollock TACs are not allocated by season and are not included in the proposed change. Therefore, that portion of the total pollock TAC is not included in this discussion. Seasonal allocations to each regulatory area are determined by the estimated seasonal pollock biomass distribution. That distribution methodology will continue regardless of the proposed changes in the total seasonal allocation.

NMFS GOA bottom trawl biomass surveys are conducted every two years. The most recent survey was conducted in 2015. Information collected from the surveys is, in part, used to determine the pollock biomass distribution between areas and seasons in the GOA. Table 1-95 shows the final GOA pollock allocations for the Western and Central GOA regulatory areas in 2003, 2006, 2009, 2012, 2015, and 2016. These years were selected to provide biomass distribution changes for a series of recent years going back to 2003.

Table 1-95 Historical pollock allocations for the Western and Central GOA regulatory areas

	Shumagin (Area 610)		Chirikof (Area 620)		Kodiak (Area 630)		W & C GOA	
Season	mt	%	mt	%	mt	%	mt	%
2003								
A (Jan 20–Mar 10)	2,894	25.00%	6,535	56.00%	2,274	19.00%	11,703	25.00%
B (Mar 10–May 31)	2,894	25.00%	7,778	66.00%	1,031	9.00%	11,703	25.00%
C (Aug 25–Oct 1)	5,500	47.00%	2,686	23.00%	3,517	30.00%	11,703	25.00%
D (Oct 1–Nov 1)	5,500	47.00%	2,686	23.00%	3,517	30.00%	11,703	25.00%
Annual Total	16,788	35.86%	19,685	42.05%	10,339	22.09%	46,812	100.00%
2006								
A (Jan 20–Mar 10)	4,210	21.63%	11,192	57.50%	4,062	20.87%	19,464	25.00%
B (Mar 10–May 31)	4,210	21.63%	13,394	68.81%	1,861	9.56%	19,465	25.00%
C (Aug 25–Oct 1)	10,249	52.65%	2,953	15.17%	6,263	32.17%	19,465	25.00%
D (Oct 1–Nov 1)	10,249	52.65%	2,953	15.17%	6,263	32.17%	19,465	25.00%
Annual Total	28,918	37.14%	30,492	39.16%	18,449	23.70%	77,858	100.00%
2009								
A (Jan 20–Mar 10)	3,234	32.01%	4,365	43.21%	2,503	24.78%	10,102	25.00%
B (Mar 10–May 31)	3,233	32.01%	5,413	53.59%	1,455	14.90%	10,101	25.00%
C (Aug 25–Oct 1)	4,391	43.47%	2,160	21.38%	3,550	35.15%	10,101	25.00%
D (Oct 1–Nov 1)	4,391	43.47%	2,160	21.38%	3,550	35.15%	10,101	25.00%
Annual Total	15,249	37.74%	14,098	34.89%	11,058	27.37%	40,405	100.00%
2012								
A (Jan 20–Mar 10)	5,797	22.64%	14,023	54.76%	5,787	22.60%	25,607	25.00%
B (Mar 10–May 31)	5,797	22.64%	17,221	67.25%	2,589	10.11%	25,607	25.00%
C (Aug 25–Oct 1)	9,338	36.47%	7,282	28.44%	8,986	35.10%	25,606	25.00%
D (Oct 1–Nov 1)	9,338	36.47%	7,282	28.44%	8,986	35.10%	25,606	25.00%
Annual Total	30,270	29.55%	45,808	44.72%	26,348	25.72%	102,426	100.00%
2015								
A (Jan 20–Mar 10)	3,632	7.99%	30,503	67.11%	11,316	24.90%	45,452	25.00%
B (Mar 10–May 31)	3,632	7.99%	37,820	83.21%	4,000	8.80%	45,452	25.00%
C (Aug 25–Oct 1)	12,185	26.81%	14,628	32.18%	18,639	41.01%	45,452	25.00%
D (Oct 1–Nov 1)	12,185	26.81%	14,628	32.18%	18,639	41.01%	45,452	25.00%
Annual Total	31,634	17.40%	97,579	53.67%	52,594	28.93%	181,806	100.00%
2016								
A (Jan 20–Mar 10)	3,827	6.41%	43,374	72.71%	12,456	20.88%	59,651	25.00%
B (Mar 10–May 31)	3,826	6.41%	50,747	85.07%	5,083	8.52%	59,651	25.00%
C (Aug 25–Oct 1)	24,421	40.94%	15,404	25.82%	19,822	33.23%	59,651	25.00%
D (Oct 1–Nov 1)	24,421	40.94%	15,402	25.82%	19,822	33.23%	59,651	25.00%
Annual Total	56,494		124,927		57,183		238,604	100.00%

Source: NMFS Table 3 at https://alaskafisheries.noaa.gov/sites/default/files/15_16goatable3.pdf for 2015
Note: The table does not include further distributions of the TACs (inshore/offshore). All seasons open and close at 1200 hours A.l.t.

Table 1-96 shows how the pollock TACs in the Western and Central GOA would have been redistributed by changing the seasonal allocation percentages and holding the TACs and biomass distribution the same as reported in those years. All of the changes in that table are driven by the change in percentages in the far right column (the Council's proposed amendment). Future TAC levels in each area will be driven both by surveyed biomass distribution and the level of the total TAC. The years reported in the table show how area TACs would have changed under the proposed options.

Table 1-96 Proposed pollock allocations for the Western and Central GOA regulatory areas with revised apportionments (based on 2015)

	Shumagin (Area 610)		Chirikof (Area 620)		Kodiak (Area 630)		W & C GOA	
Season	mt	%	mt	%	mt	%	mt	%
2003								
A (Jan 20–Mar 10)	3,511	25.00%	7,864	56.00%	2,668	19.00%	14,044	30.00%
B (Mar 10–May 31)	3,511	25.00%	9,269	66.00%	1,264	9.00%	14,044	30.00%
C (Aug 25–Oct 1)	4,400	47.00%	2,153	23.00%	2,809	30.00%	9,362	20.00%
D (Oct 1–Nov 1)	4,400	47.00%	2,153	23.00%	2,809	30.00%	9,362	20.00%
Annual Total	15,822		21,440		9,550		46,812	100.00%
2006								
A (Jan 20–Mar 10)	5,052	21.63%	13,431	57.50%	4,875	20.87%	23,357	30.00%
B (Mar 10–May 31)	5,052	21.63%	16,072	68.81%	2,233	9.56%	23,357	30.00%
C (Aug 25–Oct 1)	8,198	52.65%	2,362	15.17%	5,009	32.17%	15,572	20.00%
D (Oct 1–Nov 1)	8,198	52.65%	2,362	15.17%	5,009	32.17%	15,572	20.00%
Annual Total	26,501		34,227		17,126		77,858	100.00%
2009								
A (Jan 20–Mar 10)	3,880	32.01%	5,238	43.21%	3,004	24.78%	12,122	30.00%
B (Mar 10–May 31)	3,880	32.01%	6,496	53.59%	1,806	14.90%	12,122	30.00%
C (Aug 25–Oct 1)	3,513	43.47%	1,728	21.38%	2,840	35.15%	8,081	20.00%
D (Oct 1–Nov 1)	3,513	43.47%	1,728	21.38%	2,840	35.15%	8,081	20.00%
Annual Total	14,786		15,189		10,491		40,405	100.00%
2012								
A (Jan 20–Mar 10)	6,957	22.64%	16,827	54.76%	6,944	22.60%	30,728	30.00%
B (Mar 10–May 31)	6,957	22.64%	20,664	67.25%	3,107	10.11%	30,728	30.00%
C (Aug 25–Oct 1)	7,471	36.47%	5,826	28.44%	7,190	35.10%	20,485	20.00%
D (Oct 1–Nov 1)	7,471	36.47%	5,826	28.44%	7,190	35.10%	20,485	20.00%
Annual Total	28,855		49,143		24,432		102,426	100.00%
2015								
A (Jan 20–Mar 10)	4,358	7.99%	36,603	67.11%	13,581	24.90%	54,542	30.00%
B (Mar 10–May 31)	4,358	7.99%	45,384	83.21%	4,800	8.80%	54,542	30.00%
C (Aug 25–Oct 1)	9,748	26.81%	11,701	32.18%	14,912	41.01%	36,361	20.00%
D (Oct 1–Nov 1)	9,748	26.81%	11,701	32.18%	14,912	41.01%	36,361	20.00%
Annual Total	28,213	15.52%	105,389	57.97%	48,204	26.51%	181,806	100.00%
2016								
A (Jan 20–Mar 10)	4,588	6.41%	52,047	72.71%	14,946	20.88%	71,581	30.00%
B (Mar 10–May 31)	4,588	6.41%	60,894	85.07%	6,099	8.52%	71,581	30.00%
C (Aug 25–Oct 1)	19,537	40.94%	12,322	25.82%	15,858	33.23%	47,721	20.00%
D (Oct 1–Nov 1)	19,537	40.94%	12,322	25.82%	15,858	33.23%	47,721	20.00%
Annual Total	48,251		137,584		52,760		238,604	100.00%

Note: All seasons open and close at 1200 hours A.l.t.

Table 1-97 shows the changes in the TAC apportionments by area and season that would have resulted using the annual data reported in the previous tables. Increasing the seasonal apportionment to the A and B seasons to 30% increased the total annual pollock TAC in Area 620, while decreasing the 610 and 630 annual apportionments in each year considered. The reason is that the pollock biomass distribution is currently relatively greater in 620 during those seasons. Area 610 has the smallest percentage of biomass in those seasons, so increase in that area

was the smallest. Reductions in the C and D season TACs more than offset the gains in the A and B seasons in areas 610 and 630.

The right side of the table shows the percentage change in price that is necessary for the total ex-vessel gross revenue generated from the pollock fishery to be unchanged. Using 2003 as an example, the ex-vessel price in the A and B seasons would need to be 178% of the C and D season price to generate the same ex-vessel gross revenue from the Area 610 pollock fishery. This calculation assumes that the entire TAC is harvested in each season and that all of the pollock is sold for the same price per pound during that season. In Area 620 the A and B season price only needs to be 38% of the C and D season price for the same amount of gross ex-vessel revenue to be generated from pollock in that area. In Area 630, 226% of the C and D season price would need to be realized in the A and B season.

The percentages reported in the table indicate that it is unlikely that the roe bonus would make up for the reduced available harvests in Areas 610 and 630. The 2015 Economic SAFE Report (Fissel, et al., 2015) states that Alaska pollock roe accounted for 11 percent of the species' wholesale value in 2014. Prior to 2007, roe often accounted for one-third to one-fifth of the total first wholesale value of Alaskan pollock. This indicates that while pollock roe is still valuable, the relative value has decreased as a result of declining Japanese consumption patterns and the weakness of the yen relative to the U.S. dollar. Assuming that the roe bonus has been as much as 135% of the C and D season price[72] and is less in 2016, the gross pollock revenue from Areas 610 and 630 will decline and 620 gross pollock revenues will increase.

The expected lower gross revenues in Areas 610 and 630 that result from changing the seasonal allocations will not impact all vessels the same. Vessels that focus on the A and B season fisheries and do not fish GOA pollock in the C and D seasons may benefit. The vessels that are most reliant on the C and D season pollock fisheries in those areas will be most negatively impacted, given current market and biological conditions.

[72] A roe bonus of 135% is based on information presented in the Economic SAFE, where roe has accounted for up to one-third of the pollock first wholesale value. The current roe bonus in the GOA is assumed to be less than that amount because of the world market for pollock roe, strong US dollar, and the small fish size in the 2016 GOA pollock fisheries. Current pollock roe bonus information is not available from AKFIN summaries of NMFS data.

Table 1-97 Change in amount of pollock assigned to each season and regulatory area (based on 2015)

	Metric Tons				Break even price change		
Season	610	620	630	W&C GOA	610	620	630
2003 (TAC = 46,812 mt)					178%	38%	226%
A (Jan 20–Mar 10)	617	1,329	394	2,341	The percentages above show		
B (Mar 10–May 31)	617	1,491	233	2,341	the ratio of A/B season prices		
C (Aug 25–Oct 1)	-1,100	-533	-708	-2,341	to C/D season prices		
D (Oct 1–Nov 1)	-1,100	-533	-708	-2,341	necessary for their to be no		
2003 Total	-966	1,755	-789	0	change in gross revenue		
2006 (TAC = 77,858 mt)					243%	24%	212%
A (Jan 20–Mar 10)	842	2,239	813	3,893			
B (Mar 10–May 31)	842	2,678	372	3,892			
C (Aug 25–Oct 1)	-2,051	-591	-1,254	-3,893			
D (Oct 1–Nov 1)	-2,051	-591	-1,254	-3,893			
2006 Total	-2,417	3,735	-1,323	0			
2009 (TAC = 40,405 mt)					136%	44%	167%
A (Jan 20–Mar 10)	646	873	501	2,020			
B (Mar 10–May 31)	647	1,083	351	2,021			
C (Aug 25–Oct 1)	-878	-432	-710	-2,020			
D (Oct 1–Nov 1)	-878	-432	-710	-2,020			
2009 Total	-463	1,091	-567	0			
2012 (TAC = 102,426 mt)					161%	47%	214%
A (Jan 20–Mar 10)	1,160	2,804	1,157	5,121			
B (Mar 10–May 31)	1,160	3,443	518	5,121			
C (Aug 25–Oct 1)	-1,867	-1,456	-1,796	-5,121			
D (Oct 1–Nov 1)	-1,867	-1,456	-1,796	-5,121			
2012 Total	-1,415	3,335	-1,916	0			
2015 (TAC = 181,806 mt)					336%	43%	243%
A (Jan 20–Mar 10)	726	6,100	2,265	9,090			
B (Mar 10–May 31)	726	7,564	800	9,090			
C (Aug 25–Oct 1)	-2,437	-2,927	-3,727	-9,091			
D (Oct 1–Nov 1)	-2,437	-2,927	-3,727	-9,091			
2015 Total	-3,421	7,810	-4,390	0			
2016 (TAC = 238,604)					641%	33%	226%
A (Jan 20–Mar 10)	761	8,673	2,490	11,930			
B (Mar 10–May 31)	762	10,147	1,016	11,930			
C (Aug 25–Oct 1)	-4,884	-3,082	-3,964	-11,930			
D (Oct 1–Nov 1)	-4,884	-3,080	-3,964	-11,930			
2016 Total	-8,243	12,657	-4,423	0			

Note: Reported numbers in rows and columns may not add to the totals due to rounding errors. All seasons open and close at 1200 hours A.l.t.

In terms of reducing Chinook PSC rates, the number of Chinook caught per metric ton of groundfish in the pollock target fisheries is typically greater after August. Table 1-98 shows the number of Chinook salmon caught per metric ton of groundfish in the GOA pollock target fisheries. Only February in Area 620 is above the average during the first half of the year. Almost all of the cells in the table are above the annual average in October. This indicates that moving more of the pollock harvest to the and A and B seasons may reduce Chinook PSC, assuming all other factors are unchanged.

Table 1-98 Chinook salmon per mt of groundfish in the pollock fishery (2010-2015)

					Chinook salmon per 300,000 pound trip			
Month	610	620	630	W & C GOA	610	620	630	W & C GOA
1	0.2452	0.1041	0.0256	0.1302	33.4	14.2	3.5	17.7
2	0.1571	0.1639	0.0838	0.1474	21.4	22.3	11.4	20.1
3	0.0617	0.0349	0.1082	0.0504	8.4	4.8	14.7	6.9
4	0.1070	0.0235	0.0520	0.0412	14.6	3.2	7.1	5.6
5	0.0218	0.0225		0.0224	3.0	3.1		3.1
6	Closed to directed fishing							
7								
8	0.0642	0.0852	0.0201	0.0648	8.7	11.6	2.7	8.8
9	0.1414	0.1699	0.0768	0.1202	19.2	23.1	10.5	16.4
10*	1.0145	0.3366	0.1785	0.4410	138.1	45.8	24.3	60.0
11	Closed to directed fishing							
12								
Annual	0.3906	0.1191	0.1196	0.1738	53.2	16.2	16.3	23.7

Source: AKFIN summary of NMFS Catch Accounting data

This action also allows modifying the pollock season dates in three ways. First it provides options to combine the four pollock seasons into two season. Moving to two seasons would combine the A and B seasons and the C and D seasons. This option would also extend the current B season closing date from May 31 to June 10 and moving up the current C season opening date to June 10 (Table 1-99). A suboption is also considered that would allow the GOA pollock fishery to remain open from November 1 through December 31.

Table 1-99 Current and proposed GOA pollock season dates for the Western and Central area

Current Seasons	**Proposed Seasons**
A: January 20 through March 10	A: January 20 through June 10
B: March 10 through May 31	
C: August 25 through October 1	B: June 10 through November 1 or through December 31
D: October 1 through November 1	

Note: All seasons open and close at 1200 hours A.l.t.

The proposed changes would apply to both the limited access fishery and cooperatives, but season date changes would primarily impact members of cooperatives. Open access fishery members are anticipated to close before June in the early season(s) or before November in the fall season because the TAC is taken or the PSC limit reached. Vessels operating in this fishery will continue to compete to harvest any pollock TAC available. Delaying harvests would result in persons missing the opportunity to harvest a greater portion of the pollock TAC. This creates economic incentives to fish when the season opens and continue fishing until the TAC is taken.

Under any of the considered options there will be many LLP licenses that do not receive an allocation but that could be used to fish in the limited access fishery (Figure 1-4). Persons with relatively small allocations

are more likely to join the limited access fishery if they perceive that fishery as an option to increase their harvest by fishing competitively. Persons with larger allocations are most likely to join a cooperative to protect their allocation from other participants. As a result, it is possible that the limited access fishery would be closed to directed fishing for the entire year because the allocation is too small to manage[73] given effort expected to enter the fishery. In that situation the season date change would have no impact on the limited access fishery.

Consolidating the current four pollock seasonal apportionments into two contiguous seasons would provide additional flexibility to harvesters to spread their harvests throughout the year. Experience with catch share programs indicates that harvest patterns tend to become more evenly distributed throughout the year as vessels seek to harvest fish in accordance with more individualized harvest plans and are not participating in a race for fish. The impacts of potential changes in pollock harvest patterns on the human environment and ESA-listed species under Alternative 2 and Alternative 3 will be addressed in more detail in the EIS and as appropriate in an ESA Section 7 consultation.

When the race to fish is eliminated, combining the A and B seasons allows for better timing for harvesting pollock roe at its peak. In years when the roe peaked early or late, the apportionment of TAC to the current A and B seasons would not provide the opportunity for participants to time the fishery to harvest the majority of the roe at its peak value. When the roe quality is best earlier in the year, vessels could harvest pollock assigned to the A season, but B season pollock would not be available until March 10. Fishing on the B season TAC may not be complete until after the roe is overly mature or the fish have already spawned and are of lower quality. During years that the pollock roe is slower to mature, harvesters could delay pollock fishing until it has a higher value without forgoing some of the A season TAC.

Steller sea lion protection measures at 50 CFR 679.20(iv)(B) indicate that a maximum of 20% of a seasonal GOA pollock allocation may be added to or subtracted from remaining seasonal apportionments, provided that any revised seasonal apportionment does not exceed 20% of the seasonal TAC apportionment for the statistical area. Under the current equal seasonal allocations 20% is an equivalent number of metric tons in all seasons. If the percentages are changed, as discussed above, 20% of the early season(s) could not be rolled over to a later season, because it would be greater than 20% of that season's initial TAC.

Eliminating the closed period from May 31 to August 25 could allow pollock harvested in excess of the MRA to be retained. Current management measures require any pollock harvested in excess of the MRA to be discarded. Keeping the fishery open during the summer months, especially when cooperatives have their own allocation of pollock, could reduce pollock discards, but only to the extent that processors are willing to provide a market for those fish during peak salmon processing periods. During 2015, about 0.6% of GOA pollock harvests were discarded. Most of the discards in the pollock fishery are juvenile pollock or pollock that are not the size to fit properly in the processing machinery. It is likely that any limited access fishery would be closed by then. (Note to the reader we intend to get data on discard rates when the GOA pollock fishery is closed for future versions of this paper).

Chinook PSC rates are reported to be lower during the month before and after the current closure period (Table 1-98). If the rates during the closure are representative of those rates, fishing pollock during the

[73] NMFS Inseason Management has traditionally not opened limited access fisheries when the TAC would not allow anticipated effort to fish for 24 hours.

summer could reduce Chinook PSC. Halibut usage is not expected to be substantially impacted because of the limited amount of halibut PSC used in the midwater pollock fishery.

Keeping the fishery open during November and December could increase Chinook rates and reduce pollock discards (Table 1-98). The change in the amount of regulatory discards would likely be small based on the small percentages of discards that occur in the pollock fishery and assumed reluctance of harvesters to fish pollock when Chinook salmon PSC rates are high.

Keeping the fishery open longer will allow harvesters to engage in more multispecies harvests that could reduce regulatory discards and allow cooperative members more flexibility in harvesting their allocation. Because each person will receive a different mix of species (assuming that the cooperative allows them to fish the quota that they bring into the cooperative, as is often the case in other cooperative programs) each cooperative member will attempt to harvest so that their individual allocation can be harvested in a manner to maximize each operation's net revenue. Those decisions would need to account for participation in other fisheries in Alaska and on the West Coast.

1.7.2.7 Pacific Cod Season Dates

Option 4: Modify the trawl Pacific cod fishery seasons: Jan 20 to June 10 and June 10 to Nov 1. No change to the A and B season allocations.

Suboption: The second season for Pacific cod is June 10 to December 31.

Directed fishing for Pacific cod with trawl gear in the Western and Central Regulatory Areas of the GOA is authorized during two seasons, as shown in Table 1-100. The proposed action would move the start date of the B season from September 1 to June 10. Changing the B season start date would eliminate the regulatory closure that is now in place from June 10 through September 1. Allowing the fishery to remain open would allow harvesters to retain Pacific cod in excess of the MRA during that period, potentially reducing regulatory discards.

Table 1-100 Current and proposed Western and Central GOA Pacific cod fishing season with trawl gear

Current Seasons	Proposed Seasons
A: January 20 through June 10	A: January 20 through June 10
B: September 1 through November 1	B: June 10 through November 1 or through December 31

Note: All seasons open and close at 1200 hours A.l.t.

Less than 2% of the Pacific cod harvested by CVs was discarded in 2015. As discussed under the season changes for pollock, keeping the fishery open during the summer months eliminates regulatory discards that could result from catches exceeding the MRA when Pacific cod is closed to directed fishing. IR/IU regulations require Pacific cod to be retained with the fishery is open, so eliminating the regulatory closure under a cooperative structure would allow the IR/IU regulations to remain in effect while the cooperative is fishing. Unlike the Rockfish Program, checking out of the proposed program does not allow cooperative member vessels to fish in GOA limited access trawl fisheries. When a cooperative (or a member of a cooperative) catches their limit of an allocated species, it is required to stop fishing with trawl gear in the

GOA. Other options associated with the overall amendment package will determine their options in GOA non-trawl fisheries and the BSAI groundfish fisheries.

Because the Pacific cod directed fishery has been closed to fishing with trawl gear from June 10 through September 1, data are not available to study PSC rates during that time period. However, Table 1-101 shows the average monthly Chinook salmon PSC rates in the Pacific cod fishery from 2010 through 2015. Information in that table shows the PSC rates were higher later in the year (October).

Table 1-101 Chinook salmon per mt of groundfish in the Pacific cod fishery (2010-2015)

Month	CG	WG	W & C GOA
1	0.0164	0.1073	0.0318
2	0.0545	0.0272	0.0331
3	0.0174	0.1081	0.0317
4	0.0273	0.0000	0.0273
5	0.0000	0.0000	0.0000
6	0.0000		0.0000
7	Closed to directed fishing		
8			
9	0.0449	0.0000	0.0449
10*	0.1051		0.0995
Annual	0.0350	0.0476	0.0390

Source: AKFIN summary of NMFS Catch Accounting data

Table 1-102 reports the average monthly halibut PSC rates in the Pacific cod fishery from 2010 through 2015. As discussed for the Chinook salmon PSC rates, the early year Central GOA rates are generally lower than in the months later in the year. The closures during July and August prevent a more detailed review of how Chinook usage might change if more fishing for Pacific cod occurred in June, July, and August.

Table 1-102 Kilograms of halibut per mt of groundfish in the Pacific cod fishery (2010-2015)

Month	CG	WG	W & C GOA
1	0.0181	0.0129	0.0172
2	0.0194	0.0142	0.0153
3	0.0171	0.0055	0.0153
4	0.0168	0.1893	0.0169
5	0.0154	0.2398	0.0164
6	0.0179		0.0179
7	Closed to directed fishing		
8			
9	0.0337	0.0230	0.0337
10*	0.0422		0.0423
Annual	0.0236	0.0129	0.0207

Source: AKFIN summary of NMFS Catch Accounting data

Persons targeting Pacific cod will need to consider the tradeoffs between harvesting Pacific cod earlier or later in B season. Based on the information presented, it appears that rates for both Chinook salmon and halibut PSC are lower before October. Based on this criterion alone, PSC rates may be reduced by fishing earlier in the B season. This does not account for fishing changes that could be implemented under a cooperative structure to reduce PSC rates throughout the year. Ultimately, the decision on when and where to fish depends on a wide-suite of considerations that allow harvesters to maximize the net value of the fishery while achieving other conservation goals required under the MSA. Reducing the amount of PSC available increases the value of PSC in these

considerations. If PSC is anticipated to be a constraint on fishing, harvesters will be willing to forgo some cost savings for slightly higher values at certain times of the year, up to the point where the opportunity cost of reducing PSC usage is too great.

1.7.2.8 Other Voluntary CV Cooperative Structure Elements

This section considers elements of the proposed cooperative structure that are not specifically addressed in other sections. Table 1-103 provides a summary of the elements of the inshore cooperative structure. The comparison is made in this instance for both Alternative 2 and Alternative 3, so that the many differences are more apparent. This table is a reference for the discussion that follows. The letter next to each element in the table is only for reference in this section, and does not correspond to the Council's current motion.

Table 1-103 Summary of cooperative structure elements in Alternative 2 and Alternative 3

Element	Alternative 2	Alternative 3
A. Cooperative must be formed, with signed contract, by… And signed by…	• November 1 • (Options) 33%, 51%, 80% of the license holders eligible to join that co-op. Licenses with no qualifying catch history do not count toward the approval threshold. Option to require a representative of the community in which the processor is located sign onto the contract	• November 1 • No established threshold for contract approval; no option to require a community signatory
B. Cooperative contract elements	Bylaws, annual fishing plan, plan to monitor/minimize PSC with vessel-level accountability, provisions defining terms of a harvester leaving the co-op, commitment to abide by antitrust laws	Same, but *without* language defining terms for a harvester leaving the co-op, and *with* requirement for provisions that prevent a vessel member from economically benefitting from the co-op's activity (on a species group basis) unless that vessel actively participates in the fishery for which the vessel brought PSC quota into the co-op. (Active participation requirement shall not be less than minimum 3 *annual* deliveries per species group – pollock/cod/flatfish,
E1. Minimum cooperative formation threshold	No minimum number of harvesters in a single-processor cooperative	Option to require a minimum (2 to 5) vessels to form an inshore cooperative
F. Harvesters in multiple cooperatives	A trawl license holder with qualifying history in both areas (WG and CG/WY) "would" initially join a co-op in each area. After the initial 2-year period, a license holder "can choose to be in one co-op per region on an annual basis," implying they could alternatively choose to be in only one co-op after the first two years.	A trawl license holder can be in one cooperative per region on an annual basis (WG and CG/WY). "Can" implies a choice on the part of the license holder to be in only one coop, even if they participate in both areas, just PSC could only be used in the area to which it is assigned (see "C").
G. Multiple processors in a cooperative	N/A	Option to have a single cooperative for each region (WG or CG/WY)
H. Cooperative affiliation between harvesters and processors	Affiliation for first two years of the program (option: in the co-op sector) determined by historical landings. Cooperative contract must include "clear provisions for how a harvester and processor may dissolve their contract after the cooling off period of two years."	"Participants can choose to join a cooperative […] on an annual basis."

K. Transfer "cooling off" period	Option to prohibit sale of licenses or severable groundfish catch history for the first two years of the program	No "cooling off" period
L. Eligibility to hold a license/quota; Can communities act as license-holding individuals (in the absence of Alternative 4)?	Local governments are included in the definition of a "person." Consolidation limits are described in terms of what a "person" may hold. The definition of person includes… Similarly, active participation requirements state that a "person" must be eligible to document a fishing vessel in the U.S.	Local governments are included in the definition of a "person." Transferability provisions specify that a "person" can use cooperative PSC quota

Under Alternative 2, the Council's current range of alternatives specifies that initial inshore cooperative formation would be based on each CV LLP's shoreside delivery history during a certain set of years.[74] The resulting affiliation between the harvesters and the processor in a cooperative would persist for a minimum of two years, after which point a license holder could exit the cooperative under terms that are defined in a private cooperative contract. The analysts are operating under the presumption that these terms would likely include some form of compensation that would be "left behind" in the event that a license holder moves to another cooperative or to the Limited Access sector.

The alternative further states that a license with qualifying landings in both regions (WG and CG/WY) would initially join a cooperative with a processor in each region, as determined by landings in that region. The alternatives states, "*After the initial cooperative formation period, a license holder can choose to be in one cooperative per region on an annual basis.*" This language implies that a LLP license holder may change their cooperative affiliations after the two-year initial formation period, but must continue to participate in a cooperative in each region where the license has catch history. In other words, a license holder could not simply drop their cooperative membership in one region and continue to fish in that region using their allocation as IFQ. This seems to fit with the Council's objectives, as participation in a local cooperative with a coordinated harvest plan is key to the program's bycatch management and efficiency goals. Alternatively, a license holder could leave the cooperative and enter the Limited Access sector for that region. The catch history and PSC (after any required reductions) associated with their LLP license would be added to the total amount available; that quota would then be fished in competition with other Limited Access participants, including vessel owners that have activated latent licenses.

Allowing a vessel to be in two cooperatives (one in each area) if it has a dual-area endorsement would prevent a vessel from having to fish in an area where it does not participated in a "local" cooperative. Keeping participants engaged in a cooperative that manages bycatch and PSC for that area is likely to improve overall performance.

No matter how the program's initial limits on cooperative membership are defined, it is assumed that entities will eventually end up in the cooperative of their choice. The path to that cooperative may be affected by program

[74] The October 2015 discussion paper (Section 2.2.1) summarizes the legal opinion that NOAA General Counsel delivered to the Council regarding whether or not such an initial cooperative formation structure would be permitted under current rules. In short, NOAA GC finds that an initial linkage, even if temporary, constitutes an obligation for the harvester to deliver certain amounts of catch to the associated processor, and thus confers an onshore processing privilege. Such privileges are not currently permitted. However, NOAA GC advised that the Council could continue to analyze this cooperative structure for the time being, and might even find that initial linkages are the best way to meet the goals and objectives of the program. Even so, the Secretary of Commerce would not likely be able to approve this part of the program in the absence of any further legislative action.

elements included in the preferred alternative. Those elements might include requirements to leave a portion of the licenses catch history behind when the license holder moves to another cooperative. Such provisions make movement between cooperatives more difficult, and that is intentional. So-called "leave-behinds" protect processors that might otherwise lose a significant amount of the historical deliveries around which they have planned their business and investments. Even if harvest members do not actually leave the cooperative, the ease and impunity with which they could might affect the price negotiating dynamic between the two sectors. The Council's alternatives do not specifically reference leave-behinds, but the analysts anticipate that they would be considered during the private cooperative contracting process. Arriving at the correct level of protection is an important task, and one that might fall at least partly outside of the Council's direct control[75]. Setting protective measures too low might not sufficiently value or protect processors historical participation and investment; setting them too high could effectively force harvesters to remain in a cooperative with a processor that does not maximize the viability of their operation.

Previous Council LAPPs and the LLP have included or considered a cooling-off period after the implementation of new programs in order to allow the transfer market to stabilize. Participants would gain experience with the complexities of the new program during this period, and would have a better understanding of the values and opportunities associated with their licenses. Those values will be impacted by changes in efficiency, productivity, profitability, PSC management, and the ability to respond to operational and management challenges that arise. The Council's alternatives include an option for a cooling-off period under Alternative 2, but not under Alternative 3. The Council might consider whether the implicit value of a license truly changes less under Alternative 3 than under Alternative 2. The analysts note that Alternative 3, by allocating PSC according to equal shares or vessel capacity, could significantly change the value of a license or vessel that has little or no catch history, or that has a very high level of historical participation.

None of the current alternatives require a processor that is a member of a cooperative to take deliveries from vessels operating in the Limited Access sector. Likewise there is no prohibition preventing an unaffiliated processor from taking deliveries of cooperative quota. It is anticipated that the cooperative contracts would define delivery requirements within the bounds of other program elements. Those requirements could be very general or more specific. General requirements could include language stating that member vessels are required to deliver a given amount of their cooperative quota to their processor, and define conditions when deliveries to another processor are allowed. So, other than an option for regional landing requirements under Alternative 2, the cooperative contracts could be more restrictive than what is in the Council's preferred alternative. To the extent that contracts are restrictive and small amounts of TAC are allocated to the Limited Access sector, processors that have limited qualifying history in the GOA trawl fishery (e.g. plants in Seward) and new entrants may have relatively limited opportunities to take part in the fisheries in the future.

By contrast, Alternative 3 includes no initial cooperative formation requirements. Participants are free to join a cooperative on an annual basis by submitting an affidavit stating their intent to participate in a particular target fishery in an area for which their CV LLP is endorsed. A CV LLP holder may be in one cooperative per region (WG and CG/WY) on an annual basis. The Council also includes an option that would define a minimum number of vessels necessary to form a cooperative with a shoreside processor (options: 2 to 5 vessels), and an option that would allow cooperatives to be formed at the region level (i.e., one cooperative for all WG processors and vessels and another for all CG/WY processors and vessels).

[75] Whether the Council could cap leave-behinds or other compensatory contract elements might be a legal question for further investigation by NOAA GC.

With no mandatory initial linkage between harvesters and processors defined in Alternative 3, harvesters would be able to move more freely between cooperatives and processors on an annual basis, relative to under Alternative 2. Under the status quo, plants attract deliveries though individual business relationships, price competition, and – to some extent in the Western GOA – geography. It should be noted that existing business relationships are not trivial factors in determining where to deliver during the upcoming year. Alternative 3 provides processors with some additional leverage to maintain or attract deliveries relative to the status quo. Under Alternative 3, processors could control 5% to 20% of a cooperative's PSC allocation. The percentage would be fixed in regulation, but the actual amount would be determined on an annual basis according to the vessels that choose to join the cooperative in a particular year. While that PSC might be useful in developing positive relationships with certain harvesters, it would not act as a stable privilege that the processor can hold and promise for future years. Moreover, any preferential treatment of one harvester over another with regard to use of the processor-held PSC could potentially drive other harvesters to reevaluate their relationship with that processor; any vessel that left the cooperative would reduce the amount of deliveries coming to the processor in future years. The processor held quota could not only be use to attract new harvesters, but could be used as a reward for low PSC rates, a bonus for delivering high quality fish that have higher value, or providing other services that benefit the entire cooperative. For example, a PSC pool could be available for vessels that are willing to conduct test fishing to determine if PSC rates are low in an area before other members of the fleet could fish there.

The current structure of Alternative 2 opens the possibility that a vessel named on multiple LLPs would be initially placed in two different cooperatives within the same region, by virtue of the catch history on each of the licenses.[76] The Council has considered whether a vessel could be in two cooperatives in different regions, but it is assumed that if two licenses are stacked on the same vessel that vessel would not be required to join two cooperatives in the same area if the LLPs have the same owner. If the LLPs have different owners they would be required to join the cooperative each LLP license is assigned based on catch history. Participating in multiple cooperatives would likely involve additional membership costs for a holder of LLP licenses. In the interest of linking LLP license holders and their vessels to the processor with which they have the best, most current business relationship, it makes sense to let the owner of stacked licenses choose which cooperative to join at the time of implementation.

Persons that currently hold an LLP license meet all the criteria to hold that license and any quota that could be assigned to that license Under Alternatives 2 and 3. The groundfish LLP license regulations at §679.4 (k)(7) define the requirements that must be met to receive a groundfish LLP license by transfer. The requirements essentially are that the buyer must be a "person" eligible to document a fishing vessel in the U.S. and not exceed the license holding limits. The term "person" in the Magnuson Stevens Act[77] includes any Federal, State, or local government or any entity of any such government. This means that the local governments and entities that that represent local governments (communities) could act as license-holding entities in the absence of Alternative 4, given that neither alternative prohibits a local government or entities that represent those governments from holding quota. Alternatives 2 and 3 do not have options to generate new licenses/quota. Any harvest privilege must be acquired by transfer, which would likely include compensating the current license/quota holder.

[76] The April 2014 discussion paper (p.13) states that three individuals held stacked licenses that would fall under different processors in the initial cooperative formation process described for Alternative 2.
[77] 16 USC 1802§3(36) "Definitions"

Finally, it is noted that the proposed cooperatives are intended only to conduct and coordinate harvest, much like the CGOA RP. Both Alternatives 2 and 3 state that these are not FCMA cooperatives[78]. The RP analysis suggests that harvesters could still form an independent FCMA cooperative. However, this may not be highly beneficial given the presumed requirement to be in a harvest cooperative with a processor by November 1, especially if prices are negotiated closer to the January start of the fishing year.

1.7.2.9 Voluntary Offshore (C/P) Cooperative Structure

The CP sector's overall allocation would annually be divided among CP LLP licenses based on historical catch. Sector-level allocations of the primary species, secondary species, and PSC limits are described in Section 1.4. Each license holder would be required to join an eligible CP cooperative by November 1 of the year prior to when fishing will occur. An application must be filed with NMFS by the cooperative with a membership list for the upcoming fishing year.

Cooperatives must be comprised of a minimum of 2 separate entities (using the 10% individual and collective rule) and/or a minimum of two to four eligible LLP licenses. An LLP license must have eligible catch history (and annually issued quota) to count toward the minimum thresholds. Typically LAPPs in Alaska calculate use caps by adding up all of the QS or annual fishing quota held by a person based on their percentage of direct or indirect ownership in any entity that holds QS or annual quota. This is known as the "individual and collective" rule. For example, an individual who holds 100 pounds of CQ and has a 5 percent interest in a company that holds 100 pounds of CQ would be considered under the use cap calculation to hold 105 pounds: 100 pounds (his personal holdings), plus 5 pounds (5% of 100 pounds - his ownership interest in that company). However, NMFS also uses a different calculation method – a 10 percent threshold rule. In this case, the use cap is equal to all of the CQ held by that person and all of the CQ held by any entity in which that non-individual has a 10 percent or greater direct or indirect ownership interest. As an example, a corporation that holds 100 pounds of CQ and has a 15 percent interest in a company that holds 100 pounds of CQ, would be considered to hold 200 pounds of IFQ for use cap calculation. So while the option states that the individual and collective rule would be used to determine the minimum of two entities, it seems to be the intent that the minimum is determined according to the 10 percent threshold rule. In other words, when determining whether there are two separate entities, if two "persons" have 10 percent common ownership they would be considered a single entity. Forming a cooperative would require two entities with less than 10 percent common ownership.

Table 1-104 shows the number of LLP licenses and vessels that were fished in the GOA during the three qualifying periods. Information for the Amendment 80 cooperatives indicate that the owners of these vessels have formed two cooperatives. Based on the number of LLPs that would qualify and the limited ownership information available, more than two cooperatives would be allowed to form. However, because of relationships in the Amendment 80 fishery it appears that two or, possibly, three cooperatives could form. A third cooperative could form if the one CP that fishes only in the GOA had the will and was able to join with another entity to form a new cooperative. If more than two entities are required to form a cooperative, the likelihood that only two CP cooperatives would form in the GOA is increased. Those cooperatives could also resemble the makeup Central GOA RP cooperatives: the Gulf of Alaska Rockfish Best Use Cooperative and the FCA Cooperative.

[78] The paper by Kitts and Edwards, http://www.uwcc.wisc.edu/info/fishery/kitts.pdf, provides a good overview of FCMA cooperatives and their history.

Table 1-104 Number of CP LLPs and vessels active during the qualifying periods.

	Central GOA /West Yakutat District		Western GOA	
Years	Vessel	LLP	Vessel	LLP
2003-2012	17	17	5	22
2007-2012	14	14	19	20
2008-2012	12	12	17	16

Source: AKFIN summary of CAS data

NMFS will allocate CQ and PSC limits to cooperatives based on the catch history associated with the member's LLP licenses. Cooperative members will allocate and manage the cooperative's allocation. Management will be determined by agreement implemented in the cooperative contract(s). The function of the cooperatives is to conduct and coordinate harvest activities of the members. The cooperatives are not FCMA cooperatives.

The contract would require signatures of all LLP license holders that assign catch history to the cooperative in addition to any other LLP license holder that wish to fish the quota assigned to the cooperative by NMFS. The annual cooperative contract must include:

- bylaws and rules for the operation of the cooperative,
- an annual fishing plan, and
- operational plan for monitoring and minimizing PSC, with vessel level accountability, as part of the annual fishing plan.

Cooperative members are jointly and severally responsible for cooperative vessels harvesting in the aggregate no more than their cooperative's allocation of target species, secondary species, and PSC, as may be adjusted by annual inter-cooperative transfers. Overages are not determined by NMFS until the end of the calendar year (after fishing closes on December 31). Cooperative members may balance their cooperative ledger by acquiring or selling CQ or PSC quota within the CP sector until that date. The CP sector may not acquire CQ or PSC from the limited access fishery to cover overages, if there is a limited access CP fishery.

Cooperatives will submit a written report annually to the Council and NMFS. Specific criteria for reporting shall be developed by the Council and specified by NMFS as part of the program implementing regulations, but may correspond to the RP cooperative required annual reports. Those reports include on:

- membership of the Cooperative by vessel and LLP license,
- monitoring the fishing plan,
- catch of cooperative members,
- retained and discarded primary and secondary CQ,
- halibut PSC limit usage,
- Chinook salmon PSC limit usage,
- sideboard limits,
- trades, overages, and underages.

1.7.2.10 Fishery dependent community stability

Refer to the "Preliminary Social Impact Assessment" for a detailed discussion of the dependent communities and the potential impacts of Alternative 2 on those communities.

1.7.2.11 Gear Conversion

Gear conversion is the concept of allowing persons that hold trawl cooperative quota in the GOA to fish that quota with pot gear to reduce bycatch of groundfish, crab, and PSC species. The impacts of gear conversion on habitat and bycatch will be addressed in the relevant sections of a fully developed EIS document, when completed. Pacific cod is the primary species that is considered for gear conversion. Persons could either annually or permanently use a cooperative's trawl quota to fish with lower impact gear types. Any cooperative quota taken with pot gear would be deducted from the trawl cooperative's annual allocation. Potential challenges associated with this accounting exercise was addressed in the GOA Trawl Bycatch Management discussion paper presented to the Council in October 2014.[79] NMFS's ultimate responsibility in designing regulations is to ensure that this provision does not deprive any historical pot gear participants of the ability to catch Pacific cod at their relative historical levels; that task is most complicated for vessels that have historical participation in the Pacific cod pot fishery and also qualify for cod quota under the trawl program by virtue of their historical trawl participation.

The Council has noted that allowing quota holders to utilize non-trawl gear may provide the sector greater flexibility to meet a primary objective of this action: to reduce PSC and to better utilize available PSC in the Pacific cod fishery. Pacific cod is the only groundfish species proposed for allocation that is substantially harvested using both trawl and pot gear. If changes occur in the fisheries that provide incentives (resource and economic) to harvest pollock with fixed gear, the gear conversion regulations developed for the Pacific cod fishery may be extended, all or in part, to the GOA pollock allocations or any other target fisheries that are allocated.

The extent that Pacific cod quota will be fished using pot gear is not known. Decisions will be based on the benefits that can be generated fishing the quota with trawl gear versus pot gear. Vessels using trawl gear use more halibut PSC than vessels fishing Pacific cod with pot gear (which is not subject to halibut PSC limits because of the low halibut PSC usage). Operators might choose to use pot gear because they do not have access to available PSC quota, or because they want to minimize the use of PSC quota in the cod fishery in order to expand their business plan into other groundfish targets. The use of halibut in the trawl Pacific cod fishery is discussed in Section 1.3.2.5.1. Future savings of the halibut PSC used by trawl vessels in the Western GOA and Central GOA Pacific cod trawl fisheries will be highly dependent on the amount of quota harvested under the gear conversion rule.

1.7.2.12 Cooperative member's limitations in other fisheries

Sideboards are designed to limit the ability of persons granted exclusive harvest privileges (i.e. LAPP participants) to expand their effort in other fisheries beyond historic participation levels at the expense of persons who do not hold similar privileges. Sideboards may be applied to federally permitted vessels fishing in federal waters and parallel fisheries that occur in waters adjacent to the BSAI/GOA. The Council's motion stated that GOA sideboard limits on allocated GOA Trawl Bycatch Program species would be removed for the Rockfish Program (CV and CP sectors), GOA non-exempt AFA CVs, non-AFA crab vessel, and Amendment 80 vessels (groundfish and halibut PSC). The Council is considering the removal of sideboards that, in essence, protected GOA fisheries from effort spillover from other rationalized fisheries. Those sideboards would no longer be necessary under a GOA program that allocates those groundfish species based on historical catch, because that historical catch was limited by those sideboards. Two other reasons for removing existing sideboards were discussed at the October 2014 meeting. First, sideboards limiting the GOA harvest of AFA vessels would be difficult to monitor within the GOA cooperative structure, because the restrictions on non-exempt AFA vessels are vessel-based, and the GOA cooperatives would be LLP-based. Second, the Council does not wish to limit a

[79] http://npfmc.legistar.com/gateway.aspx?M=F&ID=40ad31b4-d26e-495f-bbbc-e5750f9347ae.pdf

cooperative's potential to benefit from achieving reduced halibut PSC rates and utilizing that PSC to target previously under harvested flatfish TACs.

The Council is considering whether additional sideboards on directed fishing for Pacific cod with pot gear in the WG and CG (harvest that accrues to the Pacific cod pot sector allocations), as well as the BSAI Pacific cod and yellowfin sole fisheries are necessary as part of this action.

The October 2014 discussion paper defined some general regulatory conditions that may provide guidance on whether sideboards are appropriate. Those conditions include:

- When the TAC is, or is expected to be, a constraint and LLP holders who are not part of the LAPP (e.g., fixed gear vessels) and they must compete for catch with LLP holders in the LAPP.
- All constraining TACs are not divided among LLP holders in a LAPP and those in the limited access fishery.
- Insufficient regulatory barriers or cooperative rules are in place to prevent LAPP participants from entering fisheries to an extent that harms other participants in the fishery. Regulatory barriers currently include the groundfish license program and its associated endorsements, TAC sub-allocations, and limitations imposed under various LAPPs.

1.7.2.12.1 GOA Pacific cod

When NMFS and Council staff reviewed this issue for the 2014 October meeting they recommended that additional sideboards for the fixed gear Pacific cod fisheries in the GOA not be implemented at this time. That conclusion was based on the understanding that trawl and fixed gear harvests of Pacific cod in the Western and Central GOA are limited by TAC apportionments to gear trawl, pot, hook-and-line, and jig gear. Participation in the Western and Central GOA fixed gear Pacific cod fisheries is also limited by endorsements on groundfish LLPs. NMFS staff noted that additional sideboards for WY Pacific cod are not recommended because historically there was little effort in that area so the management cost of monitoring a sideboard in EGOA Pacific cod trawl fishery might exceed the benefits that are derived. This paper provides additional information on management issues with the program, but does not draw different conclusions.

GOA Pacific cod reallocations. NMFS publishes information[80] on GOA Pacific cod reallocations that have occurred within a fishing year since 2012, when the most recent Pacific cod allocations were implemented. That information indicates that the WG CV trawl Pacific cod TAC is not typically fully harvested and a portion of the TAC is reallocated to the pot sector. During 2012, 2013, and 2014 at total of 1,550 mt, 2,100 mt, and 900 mt were reallocated away from the trawl CV sector, respectively. The pot gear sector's allocation was increased by 2,000 mt, 2,000 mt, and 550 mt those years.

The pot gear sector's allocation in the CG was increased by 2,250 mt in 2012 and 500 mt in 2014. There was no reallocation to the CG pot sector in 2013. A total of 2,750 mt of Pacific cod was reallocated from the trawl CV sector in 2012, and 1,000 mt was reallocated from the sector in 2013. During 2014, there was no reallocation from the trawl sector.

If Pacific cod is allocated to cooperatives and its members are able to efficiently harvest the cooperative's quota or the cooperative does not check out of the fishery[81], the amount of Pacific cod reallocated to the pot gear sector

[80] http://alaskafisheries.noaa.gov/sustainablefisheries/inseason/goapcod_reallocation.pdf
[81] It is assumed that a cooperative allocation will only be reallocated when the cooperative checks out of a fishery.

may be reduced in the future. In these cases, Pacific cod that was historically reallocated would not be available to the pot gear sector members that are not a part of a trawl cooperative.

Summary of LLPs. A summary of the groundfish licenses that have a trawl endorsement for the GOA are presented in Table 1-1. That table indicates that there are 152 groundfish licenses (CVs and CPs) that have a trawl endorsement for either the WG or CG area. A total of 111 of those license are not endorsed to fish for Pacific cod in the GOA[82]; 85 of which are designated as CV licenses. Summing the rows with a WG Pacific cod pot endorsement indicates that there are 31 CV groundfish licenses with that endorsement. One license that has a trawl endorsement also has a HAL Pacific cod endorsement in the WG, and one trawl license has a jig endorsement.

Seven licenses have a CV CG Pacific cod pot endorsement. Two licenses have a CG CV HAL endorsement, but one of those licenses also has a CG CV pot endorsement and is included in the seven pot gear endorsed vessels. Any limitations placed on vessels and their associated license that are in a trawl cooperative would be focused on these entities. This provides limited opportunity for the trawl fleet to increase effort in the Pacific cod pot fishery without purchasing LLPs with a Central GOA pot gear endorsement. Effort in the hook-and-line and jig fisheries are even more limited by the trawl licenses with a Pacific cod gear endorsements.

Table 1-105 Groundfish licenses in 2015 with a GOA trawl endorsement by area, gear, and Pacific cod endorsements

	No WG Trawl Endorsement			WG Non-trawl endorsement	Both WG Non-trawl & Trawl Endorsement				WG Trawl only			
Pacific cod Endorsements on GOA trawl licenses	CG Non-trawl; Trawl	CG Trawl	Total	CG Non-trawl; Trawl	No CG Endorsement	CG Non-trawl	CG Non-trawl; Trawl	Total	No CG endorsement	Trawl only	Total	Total Licenses
C/P Total	**1**	**6**	**7**	**1**			**2**	**2**	**7**	**11**	**18**	**28**
None	1	5	6				2	2	7	11	18	26
CG CV TRAWL		1	1									1
WG CP POT				1								1
CV Total	**28**	**14**	**42**	**4**	**4**	**16**	**34**	**54**	**7**	**17**	**24**	**124**
None	24	14	38	2	2	3	16	21	7	17	24	85
AI CV HAL; CG CV HAL						1		1				1
CG CV Pot	3		3	1			2	2				6
CG CV Pot; CG CV HAL	1		1									1
WG CV Pot				1	2	8	16	26				27
WG CV Pot; CG CV HAL						1		1				1
WG CV Pot; CG CV Pot						1		1				1
WG CV Pot; WG CV JIG						1		1				1
BS CV Pot; WG CV Pot						1		1				1
Total CV & C/P Licenses	**29**	**20**	**49**	**5**	**4**	**16**	**36**	**56**	**14**	**28**	**42**	**152**

The 2015 groundfish license database indicates that a total of 81 licenses with a MLOA of 58' or longer that have a WG Pacific cod pot gear endorsement. Since 31 also have a GOA trawl endorsement, the remaining 50 licenses can only be used when fishing non-trawl gear in the GOA and would not benefit from a trawl allocation. Holders of these LLPs are potentially impacted by future reallocations, since less Pacific cod would be available to pot gear endorsement holders after reallocations. It is also possible that some of these LLP licenses could be transferred and used on the vessels holding the 31 groundfish licenses that may fish with trawl gear but do not have a Western GOA pot Pacific cod endorsement. The owners of these vessels may wish to harvest Western GOA Pacific cod with pot gear in the future and have that catch come off the pot gear limit. If this is a concern, the Council could consider applying the GOA Pacific cod cooperative limits to all licenses associated vessels that have a trawl license assigned to a cooperative. Vessels that are fishing under a purchased Pacific cod pot license could be required to have any catch deducted from their cooperative allocation regardless of which license they are fishing under. Once the cooperative checks out of the fishery, then vessels with a license endorsed to fish in an area with pot gear could utilize that license and the catch would be deducted from the pot gear allocation.

[82] One CP license has a "CG CV Trawl" endorsement in the Pacific cod endorsement field.

There are 113 CV licenses that have a CG trawl endorsement. Only seven of those licenses are endorsed to fish Pacific cod in the CG with pot gear. An additional 63 licenses have a CG Pacific cod pot gear endorsement, but are only allowed to use non-trawl gear in the GOA. The holders of these licenses could potentially be impacted by the seven licenses that could join a trawl cooperative, if the regulations allowed them to increase effort in the Pacific cod fishery using non-trawl gear. Because of the limited opportunity for vessels with a trawl endorsement to fish Pacific cod with pot gear in the Central GOA, it is less apparent that additional Pacific cod sideboards on the trawl fleet are necessary in the Central GOA. The greatest opportunity for expansion would be the purchase of LLP licenses with pot gear Pacific cod endorsements.

Catch data. Data from the 2008 through 2014 fisheries shows the catch in the Pacific cod target fishery by vessels with a license that has a GOA trawl gear endorsement. Catch using only pot gear is reported. Table 1-106 also includes information on the number of licenses and vessels used. The far right column shows retained catch in the Pacific cod pot fishery as a percentage of the final allocation. The calculation is only presented for the years the most recent Pacific cod allocations were implemented, 2012 through 2014. The calculation may also overstate the actual amount of Pacific cod catch in the pot fishery since the total is all groundfish retained catch in the Pacific cod pot fishery. While it is assumed that a very large percentage of the catch retained is Pacific cod it is not likely 100%.

The catch data indicates that before 2011 almost all of the Pacific cod endorsed licenses were used to fish with pot gear. During this time the Council was considering Pacific cod allocations, which may have impacted the number of vessels and licenses in the fishery. Fewer licenses and vessels were active in the Pacific cod fishery from 2012 through 2014. However, in 2014 the vessels that were active in the WG reported catching a much higher percentage of the final allocation[83].

Table 1-106 Pacific cod catch by vessels with GOA trawl endorsed licenses in the pot gear fishery

Area	Year	Licenses (#)	Vessels (#)	Catch (mt)	Final Allocation (mt)	% of Final Allocation
WG	2008	32	29	5,239		
	2009	30	28	4,755		
	2010	30	27	9,575		
	2011	32	29	11,071		
	2012	28	26	4,556	9,859	46.2%
	2013	21	19	5,471	9,859	55.5%
	2014	24	22	8,633	9,042	95.5%
CG	2008	5	5	697		
	2009	5	5	531		
	2010	7	7	1,277		
	2011	8	7	2,527		
	2012	7	6	1,810	14,005	12.9%
	2013	5	5	763	10,073	7.6%
	2014	4	3	872	11,352	7.7%

Source: AKFIN summary of CFEC Fish Ticket data

[83] Once again note that this may overestimate the actual total.

Catch Accounting. Catch accounting is an important component when considering whether additional sideboard limits are necessary. Rules that are developed for catch accounting will determine when a vessel that is harvesting for a cooperative during part of the year and fishes for Pacific cod with pot gear has Pacific cod catch deducted from the cooperative allocation and the Pacific cod pot gear allocation. Previous discussions have noted that sideboards could apply the entire year or only when the traditional trawl fishery was open. If trawl sideboards for Pacific cod were only in effect during the periods when the GOA Pacific cod trawl fishery was open to directed fishing, the sideboard limits would be enforced:

1. from 1200 hours, A.l.t., January 20 through 1200 hour A.l.t., June 10; and
2. from 1200 hours, A.l.t., September 1 through 1200 hours, A.l.t., November 1.

Persons with a non-trawl gear endorsement for Pacific cod could fish before January 20, from June 10 to September 1, and after November 1 using non-trawl gear. This approach assumes that the current seasons will remain in place if target species allocations are issued to cooperatives. In this case, any Pacific cod catch by cooperative member vessels would be deducted from the cooperative's allocation when the fishery is open. If the Pacific cod fishing seasons are altered after an allocation to cooperatives, then a different catch accounting system may be appropriate. For example, catch would accrue against the cooperative's allocation until they check out of a fishery. After the cooperative checks out of the GOA fisheries any catch would require appropriate LLP endorsements to fish Pacific cod and would accrue against the allocation for the gear type used to harvest the Pacific cod.

Vessels assigned an LLP that was used to issue quota to a cooperative could utilize gear conversion provisions to fish Pacific cod with fixed gear, but only when the cooperative has not checked out of the GOA fisheries and the cooperative has sufficient quota to cover that catch. Any Pacific cod harvest (fixed or trawl gear) in that circumstance would be deducted from the cooperative's Pacific cod trawl allocation. However, vessels using pot gear could benefit from reduced halibut PSC mortality to harvest Pacific cod. Vessels with a Pacific cod endorsement for pot gear would be allowed to use that LLP to fish with Pacific cod with pot gear and have the catch deducted from the pot gear allocation during times of the year when fishing for Pacific cod is not open to cooperative members.[84]

It is assumed that vessels (license holders) that are not members of a GOA trawl cooperative are still allowed to participate in GOA limited access trawl fisheries, if target and PSC species are available to support the fishery. Because these vessels are not receiving benefits from operating in a LAPP, they are assumed to not be subject to sideboard limits in the Pacific cod fisheries.

While based on the information available to the analysts it does not appear sideboard limits are necessary for the GOA Pacific cod pot fishery, it should be noted that members of the pot fishery remain very concerned over the potential of the trawl fleet to shift effort into the Pacific cod fishery. Should the Council wish to implement sideboard limits as a precautionary measure it could do so. The sideboard limit could be based on the percentage of the Pacific cod pot fishery harvested by CVs with a trawl LLP license from 2012 through 2015. This would represent years after the current Pacific cod split. Sideboard limits could be applied to all trawl CVs or just those in cooperatives. If CVs that fish in the limited access fishery are excluded from the sideboard limit and their trawl Pacific cod fishery is not opened to directed fishing, they may increase effort in the pot fish. No information is available that allow the analysts to know with certainty which LLPs will be assigned to cooperatives or the limited access fishery after the program is implemented.

[84] This must be defined. It would likely be based on licenses and vessels and not fishing companies, since companies may own licenses and vessels that only participate in the non-trawl fisheries.

1.7.2.12.2 BSAI Limited Access Pacific Cod Fisheries

This discussion is limited to the catcher vessel fishery. Catcher/processors that have fished in the GOA are Amendment 80 vessels and are subject to the Amendment 80 limits established for the BSAI, including Pacific cod.

Summary of LLPs. The License Limitation Program requires that all vessels greater than or equal to 32' LOA must have valid groundfish license to fish in the BSAI federal and parallel fisheries. Because all GOA trawl vessels are longer than 32' LOA, they are all required to have a valid license with a trawl endorsement for the BS and/or AI to fish Pacific cod in the BS/AI. The Pacific cod CV trawl fishery does not have an additional Pacific cod endorsement like the pot and hook-and-line fishery. Any catcher vessel that has a trawl endorsement is eligible to harvest Pacific cod from the trawl catcher vessel allocation. Table 1-107 shows that 48 groundfish licenses[85] that have both a GOA and BS/AI trawl endorsement. Two of the licenses have a maximum LOA of 59'. The remaining licenses are for larger catcher vessels. Most of the licenses (37) are derived from AFA vessels, while 11 are not. This does not imply that only these licenses may be used to allow a vessel to fish in both the GOA and BSAI with trawl gear. Vessels fishing with trawl gear in the GOA that do not have a BSAI trawl gear endorsement may stack licenses on their vessels to have the endorsements to fish in the BSAI with trawl gear. Vessel owners that have or will take advantage of this ability in the future will increase the number of GOA trawl vessels that can fish in the BSAI with trawl gear beyond those listed in Table 1-107.

Table 1-107 Groundfish CV licenses with a trawl endorsement for at least one GOA area that also have a BSAI area endorsement for trawl gear

AFA	Area Endorsements			
	AI	AI & BS	BS	Total
No	1		10	11
Yes		7	30	37
Total	1	7	40	48

Source: RAM LLP database, July 2015

AFA CV Sideboard Limits. AFA vessels and their licenses are subject to Pacific cod trawl gear CV sideboard limits. Those limits allow the AFA CVs to harvest up to 86.09% of the Pacific cod trawl CV allowance. A summary of the 2015 allocations are presented in Table 1-108.

Table 1-108 Initial BSAI Pacific cod trawl limited access allocations and AFA sideboard limits for 2015

Season	Trawl limited access (mt)	AFA sideboard limit (mt)	Amount not available to AFA vessels (mt)
January 20 to April 1	36,426	31,359	5,067
April 1 to June 10	5,415	4,662	753
June 10 to November 1	7,384	6,357	1,027
Total	49,225	42,378	6,847

[85] There are also 11 licenses linked to these licenses.

The non-AFA license holders may participate in the fishery at any level as long as it is open to directed fishing, but the AFA sideboard limits grant access to a minimum of 6,847 mt, based on the 2015 TAC. The actual amount of the sideboard limit will vary annually with the Pacific cod TAC.

Rollovers. Because BSAI Pacific cod subdivided among several categories of vessels, regulations include authority for NOAA Fisheries to roll-over TAC that is projected to be unused from one sector to another. Table 1-109 indicates that over the past five years (2010 through 2014), TAC has been rolled from the trawl CV category for use by other vessel categories. Earlier years have also shown similar patterns.[86] The reallocations of Pacific cod from catcher vessels using trawl gear typically begin during the second half of August. Typically two or three reallocations are made from the trawl CV allocation from August through the end of the fishing year.

Given that 3,700 mt to 7,500 mt of Pacific cod are reallocated from the trawl CVs annually, it appears that sideboards limiting effort in that fishery would benefit participants in other Pacific cod fisheries more than the trawl CVs. The primary beneficiaries of roll-overs from the trawl CVs in recent years have included the Amendment 80 cooperatives, AFA CPs, and HAL/pot gear CVs that are less than 60' LOA.

Table 1-109 BSAI trawl limited access fishery Pacific cod initial allocations and reallocation, 2010 through 2014

Year	Initial Allocation (mt)	Final Allocation (mt)	Reallocation Amount (mt)	% Reallocated
2010	33,309	28,175	5,134	15%
2011	44,987	39,897	5,090	11%
2012	51,509	47,749	3,760	7%
2013	51,312	43,812	7,500	15%
2014	50,107	43,107	7,000	14%

Source: NMFS reallocation reports

Catch Data. From 2012 through 2014, a total of 16 non-AFA and non-Amendment 80 vessels that are associated with GOA groundfish trawl licenses harvested Pacific cod from the BSAI with trawl gear as CVs. Some of these vessels used other licenses in addition to the GOA trawl licenses referenced in Table 1-107. Two of the licenses were CP-designated licenses that were used as CVs to deliver their catch to vessels acting as a mothership. Both licenses were owned by the same company, so any catch history for the mothership deliveries cannot be separated from the shore-based deliveries; those deliveries to motherships increased in 2014, relative to 2012 and 2013.

In 2014, four GOA Trawl CV licenses were used to deliver BSAI Pacific cod harvested with trawl gear to shoreside processors. Ten licenses were used in 2013, and 12 licenses were used in 2014. The amount of Pacific cod delivered by CVs (including vessels with CP licenses acting as CVs and delivering to offshore processors) was greatest in 2012, at 9,146 mt. That amount decreased to 6,806 mt in 2013, and slightly rebounded to 6,995 mt in 2014. When considering only the non-AFA CVs delivering to shore-based processors, their 2014 catch of Pacific cod catch decreased to roughly 1/3 of 2012 levels. The catch amounts for these vessels is approximately equal to the amount of BSAI trawl Pacific cod that was not subject to AFA sideboard limits. If a sideboard limit for the GOA trawl vessels were to be set at the catch levels in recent years, that limit would not leave any BSAI trawl Pacific cod TAC that is in excess of the AFA and GOA sideboard limits. If both groups harvested up to their sideboard limit, persons who are not in either program would not a have percentage of the TAC that is set aside for their exclusive use.

[86] http://alaskafisheries.noaa.gov/sustainablefisheries/inseason/bsaipcod_reallocation.pdf

During the years 2012 through 2014, from 17 to 22 licenses associated with AFA vessels holding a GOA trawl license fished Pacific cod in the BSAI. The catch of these vessels has declined from about 19,500 mt in 2012 to about 14,600 mt in 2014. Additional AFA CVs participate in the BSAI Pacific cod fishery that do not fish in the GOA. The catch of these vessels would increase the total, but all AFA CVs are subject to the AFA Pacific cod sideboard limit in the BSAI.

Based on the information available the BSAI trawl limited access fishery has not been constrained by TAC. Additional effort could potentially flow into the fishery as a result of the GOA program. Any increases in effort will depend on the additional amount of time persons could spend in the BSAI when the Pacific cod fishery is open. This will likely depend on the species that are allocated under the GOA Trawl Bycatch Program and the ability of cooperatives to manage fisheries that are not allocated. If there is a single cooperative for each area the cooperative may be more successful in managing unallocated species than if multiple cooperatives are developed for each area.

1.7.2.12.3 BSAI Limited Access Yellowfin Sole CV Trawl Fishery

The 2015 BSAI yellowfin sole TAC is divided among the CDQ fishery, BSAI trawl limited access fishery, Amendment 80 fishery, and an ICA. The trawl limited access fishery was allocated 16,165 mt of the TAC in 2015 (10.8% of the total). Table 34 to part 679 provides a description of the annual apportionment of BSAI yellowfin sole between the Amendment 80 and BSAI Trawl Limited Access Sectors[87]. That table shows that there are seven different ITAC levels that may be used determine the allocations. Different percentages of the ITAC are allocated to each sector depending on the level of the ITAC. When the ITAC goes above a given amount the percentage for the portion of the ITAC above the threshold is decreased for the Amendment 80 sector and increased for the Trawl Limited Access sector. That means that when the ITAC increase above a threshold, both sectors' allowable catch increases, but the Trawl Limited Access sectors allowable catch increases at a greater rate.

Between nine and 16 vessels have participated in the BSAI trawl limited access sector annually, from 2008 through 2012, including both catcher processors and harvesting vessels delivering to vessels acting as motherships. Utilization of the yellowfin sole TAC by the sector in 2008 through 2012 indicates that the sector harvested less than half of its target allocation during the earlier years; however, this proportion increased in 2011 and 2012, to 75% and 79%, respectively. In 2013 the NMFS prohibited directed fishing for yellowfin sole by vessels participating in the BSAI trawl limited access fishery on November 10. The action was taken to prevent the sector from exceeding its allowable catch. The trawl limited access sector was not closed to directed fishing for BSAI yellowfin sole in 2014.

Only two non-AFA licenses are reported to be associated with the GOA trawl fishery and harvested BSAI yellowfin sole since 2009. These licenses are CP designated licenses that are used as CV and deliver to a vessel acting as a mothership. The same two vessels were discussed for the BSAI cod fishery. These two vessels are operated by a company associated with the Amendment 80 program. Because there are only two vessels and they are operated by the same company, staff is prohibited from reporting catch data.

Under the provisions of the Amendment 80 program, yellowfin sole TAC and prohibited species allowances can be reallocated from the BSAI trawl limited access sector to the Amendment 80 cooperatives during the course of the year. Yellowfin sole was reallocated in from 2008 through 2011. In 2008 and 2009, 6,000 mt of yellowfin sole

[87] http://alaskafisheries.noaa.gov/rr/tables/tabl34.pdf

was reallocated; in 2010, 20,000 mt, and in 2011, 2,000 mt of yellowfin sole was reallocated. No reallocations were made after 2011.

Both the CDQ groups and the Amendment 80 cooperatives have the opportunity to increase their initial allocation of yellowfin sole, by exchanging rock sole or flathead sole quota, if there was an ABC surplus for yellowfin sole. The BSAI trawl limited access sector, however, is limited by their allocation based on the initial TAC, since they are not included under the flatfish flexibility program.

In recent years the AFA catcher vessels have not been limited by sideboards in the yellowfin sole directed fishery; because the TAC for BSAI yellowfin sole has been set above 125,000 mt. If the TAC drops below this level in the future, the AFA catcher vessels may be subject to sideboard limits. It may be appropriate to consider the need for GOA trawl vessel sideboard limits in a similar context. If the TAC falls below a given level it may be appropriate to consider sideboard limits for both AFA and GOA trawl catcher vessels at the same time. In other words, linking the need for sideboard limits for the non-AFA catcher vessels to the same or slightly modified standards that are applied to the AFA CVs. If sideboards are determined to be necessary for AFA CVs, the defined standards could also be applied to the GOA trawl CVs. The AFA and GOA trawl CV could then operate under a single or two separate sideboard limits that are triggered by the same yellowfin sole TAC threshold.

1.7.2.13 Cooperative Reports

Cooperatives would be required to submit a written annual report to the Council and NMFS. The Council has established cooperatives reporting requirements for the AFA program, the Amendment 80 sector, the Central GOA Rockfish Program, and BSAI crab cooperatives. Cooperative reports are intended to help the Council track the effectiveness of the cooperative and their ability to meet the Council's management objectives. Cooperative reports are also a tool for participants to provide feedback on the programs. Required elements establish a minimum amount of information to be provided to the public, and the Council has the flexibility to request additional information that might pertain to a management issue of current interest.

The particular reporting elements that the Council requires are intended to reflect of the program's objectives. For instance, the Council may request more detailed PSC or bycatch information if it is considering some form of performance-based quota reallocation. Reporting requirements must be in compliance with the confidentiality regulations in the MSA. Typically, confidentiality restricts the public release of vessel-level data on catch and effort. However, MSA §402(b)(2)(A) includes an exception that is specific to observer data in the North Pacific: "Any observer information shall be confidential and shall not be disclosed, except […] as authorized by a fishery management plan or regulations under the authority of the North Pacific Council to allow disclosure to the public of weekly summary bycatch information identified by vessel or for haul-specific bycatch information without vessel identification."

The proposed regulations for the program should specify whether a cooperative report would be submitted to the Council or to NMFS. Information submitted directly to the Council is subject to confidentiality restrictions. NMFS would have access to vessel-level catch and PSC information through CAS data. However, a vessel-level cooperative report could supply additional information, such as individual accountability measures. The Council could recommend a two-step process for cooperative report publication, wherein cooperatives submit their report to NMFS and the agency redacts or summarizes confidential data before the document is made public. This process would require additional NMFS staff time, but could allow the Council to request information to which it is not typically able to access. The utility of this additional step would depend on which reporting elements the Council eventually requests as part of the final cooperative program structure.

The following is a list of reporting elements from across existing cooperative-based programs in Alaska. The Council should add or subtract from this list when it develops it preferred alternative.

1. Annual allocations to the cooperative.
    a. Sub-allocations to each vessel;
    b. Inter-cooperative transfers (permanent and in-season);
    c. Intra-cooperative transfers (in-season).
2. Catch and retention
    a. Retained and discarded catch on an area-by-area and a vessel-by-vessel basis;
    b. Catch of sideboarded species;
    c. Percent of groundfish retained, and retention rate relative to the aggregate rate among all cooperatives;
    d. Total landings by cooperative vessels outside of the State of Alaska;
    e. PSC by species (by season).
3. Monitoring and accountability
    a. Monitoring methods;
    b. Vessel-level incentive measures;
    c. Cooperative actions taken in response to member vessels that exceed catch or bycatch sub-allocations;
    d. Changes in cooperative management or incentive measures since the previous reporting year.
4. Internal performance review
    a. Description of how incentive measures affected individual vessels;
    b. Description of how incentive measures affected PSC levels relative to current levels;
    c. Estimate of the amount of PSC species avoided (as demonstrated in the AFA's Intercooperative Agreement Annual Report by movement of fishing effort away from "Salmon Savings Areas" that are established in regulations). Equity and opportunity measures (voluntarily submitted by BSAI crab cooperatives)
5. Changes in crew compensation;
    a. Changes in quota share lease rates;
    b. Changes in the availability of quota share for transfer to active participants and crew members.
6. Additional elements that are specific to the proposed GOA program might be required. For example:
    a. The number of LLPs enrolled in the cooperative (as distinct from the number of vessels), and a summary of their area and gear endorsements;
    b. The number of vessels that were active in landing catch of allocated GOA groundfish species;
    c. PSC rates (number or weight of Chinook salmon/halibut per metric ton of groundfish), and rate by target fishery;
    d. Initiatives specific to the GOA that were developed to minimize or avoid PSC (e.g., timing stand-downs, or area-based strategies);
    e. Information pertaining to the cooperative's member processor or processors' distribution criteria for processor-held PSC quota, if that option is selected, and the amount distributed to each cooperative vessel;
    f. Description of intra- and inter-cooperative transfers, and whether those transfers resulted in the harvest of additional groundfish;
    g. Summary of unforeseen issues that the cooperative addressed during the year, or issues that continue to present a management challenge (providing an avenue for input on the future use of Adaptive Management quota).

The reporting deadline for cooperatives under other programs requires cooperative representatives to provide an oral presentation of their required written reports at the April Council meeting. If the Council requires or formally

encourages a voluntary oral report, the submission deadline for the written document would likely be tied to that same reporting time period.

1.7.2.14 Limited Duration

The term "duration" refers to the lifetime of a privilege or share itself, not its possession by an entity (Anderson & Holliday, 2007). Possession of shares is governed by initial and subsequent eligibility requirements, transfer provisions, and other applicable rules. The MSA is very clear about most aspects of duration; LAPPs may be revoked or limited in accordance with the MSA, they do not confer rights of compensation, and they do not create any ownership of a fish before it is harvested [Section 303A(b)].

Because "the language is somewhat obscure, the revised MSA effectively mandates that duration of LAPs be equal to the actual life of the plan [Section 303A(f)" (Anderson & Holliday, 2007). They reasoned that unless the Council takes action the permit will be renewed before the end of the period (maximum of 10 years) for which they are issued, unless they have been revoked for cause. That is, the current owner of a privilege is entitled to have the permit renewed unless he or she fails to comply with the requirements of the plan or commits an act that is prohibited by the MSA in general. They did note, however, that Councils have the option of creating their own conditions for duration and renewal of quota. He then stated that the conditions should be well defined, easily monitored, and subject to clear-cut determinations of compliance.

Globally there is no consistent pattern to the duration of fisheries privileges. They range from annual to perpetual. For example, in New Zealand privileges are held in perpetuity while in the Falkland Islands privileges are held for 25 years (Harte and Barton 2007). In Canada, privileges are granted "annually" while in Australia they vary from fishery to fishery depending on the duration of the management plan (Arnason, 2001). With few exceptions (notably several fisheries in Chile) privileges have what Anderson calls "rolling conditional permanence." For example, in both the Canadian and Australian situation the continual renewal of short-term privileges has resulted in the expectations by holders and management agencies that the privileges are a form of rolling conditional privileges. Holders of such privileges have a legal or procedural expectation based on precedence that their basic privilege to access a fishery will be renewed before or when it expires. As noted earlier it is the certainty associated with the management of the fishery that matters as much as the statutory duration of the privilege when it comes to the perception of its value by the asset owner and the broader marketplace.

The Council's action on the Rockfish Program noticed the industry that quota would not be renewed unless the Council took additional action, as opposed to requiring the Council to take action to revoke the permit. While the Council retains the option to reissue rockfish program quota to the same persons and in the same amounts, it also wanted to ensure persons did not assume that the quota being issued was a "permanent allocation". Based on the rockfish program allocation and the halibut/sablefish IFQ programs, the Council has demonstrated its authority to develop both limited duration and perpetual duration quota programs. Those programs highlight that quota allocations may take on a variety of forms and durations that are dependent on the Council's objectives for that fishery.

Another aspect of duration that is important to consider is stakeholder expectations of the program. The durability of the privilege depends on both the length of time it is issued and the privilege holder's perceptions of a program's management. For example, a fixed-term privilege granted for a short period but with a strong presumption of renewal may be just as durable and will confer the same or greater economic benefits than a privilege granted for 20 years but carries with it an expectation that the government will fundamentally change aspects of the management program within that period.

The Pacific Council has recently addressed the issue of fixed-term allocations (auctions) relative to long-term allocations. The findings of their SSC (PFMC) and NMFS indicate that the choice of a harvest privilege's duration can impact the flexibility that managers have in addressing policy goals in the future, the level of transaction costs for the managed sector, and the incentives that resource users face for investment in, and conservation of public resources. Each of these issues is addressed in the following sections, drawing heavily on the findings of the Pacific Council and other published papers.

Fixed-term privileges would not require the Council to specify each problem area in advance, as it develops a catch share program. Councils have the authority to set rules in the plan to limit or forbid certain actions that it believes will lead to unsatisfactory outcomes. These rules must be defined before the plan is implemented, and the uncertainty of their effectiveness is a concern. It is not always possible to project specific outcomes given limits on information that is available during the design and implementation phases of the program. Maintaining greater flexibility to react to behavior that does not reflect the Council's intended objectives reduces the need to project each negative outcome that may arise.

Fixed-term privileges could allow Council's greater flexibility to modify a program if it is not meeting its objectives, especially in regards to performance standards by the harvesting/processing sector and the program's impact on other stakeholders. This can be important when a LAPP is being developed to specifically modify behavior associated with PSC usage. Periodic program adjustments may also ensure that community access and other potential goals are being reached (Cullenberg, 2006)

The U.S. Commission on Ocean Policy's Recommendation 19-15 proposed that the National Marine Fisheries Service be responsible for issuing national guidelines for catch share programs; it outlined several key features, one of which was limiting the duration of quota shares. The Commission determined that allocating fixed-term privileges was an effective tool to help ensure that catch share programs meet current and future objectives.

Unintended consequences may result from the initial allocation of privileges, in addition to less than optimal economic outcomes of an initial allocation. Fixed-term privileges offer resource managers potential flexibility to redistribute allocations based on defined criteria. As a result, changes in policy may be implemented more easily, and with less resistance under a system of time-limited rights. This is constant with other studies that found business plans do not require perpetual allocations, and 10 year allocations should be sufficient for most business plans presented to banks (Macinko & Bromley, 2007).

One concern about long-term privileges is that they capitalize the value of the fishery and therefore, when traded, confer benefits to the initial recipients in the form of windfall gains (if the initial allocation is free or cheap). These may be viewed as inequitable from society's standpoint, since most of these gains are captured by the initial recipient of quota when they sell it in the open market. The initial privilege recipients capitalize a portion of the stream of future benefits, thereby reducing benefits to future fishery participants. This is known as the transitional gains trap.

Creating a LAPP with either fixed duration or a relatively unlimited or "rolling" duration does two things:

1. It allows those who have created an asset value for the resource through investment, innovation and entrepreneurship to capture a portion of that value through the sale or leasing of privileges.
2. It encourages new entrants to enter a sector because they now have the potential to extract a proportional share of the future benefits created from rents generated by their ongoing investment, innovation and entrepreneurship.

Detriments of limiting duration are primarily incurred by the persons that are initially allocated quota. By allowing the privilege to be as permanent as current policy allows, the owner of the quota will have the securest planning horizon and will have better incentives to make efficient investments in harvesting and processing equipment and to develop market channels. Longer term privileges are expected to generate greater economic returns to the quota holder than shorter term privileges.

Based on the information presented, it appears that the setting the duration of the program to close to the 10-year limit will both provide a sufficient planning horizon to develop a business plan. At the same time, if the harvest privilege is considered less durable it will reduce the amount of long-term net present value that can be removed from the fishery by the initial recipients of quota. Fixed duration quota will not prevent the quota holders from capturing the rents associated with annual leasing of quota. Short-term leasing will still allow the quota holders to capture the annual rents, but not the entire long-run stream of net benefits associated with the sale of the underlying harvest privilege. If the object is to limit the amount of rents that can be capture from those allocations, it must be accomplished through mechanisms like limiting the amount of a person's allocations they can lease on an annual basis. Those types of options are included as part of this package.

1.7.2.15 Cost recovery and loan program

The proposed actions would implement a LAPP cost recovery fee program for the GOA non-Rockfish Program trawl landings of allocated species. The MSA both authorizes and requires the collection of cost recovery fees for LAPPs. MSA cost recovery fees may not exceed three percent of the ex-vessel value, and must recover costs associated with the management, data collection, and enforcement of these programs that are directly incurred by government agencies tasked with overseeing these fisheries.

Cost recovery fees would be collected from the GOA trawl cooperatives. LLP license holders that have their quota assigned to the limited access fisheries are not subject to costs recovery, since they are not assigned an exclusive harvest privilege in that fishery. The cost recovery fee percentage would be determined annually by the Regional Administrator (RA) of the NMFS Alaska Region (NMFS or Region) and published in a Federal Register (FR) notice. Along with the fee percentage, standard ex-vessel prices will be reported in an FR notice for each species directly allocated to the cooperatives. Implementing a system that relies on data already being collected would reduce the reporting burden on industry and NMFS. Reducing costs incurred by NMFS will help minimize future cost recovery fees that must be paid by persons participating in cooperative program. The program would require Volume and Value reports to be implemented for all species. The report will be similar to those collected for the RP, but the dates of collection will be similar to those collected for the Amendment 80, AFA, and CDQ cost collection programs.

NMFS will add total reported landings from January 1 through November 30, and estimate total landings in each year (beginning in 2016) from December 1 through December 31. Under the Rockfish Program, which is expected to be similar to the proposed program, NMFS:

1. compiles a list of all allocated species landings by species and month;
2. uses the proposed ex-vessel volume and value data to calculate a set of standard ex-vessel prices for fish landed;
3. applies the appropriate standard ex-vessel price to each landing, creating a standard ex-vessel value for each landing;
4. sums the total standard ex-vessel values of all landings to derive the total ex-vessel value of the year's allocated species;

5. compiles all direct management, monitoring and enforcement costs (direct program costs) attributable to the program;
6. uses direct program costs and total ex-vessel value to calculate the annual fee percentage;
7. applies the fee percentage to the standard ex-vessel value of a landing to determine the fee owed for each landing;
8. sums the fees owed for all landings on the CQ permits held by each permit holder. This final figure is the annual fee liability each permit holder owes and is based on standard ex-vessel prices and values; and
9. mails CQ permit holders a summary that itemizes their landings and shows their calculated fee liability.

Estimated gross ex-vessel revenue from the species directly allocated to the cooperatives will vary depending on the primary and secondary species that are selected for allocation to cooperatives. Fee estimates from the 2003 through 2014 data, the most recent years for which data were available, are presented to provide an indication of variation in fees that may occur between years. The most recent year of ex-vessel value data available when the projections were calculated was 2014. The table also provides estimates of the fee if it were set at the maximum 3% level. Because estimates of agency costs are not provided in this version of the document, estimates of what the fee percentage might be at the start of the program are not provided. However, in the only other GOA trawl LAPP, the 2015 Rockfish Program cost recovery fee was determined to be $361,790.

Table 1-110 Estimated ex-vessel value of allocated species and the maximum cost recovery fee at 3%

Species	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	Millions of Dollars (Nominal)											
Pacific cod & Pollock	$18.78	$21.33	$28.74	$27.82	$24.33	$36.24	$18.50	$35.67	$37.45	$50.02	$43.98	$52.52
Rockfish	$1.54	$2.25	$2.32	$4.22	$4.37	$4.03	$4.15	$4.77	$6.13	$4.98	$2.63	$4.07
Shallow Water Flatfish - GOA	$1.49	$0.76	$2.24	$3.87	$5.44	$6.00	$4.61	$2.56	$1.67	$2.13	$2.78	$2.02
Total	$21.81	$24.34	$33.31	$35.92	$34.13	$46.26	$27.25	$43.00	$45.24	$57.13	$49.39	$58.61
	Percent of annual ex-vessel value by species											
Pacific cod & Pollock	86%	88%	86%	77%	71%	78%	68%	83%	83%	88%	89%	90%
Rockfish	7%	9%	7%	12%	13%	9%	15%	11%	14%	9%	5%	7%
Shallow Water Flatfish - GOA	7%	3%	7%	11%	16%	13%	17%	6%	4%	4%	6%	3%
	Maximum cost recovery fee (fee set at 3%) in millions of dollars											
Pacific cod & Pollock	$0.56	$0.64	$0.86	$0.83	$0.73	$1.09	$0.55	$1.07	$1.12	$1.50	$1.32	$1.58
Rockfish	$0.05	$0.07	$0.07	$0.13	$0.13	$0.12	$0.12	$0.14	$0.18	$0.15	$0.08	$0.12
Shallow Water Flatfish - GOA	$0.04	$0.02	$0.07	$0.12	$0.16	$0.18	$0.14	$0.08	$0.05	$0.06	$0.08	$0.06
Total	$0.65	$0.73	$1.00	$1.08	$1.02	$1.39	$0.82	$1.29	$1.36	$1.71	$1.48	$1.76

Source: AKFIN summary of CAS and COAR data.

All cost recovery fees must be submitted to NMFS by the designated representative of each cooperative. The fee liability payment must be submitted to NMFS using an approved electronic method by December 31 of each year. Insufficient or late fee submissions may result in the sending of an Initial Administrative Determination (IAD) to the designated representative stating that the permit holder's estimated fee liability was not submitted and NMFS may disapprove all or part of the allocation or application for allocation transfers to or from the CQ permit holder.

It is expected that the fee will be borne by the harvesting vessel owners (or shared by the owner and the harvesting crew as a cost of business). The amount of the fee will determine the annual impact, but the overall fee assessed is expected to be less than the benefits the quota recipients derive from harvesting or leasing their allocation. To the extent that a portion of the cost is taken from the crew shares, it will result in a reduction in crew revenue. The overall impact to the crew that results from the cost recovery fees will depend on how crew shares were modified by vessel operators in response to the program in general.

Participants in the program will be required to submit Volume and Value reports for the landings of species that are subject to the cost recovery fee. It is estimated, based on previous Volume and Value reports for the Central

GOA Rockfish Program, that each annual submission will require two hours of staff time from the processors, in addition to their time spent filing numerous other required reports.

Communities are not expected to be substantially impacted by this action. This action will not change the amount of fish landed under the subject LAPP, nor will the action change the location of deliveries. However, communities may realize very modest impacts through reduced income of residents, and therefore reduced expenditures in those communities. Residents include any vessel owners or crew members that realize reduced income as a result of cost recovery fee payments.

1.7.3 Analysis of Impacts - Alternative 3: Cooperatives with Annual PSC Allocations

Many of the impacts to harvesters described under Alternative 2 also apply to Alternative 3. For example the costs associated with cooperative formation, preparing annual reports for NMFS, and meeting additional monitoring requirements. This section will briefly address major cost issues, but will focus more heavily on issues not already covered in Section 1.4.2.3 (PSC allocations), Section 1.5 (Excessive Shares), Section 1.6 (PSC Reductions), Section 1.10.3 (Impacts on Crew), or the Social Impact Assessment (Appendix 5). The reader is referred to those sections for a more detailed discussion of those specific issues.

1.7.3.1 Observer Coverage and Monitoring

Observer coverage and monitoring requirements are the same as reported for Alternative 2. The reader is referred to Section 1.7.2.5 for an estimate of the change in observer costs relative to the status quo. Like under Alternative 2, NMFS and the Council have determined that full observer coverage is necessary to monitor the allocations to cooperatives. Only PSC allocations are made under Alternative 3, but for NMFS to manage those allocations its staff needs information that is verified by observers. This action would permit the use of EM in place of some observer functions if regulations are developed in the future specifically for the trawl fishery. The structure of the EM program, it allowable uses, and its limitations will be defined in that future amendment package.

1.7.3.2 Sector eligibility

1.7.3.2.1 Inshore sector

Alternative 3 differs from Alternative 2 in that the requirement for a PSC allocation is that a person has a vessel[88] that is assigned a valid LLP license to fish with trawl gear in the GOA. That person would be eligible to apply for an allocation of PSC based on their qualifying for a share of the defined quota pools[89]. If the holder of an LLP license that is attached to a vessel that is issued an allocation chooses not to join a cooperative, it may fish in the limited access fishery. The vessel must still hold a valid FFP and a valid LLP license endorsed for GOA trawl gear in the area they wish to fish. Vessels must pre-register to operate in the limited access fishery by October 1 of the year prior to when fishing will occur. A vessel may not participate in both the limited access fishery and a cooperative.

The dates for registration in the Limited Access fishery is October 1 and the date to register for a cooperative is November 1. A vessel operator must determine which fishery its vessel will participate in by the earlier date. Those vessels will need to apply for the equal share and vessel dependency allocations at that time. The

[88] The vessel must meet the LLP license requirements that allows the vessel to fish with trawl gear in the GOA. The vessel must be assigned to a cooperative or registered in the limited access fishery for the PSC allocations to be available to the cooperative or limited access sector.
[89] The pools defined are equal shares, vessel dependency, and membership in an inter-cooperative agreement.

application to join the limited access fishery must include those completed forms. Vessel operators applying for the limited access fishery will incur some additional costs associated with completing that paperwork. The cost is expected to be slightly less than the paperwork costs of joining an Alternative 3 cooperative. Cooperative costs will be greater because of the work associated with developing and monitoring the components of the cooperative contract. The paperwork costs for vessel operators under Alternative 2 and Alternative 3 will be similar. The primary difference will be any costs associated with monitoring and reporting primary and secondary species catches of allocated species under Alternative 2.

The overall amount of PSC allocated to the CV sector under Alternative 3 is expected to be sufficient to cover the amount needed to harvest the pollock and Pacific cod fisheries. Because PSC limits are not expected to constrain those fisheries, since they have not been most years under the Status Quo, the objectives of the program to share information and avoid PSC and bycatch to the extent practicable are about the same as the Status Quo. The incentive to avoid PSC in the flatfish fisheries are greater and about the same as Alternative 2, because the PSC limit, typically halibut, and not the TAC, limits harvests in those fisheries. Some harvesters would determine that they are not able to put the PSC reduction plan into practice successfully. Implementing measures to slow harvest, in order to reduce PSC usage, would reduce the revenue they generate from the fishery. Reductions in gross revenue coupled with increased harvesting costs could result in the new program objectives not being practicable for some firms. Since it is expected that some firms will choose to operate as they did under the Status quo to maintain or improve harvest shares of the primary species, it will increase pressure on all other firms to behave as they did under the status quo.

Any catch by vessels using PSC initially assigned to the inshore sector must be delivered to processors in the inshore sector. This requirement is necessary to prevent PSC assigned to the inshore sector from migrating to the CP sector.

1.7.3.2.2 Offshore sector

The offshore sector eligibility will be the same as defined under the No Action Alternative. CPs are limited by the LLP license they hold and any limitations already imposed by other regulations.

1.7.3.3 Species Not Allocated

Alternative 3 does not allocate any primary or secondary groundfish species. A concern expressed by many members of the affected fishing industry is that by not allocating pollock, Pacific cod, and valuable secondary species the program does not stop the race to fish. Members of the trawl CV sectors will still compete to harvest these species and that completion will greatly reduce the benefits associated with a rationalized fishery. Members of the fleet have stated that they are less likely to share information that can reduce the PSC limit usage or rate of PSC limit usage relative to Alternative 2 in those fisheries. Benefits of a more rational fishery could be realized in the flatfish fisheries. However these fisheries are typically not prosecuted by vessels in the Western GOA. Those vessel operators are expected to realize increased costs associated with the program, but the benefits they realize are limited to their ability to form a voluntary cooperative that would allocate those valuable groundfish among all CV fishing those species with trawl gear. Getting all members of the sector to agree to an allocation and to abide by that allocation for the entire fish year, including persons that join the limited access fishery, holds the same challenges as the status quo voluntary cooperatives. The same is holds true in the Central GOA and West Yakutat District, the current issues associated to implementing a voluntary cooperative would exist. Those issues are described in Appendix 1.

1.7.3.4 Voluntary inshore cooperative structure

As stated above, the Council could not obligate a harvester to deliver to any specific plant, but some form of delivery requirement or preference is expected to emerge in the private contracting process for single-processor cooperatives. The risk of having harvesters leave a cooperative, which might be easier to do under Alternative 3, gives harvesters more bargaining power and creates uncertainty for processors in the amount of fish they will receive from one year to the next. Alternative 3 includes an option to create a single cooperative for all harvesters and processors in a region (WG or CG/WY). This might mitigate that uncertainty by bringing all parties under a single agreement that would, in theory, balance internal business interests. However, region-wide multi-processor cooperatives present their own set of challenges. The Council received testimony stating that the notion of multiple processors negotiating, planning, and overseeing production strategies in real-time runs a high risk of testing, if not violating, antitrust regulations. One of the central benefits to the cooperative strategy, in the broadest sense, is that it allows processors and harvesters that are members of a cooperative to coordinate on business strategies that go beyond production and include market strategies. Even if harvesting and processing stakeholders wished to assume this risk, enforcement agencies' burden to monitor antitrust compliance would be high. Assuming that all parties agreed to enter into a region-wide cooperative, the complexity of negotiating such a contract on an annual basis would be significant and time consuming The "super" cooperative might fall back on some objective delivery history to determine intra-cooperative privileges, but that would, in a sense, defeat some of the purpose of innovating away from the business plans of the pre-cooperative era. The process would need to begin well before the November 1 deadline to form a cooperative, and could be beset by harvesters who could threaten – all the way up until the deadline – to opt into the Limited Access sector for the upcoming year. For the cooperative to function, all eligible harvesters would need to join the cooperative. Persons that hold out and are the last to join might be given greater incentives/concessions to allow the cooperative to form. In the long-run as other members of the fleet see this type of behavior it will force all members to agree to the same cooperative terms and conditions or the cooperative will be less likely to form.

The Alternative 3 option that establishes a minimum number of vessels (2 to 5) necessary to form a cooperative is likely intended to ensure that cooperatives are of a sufficient size to achieve certain economies of scale in production, value added products, bycatch management, and to reduce the likelihood of a cooperative allocation being used like IFQ. Even at the high end of this range, a cooperative could be constructed where the vessels/LLP licenses are owned by the same entity. Current LLP regulations allow a "person" to hold up to 10 LLP licenses[90]. Ten licenses, or even vessels, would meet the number required to form a cooperative. Ownership data at the firm level is not available for all LLP licenses. Table 1-111 shows the count of the 124 GOA CV trawl LLP licenses by the address listed in the RAM LLP License database. This is a somewhat better indication of common ownership than the name of the firm on the LLP license, is some firms have a separate corporation for each vessel they operate. Often these corporations have the same address and the same ownership. Using this proxy there were 66 LLP license with a unique address, 14 addresses were associated with 2 LLP licenses, 4 addresses were associated with 3 LLP licenses, 3 addresses were associated with 3 LLP licenses, and 1 address was associated with 6 LLP licenses.

[90] The legal definition of a person includes corporations and other combined entities.

Table 1-111 Count of GOA trawl CV LLP licenses by the address of the license holder

LLP License Count	By Unique Address	Total LLP Licenses
1	66	66
2	14	28
3	4	12
4	3	12
6	1	6
All		124

Source: NMFS RAM LLP Groundfish License database, March 2016.

Based on information presented in the table, if the minimum number of LLP licenses to for a cooperative was 5, then only one firm appears to be over the limit currently and could form a cooperative on its own. If the number of LLP licenses needed to form a cooperative is reduced to 4, then 4 firms could form their own cooperative. Reducing the number of LLP licenses to form a cooperative to 3 would increase the potential number of single firm cooperatives to 8. A total of 22 firms could form their own cooperative if the number of LLP licenses is reduced to 2.

One might also consider that several of the currently active GOA shore-plants receive trawl-caught groundfish from a fleet that is within this minimum size range of 2 to 5 vessels. Other plants that received trawl groundfish in the past, including some in Central GOA communities other than Kodiak, have not maintained a trawl market (reportedly due, in part, to Steller sea lion mitigation measures). Setting a minimum vessel threshold could make it extremely difficult for a plant to form or maintain a cooperative. Assuming that processing plants that are not part of a cooperative would receive few, if any, trawl deliveries from vessels outside of the Limited Access sector (which could be all the active vessels), a threshold might actually contribute to processor consolidation.

In practice, it would seem very difficult for a plant with only two or three dedicated trawl vessels to attract additional vessels to its cooperative and maintain them on an annual basis; this is especially concerning in light of recent trends of processor consolidation in Kodiak and the general nature of the groundfish processing sector which relies on high investment, high volume, and low marginal revenue. Moreover, setting a specific minimum vessel threshold could create unintended "boundary effects" where a vessel might arbitrarily find itself in an enhanced negotiating position because a processor needs one more vessel to form a cooperative (or cannot afford to lose a vessel and still maintain its cooperative in the upcoming year).

A vessel owner might purchase a second license that had been initially assigned to a different cooperative on the open transfer market. Licenses might be purchased for their catch history, associated PSC, or to gain an area endorsement for their vessel; under Alternative 3 (where equal shares are determined by historical participation in a particular target fishery – e.g. cod or flatfish), an individual might purchase a license to access additional PSC quota. Here, again, the purchaser would probably not want to be in two separate cooperatives in the same region, and would need to understand whether the removal of that license from the other cooperative is subject to "exit provisions" defined in the cooperative's contract. This is a different case from where a vessel owner with two licenses needs to move them into the same cooperative. One would expect the purchaser to consider pre-defined cooperative exit provisions and reflect any required compensation in the value of their purchase offer.

1.7.3.5 Voluntary offshore (C/P) cooperative structure

Any cooperative formed by the CP sector would fall outside the requirements defined in this program. A CP cooperative would be voluntary and designed by members of the CP sector. Any vessel with a CP LLP trawl license that is not a member of the CV sector could participate in the voluntary cooperative under the rules defined in its cooperative contract.

For the cooperative to function, all active members of the CP sector must join the cooperative. The cooperative structure could be a single cooperative or more than one cooperative that coordinate their activities, including the division of PSC and groundfish species through an inter-cooperative agreement. Whether a cooperative(s) will form depends on the increased value that can be derived from the fisheries under the status quo relative to a cooperative structure. Benefits will result from the rockfish fisheries in the Western GOA and West Yakutat District. In these fisheries the CP sector could determine how the TAC is divided to firms in the cooperative. PSC limits assigned to the fleet should be sufficient to cover catch in these fisheries. Any benefit to the flatfish fisheries are expected to be the result of dividing the CP sector PSC limit between the companies that are participants in the GOA flatfish fisheries. The CP fleet already controls effort in the GOA flatfish fisheries through the Amendment 80 sideboard limits. Those sideboard limits will remain in place under Alternative 3.

Overall the most difficult negotiations may be how to divide the GOA halibut PSC limit among firms, especially if there are significant reductions in the overall PSC limits. Firms will have different incentives since some firms focus on rockfish, others focus on rockfish and flatfish, and one firm is limited to Central GOA flatfish. The halibut PSC limit can be used in any GOA trawl area. If firms are able to create a voluntary cooperative they may be able to better work around limits set for the shallow-water and deep-water complex or be able to negotiate a structure where those limits are not managed as separate limits.

1.7.3.6 Cooperative member's limitations in other fisheries

Vessels fishing under Alternative 3 are only allocated PSC limits. Because they are not allocated primary and secondary species they must still compete to harvest their historical share of those species. The need to compete, especially in the pollock and Pacific cod fisheries will likely maintain historical harvest patterns by vessels. As a result, additional sideboard limitations for the CV sector is assumed to not be necessary. The CP sector is already operating under sideboard limits imposed by the Amendment 80 program. As a result of the structure of the proposed program and the status quo regulations, no additional sideboard limits are suggested for the CV or CP sectors.

1.7.3.7 Program review

The MSA defines a timeline for reviews of LAPPs. Because this program is not a LAPP, based on the MSA definition of a LAPP, the program review would be up to the Council's discretion. Given the controversial nature of the program and the outstanding questions the program might have on PSC limits, OY, and communities, the Council could choose to hold less formal reviews when the annual reports are presented and a more formal review of the program when specific issues are brought to the Council's attention. This structure would allow reviews to be conducted as needed, but not schedule reviews if the program is perceived to be functioning as intended.

1.7.3.8 Cost recovery and loan program

Alternative 3 is not considered a LAPP because a person is not issued a permit and assigned a percentage of the TACs. As a result, vessels participating in cooperatives are not subject to cost recover as defined in the MSA.

1.7.4 Analysis of Impacts- Alternative 4: Alternative 2 Cooperative Program with either CFA or AMP

The CFA impacts on harvesters are primarily associated with the increased cost to access quota, increased costs complying with any PSC reduction mandates associated with the use of CFA quota, and the changes in quota distribution patterns. Impact associated with Adaptive Management Quota Programs are not addressed in this version of the document. Additional information cannot be provided until greater specificity on the program's structure is developed.

The CFA structure defined in Alternative 4 will allocate 5 percent to 15 percent of the CQ issued for groundfish and PSC species to the CFA(s). The CFA can then lease that quota to persons that meet the criteria developed for the program. CFA quota could be leased to qualified applicants representing eligible Gulf communities.

The users of CFA will have limited ability to use that quota as part of the business plan presented to lenders. The firm does not hold the underlying asset and can only use the quota as part of their business plan for the duration they have guaranteed access to the use of the quota. To the extent the CFA can provide a multi-year guarantee, the firm can use the future revenue stream to help access a loan. If the allocations are short term and subject revocation for failure to perform up to set standards, the value of the CFA will have less value in securing loans to purchase more quota.

Harvesters that lose a portion of their quota (based on catch history) and do not receive an allocation of CFA quota will be negatively impacted. The loss of future gross ex-vessel revenue, and the associated net-revenue, will reduce profit margin of firms. Firms that continue to operate in the fishery will still need to cover their fixed costs. Those costs are not expected to change as a result of CFA quota redistribution. These firms could save on variable costs (e.g. observer costs), but overall the profitability of the firm could decline.

Another object of CFA quota allocations is to incentivize additional bycatch savings beyond standard requirements by rewarding those willing to adopt additional measures to reduce bycatch with access to additional CFA quota. The increased access to CFA is expected to increase costs. Costs will increase as a result of the quota lease price and the cost of PSC avoidance measures that are implemented. It is assumed that there would be some increase in net value derived from the use of the quota, but the increase in total value derived from the CFA quota and the directed halibut and Chinook salmon fisheries may not be sufficient to offset the reductions in value of Alternative harvesters. The increased value to the directed fisheries are discussed in the PSC reduction section of this document. However, if the PSC savings in one fishery are used in another groundfish fishery, any benefits would flow exclusively to the CFA quota users and not the participants in the directed halibut and salmon fisheries.

Another stated objective of the CFA program is to facilitate gear conversion within provisions of main program. As described in other sections of the document, gear conversion would primarily impact Pacific cod allocations and halibut PSC limits. It is assumed that a criteria for use of CFA quota be that persons issued the quota would be required to fish some or all of the quota with pot gear. Also because it is within the Alternative 2 structure the CFA quota must be used within a cooperative. As a result the CFA quota could be only fished by vessels with a trawl endorsement on their LLP license. Fishing for Pacific cod with pot gear would benefit harvesters whose vessel is already equipped to use both pot and trawl gear. In the Western GOA it would benefit smaller combination boats and in the Central GOA vessels that have used pot gear in the past for Pacific cod. In both cases these are more likely to be more local participants than vessels that have a greater portion of their fishing year in the BSAI or on the West Coast.

Annual reporting to the Council would be required. The intent of the CFA is to ensure that quota is anchored in GOA communities and that community concerns, including sustained community participation, entry opportunities, equitable crew compensation, bycatch reduction, among others are addressed in the initial program design.

1.8 Analysis of Impacts on Processors

This section addresses the relative potential impacts on the inshore processing sector under the No Action alternative and the three action alternatives. Impacts on at-sea processors (CPs and motherships) are discussed in the harvester impact section (Section 1.7). The inshore processing sector includes all facilities with FPPs that receive GOA trawl landings from catcher vessels, including both shorebased facilities and stationary floating processors. Table 1-44 summarizes the number and location of such facilities from 2010 through 2015.

Rather than repeating the analysis in the previous section, this section incorporates by reference the conclusions about how harvesters might alter their delivery patterns under the various action alternatives and their suboptions. Those business and behavioral changes directly affect processors, though they do not account for the entire set of potential impacts that are discussed below. The reader is referred specifically to the sections on Alternative 2 that address "Fishery Changes," "Changes in Season Dates and Seasonal Apportionments," Pacific Cod Season Dates," and "Other Voluntary CV Cooperative Structure Elements" (Section 1.7.2.4 through 1.7.2.8), and Section 1.7.3.4 on the "Voluntary Inshore Cooperative Structure" under Alternative 3. Processor consolidation is discussed in Section 1.11of this document, and in the Community Impact sections of the Preliminary SIA (Section 6.1.2 of that document)

As with impacts on harvesters, the analysts expect Alternative 2 to result in a fishery that resembles other cooperative quota-based fisheries in the North Pacific, such as the Central GOA Rockfish Program. Some notable caveats to the assumption are discussed below in Section 1.8.2. Alternative 3 would result in fisheries that have aspects of both the status quo and the Alternative 2 cooperative program. In regards to processors, Alternative 3 most notably differs from Alternative 2 in the ease with which harvesters could change their cooperative affiliations from year to year and the timing of pollock and Pacific cod deliveries, as harvesters would continue to compete for a portion of the TAC in a race for fish. In some reasonably envisioned scenarios, Alternative 3 involves a higher relative likelihood that some cooperatives (subsets of the harvest fleet and their processing partners) will have to cease fishing before the end of the season due to attainment of their PSC quota and an inability to lease quota on the market to continue fishing; this, in turn, increases the likelihood that aggregate groundfish catch will be lower, and that the adverse economic impact of that reduced catch will not be distributed evenly across the sector. Alternative 4, which can only be selected if paired with Alternative 2, would not fundamentally change the manner in which the fishery is prosecuted compared to Alternative 2 but could moderately affect the number of new or small-scale participants. Given the advantages conferred by Alternative 2 on the set of processing plants that are currently (or recently) active in the GOA trawl fishery relative to new processors, Alternative 4 is not expected to have a substantial impact on the inshore processing sector in the near- or medium-term.

1.8.1 Alternative 1: No Action

The best description of the GOA inshore trawl processing sector as it currently exists is provided in the Section 1.3 of this document (Description of Fisheries), and in the Preliminary Social Impact Assessment that is also presented under the C-10 Agenda Item for the December 2016 Council meeting. Section 1.3.2.3.1 illustrates the annual pattern of fishing by GOA CVs, reporting weekly ex-vessel revenues by area and by target fishery (Table 1-28 through Table 1-30). Those tables establish that the Western GOA plants rely on pollock and Pacific cod in

the first part of the calendar year, and on pollock in the fall. In between, those plants receive primarily salmon, halibut and sablefish with smaller amounts of crab. The West Yakutat trawl fishery is mainly comprised of early-year pollock, which is delivered to plants located in the Central GOA (primarily Kodiak). The Central GOA trawl fishery is more diverse, and shorebased plants follow a traditional pattern of pollock and Pacific cod, followed by flatfish, rockfish and salmon, then returning to pollock and cod in the fall season. Relative to other GOA regions, the Central GOA and Kodiak in particular rely on flatfish deliveries to fill gaps in a nearly year-round operation that employs a workforce made up of a high number of resident workers compared to the Western GOA and BSAI.

Because Alternative 1 represents "no action," selecting this alternative does not guarantee a maintenance of the status quo. The processing sector is subject to market forces that affect profitability, stability, expansion, and consolidation. The effect of these forces can be observed in recent changes to the working waterfront in Kodiak, which are described in the Preliminary Social Impact Assessment. In short, operations that were not able to withstand a downward cycle in wholesale product prices have closed and/or been acquired by companies that had existing local interests. That development might be illustrative of the notion that, in limited access regimes, downcycles and volatility create opportunities for larger entities to invest in market share at a low cost. This section provides a broad overview of market, regulatory, and environmental factors that challenge the processing sector, and may continue to change the production and employment landscape under the existing limited access regulatory regime. This section also summarizes employment patterns in the GOA groundfish processing sector, incorporating information from the Preliminary Social Impact Assessment and drawing on information generated through the first year of the GOA Trawl Economic Data Report (EDR) initiative.[91]

Under limited access management, processing plants compete for deliveries based on location, the ex-vessel prices offered to harvesters, and, theoretically, through incentive structures that might include preferential delivery schedules. The extent to which a plant must compete on ex-vessel prices likely depends on the number of vessels in the fishery and the quantity of fish – trawl-caught and otherwise – available on the market at a given time. It is reasonable to expect that a plant with geographically close competitors might offer higher prices than one that provides the only market in a large geographical area.[92] Excessive consolidation in localities with multiple markets, such as Kodiak, is mitigated by the fact that a single plant can only intake fish up to its line capacity; in pulse fisheries, one plant cannot provide a market for every vessel that has entered the fishery in that area at a given time.

Individual plants vary in their dependency on the GOA groundfish trawl fishery relative to other sources of deliveries. Tables 16 through 19 in the Preliminary SIA (Section 4.1.3) summarize the number of plants taking GOA groundfish trawl deliveries in each active community (by year), and the proportion of total revenue that each community's active groundfish plants derived from these fisheries as opposed to salmon and fixed gear fisheries. Plants, and thus their exposure to the ups and downs of fishery performance and external market forces, also vary in ownership structure. Individual companies own processing facilities that accept GOA trawl groundfish in multiple communities. Those companies might specialize their plants to focus on different product forms, thus providing two different types of markets for the same target species. Vessels that develop a relationship with that company might be more likely to delivery to more than one GOA community, or to deliver to tender vessels that move catch to a specific plant depending on the processing company's market strategy. Some processing companies also own harvest vessels ("vertical integration"). Those companies might have more

[91] For the purpose of this analysis, EDR data was primarily used to discuss potential impacts on GOA trawl captains and crew. The caveats associated with that data – which covers only 2015 – are provided in Section 1.10.
[92] The price difference is likely due to limited competition as well as higher operating costs in more isolated communities.

options for packages with which to compensate harvesters. For example, a processor-owned vessel might accept a lower ex-vessel price per pound, but receive more guaranteed trips when harvest limits are low. Plants that have a business relationship with a harvester might find it easier to develop harvest plans that deviate from the typical race for fish in order to develop new product forms, or fish at atypical times in order to fill market demand. These arrangements are similar in some ways to what some industry participants would expect to develop under a formalized harvester-processor cooperative, as expressed in the action alternatives. Due to the state of ownership data reporting, the analysts do not have reliable information to report on the number or distribution of processor-owned harvest vessels in the current GOA trawl fleet. Anecdotal information indicates that this business structure is more common in the fleet operating out of Kodiak, relative to other GOA areas.

From 2003 through 2014, the community of Kodiak accounted for roughly half of the number of plants participating in the fishery (an average of 8.1 out of 15.4 plants per year), and three-quarters of all GOA trawl-caught processing first wholesale gross revenues on an annual average basis. Taken as a group, Kodiak plants that received GOA trawl deliveries relied on the trawl fishery for 27.6% of total gross revenues (as measured by ex-vessel payments to vessel operators), as opposed to only 3.9% reliance for plants in other communities that received GOA trawl deliveries. Of the communities that had more than one plant, on average, taking GOA groundfish trawl deliveries during the 2003 through 2014 period, Kodiak was the only Alaska community that has had multiple active plants operating in any single year dating back to 2007. In terms of processor consolidation, Kodiak has already experienced processor consolidation, with two local shorebased processors being purchased by a third within the last few years. At the time of preliminary fieldwork (June 2016), however, the community was expecting a new entrant in the shore-based processor sector, but the operational plans of that processor were unknown. The number of active plants in Kodiak had declined from a peak of 10 in 2007 to seven in 2014.

There are no indications that the number of processors in other GOA communities that take trawl deliveries is declining as a result of consolidation. Table 1-112 shows that most communities have only one plant that participates in the fishery (the plants identified as Seattle-based are floating processors whose ownership companies list a Seattle business address). Communities that are heavily engaged in the fishery, such as King Cove, Sand Point, and Akutan, have only one high-volume processor. Market forces do not appear to pose an imminent threat that these plants' ownership companies will relocate their groundfish operation or disengage from the fishery, in part due to the geographical collocation of local fleets and productive fishing grounds.

Table 1-112 Shorebased processors accepting GOA groundfish trawl deliveries, 2003 through 2014 (from Preliminary SIA, Table 16)

Geography	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Average 2003-2014 (#)	Average 2003-2014 (%)	Total Unique Plants
Akutan	1	1	1	1	1	1	1	1	1	1	1	1	1.0	6.5%	1
King Cove	2	2	2	2	1	1	1	1	1	1	1	1	1.3	8.6%	3
Kodiak	6	8	7	8	10	9	9	9	9	7	8	7	8.1	52.4%	24
Ninilchik	1	0	0	1	0	0	0	0	0	0	0	0	0.2	1.1%	1
Sand Point	1	1	1	1	1	1	1	1	1	1	1	1	1.0	6.5%	1
Seward	0	1	1	0	0	0	0	1	2	2	1	1	0.8	4.9%	3
Unalaska/ Dutch Harbor	1	2	1	1	1	1	1	1	2	1	0	0	1.0	6.5%	4
All Other AK*	2	0	0	0	0	0	0	0	0	1	0	0	0.3	1.6%	3
Alaska Total	14	15	13	14	14	13	13	14	16	14	12	11	13.6	88.1%	35
Seattle	2	2	2	0	1	1	1	1	2	2	2	2	1.5	9.7%	3
Other/ Unknown	0	0	0	1	1	0	0	0	0	1	0	1	0.3	2.2%	1
Grand Total	16	17	15	15	16	14	14	15	18	17	14	14	15.4	100.0%	36

* Other Alaska communities that processed shoreside GOA trawl deliveries in 2003-2014 were Homer (2003), Kenai (2003), and Sitka (2012).

Two of the market factors that currently influence the profitability and stability of the GOA groundfish processing sector include world demand for groundfish products and relative currency valuations. Groundfish products tend to be highly substitutable, meaning that Alaska products cannot necessarily differentiate themselves to consumers unless done so through marketing efforts. Increased production from other regions, such as Russia, can decrease demand for Alaska products. Growth in aquaculture supply can also affect demand for wild-caught Alaska groundfish. Changing consumer tastes can also influence demand. In some high-income markets, groundfish might compete with other whitefish such as halibut or snapper/grouper products. Recent years have displayed a lower price for pollock roe, as its main market in Japan has seen a shift to other products that is largely attributed to generational change in consumers. Looking to the future, the profitability of the processing sector and the Alaska groundfish industry at large could be affected by increased production costs. For example, higher fuel costs could increase the cost of production and product transshipment. Higher energy and labor costs could decrease profit margins for shorebased processors as well. Currency fluctuations can make U.S. exports seem more expensive to international buyers, in either nominal or relative terms, thus decreasing demand. Again looking ahead, trade protectionism that results in tariffs could negatively impact export demand for U.S. products.

In terms of getting raw products into processing lines in an economical and viable manner, the processing sector faces both regulatory and environmental challenges. The current regulatory challenges largely recall a key impetus for this action: hard cap limits on halibut and Chinook salmon PSC that threaten to close down directed fisheries at unpredictable times. The potential for closures on short notice could threaten processors' ability to fulfill orders, and complicates hiring and staffing decisions – particularly at operations that rely on a largely non-resident work force. Other regulatory factors that affect the processing sector's operation include season dates, closed periods for pollock and Pacific cod, and the apportionment of pollock TACs across seasons in an effort to reduce impacts on protected marine mammals. As described in Section 1.7.2.6, seasonal apportionments can mean that the pollock fishery must stop between the A and B seasons even if roe content is still of high quality and value, or that a significant portion of the annual TAC must be caught during times of the year that tend to have

higher Chinook salmon PSC rates (which in turn can threaten to close down the directed trawl fishery at unpredictable moments).

Environmental challenges could be emerging as part of a natural cycle, or could be linked to systemic environmental change in the North Pacific. These challenges include reported higher abundance of juvenile Chinook salmon on the GOA trawl fishing grounds, variations in fish size (some of which might be unmarketable), poor fish aggregation that reduces CPUE, variation in the timing of roe maturity, and cyclical variation in overall year-class size for important commercial groundfish species such as pollock.

The remainder of this section summarizes available information on employment at shoreside processing facilities in the GOA groundfish sector. EDR data from the only year available (2015) shows that seven shoreside processing facilities operated in Kodiak (all shorebased plants), and six shoreside facilities operated in other GOA localities (shorebased plants in Sand Point, King Cove, and False Pass, plus three stationary floating processors for which processing location information is not readily available). Data from 2015 might be different from the typical year because one Kodiak facility only became operational mid-way through the year, while another switched modes of operation after being acquired by another company during the year. Nevertheless, this information is the best available given the novelty of the GOA trawl EDR instrument, and provides a baseline for future analysis of changes in the fishery subsequent to management actions. The following tables are excerpted from Section 5.2.1.4 of the Preliminary SIA. Table 1-113 shows the number of individuals employed, hours worked, and labor payments for processing workers in Kodiak and in all other active communities, by month. Table 1-114 shows the number of non-processing workers employed by processing companies and their total wages and salaries for the entire year. Information is aggregated to the Kodiak/non-Kodiak level in order to maintain confidentiality.

Table 1-113 Kodiak and other shoreside processor hours and labor payments for groundfish processing employees by housing type, by month, 2015 (from Preliminary SIA, Table 48)

Month	Number of Federal Processor Permits	Number of Groundfish Processing Employees	Processing Labor Person-Hours		Processing Labor Payment	
			Housed	Not Housed	Housed	Not Housed
Kodiak						
January	7	1,422	34,440	182,484	$326,052	$2,165,849
February	7	1,645	127,474	214,655	$1,339,541	$2,659,635
March	7	1,686	126,612	315,540	$2,390,093	$3,958,886
April	7	1,567	82,725	213,604	$954,102	$2,785,893
May	7	1,136	25,805	160,411	$286,175	$1,874,488
June	7	1,123	18,898	119,953	$225,211	$1,478,947
July	7	533	6,714	83,271	$82,558	$1,024,004
August	7	532	6,903	78,400	$97,876	$952,292
September	7	1,447	98,001	264,578	$1,095,659	$3,411,559
October	7	1,403	107,747	244,705	$1,272,712	$3,172,959
November	7	1,108	28,320	100,738	$340,911	$1,286,226
December	7	407	4,768	46,271	$68,512	$579,133
Total	--	--	668,407	2,024,610	$8,479,402	$25,349,871
All Other Geographies						
January	6	890	109,932	0	$1,228,038	$0
February	6	1,201	255,023	101	$2,810,615	$1,446
March	6	1,186	364,564	627	$4,417,681	$1,395

April	5	1,017	260,233	0	$3,100,578	$0
May	5	176	27,440	0	$322,100	$0
June	5	500	31,835	0	$392,269	$0
July	5	474	124,382	0	$1,575,885	$0
August	5	488	97,974	0	$1,260,775	$0
September	5	601	250,365	0	$3,053,302	$0
October	5	544	192,045	0	$2,291,918	$0
November	5	236	13,558	0	$168,687	$0
December	5	0	0	0	$0	$0
Total	--	--	1,727,351	728	$20,621,848	$2,841

Table 1-114 Kodiak and other shoreside processor wages and salaries for non-processing employees, 2015 (from Preliminary SIA, Table 49)

Community	Number of Non-Processing Employees	Total Wages and Salaries
Kodiak	105	$6,046,418
All Others	687	$11,109,935
Total	**792**	**$17,156,353**

1.8.2 Alternative 2: Cooperative Program with Allocations of Groundfish and PSC Species

1.8.2.1 Initial Cooperative Affiliation Between Processors and Harvesters

The key difference between Alternative 2 and Alternative 3 (and the No Action alternative) is the mechanism that determines initial cooperative affiliations between harvesters and processors. Element 6.d states:

> *Initial (2 years) cooperative formation (suboption: in the first two years of each harvester's participation in a cooperative) would be based on the majority of each license's historical landings (aggregate GOA trawl groundfish deliveries, excluding Central GOA rockfish harvested under a rockfish cooperative quota allocation) to a processor during:*
>
> *Option 1. The qualifying years for determining target species allocations.*
>
> *Option 2. 2011 – 2012, or the two most recent qualifying years they fished.*

(The effects of cooperative formation on harvesters was discussed in Section 1.7.2.8; that discussion covers the relative effect on price negotiation between the harvesting and processing sector, as well as impediments to harvesters and processors ending up in a cooperative business arrangement with the partners of their own choosing.)

The analysts anticipate that cooperatives forming at the outset of the program will include most of the vessels (license holders) that received quota share allocations, and that the cooperatives will develop contracts that restrict the delivery of cooperative quota to the co-op's processor member in most cases. Moreover, the contracts are likely to seek to preserve stability in future landings for the processor member by defining "exit provisions" that impose a penalty on harvesters if they choose to move to another processor-based cooperative after the first two years of the program ("cooling-off period"). If the Council selects the suboption that the initial two-year period begins when a harvester first enrolls in a cooperative (as opposed to fishing in the limited access sector), then *all* harvesters who received initial quota shares will be subject to exit provisions at some point – that is, after they have moved into the cooperative where their affiliation is not based on historical landings.

If exit provisions are assumed to be a standard component of the cooperative contracts, then initial cooperative affiliations are critically important to the distributional outcomes for three sets of stakeholders: processors who can from cooperatives at the outset of the program, processors that cannot form cooperatives at the outset of the program (both new entrants and plants that have received historical deliveries but did not receive the majority of deliveries from any individual license holder), and harvesters. Previous discussion papers on this action acknowledge the benefit of establishing a reasonable and objective basis for forming initial cooperative affiliations, given their importance in light of exit provisions. Without such a basis, the processing sector could experience significant disruption at the time of implementation, as harvesters might coalesce around a small number of processors to form a few highly efficient cooperatives with larger PSC allocations over which to share risk. That outcome could leave some processors who depend on GOA trawl deliveries with greatly reduced groundfish revenues. At the same time, the analysts have worked through the exercise of mapping out initial cooperative affiliations based upon the two options listed above and found instances of vessels that would be placed in a cooperative affiliation with a processor to whom they chose to sever business ties at some point during the qualifying years, as well as instances of processors who would see their current fleet roster shrink from a viable number of groundfish trawlers to only one or two vessels. In considering an alternative to basing initial affiliations on an objective measure such as historical deliveries, the analysts note that vessels might not in fact find it so easy to coalesce around a small number of processors due to the natural constraint of a given plant's capacity to receive landings, and the value of existing relationships between vessels and their markets. The Council would benefit from further stakeholder input on the likelihood of mass movements between processors at the implementation of a cooperative program that does not restrict initial affiliation choices.

1.8.2.2 Sector eligibility

Alternative 2 would not create a "closed class" of processors. Any shoreside processor with an eligible FPP could participate in the program. However, it is possible that this action alternative would place processing plants that can form a cooperative at the outset of the program in an advantageous position relative to processors that did not receive the majority of any GOA trawl vessels deliveries during the selected qualifying period. The issue of how cooperatives will initially form remains unresolved at this time. The language of the alternative states that initial cooperative affiliations between harvesters and processors will be determined based on historical deliveries, but NOAA GC has opined that the Secretary of Commerce is unlikely to be able to approve that part of the action without changing the governing statute. Presuming that initial cooperative formation is based on historical deliveries, plants that are unable to form a cooperative with vessels that receive groundfish and PSC quota would likely be restricted to participating in the limited access sector of the fishery for the first two years of the program, which might not be opened to directed fishing if available harvest and reduced PSC limits are not sufficient for NMFS inseason management to allow directed trawl fishing. These plants could theoretically receive deliveries from any vessel, but it is anticipated that private cooperative contracts will limit the amount of cooperative quota that can be delivered to other processors. After the initial two-year cooling off period, those processors could attract vessels to form a cooperative with them, but it is likely that vessels who leave their initially assigned cooperative would have to incur a penalty – as defined in the private cooperative contract – to change their affiliation. Such penalties reduce the likelihood of vessels moving away from their initial processing partner, which provides stability to the set of historically involved processors but reduces competition in the ex-vessel market.

Throughout the GOA, affirming the historically-based initial cooperative formation mechanism could raise barriers to entry by new shorebased plants. New shorebased plants that have business or ownership ties to plants with historical participation would be less affected than those that do not because they are likely to receive permission to take deliveries from vessels whose cooperative affiliation to a plant with which the new plant shares business interests. Basing initial cooperative affiliation on a simple "majority of deliveries" rule could have the

greatest adverse impact on shorebased or stationary floating processors who have periodically entered the GOA groundfish market to fill market demand – thus benefitting the harvest sector – but never sustained participation for long enough to receive the majority of any single vessel's GOA trawl deliveries.

In the Central GOA, plants that cannot initially form a cooperative and are located outside of Kodiak might be further restricted by an option for a Kodiak delivery requirement placed on cooperative quota that is derived from landings that were delivered to Kodiak during the selected qualifying years.

1.8.2.3 Processor allocations of PSC

Alternative 2 includes an option to give processors control over 10% to 40% of the GOA PSC that is allocated to CV licenses and assigned to a cooperative (Alternative 2, Part 6.b). Allocations to an individual processor would be determined according to the amount of PSC assigned to the CV LLP licenses in its cooperative. Processors could assign that pool of PSC incrementally to vessels within the cooperative, under terms established in the approved cooperative contract. Annual contract terms might address when and how processor-held PSC quota can be activated, and how its use promotes vessel-level accountability as well as the cooperative's plan for monitoring and minimizing PSC, as required under Alternative 2, Part 6.f. The Council could require Inshore cooperatives to include information in their annual reports on how this PSC was allocated.

The option further states that the PSC allocated to a processor could not be used by CVs in which a processor cooperative-member holds more than a 10% ownership stake in the vessel.[93] The language in Element 6.b references the term "individual and collective rule," which was first used in the regulations for the halibut and sablefish IFQ program (§679.42) that established quota share use caps, but the term itself is not defined. The regulations for that program define standards for measuring affiliation at §680.2. In this case, the Council is most interested in establishing a simple standard that represents some truth about whether decisions about the vessel's activity are made by a vessel owner (and/or operator) or a processing company to which the vessel delivers its catch. In short, processor control over a vessel may exist when a processor has the ability to direct the business operations of the vessel. In addition to direct ownership, a controlling stake in an entity could be the result of a lease arrangement. The Crab Rationalization Program describes the linkage between processors and harvesting vessels through the term "Affiliation." According to the definition cited above, a processor and a vessel would also be considered affiliated if a third entity (e.g., corporation, association, partnership, joint-stock company, trust, etc.) directly or indirectly[94] owns or controls a 10 percent or greater interest in, or otherwise directs the business operations of, both the processor and the vessel. In the Crab Program, affiliation is determined through an affidavit that is submitted as part of the annual application to receive cooperative quota. The application defines the term "affiliation" according to §680.2, and the applicant indicates whether they are affiliated with any entities that hold crab processing quota[95] and identifies those entities by name, address, and phone number. That information is submitted under penalty of perjury. The information is not routinely audited, but could be investigated by NOAA OLE if there was reason to question its truthfulness. NMFS asks permit or quota share

[93] The option under Element 6.b uses the term "individual and collective rule" for determining whether a processor holds more than a 10% ownerships take in a trawl vessel. The analysts believe that the Council's real intent is to establish an ownership "threshold" that essentially says, 'A processor can provide PSC quota to a vessel if it has no more than a 10% ownership stake in that vessel.' The core of this option is to determine who really controls the vessel's activity and fishing plan – the processing company or the owner/operator. This document provides an example of how a threshold rule might be simply applied to the context of transferring PSC quota in Section 1.7.2.9.

[94] "Indirect interest" is defined as an interest that passes through one or more intermediate entities. "An entity's percentage of indirect interest in a second entity is equal to the entity's percentage of direct interest in an intermediate entity multiplied by the intermediate entity's direct or indirect interest in the second entity." (§680.2(2))

[95] See Block F in: http://alaskafisheries.noaa.gov/ram/crab/ifqannualapp.pdf.

holders that are corporately held to identify who owns the corporation to the individual level, again under penalty of perjury.

For the GOA program, an entity wishing to use a vessel to harvest a portion of an inshore cooperative's annual quota could be required to state whether 10 percent or more of the entity that owns the vessel is, itself, owned by the processor associated with the cooperative, if the vessel-owning entity is otherwise "controlled" by the cooperative processor, or if a third entity controls both the processor and the vessel-owning entity. If any of those statements are true, then the vessel and processor are affiliated.

1.8.2.3.1 Defining the Objective of the Option

The Council has discussed several purposes for considering processor control over a portion of a cooperative's annual PSC allocation as it relates to the program's overall goals and objectives. Allocating cooperative PSC to processors could serve any, or all, of the following five purposes:

1. Help balance the negotiating power between the harvesting and processing sectors;
2. Place marginally more PSC quota under the control of the entity that is in a position to distribute it in a manner that achieves Council and cooperative objectives;
3. Provide processors an access privilege that could be leveraged to recruit harvest vessels to join their cooperative;
4. Build into the program a mechanism that facilitates the use and effectiveness of intra-cooperative performance incentive plans;
5. Compensate for, or defray, the impact of the capital asset devaluation that processors' past investments might undergo in the transition from a limited access pulse fishery to a rationalized fishery.

This subsection discusses the various rationales for granting processors control over a portion of cooperative PSC quota in greater detail. Program goals and objectives that are consistent with each rationale are identified (paraphrased, as applicable). As a caveat, most of the goals and objectives that are referenced below call for a balance of benefits for both the processing and the harvesting sectors, among other stakeholders. In some cases, a measure that might benefit processors would require a trade-off in harvester benefits.

1. Balance negotiations. Allocative actions inevitably affect negotiating dynamics in the ex-vessel market. If CVs are able to deliver their catch to any processing plant, allocating harvest privileges exclusively to LLP license holders could create a favorable situation for harvesters at a cost to processors, relative to the No Action alternative.[96] Processors competing for deliveries might have to bid up or promise higher ex-vessel prices in order to fill their line capacity. Processors have testified to the Council that their sector has made capital investments to meet peak demand during high-pulse periods in the GOA trawl year; they state that those investments were instrumental in developing GOA groundfish markets. Processors are concerned that they might find themselves overcapitalized for a more moderately paced catch share fishery. Even if harvesters and processors are formally linked through a cooperative's contract terms, the harvest sector's control over groundfish and PSC quota would give vessels greater influence over the timing and delivery of catch which, in turn, could affect ex-vessel prices, variable operating costs, and the flow of economic rents.

[96] Note that the Council's current version of Alternative 2 includes initial Inshore cooperative formation requirements based on historical deliveries that would likely not allow for free delivery to any processing plant, but NOAA GC has cautioned the Council that such a program element would be difficult for the Secretary of Commerce to approve under existing regulatory guidance.

Giving processors additional control over a cooperative's PSC would likely provide that sector with more influence over cooperative vessels' harvest and delivery plans. PSC has implicit value as a potential constraint on groundfish harvest. It should be noted, however, that processors have *some* inherent influence over vessels' fishing plans, regardless of where the harvest allocation resides. Vessels will always require a delivery market, and their ability to withhold their effort for a better ex-vessel price is limited by the seasonality of fishing, and GOA processors' well-understood plan to largely switch from groundfish to salmon products during the summer months.

The proportion of PSC quota that processors could control ranges from 10 percent to 40 percent of a cooperative's allocation. Changes in bargaining power will occur when the PSC limit available to the harvesters in a cooperative constrains their fisheries. If harvesters assume that they will not need to access the processor-held PSC, the option would have little impact on relative bargaining power. When PSC is viewed as potential constraint, a relatively small allocation to processors could result in substantial shift in power. These impacts will vary by fishery and as a result harvesters will individually determine the strength of their bargaining position. For example, harvesters that fish flatfish after the pollock and Pacific cod fisheries close will be in a worse bargaining position if the halibut PSC limit is reduced and their processor controls part of the cooperative limit. In that situation the lowest processor allocation percentages under consideration could have a substantial impact on a harvester's bargaining position. A harvester in a cooperative that only fishes pollock would be much more concerned with the Chinook salmon PSC limit controlled by the processor than about control of halibut PSC. If harvesters do not view PSC as a constraint to their business plan, the excess held by the processor will not impact how they negotiate with the processor. In those cases, processors would need to control a percentage of PSC at the higher end of the considered range if it is to affect their position in the cooperative's business.

Applicable Council Goals/Objectives:

4 – Consider the value of assets and investments in the fishery, and dependence for harvesters, processors, and communities.

5 – Balance the interests of all sectors and provide equitable distribution of benefits and similar opportunities for increased value.

6 – Promote community stability by providing employment opportunities and increasing the economic viability of harvesters and processors.

8 – Allow processors to better plan operational needs as well as identify and exploit new products and markets.

2. Enhance efficiency in use of PSC quota. The processor member of a cooperative is in an advantageous position to manage in-season PSC usage and needs within the cooperative. A processor is able to monitor offloads, speak with skippers after each trip about where PSC was encountered, and would have an understanding of PSC levels before observer data is transmitted and revised after NMFS debriefing (either through personal communication or by observing salmon bycatch, which is required to be brought to shore). Vessel operators would undoubtedly be able to communicate similar information amongst themselves – especially under a cooperative structure – but processors have systematic access to near real-time data, and have a private incentive to manage the cooperative's PSC quota in a manner that increases the fleet's potential production level in aggregate. For example, the processor would have a good idea of which vessels are the cleanest (in terms of PSC) and most efficient, so this measure might increase overall TAC utilization. In an economic sense, the processor is in a good position to minimize the internal transaction costs involved in managing the cooperative's PSC. It should be noted, however, that a cooperative manager might fill the same role, to the extent that he or she could access the same quality of timely information; the cooperative manager might use that position and information to serve harvester interests, first.

Applicable Council Goals/Objectives:

2 – Increase the ability of the trawl sector to avoid PSC and utilize PSC more efficiently and cooperatively.
7 – Improve the ability of the trawl sector to achieve Optimum Yield.

3. Facilitate cooperative formation. If the Council recommends a program without fixed linkages between harvesters and processors – where vessels can co-op with any plant, or change their affiliation from year to year – giving processors control over some cooperative PSC might provide processors with a tool to recruit and retain vessels with harvest quota. While the amount of PSC over which a processor has control would be determined on an annual basis, depending on which LLPs are enrolled in their cooperative, the processor's choices about how to distribute that quota during the year might affect vessels' choices about cooperative affiliation in subsequent years. The details of how processor-held PSC quota is distributed would likely be subject to bylaws that are established in the cooperative contract, which is submitted to NMFS but developed independently.

Applicable Council Goals/Objectives:
4 – Consider the value of assets and investments in the fishery, and dependence for harvesters, processors, and communities.
6 – Promote community stability by providing employment opportunities and increasing the economic viability of harvesters and processors.

4. Facilitate cooperative incentive plans. Using regulations to place some amount of a cooperative's PSC under the processor's control effectively builds in a starting point for the development of intra-cooperative performance-based incentive programs. Developing incentive-based measures without a built-in processor PSC allocation could set up a more contentious process, as contract negotiations would have to start with the question of how much (what percentage) of each LLP's annual PSC allocation would have to come "off the top" to fund the incentive pool. Giving the processor control over a larger the proportion of the PSC quota pool would strengthen the effect that any incentive might have on fleet behavior, as it would increase the likelihood that harvesters would need access to processor-held quota in order to catch their suballocation of groundfish. Performance-based incentives would also have a greater effect on fleet behavior during years in which PSC is likely to be a constraint – for example, in years of high Chinook salmon abundance. Each cooperative could define its own objectives for the use of processor-held PSC, and those objectives could go beyond bycatch minimization. Processors could use the quota to support vessels that stay in the GOA year-round and keep the plant and its employees operating later into the fall; they could encourage vessels to go out fishing at certain times when market values are high or when line capacity is unfilled; they could incentivize vessels to expand into underutilized flatfish targets; or they could reward vessels for maximizing their catch of high-value secondary species (limited by MRAs). Cooperatives could set different objectives for the use of Chinook salmon PSC versus halibut PSC, where one account could be used to encourage bycatch avoidance and the other could be used to encourage enhanced value creation.

Applicable Council Goals/Objectives:
2 – Increase the ability of the trawl sector to avoid PSC and utilize PSC more efficiently and cooperatively.
3 – Reduce bycatch and regulatory discards.
6 – Promote community stability by providing employment and entry opportunities and increasing the economic viability of harvesters and processors.
7 – Improve the ability of the trawl sector to achieve Optimum Yield, including increased retention, utilization, landings, and value.
8 – Increase stability relative to the volume and timing of trawl landings.
14 – Promote active participation by owners of fishing privileges.

5. Compensate processors. As alluded to under the first possible rationale, processors have testified to the Council that their sector has built up capital that was necessary to support the GOA limited access fisheries, but that might be underutilized if the fishery is rationalized. In the context of the current Council motion, which does

not contemplate allocating harvest privileges to processors, those stakeholders have proposed several avenues that would guard against economic rent dissipation to some degree. Those proposals have included fixed harvester-processor cooperative linkages, which is implied by the Council's current language, and the option discussed in this section. Recall, also, the caveat that direct or indirect forms of "compensation" to the processing sector would have a countervailing effect on the harvest sector.

Applicable Council Goals/Objectives:

4 – Consider the value of assets and investments in the fishery, and dependence for harvesters, processors, and communities.

5 – Balance the interests of all sectors and provide equitable distribution of benefits and similar opportunities for increased value.

6 – Promote community stability by increasing the economic viability of harvesters and processors.

1.8.2.3.2 Other Considerations

Effects on processor-owned vessels. The Council could choose whether or not to allow processor-held PSC quota to be used on vessels that are owned by the cooperative's processor, as determined by the individual and collective rule (suboption to Element 6.b). Originally the Council's alternative prohibited use of that quota on processor-owned vessels as a measure to prevent preferential treatment of certain vessels by the processor. However, depending on how the option is structured, that limitation might unintentionally disadvantage the vessels that are processor-owned, in turn, adversely impacting the skippers and crew on those vessels who are compensated in relation to their catch. Prohibiting such use would prevent a processor-owned vessel from using up to 40 percent of the PSC quota that came into the cooperative by virtue of its LLP. Such a reduction could significantly reduce that vessel's harvest opportunity in a PSC-constrained year. By contrast, unaffiliated cooperative vessels, as a group, would have access to additional PSC quota that came into the cooperative due to someone else's catch history. In effect, this constitutes a transfer of harvest opportunity from one sub-group within the cooperative to another. The cooperative manager could attempt to rectify the situation by reapportioning a compensating amount of the cooperative's unrestricted PSC to the processor owned vessels. Perhaps a simpler way to avoid inequity while still funding a processor-held PSC account would be to only give the processor control over 10 to 40 percent of the PSC that is associated with LLPs that are *not* named on a processor-owned vessel. Another approach would be to allow processor-owned vessels to use up to the amount of PSC that was allocated to the cooperative by virtue of their LLPs. In other words, if the processor-owned vessels/LLPs accounted for 60% of the cooperative's PSC allocation, then they could access up to 60% of the cooperative's PSC. The latter scenario is not defined as a suboption to Element 6.b. That suboption would effectively exempt cooperatives that exclusively consist of processor-owned vessels from limitations on their use of the PSC that was allocated to their LLPs. Whether any such cooperatives would exist will depend on how the cooperative formation process is structured (i.e., through delivery history or through voluntary affiliation).

Even if there is no direct adverse impact on processor-owned vessels – as might be the case in a year when harvest is not constrained by PSC – preventing processor-owned vessels from accessing a set-aside pool of PSC quota might also eliminate an opportunity to provide those vessels with positive incentives. If, for example, the cooperative contract stipulates that processor-held PSC is distributed based on bycatch performance, the processor-owned vessels would experience additional bycatch performance incentives.

If the Council were to remove the restriction on processor-owned vessels using the processor's PSC quota, it may be worth including a specific requirement for the cooperative's annual report to include a breakdown of which vessels received that PSC quota, and why. The Council or NMFS would be able to monitor whether the PSC was

distributed at a level it considers equitable, whether it was distributed according to cooperative bylaws, and whether any sub-group of cooperative vessels was obviously disadvantaged.

Western vs. Central GOA. The Council could consider including a suboption that would allow the selection of different percentages of processor-held PSC in either GOA regulatory area. For example, the Council could give processors in Central GOA cooperatives control over 20 percent of the cooperative's PSC quota, but give Western GOA processor control over only 10 percent of PSC quota (or vice versa). Several of the rationales provided earlier in this section would characterize this option as a measure to either help processors recruit or maintain a harvesting fleet, to balance price negotiating positions between harvesters and processors, or to compensate processors for the devaluation of capital as fisheries transition from high-pulse derbies to moderately paced catch share fisheries. Future analysis of the larger GOA Trawl action might reveal that the need to counteract these outcomes is not the same in both areas. For example, Western GOA trawl CVs participate mainly in pollock and Pacific cod fisheries, which might be less likely to spread out over time under a catch share program. Relative to flatfish, the timing of those directed fisheries might still be constrained by pollock roe content, fish aggregation, or the historical movement of that fleet into state fixed-gear fisheries or BSAI fisheries at certain points in the year. In terms of competition among processors for deliveries, analysis might reveal that Western GOA vessels have a much more limited ability to shop their catch to different plants, given the geography of the area. These and other more specific examples might emerge as the Council fully defines its proposed structure for cooperative formation and the flexibility, or lack thereof, in harvester-processor affiliation.

1.8.2.4 Observer Coverage and Monitoring

Alternative 2 would move all GOA trawl CVs into the full observer coverage category, where vessel owners would be solely responsible for contracting with an observer provider company and paying a daily rate for coverage. Under the status quo, GOA trawl CVs operating outside of the Central GOA Rockfish Program are in the partial coverage category, meaning that a fee of 1.25% of ex-vessel value is levied on their annual landings (see Section 1.3.1.6). NMFS calculates that fee liability at the end of the year and collects it from the vessel's processor. The intent of the fee structure – and the analysts' understanding of how it is applied – is for the harvester and the processor to share the liability equally, meaning that processors of non-Rockfish Program GOA groundfish are paying 50% of the collected fee. Table 1-94 in Section 1.7.2.5 reports that between $622,000 and $922,000 in fees were collected annually on the basis of GOA trawl CV groundfish landings from 2013 to 2015. Fifty percent of that liability would equate to between $311,000 and $461,000. That amount would be saved by the processing sector, in aggregate, if the fishery were moved into the full coverage category, while the harvest sector would be paying significantly more for observer coverage. The analysts do not anticipate that paying 100% of monitoring costs would result in any additional bargaining leverage for harvesters, while the change would be a clear benefit to the processing sector. Benefits to the processing sector would be distributed in direct proportion to the plants (and their ownership companies) that generate the most groundfish revenue when denominated in terms of ex-vessel payments to harvesters.

1.8.2.5 Employment and Work Flow

For processors that are able to form viable cooperatives through initially assigned affiliations or by attracting deliveries in the future at some cost, Alternative 2 could stabilize the sector against unexpected closures. That stability benefits processing workers in all active communities; local social and economic multipliers are expected to be higher in communities where plants employ a resident workforce. Plants that rely on non-resident crews might benefit from efficiencies in labor planning if managers know when seasons will occur and how long they should last, reducing the frictional costs of hiring, travel, and training. Plant managers could leverage what control they have over harvest timing (e.g., control of PSC quota) to minimize downtime between fishery seasons.

Experienced plant workers could be kept active during shoulder seasons if flatfish utilization increases or if the pollock and Pacific cod season dates are lengthened; retaining valuable workers typically reduces the cost of developing higher-skill positions, improves product quality, and increases morale that could in turn benefit recruiting efforts.

Shifting the nature of the fishery to a quota-based system might result in fewer jobs at peak times, relative to the status quo, though the extent to which fisheries are spread out over time will still be constrained by seasonal species aggregation (as it affects CPUE), roe content, and the need to focus on salmon processing during the summer months. The jobs that do remain would be more stable, but might provide less overtime pay; whether workers view that as a net benefit is likely to depend on their personal household situation and their ability to access other employment when they are not working at the plant; the analysts do not expect non-resident workers living in provided housing to be able to work elsewhere when the plant is inactive. As a general conclusion, the analysts do not expect this alternative to affect the base hourly wage that processing workers are paid, relative to the status quo or the other action alternatives.

Controlling the timing of deliveries might also benefit plant operations by reducing the amount of otherwise idle capital, and reducing costs associated with having to unexpectedly reconfigure processing lines when a fishery closes. Plants operating in a cooperative with target species allocations could decide to switch processing modes away from species that are generating high PSC rates and focus on other fisheries without leaving higher-value fish “on the table” for other plants and cooperatives to sweep up. For example, a cooperative that is constrained by Chinook PSC could stand down from pollock fishing during the C/D season and focus on Pacific cod or even flatfish targets without losing its ability to maximize its gross revenue from pollock. This could, in effect, extend the length of the active period during the fall GOA fisheries and increase work opportunities.

Among the communities that are currently engaged in GOA trawl-caught groundfish processing, the Preliminary SIA indicates that Kodiak is the only locality where some measure of consolidation might be expected. The program itself does not guarantee or promote consolidation, but the measures to guard against it are not so strict as to rule out minor shifts that would have a substantial impact on a particular population of workers – at least during some parts of the calendar year. If initial cooperative affiliations are unrestricted or if cooperative exit provisions are weak, some processors could lose deliveries that would result in lost employment opportunities, at least on an hourly basis. The analysts expect that those dynamics are most likely to play out in Kodiak where multiple markets are available to a local fleet. If initial affiliations are established according to historical deliveries, the greatest impact would occur at plants that have made GOA trawl-caught groundfish part of their annual business plan but did not develop long-lasting delivery relationships with a consistent set of harvest vessels. It should be noted that some forces that could bring about plant consolidation are external to this program and the Council’s policy recommendations.

1.8.3 Alternative 3: Cooperative Program with only PSC Apportionments

Alternative 3 would result in fisheries that have aspects of both the status quo and the Alternative 2 cooperative program. In regards to processors, Alternative 3 most notably differs from Alternative 2 in the ease with which harvesters could change their cooperative affiliations from year to year. In some reasonably envisioned scenarios, Alternative 3 involves a higher relative likelihood that some cooperatives (subsets of the harvest fleet and their processing partners) will have to cease fishing before the end of the season due to attainment of their PSC quota and an inability to lease quota on the market to continue fishing; this, in turn, increases the likelihood that aggregate groundfish catch will be lower, and that the adverse economic impact of that reduced catch will not be distributed evenly across the sector. As is the case with harvesters, processing entities that have greater access to financial reserves are better situated to withstand years where the alternative has a negative effect on gross

revenues, all else equal. Processing plants that rely less heavily on trawl-caught groundfish products would be less exposed to an annual loss within the groundfish operation, but facilities that run low profitability margins might still be susceptible to an operational shut-down for any period of the year. Wage losses for processing workers – further discussed in Section 1.8.3.5 – would be direct.

Harvesters are expected to continue racing to harvest the pollock and Pacific cod TAC, and might use more PSC when catching those species under Alternative 3 relative to Alternative 2. If this occurs processors will likely realize smaller amounts of flatfish deliveries under Alternative 3. Under the status quo all harvesting and processing activity was stopped when an area/fishery PSC limit was reached. Under Alternative 3, cooperative closures could distribute adverse impacts unequally, depending on how effective cooperatives are at limiting their PSC usage. Moreover, cooperatives that take additional steps and incur direct or opportunity costs to avoid PSC might still be the ones that are shut down first, either as a result of random PSC encounter events or as a result of receiving a combined PSC allocation that is not reflective of the cooperative vessels' past use and harvest capacity. As illustrated in the June 2016 discussion paper[97], the annual allocation of PSC quota to historically active and GOA-dependent CVs (and their processing partners) could be dissipated by equal share allocations to vessels that are new entrants or vessels that spend only a short amount of time in the GOA and do not have strong incentives to preserve PSC for year-round fishing and processing.

1.8.3.1 Sector Eligibility

Alternative 3 has the same minimal restriction on sector eligibility as Alternative 2 – simply that a shoreside processor possess an eligible FPP. In practice, however, Alternative 3 would allow processors to compete for deliveries in a manner that is more similar to the status quo. Alternative 3 does not dictate initial cooperative affiliations based on historical deliveries, nor does it include a two-year cooling-off period where vessels are restricted from switching their cooperative affiliations. As a result, vessels are expected to move more freely between processors, though that movement may be tempered by the reality that harvester-processor relationships are carefully developed over years and are not completely malleable.

1.8.3.2 Observer Coverage and Monitoring

Alternative 3 would be identical to Alternative 2 in terms of the effect on the processing sectors' payments for fishery monitoring. GOA trawl CVs would be moved from the partial to the full observer coverage category. As a result, processors would no longer be responsible for half of the 1.25% ex-vessel-based partial coverage fee. During the 2013 through 2015 period, those payments by the processing sector, in aggregate, would have totaled between $311,000 and $461,000. Refer to Section 1.8.2.4 for a slightly more detailed description.

1.8.3.3 Delivery Patterns

Harvesters will begin fishing on January 20th and race to catch pollock and Pacific cod while TAC is available. Processors will need to match processing capacity with the number of vessels delivering, much like they do under the status quo. Because PSC limits will not be assigned by fishery or season, the early-season pollock and Pacific cod fisheries are anticipated to be closed by NMFS when the TAC is met, and not as a result of PSC limits. If the pollock A/B and C/D seasons are combined, additional catch could be taken earlier in the year. Processors could benefit because there are no "gaps" between seasons, which reduces potential downtime for employees. Changing seasonal limits is especially beneficial to plants that rely more heavily on non-resident workers who must travel to the plant location and are often housed on-site.

[97] http://npfmc.legistar.com/gateway.aspx?M=F&ID=7d3ee4c2-7399-4d1c-8e37-d31dae688924.pdf

Delivery patterns later in the year could spread out over time, relative to the status quo, as specific cooperatives approach their individual PSC limit(s). Cooperatives that are close to their limit would exit the fishery. The remaining cooperatives would continue to compete for the most valuable species available. Cooperatives that approach or reach their PSC limit could conceivably extend their season by acquiring annual PSC quota through transfer, though the analysts expect transfers near the end of the year to exact high transaction costs because many cooperatives will be within a single "lightning strike" PSC encounter of having to exit the fishery prematurely.

Flatfish harvests in the fall and winter could be spread out and fished in a rational manner. Benefits from this behavior would accrue to processors in the Central GOA. Processors in the Western GOA traditionally have not taken deliveries of flatfish and the harvesting vessels in their cooperatives are unlikely to have sufficient halibut PSC to create opportunities for their processors expand into those fisheries, even if time is available and market conditions are favorable.

1.8.3.4 Harvester/Processor Negotiation

Because harvesters will continue to race for pollock and Pacific cod, bargaining positions relative to price negotiation will be similar to the status quo. Neither individual harvesters nor individual cooperatives can postpone fishing without risking the loss of catch and the associated revenue. Processors face similar pressures, since delaying fishing could reduce their market share. If one cooperative begins fishing at the start of a season, other cooperatives will feel pressure start. If a limited access sector is open in addition to the cooperative fishery, early effort from that sector could increase pressure to fish when the season opens.

At a micro-level, the requirement to place CVs in the full observer coverage category could benefit processors in negotiation because harvesters are paying observers to wait in town and be ready to deploy. The need to have an observer on hand and ready to leave with the vessel is greater under Alternative 3 than under Alternative 2 because the opportunity to catch fish is rival and not allocated.

Processors might feel pressure to grant incentives to vessel owners who hold a GOA trawl-endorsed LLP license that is "latent" with respect to Alternative 2. Bringing those vessels into the processor's cooperative increases the shared PSC allocation and increases the likelihood that the plant will receive deliveries throughout the season. These enticements might become more valuable over time if experience with the program indicates that the PSC allocation scheme does an insufficient job of matching PSC quota in constrained years to harvesting and processing capacity.

1.8.3.5 Employment

Employment under Alternative 3 is expected to be similar to the status quo. Workers would still be expected to get overtime hours during the peak processing times for pollock and Pacific cod. Slight variations in delivery patterns may result from the flatfish fisheries, because they will be constrained by halibut PSC limits. This could benefit the local workforce if Kodiak plants can utilize local workers to process flatfish at slower pace when pollock and Pacific cod are closed. If some plants can extend the processing season for local workers it would help to ensure the local base of workers is available in the future. In general, the greatest risk to processing labor is that initial allocations of PSC to cooperatives is not distributed in a manner that supports fishing at historical levels, and that the PSC transfer market does not function efficiently because of high transaction costs or reticence to part with PSC due to uncertainty about lightning strikes that might occur later in the year. These factors could cause multiple cooperatives to exit the fishery early, thus stopping deliveries to plants, while other cooperatives hoard PSC that end up going unused at the end of the year.

1.8.4 Alternative 4: Cooperative Program with either CFA or AMP

Alternative 4 could be selected only in tandem with Alternative 2, meaning that impacts on processors need only to be considered in the context of a program that allocates groundfish and PSC quota to cooperatives and a limited access sector, and that might contain options through which processors control a portion of each Inshore cooperative's PSC allocation. The core impacts on shorebased processors that would occur under a cooperative groundfish allocation program are discussed in Section 1.8.2.

The CFA option under Alternative 4 (Option 1) has been more fully developed through stakeholder input at the Council level, relative to the Adaptive Management option (Option 2). The central purpose of establishing a CFA – or two CFAs (Central GOA and Western GOA) – is to ensure that the trawl fisheries benefit GOA coastal communities. At a high-level, this goal should align with the interest of processing plants and the companies that own them, as fish processing is a critical part of these local economies as an employer and socioeconomic keystone. However, Element 4 of the CFA option defines a list of eligible coastal communities[98] that includes localities with processing capital but that have not received GOA trawl landings in recent years. If the CFA were to allocate quota with the goal of redirecting landings to eligible but previously unengaged communities, the current participants that would likely otherwise have received those landings might experience a small decrease in revenue. Any such redistribution of processing activity would be limited by the total amount of quota that is allocated to the CFA (capped at 5% to 15% of the total in each area), elements of Alternative 2 that create local delivery requirements (e.g., for Kodiak), or private cooperative contract provisions that require landings to be delivered to the cooperative's processor member. As currently written, the initial formation of cooperatives would be based on recent historical delivery patterns, and vessels could not change cooperative affiliations for the first two years of the program. Because CFA quota must be fished within a cooperative structure, cooperative contracts might preclude the delivery of CFA quota to plants with no recent participation in the GOA trawl fisher for at least the first two years of the program. The stakeholder proponents of the CFA option have largely testified that CFAs would focus on creating entry opportunities for harvesters and have not indicated a core mission to redistribute landings across processors, but the possibility of small to moderate shifts over the long term must also be considered.

Processors would have a seat on the CFA Board of Directors for the GOA or for each area of two CFAs are established. The other seats, described under Element 5 Option 1 to the CFA option, would include representatives of local boroughs and municipalities, which would also have a vested interest in maintaining the health of the processing sector. At least one Central GOA Board seats are designated for representatives of CQE communities, which could promote an interest in facilitating processing outside of the traditional locations, though the maximum amount would be small – and smaller still if the Council recommends a Kodiak delivery requirement for quota that was historically delivered to Kodiak under Alternative 2.

Element 3 of the CFA option lists four primary goals that would be established in regulation and/or the GOA Groundfish FMP. The fourth listed goal is to "incentivize bycatch [PSC] savings beyond standard requirements by rewarding those willing to adopt additional measures to reduce bycatch with access to additional CFA quota." The CFA would likely give preference to operators requesting leased CFA quota who utilize excluder devices or other fishing and at-sea communication best-practices in order to minimize PSC, or could make those practices

[98] Kodiak, Homer, Seward, Whittier, Valdez, Cordova, and any other community that meets the Community Quota Entity (CQE) eligibility criteria. The latter category includes 45 communities, which can be found in Table 21 to Part 679 in Federal Regulations, not including Adak which is not in the Western GOA, Central GOA, or West Yakutat (https://alaskafisheries.noaa.gov/sites/default/files/tabl21.pdf).

prerequisite. To the extent that these practices reduce PSC and extend fishing seasons, GOA processors stand to benefit as the fisheries are more likely to approach optimum yield and potentially expand into historically underutilized flatfish markets. These benefits might have a greater economic impact in the Central GOA, where the TACs for primary groundfish target species tend to be fully harvested in years that are not constrained by the new PSC hard caps. To the same end, the CFA could use its quota allocation process to encourage harvesters to take advantage of the gear conversion option under Alternative 2 that would allow trawl Pacific cod quota to be harvested using pot gear. Trawl vessels using pot gear might trade off some measure of harvest efficiency in order to avoid the accrual of PSC to their cooperative quota limit, and thus could similarly extend a PSC-constrained fishery (refer also to Section 1.7.2.11). While CFAs provide another potential avenue to establish incentives that reduce PSC levels, it is not clear whether they would achieve results that are not possible through the basic cooperative structure proposed under Alternative 2.

In addition to extending PSC-constrained fisheries, CFAs might also create incentives for harvesters to fish at certain times of the year for market purposes, presumably setting up those incentives in coordination with processor representatives on the CFA Board. Spreading out the timing of catch might allow processors to focus on value added product forms, which could increase revenues, payments to fishermen, and keep line workers employed over a greater portion of the year. As mentioned above, similar goals might also be achieved through the basic cooperative structure of Alternative 2.

The CFA option includes use caps to prevent the leasing of CFA quota from driving consolidation or from benefitting only one or two processing plants at the expense of others who do not receive deliveries of CFA fish, but would have received those fish if the 5% to 15% set-aside was not removed from the Alternative 2 allocation scheme. The Council could select a facility-based processor use cap at 10% to 30% of the CFA quota in each area (Central GOA and Western GOA). For example, a 30% Central GOA CFA processor use cap would ensure that no fewer than four processing plants receive deliveries of a given species that is allocated to CFAs. Because the cap is facility-based, this measure would not preclude a single company that owns multiple plants from receiving more than the cap level for a given species. The Council may wish to consider whether the cap could only be applied in one of the two GOA areas, or set at different levels in each area. Setting a 10% cap would require 10 active plants in order for all CFA quota to be processed; this would result in stranded CFA quota in the Western GOA, where it is unlikely that 10 shoreside facilities will operate in any given year. Table 1-44 lists the number of shoreside facilities that operated in each year since 2010, by municipality. Between three and five plants received GOA trawl groundfish in any given year across the communities of King Cove, Sand Point, Akutan, Dutch Harbor/Unalaska, and False Pass. Those counts do not include floating processors operating in the inshore sector, which have also processed GOA trawl groundfish in every year.

The Adaptive Management option would potentially set aside the same amount of groundfish and PSC quota allocations (5% to 15%) and would allow NMFS to allocate that quota on the basis of approved stakeholder proposals for uses that meet the AM program's goals and criteria. If no such proposals are submitted and approved, that quota would be "passed through," or allocated to the general pool of eligible quota share holders who would otherwise have received it. While the Council has yet to develop eligibility criteria to receive AM quota, the language of the option defines five goals and objectives for the program option (Alternative 4, Option 2, Element 1). Three of those five goals tie directly to processors: Community Stability, Processor Stability, and Uses that Address Unintended Consequences. Because the eligibility criteria remain undefined, nothing precludes a processor or group of processors from submitting a successful proposal to receive and utilize groundfish or PSC quota to ends that promote community or processor stability.

As stated in previous discussions of the AM option, situating the set-aside as a "pass through" means that the likelihood of quota shares being pulled back from the general pool and reallocated to a subset of the fisheries' stakeholders on the basis of a proposal becomes lower over time. Between the time of implementation and the submission of a proposal, quota recipients are likely to become reliant on their full allocation of quota in order to meet their business plan obligations. Reducing allocations across the board for all participants who are not involved in the proposal – directly or through a cooperative – is likely to create demonstrable distributional impacts that would need to be justified by establishing that the GOA Trawl Bycatch Management program has created a direct, adverse, and potentially unforeseen impact on a distinct set of stakeholders.

1.9 Analysis of Impacts on Tenders

NMFS has issued a proposed rule that would require tender vessel operators to use the "tLandings" software application to prepare electronic landing reports. This action improves the timeliness and reliability of CV landing reports for use in catch accounting and inseason management. That action will also provide better information about tender operations that could aid decision makers in cases where the changing uses of tender vessels affect the fishery or the execution NMFS's monitoring plan. If the tender vessel is not identified on the current paper reporting system, NMFS cannot distinguish a tender vessel delivery to a processor from a vessel delivery to a processor.

In February 2015, the Council reviewed a report describing the legal framework for tendering GOA groundfish and recent tendering activity in the GOA pollock and Pacific cod fisheries (NPFMC, 2015). The Council requested that report after members of the public expressed concern that tendering operations were being used to shift deliveries away from ports in GOA (primarily the Western GOA ports) and Aleutian Islands communities. After reviewing that document, the Council recommended retaining existing regulations that allow CVs to tender pollock and Pacific cod to achieve operational efficiencies. Under recent practices, small vessels operating in Area 620 were using tenders to deliver to Sand Point, and large vessels in that area were tendering fish to Kodiak. The report stated:

> *"[S]ome harvesting vessels associated with one Kodiak processor changed their fishing pattern to begin delivering some of their pollock to tender vessels stationed at the 157° line, rather than to the Kodiak plant, and the fish was then transported to the company's other processing plants on the Alaska Peninsula. The company noted it was better utilizing its processing capacity across all plants… It was also reported that the recent increase in use of tender vessels in the Area 620 pollock fishery, and the delivery of that fish to other Alaska communities, has changed the distribution of landing tax revenue, and economic activity associated with processing pollock, away from Kodiak to other communities."*

Since that report was published, the processing firm referenced in the report has increased its capacity in Kodiak, thus reducing the need to tender fish. While capacity constraints might not always factor into a firm's future decisions regarding the use of tenders, those decisions might be affected by the structure of fishing regulations (e.g., observer coverage requirements) and changes in fishing costs (e.g., fuel costs).

1.9.1 Alternative 1: No Action

The analysts assume that vessels would continue to use tenders when doing so increases operational efficiencies. For small CVs, efficiencies are primarily associated with limiting the time and distance that a vessel must travel to transport fish to a plant. Small CVs can reduce harvesting costs if delivering to a tender is less costly than transporting catch to the processor themselves. Transportation costs increase when vessels fish farther from the plant, or the price of fuel increases. Vessels fishing the Western portion of Area 620 may have to travel 150 miles

each way to deliver to Sand Point. Vessels that have a small hold capacity may determine that it is more efficient for their operation to deliver to a tender at the 157˚ West Longitude line and avoid the time and expense associated with the approximately 300 mile round trip delivery.

The amount of pollock and Pacific cod that will be tendered in the GOA will depend not only on TACs, but whether the use of tenders increases the amount of pollock or Pacific cod that a CV is able to harvest during the open season. Vessel operators will continue to race to harvest pollock and Pacific cod under Alternative 1, especially when the remainder of a season is projected to last less than 24 hours. Under that situation, industry has had difficulty gaining unanimous agreement to form voluntary cooperatives. Using tender vessels could allow a CV to harvest more pollock and Pacific cod if constraints on the fishery do not allow daily deliveries.

1.9.2 Alternative 2: Cooperative Program with Allocations of Groundfish and PSC Species

Both pollock and Pacific cod would be allocated to cooperatives under Alterative 2. Vessels in cooperatives would only elect to deliver to tenders if it reduces costs since the amount of pollock and Pacific cod an individual may harvest is determined by his or her cooperative allocation, and not by competition. If the Limited Access fishery is open to directed fisheries, the same incentives to use tender vessels that were described under Alternative 1 would apply.

The requirement for all trawl CVs to carry 100% observer coverage is a primary cost consideration under Alternative 2. The analysts understand that this requirement would apply to CVs that deliver to a shorebased processor, a stationary floating processor, or a tender vessel. Observer coverage requirements would apply to vessels delivering to tenders in order to monitor at-seas discards. Exempting CVs that deliver to tenders from observer coverage would incentivize CVs to deliver to tenders to avoid the observer costs. Catch and discards that occurred prior to delivering to a tender could not be monitored, and total catch estimation would suffer. If the only purpose of the observer on a CV delivering unsorted codends to a tender is to account for at-sea discards, maintaining the monitoring requirement could create an incentive to develop electronic monitoring (EM) options for the trawl sector in place of an observer. Some studies show that the EM costs less that human observer monitoring if the EM objective is simply to verify that at-sea discards did not occur (as opposed to using EM to determine the size, species, and weight of those discards) (GARFO and NEFSC, 2015). If the Council pursues EM options for the trawl CV sector, it will also need to consider how CVs that would then be in the full coverage category would pay for electronic monitoring and video review, and how that payment is applied to vessels that might also fish in the partial coverage category when using fixed-gear, where EM is funded through the 1.25% ex-vessel based monitoring fee.

1.9.3 Alternative 3: Cooperative Program with only PSC Apportionments

Whether or not Alternative 3 alters the amount of tendering in the GOA CV fleet will depend on how much the use of tenders reduces vessels' costs or allows vessels to catch a larger portion of the unallocated groundfish species. CVs will select business practices that allow the vessel to harvest as much pollock and/or Pacific cod as possible within the constraints of PSC limits and fishing costs.

In some cases, as described under Alternative 1, the use of tender vessels could allow a CV to increase its harvest of pollock and/or Pacific cod, through reductions in the time spent transiting to and from the fishing grounds and waiting to offload at the plant. The increase in harvest could provide a benefit that warrants the cost of contracting a tender. Such is not the situation under Alternative 2, under which transit and waiting time does not necessarily affect the amount of groundfish that a vessel will catch over the course of the season. Therefore, the incentive to utilize a tender is likely to be greater under Alternative 3 than under Alternative 2.

If the motivation to use a tender is based solely on minimizing operational costs (e.g., fuel, or the daily cost of paying for a full coverage observer), then the difference in use of tenders under the two main action alternatives might not be so great. This is most likely to be the case in years where pollock and Pacific cod TACs are not a constraint to the fishery in a particular season or management area.

1.9.4 Alternative 4: Cooperative Program with either CFA or AMP

The analysts expect that implementing a CFA in conjunction with Alternative 2 would have little or no impact on the use of tender vessels. The most likely scenario under which Alternative 4 increases the use of tender vessels is if a CFA or AMP redistributes quota to smaller CVs that are more likely to use tenders due to their limited hold capacity and desire to reduce the operational cost of making long deliveries from relatively remote fishing grounds.

1.10 Analysis of Impacts on Captains and Crew

When the Council began developing alternatives for the GOA Trawl Bycatch Management Program, it simultaneously recommended to the SOC the implementation of a GOA Trawl Vessel Economic Data Report (EDR) that is focused on the collection of employment data and some costs associated with the GOA trawl fisheries. The first year of data collection covered the 2015 fishing year. That information is used in this section to provide quantitative information on employment. Several caveats associated with the data are described first.

Since 2015 is the first year of the data collection program, this document provides only a single year of employment and compensation information. Industry members are instructed that an EDR must be submitted in a timely fashion (by the defined due date) and all information fields must be accurately completed according to instructions on the form. At the time these data were developed for use in this paper, the due date for submission of the EDR had passed and 10 CV operators had not submitted their EDR form.[99] One vessel was sold during 2015 and each vessel operator was required to submit an EDR for the portion of the year that they operated the vessel. This sale and the resulting double-submission increased the captain/crew count by four individuals.

No audits of the data have been conducted on the EDR data at this stage, and the information submitted has not been verified. Audits typically identify outliers in the data. Because other years of data do not exist to determine outliers, such an audit could not be conducted.

Data on individual harvesting crew members working on Amendment 80 CPs were also collected for the first time in 2015. That information was gleaned by adding questions to the Amendment 80 EDR, which has been collected since the Amendment 80 program was implemented in 2008. While the Amendment 80 EDR now requires that harvesting crew license numbers are submitted, some CP operators obtain crew licenses for onboard processing plant workers, even though it is not required by law, so those employees can work as harvesting crew if needed on the trip. Some CPs provided all the crew license numbers for workers on their vessel, including processing workers, and other provided license information only for harvesting crew. Including processing crew workers in the counts will overestimate the number of harvesting crew members in the CP fleet. As a result, the numbers provided are not directly comparable to the CV crew information.

[99] Six of the 10 vessels did not appear to fish in the GOA during 2015 and are only required to submit the form indication that they did not fish with trawl gear in the GOA that year. The four other vessels did report GOA trawl landings in 2015, but have not complied with the EDR requirements. Typically, quota is withheld if a vessel does not complete a required EDR, but since no quota is issued for the GOA trawl fishery at this time, that is not an option in these cases.

This section summarizes employment at a high level. Greater detail on crew residence/location information is provided in the community impact section of this document (Social Impact Assessment Preliminary Review: Appendix 5).

1.10.1 Alternative 1: No Action

Table 1-115 shows the number of crew licenses reported in the GOA trawl CV fleet as well as estimated total and average crew compensation, based on 2015 EDR data. The EDR requires that either the ADF&G Commercial Crew license number or CFEC Gear Operator permit number must be reported for each individual who worked as a licensed fishing crew member on a GOA CV in the non-Rockfish Program trawl fishery. It is assumed that the CFEC Gear Operator permit is held by the person or persons operating the vessel. ADFG Commercial Crew Licenses are held by deck crew who do not work in the wheelhouse. The "Total Crew Licenses Reported" field double-counts crew that fished on more than one vessel. "Distinct crew members" does not double-count persons who fished on more than one CV. According to EDR data, 365 individual crew members were reported in the submitted EDRs to have worked on trawl CVs in 2015. The difference between the total instances of active crew licenses reported and the count of distinct crew members is the number of crew that worked on more than one CV in 2015. Therefore, 22 crew members fished on more than one GOA trawl vessel in 2015.

Table 1-115 CV crew counts and compensation, 2015

Permit Number Provided	Total Crew Licenses Reported	Distinct Crew Members
CFEC Gear Operator permit	112	103
ADF&G Commercial Crew license	275	262
Total	387	365
		Compensation (total)
Captain payments ($Million)		$8.93
Crew payments ($ Million)		$13.88
Total		$22.81
		Compensation (average)
Estimated average captain payment		$86,699
Estimated average crew payment		$52,977

Source: GOA Trawl EDR 2015
Note: Information for the CVs (assumed 4 that were active) that did not submit their EDR are excluded from the table.

About 28% (103) of crew workers were identified by their CFEC Gear Operator permit. This is approximately the ratio of captains to crew members that would be expected in these fisheries when accounting for relief skippers. Captains were paid roughly $8.9 million dollars in compensation and other crew were paid roughly $13.9 million. In total, captains and crew were paid about $22.3 million for making GOA trawl landings. Assuming that the CFEC permit count represents the captains and ADF&G licenses represents the deck crew, captains were paid $86,699 and crew were paid $52,977 per year, on average.

Most crewmembers worked in several different fisheries, including both state-managed and Federally-managed fisheries. For example, many of the vessels participate in Federal fisheries such as the Central GOA Rockfish Program, the GOA Pacific cod pot gear fishery, BSAI trawl fisheries for pollock and Pacific cod, and West Coast groundfish fisheries. Many of the trawl vessels that are 58' in length also participate in state salmon fisheries during the summer. The revenue to crew members in these fisheries are not included in the values reported the table above.

Crew members are compensated on a share basis, receiving a percentage of the vessel's revenues. Crew members with greater experience or working in more demanding positions may receive a larger share. Vessel owners calculate the crew percentage using various formulas. The formulas primarily differ in the deductions that are taken from gross revenues prior to distributing crew shares. For example, one vessel owner may deduct food or fuel usage from the gross revenue before calculating crew shares while a different owner might not. These deductions and the formula used by a particular vessel are typically understood by the crew before they sign on to work for the vessel. Crew participation and compensation is likely to maintain that structure under the status quo.

Table 1-116 provides information that is similar to the CV table above. The information is different because the EDR forms are not the same for the CP and CV sectors. The CP EDR is collected as part of the Amendment 80 program, and is more detailed; it focuses on cost and production information for the BSAI and GOA fisheries. As a result, CP EDR data is not specific to the GOA. The bottom portion of the table shows the days fished in the GOA and BSAI. The reader should not assume that the revenue generated from each area, or the resulting crew compensation, is proportional to the days fished.

Table 1-116 CPs active in the GOA trawl fisheries, 2015

Permit Number Provided	Total Crew Licenses Reported	Distinct Crew Members
CFEC Gear Operator permit	37	35
ADF&G Commercial Crew license	534	472
Total	571	507
		Compensation (total)
Captain/crew payments ($Million)		$13.47
Processing crew		$40.46
Total		$53.93
		Days fished
GOA		512
BSAI		3,576

Source: GOA Trawl EDR 2015

1.10.2 Alternative 2: Cooperative Program with Allocations of Groundfish and PSC Species

The implementation of a new GOA trawl management regime is likely affect captains and crew. The temporal distribution of fishing effort would be expected to expand beyond the season dates that exist under the status quo. Some vessels that have historically participated in the GOA trawl fisheries prior to or after the selected qualifying years might not receive GOA groundfish trawl allocations. Other vessels might be issued a small amount of quota or, for other reasons, might choose to lease their quota within the cooperative structure. These conditions would result in fewer crew jobs being available in the GOA trawl fishery. Notwithstanding this decrease in vessels that fish in the non-Rockfish Program GOA trawl fisheries, it is unlikely that vessels will entirely leave the North Pacific fisheries if they are substantially engaged in other fisheries in the region. However, the transfer of quota between vessels is likely to affect compensation for select individual crew members. Payments within a cooperative to lease quota are likely to accrue to the quota owner. Crew members who would have worked on the vessel from which quota was transferred would lose a potential source of income, though the direct economic impact will vary depending on those individuals' other opportunities to work during the time that they would have spent engaged in the GOA trawl fishery. Crew on vessels that gain additional fishing opportunities through leasing would realize an increase in earning potential, though that amount could be mitigated on a per-unit basis depending on the level of lease rates determined within the cooperative and the extent to which the vessel owner deducts lease-fees from gross revenue before distributing payment.

The gross amount of compensation that crew members earn across all of their fisheries could change in some cases. For example, crew on vessels that leave the non-Rockfish Program GOA fisheries would experience reduced earnings if their vessel does not expand revenues in other fisheries. Crew on vessels that remain in the GOA trawl fisheries might earn more due to increased harvests or higher ex-vessel values. Catch increases are likely under Alternative 2 for vessels that remain active in the fishery if some vessels within a cooperative lease quota or if vessels take advantage of the flexibility in timing afforded by receiving pollock and Pacific cod allocations to exploit new opportunities in flatfish markets. The overall increase in value derived from the fishery is expected to increase as TAC utilization increases and PSC rates decline. The extent to which total revenues increase depends, in part, on the structure of the association between harvesters and processors in a cooperative, the relative negotiating leverage between the two parties, and the degree to which new product forms or higher recovery rates can be achieved.

The option to allocated a portion of each cooperative's PSC to the processor member could affect CV crew compensation if the amount allocated is sufficient to give the processor clear control over which vessels fish, and when. With that leverage, it is theoretically possible that the processor would be in a position to negotiate marginally lower ex-vessel payments, which in turn affect crew shares. The Council is considering a range of 10% to 40% for the PSC allocation to processors. It is not possible to identify a tipping point above or below which the price-negotiating leverage favors the processor or the harvester, because the influence of PSC quota on fishery access depends largely on how constraining the cooperative's PSC limit is in that year. PSC could be more or less of a constraint depending on environmental factors that influence the collocation of PSC species and groundfish. Generally, one would expect a larger allocation of PSC to processors to have a depressing effect on ex-vessel values, though it should be noted that the prices paid to harvesters will be influenced by other program design choices such as whether harvesters are able to move freely between cooperatives or deliver to more than one processor in an area. During years when PSC rates are low throughout the trawl fishery, even a large allocation of PSC to processors might not affect price negotiation.

Crew on catcher/processors that actively fish under the program might benefit from consolidation of harvests on fewer vessels. Gross revenues for active CPs might also increase if allocation results in technical efficiencies – such as higher recovery rates – or if CPs are able to exploit a larger portion of the available flatfish TACs. Existing restrictions on CP participation in the GOA flatfish fisheries have resulted in the sector agreeing to fish only four vessels in recent years. Therefore, formalizing a cooperative structure for GOA CPs is not expected to have a substantial impact on participation levels in the harvest of non-Rockfish Program species.

1.10.3 Alternative 3: Cooperative Program with Allocations of PSC Species

Because Alternative 3 would not allocate quota shares of pollock and Pacific cod, the alternative is expected to generate fewer opportunities for increased ex-vessel value in the CV sector relative to Alternative 2. Similar to Alternative 2, CVs that target flatfish could generate additional gross income, and thus increased crew compensation, if the cooperative structure results in lower halibut PSC rates. However, during years when halibut PSC is a limiting factor for vessels, participation in flatfish fisheries might generally decrease as halibut PSC would first be used to target the higher-value Pacific cod fishery.

Because vessels would likely continue to race to harvest pollock and Pacific cod TACs, it is expected that about the same number of CVs would fish in the GOA trawl fisheries as under the No Action Alternative. In areas where the full amount of the TAC is not typically caught, the analysts would not expect this action to reduce fleet size, unless the general level of uncertainty surrounding the fishery reaches a level where harvesters suspend their business plan altogether. In general, the number of crew jobs available is likely to be roughly the same as under the Status quo. Relative to Alternative 2, the total number of crew jobs under Alternative 3 is expected to be

higher. The amount of compensation that crew will receive depends on a variety of factors. Vessel owners could face increased costs for observer coverage or cooperative management under either Alternative 2 or 3. Depending on how those costs are divided between the vessel and crew, total crew compensation could be reduced relative to the status quo. Because Alternative 3 is not likely to be considered a LAPP and thus would not require a cost recovery fee, the increase in costs that affect crew compensation could be smaller than under Alternative 2; however, the additional LAPP cost might be offset under Alternative 2 if ex-vessel values for groundfish species increase or if vessels expand their participation in flatfish.. For vessels that remain active, crew compensation relative to Alternative 2 might decline because vessel operating cost savings from consolidating quota on fewer vessels would not be realized in the pollock and Pacific cod fisheries. Overall, it is expected that the number of crew jobs will be greater under Alternative 3, but the overall compensation paid for those jobs could decline.

The impact on CP crew compensation is expected to be similar under Alternatives 2 and 3. CPs will be given an allocation of PSC under both options, but are not allocated pollock or Pacific cod beyond an ICA. As a result, the availability of PSC will primarily determine CP behavior, and the allocation of PSC is essentially the same under either action alternative.

1.10.4 Alternative 4: Cooperative Program with either CFA or AMP

Alternative 4 is expected to reduce compensation to some individual crew members and increase it for others. Crew working on vessels that receive an allocation that is reduced by 5% to 15% in order to fund a CFA or AMP can expect a similar reduction to their compensation. Crew on vessels that are granted access to the quota through the CFA or AMP would increase their wages through access to new fishing opportunities. The amount of the wage increase to crew working on vessels that fish CFA or AMP quota depends on how lease payments to the CFA are structured and whether they are deducted prior to determining crew compensation, or any fees that might be involved in developing proposals for adaptive management quota. The CFA contract could include stipulations on how crew shares may be impacted by the CFA lease fee. However, unless all costs deducted from gross revenue prior to calculating lease fees are audited by the CFA or NMFS, it would be difficult for the CFA to ensure that crews are not affected.

1.11 Impacts on New Entrants

The choice to enter the GOA trawl fisheries is influenced by the harvester's ability to secure a market for the catch, cost of entry, harvesting costs, and the availability of the required permits/quota to participate in the fishery. Any new entrant must establish a partnership with a processor that is willing to take his/her deliveries. New entrants in the processing sector will also need to determine if the market conditions are favorable to enter the fishery and if they will have the opportunity to attract deliveries of adequate amounts of good quality fish, at a fair price, in a consistent and timely manner. That process typically means that the harvester and processor agree on terms of the delivery - including the timing, quality, and ex-vessel price. The agreement may also specify what other goods and services the processor will provide the harvester or the harvester will provide the processor.

Costs associated with entering the GOA trawl fishery are relatively high compared to many fixed gear fisheries conducted by smaller vessels. The higher costs to enter the fishery means that this is not considered an entry level fishery by many who have testified to the Council. Persons that participate in the fishery as trawl vessel owners have traditionally worked their way to ownership by starting on the deck, working their way to the wheelhouse, and eventually securing loans to buy the needed licenses and a vessel after they have gained experience in both the business and harvesting side of the fishery. This process can occur in both family owned businesses where second generation family members tale over the business or when the business is sold at a more arms-length transaction.

Harvesting costs are expected to change under the various options. Changes in costs that are expected to have the greatest impacts on new entrants and existing harvesters were discussed in Section 1.7. Those costs are borne by all participants, though they may vary somewhat by firm. For that reason they are described in a broader context than just new entrants.

A primary change for new entrants is the difference in permit and license values before and after the proposed program is implemented. Change in costs associated with the licenses are described in expected directional change and not specific values, since the information available does not provide a basis to project specific values. However, the value of permits needed to enter the fishery are based on the buyer's expected value that can be generated from the permit. These values vary by person and depends on their businesses' internal calculation of the discounted stream of net benefits derived from the use of that asset. The internal calculation should include consideration of the value of alternative uses of that investment, since every action, choice, or decision has an associated opportunity cost. New entry then depends on whether potential entrants determine that the value of the next-highest-valued alternative use their resources is less than buying into the GOA trawl fishery.

1.11.1 Alternative 1: No Action

Under the LLP and current market conditions most LLP license holders are that are currently not participating in these fisheries are unlikely to perceive substantial gains from entering. Uncertainty associated with future value of the LLP licenses, given consideration of this proposed program, may limit the transfer of LLP licenses in the short-run. As a result, modest (if any) increase in participation should be expected in the near term.[100] Continued poor economic conditions for fish prices could lead to additional consolidation of the GOA trawl harvesting fleet and processors if LLP license holders determine it is not economically efficient to fish. The persons most willing to sell to a new entrant fall into two categories:

- persons that are not profitable in the current economic conditions and either do not have the financial resources to cover short term losses or are pessimistic regarding the future economic condition of their firm, and
- Persons that want to leave the fishery because of age, health, or other personal reasons.

Persons willing to purchase licenses/vessels are likely either:

- Individuals with experience in the fishery and with sufficient financial backing to buy permits and vessels. These people could be skippers/crew that have reached the point in their career they want to be an owner,
- Vertically integrated firms that have linkages to processors, or
- Persons that already own trawl vessels or licenses involved in the GOA trawl fisheries or other catch share programs.

When economic conditions improve, it will create incentives for persons that hold inactive LLP licenses to reenter the fishery. The activity of some of those LLP licenses will be constrained by sideboard limits in other fisheries (Section 1.3.1.9). Those limits will impact the revenue that they can generate in the GOA trawl fisheries. However, because they are subject to sideboard limits, they may derive a substantial portion of their value from other fisheries.

[100] The Council has received testimony from individuals and the data presented in this document indicates that 4 firms have entered the fishery after the 2012 cut-off date for accruing catch history. So there is has been entry and exit (the number of participants has declined) over the recent years.

1.11.2 Alternative 2: Cooperative Program

Because the discounted long-term stream of net benefits derived from the fishery is expected to increase under Alternative 2, the value of GOA trawl LLP licenses with substantial catch history is expected to be greater than under the status quo or Alternative 3. The primary difference in value, assuming programs have equal duration, is associated with the secure allocation of groundfish species and the expectation of healthy groundfish stocks in the GOA.

The reason some LLP licenses could have lower value under Alternative 2 is that they provide no opportunity to increase the harvest of the allocated species. LLP licenses with an allocation that is too small to support a fishing operation would either sell their quota, likely to a current participant, and exit the fishery or buy additional quota to make to their fishing operation more viable. Under the other alternatives the LLP license does not provide a secure allocation, but it could allow a buyer to increase the amount of fish harvested without buying additional permits or quota.

Selling an LLP license that has catch history attached allows the initial recipient of the quota to capture the future rents of the quota at the first sale. The value of the quota will depend on its duration and the expected future value of the quota by the buyer. The sum of discounted future net benefits, yields estimates of the value of the quota to the buyer. The net value varies by individual because of different assumed discount rates, the cost structure to harvest the fish, and expected market prices.

The duration of the quota is important because when the buyer capitalizes the value of the quota it sets up the potential for a transitional gains trap. A transitional gains traps may occur when a government program intended to benefit particular constituents become capitalized, and when the program ends, the capitalized rents are eliminated. If buyers have concerns about the duration of the program, it reduces the value of the quota, because the number of years that the quota is expected to generate revenue is reduced. Programs with short duration allows new entrants to buy into the fishery for a lower price because they are not paying for the all the future years of discounted expected net revenue.

The ability of processors to enter the fishery in the near term will depend on the structure of Alternative 2 that is implemented. As currently proposed, there will be very limited opportunity for a new processor to enter during the first two years of the program. Contracts developed during the first two years could impact the ability of a new processor to enter beyond the first two years.

In addition to the delivery restrictions proposed, the current market conditions are less favorable for small and less diversified processors to enter. Processors While these conditions could change after the program is implemented,

In summary, entry into the program under Alternative 2 is expected to be more costly because the buyer expects to generate more value from the fishery. This may mean that some potential new entrants would not have sufficient capital to enter the fishery. Other programs have described the result as allowing persons with “deep-pockets” to acquire quota. In the GOA trawl fishery, and trawl fisheries in general, the problem is magnified because of the cost of large vessels, expensive gear, and high management costs. Combined, these costs are substantial. These costs, in addition to the learning curve associated with operating a trawl vessel, are why people often state that this is not an entry level fishery.

1.11.3 Alternative 3: Cooperative Program with Allocations of PSC Species

The value of LLP licenses under Alternative 3 will vary depending on the discounted long-term stream of net benefits buyers of the licenses expect to generate. That value will be impacted by several factors including:

- The endorsements attached to the license that allow participation in other areas, other gear types, and other fisheries (Pacific cod endorsements),
- Catch history assigned to LLP license for other catch share programs (e.g. Central GOA RP),
- Sideboard limits attached to LLP license, and
- The number of persons expected to apply for PSC limit allocations.

The number of persons that apply for PSC allocation is limited by the number of GOA trawl LLP license available in an area. Increasing the number of LLP licenses that have an equal share of various quota pools attached decreases the average PSC limit attached to an LLP license. To the extent the decrease in PSC limits are expected to constrain the harvest of species the prospective vessel operator wishes to target, it will reduce the value of the LLP license.

Under Alternative 3 a new entrant may buy an inactive LLP license with no catch history and enter the GOA trawl fisheries. Those licenses will be assigned a PSC limit based on the PSC pools the owner is qualified to receive an equal share. Once the PSC is attached the new entrants have entered the fishery they will need to compete for catch. The competition to harvest target and valuable secondary species this will create an advantage for efficient and effective harvesters. Experience in the fisheries are expected to be a factor in determine who is the most efficient and effective, which may put new entrants at a disadvantage.

Under Alternative 3, processors are expected to respond more like under the status quo than Alternative 2. They will need to have production capacity to take deliveries under a race to fish for pollock and Pacific cod. To the extent new processors would find competing under the status quo to be not feasible, they are likely to encounter similar conditions under Alternative 3. Processors that are most likely to enter the fishery are those that are diversified in other fisheries and areas. These processors may purchase an existing plant to expand their current operations. Some processors are not active every year, but periodically take deliveries of GOA trawl caught groundfish. These processors with more sporadic histories in the GOA trawl fisheries are not considered to be new entrants. Additional discussion of the changes that have occurred in the processing sector are described in the Social Impact Assessment and Section 1.8.

In summary, Alternative 3 is expected to create a system that allows for a lower cost of entry into the fishery for harvesters relative to Alterative 2. This may enable more people the opportunity to enter the fishery. That opportunity will come at the cost of greater uncertainty with future value derived from the fishery, since they must compete for shares of the TAC. Processors that enter the fishery, if any do in the future, are expected to be those that wish to expand their existing operations.

1.11.4 Alternative 4: CFA

The goals of the program with respect to harvesters include assisting entry-level and small vessel owner-operators. To the extent the program allows new entry it will reduce the allocations available to historical participants to provide the opportunity for new entry. The new entrants are expected to use the CFA quota to develop a long-term business plan that will allow them to be self-sufficient after a time period determined by the CFA. To the extent new entrants can develop a business that allows them to use the CFA as a stepping stone to enter the fishery, it will provide assistance by reducing costs during the period they access CFA quota. The amount of the reduction will be dependent on the lease price of quota from the CFA version the open market lease price. The difference in price is not estimated in this discussion because of the uncertainty and assumptions associated with that estimate. If person do not become self-sufficient the CFA quota would be tied-up supporting

those entities and limit the quota available for future new entrants. The persons using the quota will need to transition away from CFA quota by purchasing quota on the open market to continue fishing. The ability to purchase additional quota will be dependent on the net revenue they can derive from their businesses and how much they can allocate to the purchase of quota. If they are unable to allocate sufficient capital to the purchase of new quota, transitioning to being independent of CFA quota may not be feasible.

The CFA program requires the quota to be fished in a cooperative with an associated processor. It is possible that CFA quota could be used to help new processors enter the fishery. Whether the CFA quota is delivered to new or existing processors will depend on who receives the quota, how the quota is fished (gear conversion), and where the deliveries are made. Given the uncertainty associated with who will apply for the CFA quota and how it will be distributed, projections of impacts relative to new processor entry would be tenuous at best.

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Appendix 1: Summary of Voluntary Cooperative Efforts in the Central GOA groundfish trawl fishery (submitted by Alaska Groundfish Databank)

The following was provided by industry stakeholders, at the request of NPFMC staff. The text was lightly edited for copy, but the themes, anecdotes, and conclusions remain solely those of the Alaska Groundfish Databank.

Industry and NMFS have worked together in attempts to meet management challenges with the CGOA trawl fisheries and restrictive bycatch limits. NMFS has had a difficult time managing the fishery in-season to meet bycatch restrictions and still attain optimum yield, and industry has adopted several voluntary measures to assist NMFS management. As part of this effort, NMFS has encouraged industry to attempt to develop voluntary cooperative fishing practices in CGOA trawl fisheries. These are described more fully below.

Pollock:

Voluntary CSPs have been most widely used in the Central GOA trawl pollock fisheries around Kodiak Island. Table 1 shows the voluntary catch share plans for Areas 620 and 630, by season, for the years 2010 through 2016.[101] After the Amendment 97 Chinook salmon PSC hard caps became effective during the last half of 2012, the fleet has discussed possible CSPs for every pollock season, in both Central GOA areas (620/630). The reasons for implementing a voluntary agreement are varied. Some CSPs were spurred by concerns about salmon bycatch closing the fishery, which is of greatest concern during the fall seasons when salmon bycatch rates are the highest (C and D seasons). Fall pollock quotas are set at high levels during the fall season, relative to historical TACs, and the Amendment 97 Chinook PSC limits must fund and entire year of pollock fishing (2014 through 2016 saw the highest pollock quotas since 1985). At times, the fleet has agreed to a CSP during the roe season in order to bank salmon PSC for the fall when it is most needed. CSPs have also developed during times when the remaining pollock TAC is small, and NMFS will not open the fishery because the 24-hour harvesting capacity of the fleet exceeds the remaining available quota. CSPs have also been agreed when low remaining TAC amounts allow only short pulse fisheries (three days or less) in order to avoid exceeding the TAC. TAC amounts that do not meet the 24-hour threshold persist in Area 630 for virtually every B season and in most A seasons.

Voluntary CSPs also develop due to market factors. A CSP might be necessary when the timing of the groundfish trawl fishery conflicts with Central GOA salmon processing (the salmon fishery often remains open and active when the pollock C season opens on August 25). When a race for fish does not exist, CSPs might occur so that the fleet can work with processors to provide better fish grades and improved product quality. The fleet and processors have an interest in avoiding small fish, which have been numerous on the grounds due to a large 2012 year class. CSPs allow vessels to target pollock with higher roe content, and allow processors to work with vessels to develop delivery schedules that result in higher product quality. CSPs also increase the profitability of each delivery. Some fleets and their affiliated processors prefer straight pollock deliveries, while others encourage mixed landings where pollock, Pacific cod, and flatfish are delivered together. Processors that desire mixed deliveries allow longer trip durations so that vessels can maximize catches of high-valued MRA species such as skates and sablefish. Vessels making mixed deliveries might make fewer directed pollock trips than they would if they were in a race for fish, but have decided that the higher value of mixed trips are a reasonable trade-off.

[101] "CSP" indicates a catch share agreement was implemented for that area/season with 100% consensus.

Table 2-1 Kodiak pollock voluntary catch share plans for Area 620 and Area 630, by season, 2010 through 2016

Year	Regulatory area 630			
Season	A	B	C	D
2016	Race	Race	CSP	CSP
2015	CSP	CSP	CSP	CSP
2014	CSP	CSP	CSP	CSP
2013	CSP	CSP	CSP	Race/CSP
2012	CSP	CSP	CSP	CSP
2011	CSP	CSP	CSP	CSP
2010	Race/CSP	CSP	Race	Race/CSP

Year	Regulatory area 620			
Season	A	B	C	D
2016	Race	Race	CSP	Race
2015	CSP	CSP	CSP	CSP
2014	CSP	CSP	CSP	CSP
2013	Race	Race	CSP	Race/CSP
2012	Race	Race	CSP	CSP
2011	Race	Race	CSP	CSP
2010	Race	Race	Race	Race

Organizing voluntary agreements has frequently been challenging, and requires a significant amount of trust within the fleet, between the fleet and NMFS, and in AGDB who monitors compliance with the agreements to the extent possible. The vast majority of the fleet complies with the agreements, but there are always individuals looking to bend the rules to their favor. Voluntary CSP's have been, and continue to be, uncertain and fragile.

The four biggest hurdles for developing voluntary CSPs are: (1) how to allocate the fish; (2) how to develop a closed class of participants for the fishery; (3) how to set and meet bycatch objectives; and (4) how to get 100% consensus from the participants. Building structure around each of these provisions creates opportunities for gaming the system.

The first and foremost challenge is the self-reported vessel tanking capacities that are included in the agreements and used to allocate individual pollock quotas and associated Chinook PSC limits. Any vessel that packs 300,000 pounds or more is limited to the regulated daily pollock trip limit of 300,000 pounds. All other vessel tanking capacities are self-reported. It is well known across the fleet that certain vessels have inflated their self-reported capacity, which allows them to receive a larger pollock and Chinook PSC allocation. There is no way to hold these vessels accountable due to the voluntary nature of the CSPs.

The second hurdle is the development of a closed class of participants. There are 97 trawl CV LLP licenses that can be used to fish in the CGOA, but the typical fleet size is usually around 40 vessels per fishing season. Methods used to control over-capitalization of the fishery and prevent redistribution of the pollock fishery across non-historical participants via new vessel entry include requiring vessels to be in the position to fish at or near the start of the fishery, requiring vessels to catch their own allocation of pollock (no catching or leasing pollock that was allocated to a different vessel), and requiring a vessel to demonstrate that it has a market for its catch. Each of

these provisions can be manipulated to benefit an individual vessel. Three examples of manipulating the CSP are described below:

1) *Fishing start "drop-dead" date:* Even though vessels agree to be in the area ready to fish by a designated date or on their way to the grounds by that date, this has proven to be a gray area exploited by some vessels wishing to participate in more than one area during the same season ("double dippers").

2) *Active participation requirements of harvesting vessels: under- and over-harvest of vessel allocations:* Vessels are polled at certain agreed upon dates during the season to assess whether or not they intend to catch their full allocation. Quota that is not expected to be caught is reallocated to actively participating vessels. Some vessels insist that they will catch their quota by the closure date when it is apparent to most that they are not able to do so. These vessels' unharvested quota remains in the water.

   Overages occur for individual vessel allocations for a variety of reasons: efficiency (they would rather deliver a full trip), clean-up trips where vessels aggregate partial trips, and cases where vessels intentionally catch a different vessel's allocation even though the rules prohibit this. These latter instances occur when a vessel is inefficient and cannot catch its allocation before the fishery ends, or when a vessel breaks down and is unable to catch its own allocation or the vessel leaves the area with some quota left unharvested. The agreements state that any money for pollock caught in excess of a vessel's allocation shall first be covered by another vessel in the same processor fleet (voluntary co-op) at 100% ex-vessel value; if the co-op exceeds its allocation then the ex-vessel funds will be donated to a non-profit organization of the vessel's or co-op's choosing. There is no way to monitor compliance to this provision in the agreements.

3) *Unanticipated effort enters the fishery:* Even though the agreements work to develop a closed class of participants, there is no certainty that new vessels will not join the fishery. In 2012, unanticipated effort by some Western GOA vessels in the Area 620 pollock fishery forced an early closure and caused the Area 620 C season quota to be exceeded by 2,100 mt. The voluntary CSP fell apart and CSP vessels raced to catch their allocation before the fishery closed, resulting in increased Chinook salmon PSC and the seasonal pollock quota being exceeded.

The third hurdle is setting and meeting bycatch objectives that work to minimize Chinook PSC to the extent practicable and allow the available pollock quota to be harvested. Individual vessel incentive measures include:

1) Each vessel receives a pro rata share of the pre-determined seasonal Chinook PSC limit based on its pollock allocation. Each vessel's individual fishing behavior is controlled in some way by its bycatch allocation.
2) Individual vessel performance standards and consequences for poor vessel performance to mitigate impact to the processor's co-op fleet are determined at the voluntary co-op level. There is no requirement to define or share these standards and consequences.
3) If a co-op exceeds its co-op amount of Chinook salmon PSC then the vessels within that processor fleet group agree to stand down for three days of pollock fishing. Compliance for this provision is unknown since no co-op has ever exceeded its allocation.
4) Processor fish ticket counts are used to monitor each individual vessel's bycatch behavior by trip, and the overall processor fleet's performance.
5) Chinook hot spot reporting is required based on a predetermined Chinook delivery limit as the trigger for an alert. Ninety percent of the fleet complies and reports complete information, whereas it is difficult to

get the required information from the other ten percent. There are no consequences for poor or non-reporting, and no authority to issue closures for hotspots. During the fall 2016 seasons, 45 hotspot notices were issued, and the fleet's feedback to AGDB was that vessels continued to fish in those hot zones with no repercussions.

The fourth hurdle is getting 100% consensus for each agreement (recall there are 4 pollock seasons and two management areas, so up to eight of these agreements are hashed out every year during fleet meetings in Kodiak):

1) Fleet meetings needed to implement (or not) a CSP can be contentious and it is sometimes necessary to meet 8-9 times prior to a season in order to come to an agreement (or not).
2) Special considerations to accommodate a single hold-out who refuses to sign the agreement. There is no agreement if 100% consensus is not reached. One hold-out has prevented the implementation of a CSP on several occasions.

Pacific cod:

Pacific cod is allocated to each gear sector and operational mode via the Gulf of Alaska cod sector split which became effective in 2012 (Amendment 83). Each sector receives an allocation of Pacific cod for the A and B seasons. The A/B split was effective in 2001 when the new SSL protections measures were put in place. For trawl gear the directed fishery seasons are January 20 to June 10 (A season) and September 1 to November 1 (B season). The seasonal split of Pacific cod has created challenges for the trawl sector, forcing 40% of the annual catch limit out of the high catch-per-unit-effort (CPUE) spawning aggregations (A season) into low CPUE non-spawning time periods (B season). High cod CPUE translates to lower halibut bycatch rates and lower halibut mortality while low CPUE usually results in higher halibut bycatch rates and increased halibut mortality.

In 2004 and 2005, the trawl sector exceeded the 2,000 mt annual halibut limit by 824 mt (2004) and 108 mt (2005). This occurred in part because it took time for observer data to be processed and fed into NMFS's inseason tracking of halibut bycatch. To prevent a reoccurrence, beginning in 2006, the trawl sector was managed with 12 hour openings to allow observer data to be processed in between openings ("pulse" openers with stand-downs ranging from five to 19 days, with an average of nine days). Since that time the Central GOA trawl fleet has focused efforts to improve fishery performance in the B season fishery so that NMFS could manage for more efficient elongated fishery periods. Industry-led efforts included the development of halibut excluders for use in the trawl Pacific cod fishery through an EFP and which are currently in use by many vessels (2006 and 2007), coordinating pulse openers with NMFS (2006 through 2012), and PSC monitoring where observed vessels report their observer data from the fishing grounds to AGDB to allow for improved inseason bycatch monitoring (2013 through 2016 for halibut PSC, then expanding to Chinook salmon PSC for 2015 and 2016).

The Central GOA trawl fleet executed voluntary catch share plans (CSPs) for the cod B-season fishery in 2010, 2011, and 2012. In 2010 the fleet developed a plan because the cod quota was deemed too low to open without a NMFS-approved fleet agreement. In 2011, low halibut PSC availability after September 1 resulted in two two-day pulse fishing periods followed by a "platoon" fishery structure for the last 10 days of September, during which halibut PSC was voluntarily allocated to individual vessels and only a third of the fleet fished at any one time. This allowed the fishery to remain open for an extended period. In 2012, low amounts of available halibut PSC in the B season resulted in a voluntary allocation of both cod and halibut PSC to individual vessels during the month of October; that agreement was voided later in October due to the fact that vessels struggled to locate cod on the fishing grounds. To date, not voluntary CSPs have been formed in the Central GOA during the A season for trawl-caught Pacific cod.

Flatfish:
No voluntary CSP or fleet management measures have been implemented for the Central GOA flatfish fisheries. Observed vessel PSC rates are posted on the NMFS website and circulated to AGDB members via weekly GOA fishery updates.

Conclusion:
Overall, the Kodiak pollock CSPs have kept the pollock industry within pollock TACs and Chinook salmon PSC caps. The Central GOA pollock Chinook cap has not yet been exceeded since it was implemented in 2012. AGDB thinks that NMFS would attest to the fact that the agreements have worked in managing the pollock quotas and Chinook bycatch caps.

However, the agreements are tenuous and provide uncertain benefit as a long-term fishery management structure. The Central GOA pollock fleet is small. Individuals can identify "bad actors" within the agreement –those gaming the system to benefit themselves financially, at the detriment of the other players. Whereas the CSPs have generally become less contentious since 2010, resentment has been building towards the perceived unfairness of allocations based on inflated vessel hold capacities, the actions of the "double dippers," rule-bending in regard to active participation requirements, and inconsistent bycatch measures and the ability to police those measures. Growing ill will appears to be discouraging voluntary cooperation, and internal sentiment amongst the fleet suggest less willingness to sign agreements in the future.